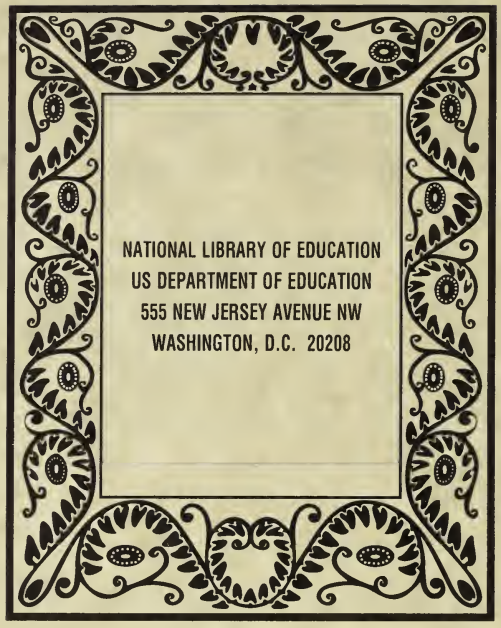
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Annual Report of the Secretary of the Interior



FOR THE FISCAL YEAR ENDING JUNE 30

1937


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A Night View of Grand Coulee Dam on the Columbia River Where the Bureau of Reclamation Is Building the World's Most Massive Structure of Its Kind.

ANNUAL REPORT OF THE SECRETARY OF THE INTERIOR



FOR THE FISCAL YEAR ENDING JUNE 30

1937

UNITED STATES

GOVERNMENT PRINTING OFFICE

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UNITED STATES DEPARTMENT OF THE INTERIOR

Harold L. Ickes, Secretary

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Annual report of the Secretary of the Interior



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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington.

MY DEAR MR. PRESIDENT: The reports of all agencies of the Department of the Interior which are herewith transmitted, demonstrate a new and lively national interest in the conservation of our land, water, and mineral resources which continued to be the principal activity and objective of the Department for the fiscal year ending June 30, 1937. It would appear that our citizens have adopted the concept that prudently conserved national resources can be made to produce a far higher standard of living for the country over a longer period if government is intelligent and energetic in enlisting our resources for such service.

Unprecedented demands made upon the Department are testimony that there exists in the United States today a better understanding of the conservation movement, with a wider appreciation of the long-range purposes of projects undertaken by your administration to protect our national heritage of wealth.

The facilities of the Department have been taxed to satisfy this healthy conception that has come to dominate national thought on certain phases of government. Fifteen million of our people in the past 12 months have availed themselves of the recreational resources administered by the National Park Service. The Bureau of Reclamation, although it is carrying on a program of hitherto unequalled scope, has been unable to meet the requirements of vast numbers of our people who seek the economic stability available through wise use of land and water. Officials of other units of the Department of the Interior report similar situations.

Energetic and faithful endeavors have been made by the members of the staff to follow the conservation tasks which have been assigned to us. A review of the reports of Bureaus and Divisions will demonstrate the progress that has been made since 1933.

SOME OUTSTANDING ACHIEVEMENTS

In a letter of transmittal, I cannot touch upon all of the many achievements, activities, programs, and plans of an organization as far reaching as the Department of the Interior, but I shall summarize a few of them. For instance:

Stabilization of the livestock industry, dependent upon the public range, is in sight. Progress beyond earlier expectations has been made under the Taylor Grazing Act and its amendments which increased the limitation on public grazing lands from 80,000,000 acres to 142,000,000 acres.

The largest program of construction in its history was carried forward during the year by the Bureau of Reclamation, with excellent progress being made in the building of the Grand Coulee Dam, the

principal engineering feature of the Columbia River Basin project. No Federal reclamation project was without water in 1936 and the total value of the crops produced on the 2,901,919 acres of reclamation land in 1936 was $136,502,480, which was $29,721,186 more than in 1935 and $36,713,477 more than in 1934.

The 1936 travel year in the national parks was the best on record with indications that the 1937 travel year will be even better. During the fiscal year increases in the national park and monument system brought the total number of areas from 135 to 140 and the total acreage from 15,496,808.34 to 17,086,671.31.

At the close of the fiscal year, 65 tribes had adopted constitutions and bylaws under the Indian Reorganization Act which were approved by the Secretary of the Interior. There was a marked increase in Indian initiative and management. Indians increased the use of their own lands for grazing, with a resultant growth of their livestock industry. The emergency conservation work was of fundamental importance in the revitalization of Indian life.

The Office of Education pioneered in the fields of conservation education, radio education, and public forums. Conservation is now being taught in a number of the schools and universities.

The market for contraband oil was virtually destroyed and the production of "hot" oil in east Texas was reduced to a fraction of 1 percent.

The Bureau of Mines continued to give valuable technical assistance to the oil industry with a view to prolonging the life of this irreplaceable resource. Other scientific studies were made during the year the results of which will be of great value to the mining industry and American business generally.

The Geological Survey continued its investigations of underground waters, so important in the drought-stricken areas; maintained technical supervision over more than 9,000 properties containing oil and gas, more than 600 containing coal, and more than 100 containing other minerals.

Improved economic conditions were reported from Alaska, Hawaii, Puerto Rico, and the Virgin Islands.

The Puerto Rico Reconstruction Administration, which is now a part of the Department of the Interior with the Secretary as Administrator, is making satisfactory progress in the rehabilitation of Puerto Rico.

LAND AND WATER USES

Primarily the work of the Department of the Interior is concerned with the custodianship of a vast national estate. The administration, protection, and prudent use of this land, our greatest natural resource, is today the chief function of this Department.

"When the topsoil is gone, men must go; and the process does not take long," said Theodore Roosevelt nearly 30 years ago. For the first time since 1908 we have in the seat of Government an administration that is giving actual heed to that warning.

There was a time when, under existing acts of Congress, the chief concern of the Department of the Interior was to dispose of public land and to encourage the exploitation of the vast mineral wealth that was to be found beneath its surface. This was the national policy and for the development of the country it was undoubtedly thought by all to

be a proper policy. But we are living in a new era. The Commissioner of the General Land Office takes cognizance of our new land policy. He points out that the work of the General Land Office has undergone a decided change in recent years. Conservation, rather than disposal, is now the dominant note in the administration of the public lands under existing laws.

While formerly the public lands were open range, subject to unrestricted grazing use, more than 110,000,000 acres of the 142,000,000-acre authorization have been included within grazing districts, and grazing leases have been issued under the supervision of the General Land Office regulating the use for grazing of approximately 5,643,000 acres outside of such grazing districts.

As of June 30, 1934, the date on which a computation was last made, the area of the unappropriated and unreserved public lands was approximately 165,695,479 acres, excluding Alaska, and not including small areas remaining undisposed of in several States. Of such lands 119,341,782 acres have been surveyed and 46,353,697 are unsurveyed. The area of the unappropriated and unreserved public lands in Alaska was approximately 346,174,242 acres, of which only 2,044,421 acres have been surveyed.

THE GRAZING PROGRAM

The Department's grazing regulation program in forwarding which we have the cooperation of the stockmen, moved forward on an enlarged basis. Just before the beginning of the last fiscal year the law was amended increasing the 80,000,000-acre limit of public lands to be included within grazing districts to 142,000,000 acres. The first 2 years of operation under the Taylor Act were largely organizational and educational while the fiscal year ended last June was marked by a decided enlargement of the program.

There was undertaken a definite program of wildlife conservation. Among other accomplishments were the determination of the proper relationship of the private and public lands involved, the study in range carrying capacities and the cooperative agreements with local stockmen and with the Federal and State agencies, having as their objectives the rehabilitation and preservation of the land.

A survey of the range, which was begun in March 1936, includes not only a determination of the carrying capacity and proper seasonal use of the land but also an examination of the private lands and water within these areas. It is believed that by 1940 we will have sufficient data to put all districts on a permit basis.

Range improvement allotments have been apportioned in accordance with the amounts of fees collected in grazing districts. These improvements consist of fencing; posting stock driveways; extermination of rodents, insects, and predatory animals; maintenance of water development, and construction of stock trails.

Parts of the range used partially or not at all in past years were made available for grazing largely through the conservation and equitable distribution of water. Dams were built to impound the water from mountain streams and to store the early run-off and check dams were constructed in dry creeks to arrest soil erosion during the wet seasons. Wherever they could be located, springs were developed, wells were sunk, and troughs and tanks were constructed.

In conjunction with the water program we opened truck trails into grazing regions and built stock trails to facilitate the movement of animals. More than 2,300,000 acres were covered in an extensive campaign against rodents and other pests.

As an important phase of the grazing administration, we instituted a four-part program of wildlife management which consisted of agreements with the stockmen and district advisory boards; range improvements through emergency conservation work; cooperation with the Bureau of Biological Survey of the Department of Agriculture in setting aside game ranges to be used jointly by domestic livestock and game, and State plans for wildlife such as those in New Mexico and Oregon.

There were issued 15,067 temporary licenses for 7,434,416 head of livestock during the year.

Enforcement of grazing regulations has been based on education and understanding. There have been comparatively few complaints. Only 607 applicants (about 4 percent) filed motions for review before regional graziers. In other words, 96 percent of the applicants were satisfied with the action taken by field officers.

Public opinion has crystallized in support of regulation of grazing on the public lands, which not only protects a priceless natural resource but ministers to the wellbeing of 2½ million people depending upon the cattle and sheep industry.

A RECORD IN RECLAMATION

The record in reclamation and irrigation is one of which I am particularly proud. The people of the West know of that record. An increasingly larger number of our citizens in other sections of the country now have a better understanding of the problems of the West and a truer conception of what the Federal Government, through the Bureau of Reclamation, is attempting to accomplish through the erection of dams and irrigation systems for the benefit of all of the people.

Having completed Boulder Dam, the operation of which controls the Colorado River, the Bureau of Reclamation is now engaged in building the Grand Coulee Dam which will make useful for power and irrigation purposes the turbulent waters of the Columbia River. Boulder Dam's first generator went into action on September 11, 1936 when the President pressed a button in Washington.

Grand Coulee Dam, 550 feet in height and containing 11,250,000 cubic yards of concrete, was the outstanding project under construction by the Bureau during the last fiscal year. Eventually it will make possible the irrigation of 1,200,000 acres of arid but fertile lands in the Columbia River Basin. It is estimated that the completed dam and appurtenant works will cost $119,000,000; the power plant $67,000,000 and the irrigation system $208,000,000. Revenues from power and from repayments by irrigation water users are expected to repay the cost of the project. In addition to the production of cheap power and its irrigation features, the Grand Coulee project will serve important functions in controlling floods and improving navigation on the Columbia River.

The construction contract for the foundation was 54 percent completed at the beginning of the fiscal year and 82 percent at the close

of the fiscal year. During the year more than 2,000,000 cubic yards of concrete were placed, a record of 13,002 cubic yards being made on June 24. The estimated cost of the foundation section is $62,900,000 and it is scheduled to be completed about the middle of the fiscal year 1938. Progress during the year was many months ahead of schedule. An average of 6,000 men was employed at the site of construction during the year. Possibly two and a half times as many more were employed indirectly in the manufacture and transportation of equipment and materials.

Work also has proceeded satisfactorily on the Central Valley project in California, another major undertaking, designed to regulate the flow of both the Sacramento and San Joaquin Rivers. The principal construction features of this project include the Shasta Dam, built of concrete masonry, 450 feet high, storing about 4,500,000 acre-feet of water, and a powerhouse with an initial capacity of 280,000 kilowatts, and an ultimate capacity of 350,000 kilowatts.

The Reclamation Bureau reports that since 1906 the grand total of crop revenues from reclaimed land is $2,311,783,232, which is approximately 10 times the cost of the Federal irrigation works serving the land. In 1936, the return to the farmer on these projects for each acre was two and one-half times that received by the average farmer the Nation over.

The Bureau carried forward the largest construction program in its history, with new records set in construction of all the types in which it engages. Six major dams were begun, making 18 storage dams and 3 diversion dams under construction. Pine View Dam, Odgen River Project, Utah, was completed and placed in service.

During the fiscal year construction work was in progress on 35 projects in 13 States. The Bureau constructed 249 miles of canals; 134 miles of drains; 14 tunnels of a total length of 49,393 feet; 222 miles of roads; 2.4 miles of railroad; 34.5 miles of transmission lines; 4,739 canal structures; 383 bridges; 851 culverts; 46 miles of pipes and 192 flumes; 2,065,006 cubic yards of concrete went into dams, together with 3,553,870 cubic yards of earth and 536,180 cubic yards of rock fill. Excavations consisted of 43,858,688 cubic yards of earth and rock.

There are tables included in this report which show that the population of farms and towns served by Federal reclamation projects exceeded in 1936 that of any previous year. There were 210,466 persons living on farms and 653,441 persons in towns on the projects. In the same areas were 859 schools and 996 churches. As an indication of a returning prosperity, total bank deposits of $226,903,747 were reported.

ANTI-LAND-SPECULATION ACT

Before I leave the very excellent record of the Reclamation Service, I wish to direct attention to the act of Congress to curb speculation in the lands adjacent to the Grand Coulee Dam project which was enacted on May 27, 1937. This was one of the most important pieces of legislation bearing on Federal Reclamation during the past year. By this measure there was written into the law dealing with the Columbia Basin development provisions which had been covered by departmental regulations on other projects since 1926. The purpose of the act is to assure settlers and home seekers of the opportunity to

acquire land at its value before the expenditure of Federal funds on the project. The act requires ratification by the State of Washington and the negotiation of repayment contracts before construction can proceed beyond the completion of the Grand Coulee Dam.

The operations of the Bureau of Reclamation over a period of 35 years have resulted in the construction of 138 storage and diversion dams; 24 powerhouses; 2,344 buildings; 19,116 miles of canals, ditches and drains; 72½ miles of tunnels; 4,367 miles of telephone lines; 267 miles of dikes and levees; 6,041 flumes; 18,694 culverts; 13,166 bridges; and 182,964 other irrigation structures.

PARK AREAS INCREASE; TRAVEL RECORD MADE

Another agency of the Department of the Interior that deals with the preservation of our natural resources is the National Park Service.

At the end of the fiscal year there were 26 national parks, 2 national historical parks, 72 national monuments, 11 national military parks, 8 national battlefield sites, 8 national miscellaneous sites, 11 national cemeteries, and 1 national parkway under the jurisdiction of the Department of the Interior. By Executive order there were transferred to the Park Service 46 recreational demonstration areas from the Resettlement Administration.

The national park system embraced 17,086,671.31 acres, a gain in one year of 1,594,733.43 acres.

One of the outstanding achievements in national legislation affecting the parks was the enactment of the bill which saved thousands of acres of the dwindling supply of the rare, giant sugar pine trees bordering the western boundary of Yosemite National Park.

The Department is availing itself to the fullest possible extent of the powers granted under the legislation which, to our way of thinking, represents true conservation both theoretical and applied. We are delighted at the opportunity to serve in assisting the Congress and the President in assuring the preservation of these trees from the destruction which threatened them.

The authorization for acquisition covering 7,200 acres includes 6,700 acres which were owned by a private lumber company which was preparing to turn the two- and three-century-old trees into lumber leaving only the desolate, sheared-off stumps as a memorial to despoiled nature. There is no opportunity anywhere else in the world to preserve as magnificent an example of virgin sugar-pine forest as exists in this one place.

Amicable relations with Mexico were strengthened through the cooperation of the National Park Service in connection with studies and investigations with respect to the proposed Big Bend National Park in Texas. Tentative boundaries of the proposed park were agreed upon at joint sessions of the commissions representing the United States and the Government of Mexico. The plan is to establish an international park linked by a bridge across the Rio Grande River at Boquillas.

Under the Service's recreational demonstration program 47 organized camp grounds were under construction in 24 areas, of which 15 were completed in time to be put into use during the 1937 summer season.

There was begun a Nation-wide study of park, parkway, and recreational area programs in the United States with a view to setting up a comprehensive plan to serve as a guide to the States and as a basis upon which future cooperation will be extended. Increased consideration was given to the regional method in developing and administering park areas.

More than 4½ millions of persons were contacted during the fiscal year as a result of the educational program of the Park Service which consists of campfire circles, hikes, attendance at park museums, and lectures by ranger-naturalists and historians.

Progress was reported in archeological and historical conservation. The number of historical and archeological sites authorized or established under the National Park Service was increased to 100.

Travel in the national parks reached a new high level during the 1936 travel year which ended on September 30 and an all-time high of nearly 15,000,000 visitors was attained during the past travel year.

The United States Tourist Bureau, a national clearing house of information on recreational and travel opportunities in the United States, territories and insular possessions, was established by the National Park Service in New York City. This bureau cooperates with the States, Territories, and insular possessions, and transportation and travel agencies in assembling and disseminating tourist information. One of its purposes is to promote abroad an interest in travel to and within the United States.

INDIANS ADVANCE CONSERVATION

No discussion of conservation would be complete without adequate recognition of the splendid work done by the Indian Service and of the accomplishments of the Indians themselves.

In his annual report to me the Commissioner of Indian Affairs says that the conservation program has been put ahead at least 20 years by the Indian Service's program of activities in soil erosion control, water development, etc.

Under the Indian Reorganization Act, there has been a marked improvement in the economic status of the Indians. They have increased the use of their own lands for grazing with a consequent growth of their livestock industry. Livestock cooperatives increased from 55 in 1935 to 119 in 1936.

Indian education also is on the upgrade. There was noted an increase in Indian day-school enrollment from 4,532 in 1928 to almost 12,000 in 1937. During the same time the number of Indian pupils in public schools grew from 34,163 to 50,328. There were 37 new day schools during the last 2 years. There also was a greater interest in secondary education, with a substantial attendance increase, taxing capacity, expected next year.

The problem of the Indian continues to be that of land. In 1887 when the General Allotment Act was passed 130,000,000 acres of land were held in trust for Indians. In 1933, when the present administration came into power, only 49,000,000 acres of the poorest land remained. At the close of the last fiscal year there was a total of 52,650,000 acres of Indian lands with additional purchases pending.

Sixty-five tribes, with a population of 86,238 as of last June 30 had adopted constitutions and bylaws under the Reorganization Act which

were approved by the Secretary of the Interior. Since this report was compiled, 71 tribes have adopted constitutions.

PETROLEUM CONSERVATION

The Connally Act, which prohibits the shipment in interstate and foreign commerce of petroleum and its products that are produced in violation of State law, was extended on June 14, 1937, to June 30, 1939.

It has been necessary to establish but one tender board, that in the East Texas field. Should the need arise, additional boards may be established by the President. The law is effective, however, in other fields although the tender system is not employed. The need for a tender board in the east Texas field is evident when the magnitude of the area is understood. This field contains more than 130,000 acres of productive territory in which 23,000 oil wells were producing in June 1937. This field produces about 15 percent of the national crude oil output. When it was discovered in 1930, it contained at least one-quarter of the oil reserves of the entire United States.

During the fiscal year the reported production of crude oil in east Texas was 160,717,784 barrels of which 92 percent were shipped on Federal tenders. Although only 8 percent of the crude oil is refined in the field, the petroleum products, including casing-head gasoline and butane, moving on Federal tenders totaled 23,233,000 barrels during the year.

The Government and the State of Texas have worked together in east Texas in the prevention of waste, with the result that the ultimate productive capacity of the field has been greatly extended. It has been estimated that the recoverable oil from this field has been increased by 30 percent or 600 million barrels, which would be equal to the discovery of 60 average-sized oil fields, through Federal and State Government cooperation. The market for contraband oil has been virtually destroyed and the production of "hot" oil in east Texas has been reduced to the vanishing point.

BUREAU OF MINES

The Bureau of Mines has given valuable technical assistance to the oil industry that is designed to prolong the producing life of wells through the application of better engineering practices and by estimating the probable life of wells by working out the relationship between the rate of fluid production and the pressure drop in the producing formation. The Bureau also has given advice in order to avoid waste in transportation and storage.

The petroleum industry as well as State regulatory bodies realizes that the difficult problem of oil- and gas-well spacing is one of major importance. Knowledge as to how wells should be spaced in order to assure maximum recovery through prolonged flowing is far from perfect. A study of present-day conditions that would show the fallacies of ruthless offset drilling would aid greatly in conserving the country's oil reserves.

The Bureau has continued to issue monthly forecasts of demand for petroleum products, thus assisting State commissions in their efforts to control production.

No one knows when it will come, but most experts foresee a day when our petroleum reserves will begin to fall and prices begin to rise. In anticipation of this, the Bureau of Mines has been operating a continuous hydrogenation plant at its Pittsburgh station to test the adaptability of various domestic coals to the process. The Bureau reports that Great Britain, Germany, France, and Japan are preparing to supplement their inadequate petroleum stocks with gasoline obtained by the hydrogenation of lignite, tar and bituminous coal.

The Bureau of Mines has continued its research for methods for making America self-sufficient in strategic minerals, particularly those of importance in warfare. Development of an electrolytic process for recovering pure metallic manganese gives hope that this country may be able to produce all that may be required of that important metal. The treatment of pegmatite tin ores is another metallurgical enterprise which, if successful, may make it possible for the United States to produce at least a part of its tin supplies now obtained from abroad.

Of late the scrap metal industry has attracted considerable attention. At one time exports attained proportions that many considered alarming. Because of the interest in this industry the Bureau, in addition to the seven nonferrous metals ordinarily included in the annual surveys of secondary material, made consumption studies of iron and steel scrap. The canvass of the use of primary and secondary tin was resumed at the request of tin consumers.

The Bureau has developed a cheap method of concentrating low-grade spodumene ore, one of the principal sources of lithium salts, that promises to help the establishment of a paying industry in the South. Spodumene occurs in large quantities in North Carolina.

Smelting companies and city governments showed a keen interest in a device for precipitating solids from air or other gases, which was developed by the Bureau on a laboratory scale and which was demonstrated successfully on a number of occasions.

The Department was called upon for technical advice following the destruction of the airship *Hindenburg* and the gas explosion at the New London, Tex., school. Experts on explosions, helium, natural gas, and safety collaborated in studies to determine the cause of the school explosion. Since that catastrophe, other communities have asked the Bureau of Mines to make similar studies of schoolhouses and other public buildings.

The Director of the Bureau of Mines points out that the number of nonmetallic minerals is so great and the variety of things that might be done with them by using cheap electric power is so numerous, that a study of the problem is urgently needed.

The Director also recommends that two additional wells be drilled in the Government-owned helium-bearing structure at Cliffside, Tex., and that one of the existing wells, which is in faulty mechanical condition, be repaired. This is necessary to meet an anticipated increase in the demand for helium for commercial and medical use.

Since the end of the fiscal year, the act authorizing the conservation, production, and exploitation of helium gas, a mineral resource pertaining to the national defense, and to the development of commercial aeronautics, was amended in many important respects by the act of September 1, 1937.

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The Secretary of the Interior will render to Congress on or before the first day of January of each year a report showing the status of the helium production fund. The National Munitions Control Board shall include in its annual report to the Congress full information concerning licenses issued, together with such information and data collected by the Board as may be considered of value in the determination of questions related to the exportation of helium gas.

MINE SAFETY WORK

During the years immediately preceding the creation of the Bureau of Mines there were on an average each year 17 mine disasters resulting in 562 fatalities. During the past fiscal year there were only 6 major catastrophies from which 56 deaths resulted. Training courses conducted by the Bureau teach men how to treat injuries and what to do in emergencies. Inspections, recommendations for improvement of practices at mines, first-aid meetings, and other means of promoting education and safety among the 2,000,000 employees of the mine industry have contributed to the conservation of natural resources, to the preservation of life, and to the prevention of suffering.

FINDINGS AND STUDIES OF THE GEOLOGICAL SURVEY

The Geological Survey during the year made more than 9,000 findings of technical facts regarding the mineral resources, water power, or storage possibilities of public lands. Surveys of underground waters were continued. Much of this work was done in cooperation with the States and 75 reports on this subject were released for public use. Drought and flood studies were continued and the measurement of stream flow was maintained at 3,379 stream-gaging stations.

The Survey made more than 4,500 tests of mineral and rock samples and in excess of 2,200 chemical analyses were completed. More than 14,500 square miles of new areas were surveyed topographically, which will result in 102 contour topographic maps in 36 States and in Puerto Rico. In addition, by the aid of aerial photography, 4,780 square miles were surveyed in five States for the production of planimetric maps without contours.

Fifty-seven books of the Survey's regular series, dealing with geology, mineral resources, and water supplies, were issued during the year and about 673,000 copies of 296 topographical and other maps were printed. A geologic map of Texas was completed. The United States is now 47.4 percent mapped, the fiscal year's increment amounting to 0.3 percent.

Fifty-nine geologic parties were in the field in 33 States during the year. Work was begun on several new projects, including studies of areas in Idaho, Arizona, the Big Horn Basin in Wyoming, and the Ohio River flood.

The Conservation Branch added 100,699 acres to the outstanding water power reserves, making a total net reserve of 6,583,439 acres.

Two deposits of activable bleaching clay are now in commercial production, largely as a result of studies and tests in the laboratories of the Geological Survey. This investigation, according to the Survey's report, led to a rationalization of the operation and other

deposits found may eventually result in a more economical use of the raw materials available.

The Chief of the Conservation Branch reports a loss of revenue because of insufficient appropriations to provide adequate supervision of operations under the mineral leasing activities on the public domain. It was pointed out that there were 85 operating properties under leases on the public domain upon which production increased between 5 and 10 percent during the year, resulting in increased revenue to an aggregate total of $6,300,000.

The Conservation Branch complains that, as in other years, as the result of inadequate appropriations, revenue far in excess of the appropriation asked for has been lost because of inability to make timely inspections of field properties and to assure that operations were conducted so as to accomplish the greatest ultimate production and effective current beneficial use of the mineral resources involved.

MORE SCHOOLS TEACH CONSERVATION

The Office of Education organized a service in conservation during the year in addition to its activities in public forums and radio education. There has been considerable demand for consultative service and for teaching materials on the subject of conservation and the Commissioner of Education reports that conservation education is gaining ground rapidly.

Conservation is being included with increasing frequency in the curricula of elementary and secondary schools, especially in connection with courses in science and social studies. Also, in the universities, the study of natural resources is more and more pointed toward conservation. A conference of leaders in the conservation field was held in Washington last June.

The increase in secondary school enrollments for the first time brought high-school graduates to more than a million for the fiscal year.

Among the significant trends noted in rural education was the abandonment of a large number of one-teacher schools in favor of larger centralized schools. The number of one-teacher schools has been reduced by 10,169 in 4 years. During the same period the number of rural schools offering high-school work was increased by 883, or 5.3 percent, but the number of children attending high schools in rural communities was increased 764,513 pupils, or 53.2 percent. The increase in the number of consolidated schools was due to the construction program of the Public Works Administration.

The salary scale of rural teachers was less encouraging. During the 4-year period rural teachers' salaries were cut approximately 20 percent while those of city teachers were cut about 10 percent.

The Office of Education reports a steady improvement in conditions in higher education. Full-time enrollments were up 6.5 percent and total enrollments increased 7.5 percent. Salaries in most colleges and universities were restored to normal levels.

Five national educational projects, begun with emergency funds, were continued, as follows: (1) Study of local school administrative units; (2) surveys of vocational education and guidance of Negroes; (3) educational radio project; (4) cooperative university research project; and (5) public-affairs forum project.

More than 400,000 listeners responded by letters to the Office of Education, showing their interest in the series of educational broadcasts during the year.

BRIGHT OUTLOOK FOR TERRITORIES AND ISLANDS

Economic conditions in the territories and island possessions showed marked improvement. With the aid of Federal emergency funds, construction programs not only aided employment but created necessary and useful public facilities in Alaska, Hawaii, Puerto Rico, and the Virgin Islands.

An important development in Puerto Rico was the purchase by the Government of the Ponce Electric Co. at a total cost of $1,082,431.41. This will permit the distribution of additional power at a fair price.

In the Virgin Islands the improvement and extension of the Blue Beard Castle Hotel, a continuation of the homestead program, and the construction of roads were among the major developments of the year.

The Alaska Legislature appropriated $400,000 for roads and airfields, passed acts creating a Territorial planning council and aeronautics and communications commission. Social security legislation and new tax schedules for mines and mining were adopted.

The Alaska Railroad deficit, $172,065, included expenditures of $174,588 for the operation of vessels from Seattle to Alaskan ports during the maritime strike and $7,449 for investigations of the mineral resources of the Territory. Based on normal operations expenses, the road would have shown a profit of $9,971.

Alaska's budget was in balance for the biennium of 1937–39. The deficit in the general fund beginning the 1933–35 biennium was $1,527,944.49. At the close of 1937 there was a surplus of $1,315,133.51.

The commerce of Hawaii showed a substantial increase, the total value of exports and imports, $219,639,784, was an increase of more than $35,000,000 over 1935.

The population of Hawaii during the fiscal year increased 3,458, making the total population 396,715, of whom 310,956 are American citizens.

A "LITTLE NEW DEAL" FOR PUERTO RICO

As a result of the widespread and varied activities of the Puerto Rico Reconstruction Administration, this island possession is making rapid economic recovery. The reconstruction program is checking certain economic tendencies among which are the concentration of land in fewer hands, the concentration of population in urban areas, absentee ownership of important property, one-crop farming, and poor health conditions.

To meet these problems the Puerto Rico Reconstruction Administration is pushing forward a comprehensive recovery program including rural rehabilitation; land purchase and resettlement; crop diversification; reforestation and soil erosion control; development of hydroelectric power; rural electrification and irrigation; extension of agricultural and vocational education; expansion of the university; and establishment of health centers and housing, including low-cost and slum-clearance projects.

The Puerto Rico Reconstruction Administration has been reorganized since the close of the last fiscal year. The President, by executive order, placed it within the Department of the Interior and designated the Secretary of the Interior as Administrator.

COOPERATION OF CIVILIAN CONSERVATION CORPS

I wish to record my appreciation of the splendid work that has been done by the Civilian Conservation Corps. With the cooperation of this fine organization the Department's conservation program has been put forward many years.

During the fiscal year, the National Park Service supervised the work programs of 91 C. C. C. camps in national parks and monuments and 353 camps in Federal, State, county, and municipal areas. The Park Service also was responsible for camp management and work supervision over 800 enrollees in Hawaii and 400 in the Virgin Islands.

There were 45 C. C. C. camps assigned to the Division of Grazing during the fiscal year. The work projects of these camps in nine States were recommended by the advisory boards of the grazing districts in which the camps were located.

There was an average of 34 C. C. C. camps in operation on reclamation projects engaged in the reconstruction of distribution systems, rodent control work, weed eradication, and forest-fire- and flood-control work.

There were also 6,387 Indian enrollees engaged in conservation work on 69 Indian reservations.

The Civilian Conservation Corps educational program of the Office of Education was considered an essential part of the entire Civilian Conservation Corps program. During the year this program was extended to include 90 percent of all of the enrollees and there were improvements in the educational activities and the instruction offered.

NEW INTERIOR DEPARTMENT BUILDING

The Bureaus and Divisions of the Department began to move into the new Interior Department Building last January and the flag of the United States was flown from its masthead for the first time on January 20, 1937. The new office facilities have greatly increased the morale and efficiency of the staff and employees.

A DEPARTMENT OF CONSERVATION

I again renew my recommendation that the name of the Department be changed to that of the Department of Conservation.

Under the present administrative set-up the public domain, in general, is administered by the Department of the Interior which, for many years, has been preeminent in conservaton. If that policy is to be followed seriously, as self-preservation demands, this Department furnishes the natural agency within which to concentrate conservational activities.

The President's Committee on the Reorganization of the Executive Departments has stated that conservation represents a major purpose of our Government. It also recommended the creation of a Department of Conservation to replace the Department of the Interior.

Legislation to carry this recommendation into effect is pending before the Congress.

The personnel of the Department, trained in conservation work and guided by the conservation ideals which have been so clearly set forth by the President, joins me in urging the early enactment of this important legislation—important to a proper reorganization of the Government and economically important to the people of the United States.

Very respectfully,

HAROLD L. ICKES,
Secretary of the Interior

THE PRESIDENT,
The White House.

BUREAU OF RECLAMATION

John C. Page, *Commissioner*

SEVERE drought over the Great Plains area and part of the West during the summer of 1936 again made the Federal reclamation projects oases within vast fields of desolation, serving anew to emphasize the value of well planned water conservation undertakings in the arid and semiarid regions.

Areas protected by adequate water storage reservoirs and canal systems suffered little. In many counties dependent upon dry farming 95 percent of the taxes were in default. Adjacent counties which included irrigated lands had tax delinquencies amounting to 5 percent or less of the total. This striking illustration of the manner in which Federal reclamation developments serve to strengthen and stabilize local governments demonstrates also one of their major services to the Nation.

No Federal reclamation project was without water in 1936, and none suffered major crop losses. It was a year of prosperity in all of these areas.

DEMAND FOR NEW LANDS

The heavy demand for new irrigable lands was sustained throughout the year. More than 100,000 farm families have been dislodged by drought from their homes in the Great Plains alone. The greater number of these families have moved on west, looking for new opportunities on irrigated lands where stored water and canals will protect them in the future from the disaster which had befallen them.

In addition to these, many others sought new lands. Some of these were recruited from those with farm backgrounds who were participating in the "back to the land" movement. They were leaving cities in search of more promising opportunities. Others were among those who had exhausted their resources on poor lands in various sections of the country. Still another group of home seekers was made up of young men and women who have come to maturity in homes founded on the irrigated lands of the West.

In the semiarid and arid West where irrigation is essential to safe agriculture, all of these hopeful homeless people look toward the irrigated districts to provide them with the opportunities they seek. Except for the new lands for which the Bureau of Reclamation was prepared to supply water for the first time, there were few farm sites available. During this year the Bureau had only a few thousand acres ready. These were rapidly settled.

It is estimated that the young men and women from other irrigated areas of the West who are now looking for places to make homes for themselves are more numerous than the offerings of new farm units which the Bureau of Reclamation can make for several years.

This situation recommends as a wise policy the early completion of several projects and divisions of projects which are now in construction and which will provide water for the irrigation of new lands.

Throughout the year construction went forward as rapidly as possible with the funds available on 10 projects which will increase the productive area as follows:

The Gila project in Arizona, which will make available on completion 150,000 acres of new land, nearly all of which is public land.

The All-American Canal in California, including the Coachella Branch, when completed will provide water for 525,307 acres, mostly public lands.

The Payette division of the Boise project in Idaho, 51,442 acres.

The Greenfields division of the Sun River project in Montana, 20,000 acres.

The Tule Lake division of the Klamath project on the Oregon-California border, 12,809 acres.

The Owyhee project in Oregon, which is partially complete, but where the irrigation facilities for 47,800 acres remained to be constructed.

The Roza division of the Yakima project in Washington, 72,000 acres.

The Kendrick project in Wyoming, which will serve 39,793 acres.

The Heart Mountain division of the Shoshone project in Wyoming, 41,000 acres.

PROSPECTS GOOD FOR 1937

At the end of the fiscal year, going into the 1937 irrigation season, drought conditions still prevailed in parts of the West. Generally, however, storage reservoirs were well-filled and the lands of Federal projects amply protected. Prospects were bright for a good year on the projects.

Lake Mead, the reservoir created by Boulder Dam, continued to fill. At the close of the fiscal year, it contained 15,000,000 acre-feet and was filled nearly to half of its capacity. Sufficient water was on

hand and in reserve to serve the irrigators of the Yuma Federal reclamation project and the Imperial Valley and other downstream irrigation projects for 3 years.

CONSTRUCTION PROGRAM

The largest program of construction in its history was carried forward during the year by the Bureau of Reclamation, with new records set in construction of all types in which the Bureau engages.

During the year 6 major dams were begun, bringing to 18 the number of storage dams and to 3 the number of diversion dams now under construction. In addition, the Pine View Dam on the Ogden River project in Utah, was completed and placed in service.

This brought to a grand total of 138 the number of storage and diversion dams which have been begun and completed by the Bureau of Reclamation since its origin in 1902. Of these, Shoshone, Arrowrock, Owyhee, and Boulder Dams each were, at the time of their completion, the highest in the world, and Boulder Dam with a height of 726.4 feet holds the record at this time.

The Bureau's construction program has been accelerated by emergency fund allotments and by appropriations. Since 1933, in 4 fiscal years, a total of $226,786,000 has been made available for construction by the Bureau of Reclamation. Of this amount, $96,254,000 was allotted from Public Works Administration funds; $61,922,000 was allotted from emergency relief funds of 1935, and $68,610,000 has been appropriated directly by the Congress.

The following table shows the source of funds and the amounts made available for the individual projects during this time:

Appropriations and Allotments for Construction and Investigations, 1934–37

State and project	Public Works allotment	Emergency Relief allotment	Appropriation, 1937	Total
Arizona:				
Gila	68,000	1,800,000	1,250,000	3,118,000
Colorado River-Indian	25,000			25,000
Salt River	200,000	3,500,000	1,500,000	5,200,000
Yuma	80,000			80,000
Verde—Investigations	127,500			127,500
California:				
All-American Canal	9,000,000	10,000,000	[1] 6,500,000	25,500,000
Central Valley		4,500,000	6,900,000	11,400,000
Klamath-Tule Lake	25,000	135,000		160,000
Colorado:				
Blue River-South Platte	175,000			175,000
Western slope surveys	150,000			150,000
Denver office quarters	20,000			20,000
Colorado-Big Thompason	150,000			150,000
Pine River			1,000,000	1,000,000
San Luis Valley	2,000			2,000
Uncompahgre	2,725,000			2,725,000
Grand Valley			200,000	200,000
Eastern slope surveys	100,000			100,000
Idaho:				
Boise-Drainage	9,000		160,000	169,000
Boise-Arrowrock		600,000		600,000
Boise-Payette		700,000	1,000,000	1,700,000
Minidoka-Gooding	26,000			26,000
Upper Snake River	2,250,000			2,250,000

[1] General Treasury.

Appropriations and Allotments for Construction and Investigations, 1934–37—Continued

State and project	Public Works allotment	Emergency Relief allotment	Appropriation, 1937	Total
Montana:				
Bitter Root	100, 000	200, 000		300, 000
Buffalo Rapids	22, 500			22, 500
Frenchtown	200, 000	60, 000		260, 000
Chain Lakes Storage	1, 750, 000			1, 750, 000
Milk River	75, 000			75, 000
Sun River	950, 000	215, 000		1, 165, 000
Nebraska: North Platte Valley	25, 000			25, 000
Nevada:				
Humboldt	1, 200, 000			1, 200, 000
Truckee River storage	1, 000, 000			1, 000, 000
New Mexico:				
Rio Grande	200, 000			200, 000
Carlsbad		1, 000, 000	900, 000	1, 900, 000
Caballo Dam—Interior	625, 000			625, 000
Transfer from State	1, 500, 000			1, 500, 000
Conchas Dam surveys	30, 000			30, 000
New Mexico, Texas, and Colorado:				
Water resources, Rio Grande Basin—Interior	80, 000			80, 000
Transfer from national resources	60, 000			60, 000
Oklahoma: Altus project surveys	30, 000			30, 000
Oregon:				
Burnt River		600, 000		600, 000
Deschutes	56, 000		450, 000	506, 000
Grande Ronde	10, 000			10, 000
Klamath-Drainage	36, 000			36, 000
Owyhee	5, 200, 000	100, 000	200, 000	5, 500, 000
Stanfield	100, 000			100, 000
Umatilla River Surveys	8, 000			8, 000
Vale	1, 000, 000	340, 000		1, 340, 000
Birch Creek Canal	25, 000			25, 000
Texas: Colorado River		5, 000, 000		5, 000, 000
Utah:				
Hyrum	930, 000			930, 000
Moon Lake	1, 100 000	140, 000		1, 240, 000
Ogden River	3, 490, 000	500, 000		3, 990, 000
Provo River	800, 000		500, 000	1, 300, 000
Sanpete	375, 000			375, 000
Washington:				
Columbia Basin surveys		250, 000		250, 000
Grand Coulee Dam	15, 000, 000	19, 800, 000	[1] 20, 750, 000	55, 550, 000
Yakima-Kittitas	39, 000			39, 000
Yakima-Roza		2, 500, 000	1, 000, 000	3, 500, 000
Yakima-Storage		180, 000		180, 000
Wyoming:				
Casper-Alcova	6, 980, 000	5, 227, 000	1, 000, 000	13, 207, 000
Riverton		1, 000, 000	250, 000	1, 250, 000
Shoshone-Willwood	50, 000			50, 000
Shoshone-Heart Mountain		1, 300, 000	700, 000	2, 000, 000
Colorado River Basin States:				
Boulder Canyon	38, 000, 000		[1] 23, 600, 000	61, 600, 000
Surveys sec. 15		250, 000		250, 000
Industrial surveys	25, 000			25, 000
Hawaii:				
Water supply survey	50, 000			50, 000
Secondary project investigations		250, 000		250, 000
Administrative expenses		1, 775, 000	750, 000	2, 525, 000
Total	96, 254, 000	61, 922, 000	68, 610, 000	226, 786, 000

[1] General Treasury.

During 1937 construction work was in progress on 35 projects in 13 States. The new dams begun were Bartlett Dam on the Salt River project, Fresno Dam on the Milk River project, Grassy Lake and Crosscut Dams on the Upper Snake River project, Boca Dam on the Truckee River storage project, and Marshall Ford Dam on the Colorado River of Texas project. Two dams—the Midview Dam on the Moon Lake project and the Anita Dam on the Huntley project were being built by C. C. C. forces.

During the year the Bureau constructed 249 miles of canals, 134 miles of drains, 14 tunnels with a total length of 49,393 feet, 222 miles of roads, 2.4 miles of railroad, 34.5 miles of transmission lines, 4,739 canal structures, 383 bridges, 851 culverts, 46 miles of pipe, and 192 flumes. It placed in dams 2,065,006 cubic yards of concrete, 3,553,870 cubic yards of earth, and 536,180 cubic yards of rock fill, and it excavated 43,858,688 cubic yards of earth and rock.

GRAND COULEE DAM—COLUMBIA BASIN PROJECT

The outstanding project under construction by the Bureau was the Grand Coulee Dam, principal engineering feature of the Columbia Basin project. This dam on completion will be the most massive masonry structure in the world. It will be 550 feet high and will contain 11,250,000 cubic yards of concrete.

The dam will have twin power houses on either side of the river with a total of 18 generating units capable of producing at capacity 2,520,000 horsepower.

The project contemplates eventual irrigation of 1,200,000 acres of arid but fertile lands in the Columbia Basin area. In addition to Grand Coulee Dam, other features will be necessary to irrigate these lands, including a pumping plant with a normal capacity of 16,000 cubic feet of water per second, and a balancing reservoir in the Grand Coulee, itself, with a capacity of 1,050,000 acre-feet of water. This reservoir will be formed by earthen dams at each end of the Coulee. An elaborate canal system to carry the water from the reservoir to the lands also is planned. It is estimated that the dam and appurtenant works will cost $119,000,000, the power plant $67,000,000, and the irrigation system $208,000,000. Revenues from power and from repayments by irrigation-water users are expected to repay the cost of the project.

In addition to the irrigation of a rich area, and the generation of a huge block of power which will be available cheaply to the public, Grand Coulee Dam will serve important functions in controlling the floods and improving navigation of the Columbia River, the Nation's second largest stream.

Grand Coulee Dam is the key structure in the long-range plan for development of the Columbia River, the uppermost and largest of 10 dams proposed in series on the stream. It will materially increase the output of firm power at all downstream sites on the Columbia River.

During the year, work on the project included continuation of construction of the foundation of Grand Coulee Dam and investigations and surveys of the Columbia Basin lands.

The construction contract for the foundation stage of the dam was awarded to the Mason-Walsh-Atkinson-Kier Co., July 16, 1934, on

their bid of $29,339,300. This contract was 54 percent completed at the beginning and 82 percent completed at the close of the fiscal year. During the year more than 2,000,000 cubic yards of concrete were placed with a record daily pour of 13,002 cubic yards on June 24. Excavation for the year totaled 2,500,000 cubic yards, and the total excavation for the structure was 16,809,204 cubic yards.

The parallel cofferdams by which the contractor confined the river to a narrow channel through the central section of the dam, thus permitting work on either side, were completed before the 1936 flood season. A second major diversion was achieved before the 1937 flood season, when two cross-river cofferdams forced the river to flow through slots left in the west section of the dam, thus unwatering the central section. These cofferdams withstood a maximum flow on June 25, 1937, of 273,500 cubic feet of water per second.

An interesting construction feature of the year was the freezing of an arch across the toe of a slide in the east forebay area to restrain 200,000 cubic yards of slipping clay long enough to complete the excavation and place concrete in the dam to a height sufficient to be out of danger. This arch, resting on a timber crib foundation, was 100 feet long, 20 feet thick, and 40 feet high, and contained about 3,000 cubic yards of frozen earth. It was constructed at a cost of $30,000, and, through halting the slide, prevented an increase in the cost of excavation which might have amounted to $200,000. An ammonia-brine refrigerating system was used with 3-inch pipes placed 30 inches apart. Not only did this operation successfully stop the slide, but it saved several weeks of construction time.

An average of about 6,000 men were employed at Grand Coulee Dam. The estimated cost of the foundation section of the dam is $62,900,000, and it will be completed about the middle of the 1938 fiscal year. A total of about 4,250,000 cubic yards of concrete will be placed under the present contract, leaving about 7,000,000 cubic yards to complete the structure. Progress during the year was very good, and the work was many months ahead of schedule.

Considerable progress was made during the fiscal year in surveys of the lands to be irrigated under the project. The work consisted of topographic mapping, section line retracement, monumenting and necessary level work, all in the Quincy Flats area. Work accomplished to date comprised 594,099 acres of retracement, 510,962 acres of monumenting, 475,925 acres of control leveling, and 347,173 acres of topography. In field mapping 192 topographic sheets were completed. About 100 men were employed on this work.

Other survey work was in progress in the reservoir site, including right-of-way surveys, and highway and railroad relocation. Studies were made of migratory fish control in cooperation with State and Government agencies.

CENTRAL VALLEY PROJECT

The Central Valley project in California, another of the major undertakings of the Bureau, is designed to regulate the flow of both the Sacramento and San Joaquin Rivers, and to redistribute, geographically, the waters of the great interior valley of the State extending from Redding to Bakersfield, a distance of 400 miles.

Through the storage and conservation of the flood waters of the two streams and their tributaries, the regulated flow of the rivers will be available for irrigation, improvement of navigation, generation of hydroelectric power, and protection in the delta region from salt water intrusion.

In the southern San Joaquin Valley, about 1,000,000 acres require supplemental water supplies for irrigation. More than 400,000 acres of highly developed agricultural lands in that area are dangerously short of water at this time, having about exhausted the underground irrigation supply. Some 40,000 or more acres have been abandoned to the encroaching desert. In the delta area where the Sacramento and San Joaquin rivers join to flow westward to San Francisco Bay there are 500,000 acres of rich lands threatened by an invasion of salt water. Regulation of the Sacramento River, a major water producer, will provide surplus water for diversion into San Joaquin Valley and a sustained flow which will prevent salt water intrusion into the delta area.

The estimated cost of the project is $170,000,000. The principal construction features include Shasta Dam, reservoir and power plant on the Sacramento River near Redding; 200 miles of transmission lines from the Shasta power plant to a load center near Antioch; the delta cross-cut canal with a capacity of 4,000 second-feet to carry Sacramento River water to the San Joaquin River near Stockton; the Contra Costa Canal, 40 miles in length with a capacity of 350 second-feet, which will extend from Antioch to Martinez and serve with supplemental waters the cities and farms on the south side of Suisun Bay; the San Joaquin pumping system which will raise 3,000 second-feet of water from the San Joaquin delta upstream to Mendota Dam; Friant Dam and reservoir of 450,000 acre-feet capacity on the San Joaquin River, east of Fresno; the Madera Canal extending north from Friant Dam and serving lands in the vicinity of Madera, and the Friant-Kern Canal, which will serve lands south of Friant Dam.

Shasta Dam will be built of concrete masonry. It will be 560 feet in height and will store about 4,500,000 acre-feet of water. Plans for the powerhouse call for an initial capacity of 280,000 kilowatts and an ultimate capacity of 350,000 kilowatts.

During the year preliminary engineering work on several of the major features was brought to completion. Shasta dam site was selected after detailed investigation of several alternate sites including one

known as the Baird site on the Pit River and another known as the Table Mountain site on the Sacramento River.

Investigation of the Friant dam site was completed in September.

During the year six contracts were awarded for work in the Government camp at the Friant dam site and bids were received on March 3 for the first construction, a 4-mile section of the Contra Costa Canal. This contract was awarded to Haas, Doughty & Jones, and Marshall & Stacy of San Francisco, Calif., on their low bid of $102,646. They were about to start work at the end of the fiscal year.

The office of the Chief Engineer was engaged in preparation of plans and specifications for construction work to be undertaken in the fiscal year 1938. This new work will include the following: Kennett division—relocation of the Southern Pacific Railroad from Redding to the Pit River, roadbed and structures; Sacramento and Pit River bridges; Kennett camp construction; Delta division—Contra Costa Canal, earthwork and structures; Friant division—construction of Friant Dam; Madera and Friant-Kern canals, earthwork, and structures.

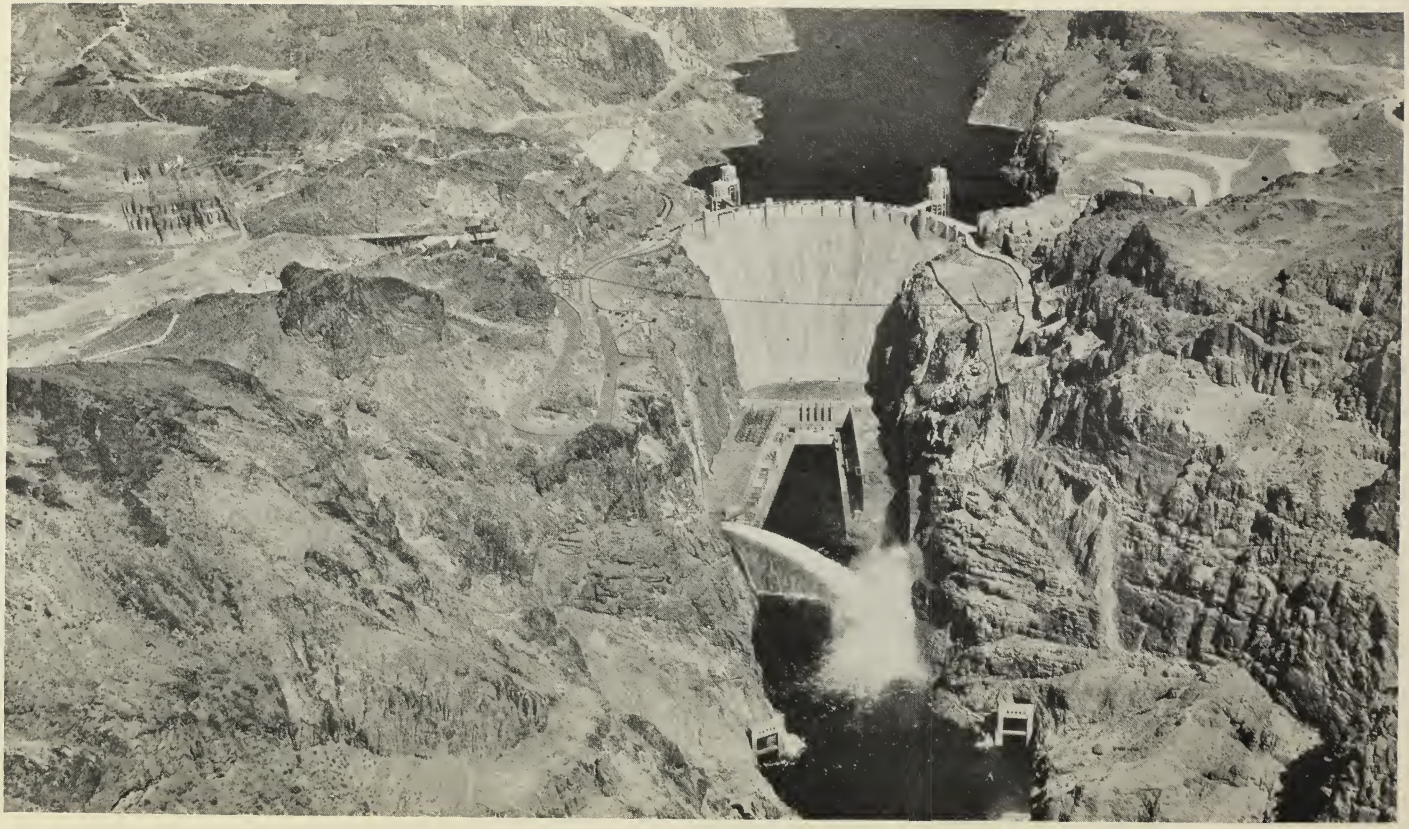
BOULDER CANYON PROJECT

The principal work in progress at Boulder Dam of the Boulder Canyon project on the Colorado River between Arizona and Nevada was the installation of machinery and equipment in the power plant. On September 11, 1936, President Franklin D. Roosevelt pressed a button in Constitution Hall in Washington starting the first generator, the A–0 unit in the Arizona wing of the power-house. Four of the 82,500 kilovolt-ampere generating units in the Nevada wing of the power-house went on the line during the year. The dates of their first operations were as follows: N–2, October 26; N–4, November 14; N–1, December 28; and N–3, March 22.

On the All-American Canal system of the Boulder Canyon project, all excavation work necessary for completion of the main canal, 80 miles in length, was under contract. Part of this work had been completed, and all earthwork, estimated to total about 65,000,000 cubic yards, was expected to be done during the calendar year 1938. Work was continued on the Imperial diversion dam and desilting works. The dam is a concrete structure, 2,990 feet long, of the hollow or floating weir type, slab and buttress nonoverflow section with a maximum height of 47 feet. The desilting works consist of six settling basins, each 269 feet wide by 769 feet long. Silt deposited in the basins will be removed by 72 rotary-type scrapers, each 125 feet in diameter, and sluiced into the river below the dam.

OTHER CONSTRUCTION

On the Kendrick (Casper-Alcova) project in Wyoming, construction of the Seminoe storage dam and power plant and the Alcova diversion dam continued, and at the end of the year, these were 30 and 72



A View of Boulder Dam.

percent complete, respectively. Government forces excavated 28.6 miles of the Casper Canal, moving 3,793,000 cubic yards of material. In October 1936 contracts were awarded for the manufacture of two 12,000-kilovolt-amphere generating units and turbines and governors for the Seminoe power plant.

Other important dams under construction during the year were the following: Bartlett Dam, 270-foot concrete multiple arch, on the Salt River project, Arizona; Parker Dam, 325-foot concrete arch, on the Colorado River near Parker, Ariz., being built for the Metropolitan Water District of Southern California; Taylor Park Dam, 168-foot earth and rock fill, on the Uncompahgre project, Colorado; Island Park Dam, 80-foot earth fill, and Grassy Lake Dam, 120-foot earth fill, on the Upper Snake River storage project, Idaho-Wyoming; Fresno Dam, 80-foot earth fill, on the Milk River project, Montana; Alamogordo Dam, 142-foot rolled earth and rock fill on the Carlsbad project, New Mexico; Caballo Dam, 85-foot earth fill, on the Rio Grande project, New Mexico-Texas; Unity Dam, 81-foot earth fill, on the Burnt River project, Oregon; Marshall Ford Dam, 265-foot concrete, straight gravity, on the Colorado River project, Texas; Utah; Bull Lake Dam, 75-foot earth fill, on the Riverton project, Moon Lake Dam, 90-foot earth fill, on the Moon Lake project, Wyoming.

A contract was awarded for construction of the Boca Dam, 110-foot earth fill, on the Truckee storage project, Nevada. Plans and specifications were in preparation for the Deer Creek Dam on the Provo River project, Utah, the Vallecito Dam on the Pine River project in Colorado, and the Roza diversion dam on the Roza division of the Yakima project, Washington.

BUREAU'S CONTRUCTION RESULTS

Our operations of over 35 years have resulted in the following:

138 storage and diversion dams have been built.
24 powerhouses.
2,344 buildings.
19,116 miles of canals, ditches, and drains.
72½ miles of tunnels.
4,367 miles of telephone lines.
267 miles of dikes and levees.
6,041 flumes.
18,694 culverts.
13,166 bridges.
182,964 other irrigation structures.

Reservoir capacity created by this construction totaled 44,898,910 acre-feet.

POWER GENERATION

The first of the giant generators in the Boulder Dam powerhouse went into operation in October 1936, and by April 1937 four of these were producing energy for the city of Los Angeles and other communities in that vicinity.

As a result, the total output of power from hydroelectric plants on Bureau of Reclamation projects increased tremendously. During the fiscal year 1937, 24 power plants on 12 projects produced a grand total of 1,056,757,865 kilowatt-hours of energy.

This places the Bureau of Reclamation in a preeminent position among Federal agencies in the field of electric power, although generation of hydroelectric power is a byproduct.

By the end of the year, the Boulder plant had settled into a steady monthly output of approximately 80,000,000 kilowatt-hours. Two new generators were being manufactured, and during the year bids for two additional generators were called.

Projects now in construction contemplate additional power developments in connection with dams which will control the Sacramento River in California, the North Platte River in Wyoming, and the Columbia River in Washington, and which will store their waters for use in irrigation. Use of the waters released from reclamation reservoirs to turn turbines increases the over-all efficiency of the project. In planning all Federal reclamation projects, the feasibility of including power development is investigated carefully, just as are other conservation ends.

RECLAMATION FUND

As was pointed out last year, accretions to the reclamation fund established by the act of June 17, 1902, are decreasing. From a high point of more than $9,430,573.98 reached in 1908, accretions to the special fund from the sale of public lands fell to an all-time low of $127,176.17 in the fiscal year 1937.

This source of revenue cannot be revived, because of new conservation policies and exhaustion of attractive farm sites on the public domain.

Again the need for new sources of accretions to the fund must be stressed. While the fund also receives repayments made by water users on operating projects, this source and the remaining productive statutory sources of accretions cannot be expected to provide sufficient money year by year to finance reclamation construction programs of the size of that now in progress.

The following table will show the accretions to the fund:

Accretions to reclamation fund, by States

States	Sale of public lands		Proceeds from oil leasing act		Total to June 30, 1937
	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937	
Alabama			$3,113.03	$181,984.46	$181,984.46
Arizona	$11,977.53	$2,686,498.75	.34	160.20	2,686,658.95
California	15,435.55	8,185,636.64	1,731,599.79	14,089,064.30	22,274,700.94
Colorado	9,914.46	10,273,223.66	77,031.27	636,005.43	10,909,229.09
Idaho	4,860.47	7,010,768.12	1,941.17	19,388.23	7,030,156.35
Kansas	8.84	1,033,037.60			1,033,067.60
Louisiana			30,950.42	73,261.66	73,261.56
Montana	14,571.77	15,342,828.34	50,753.91	1,196,121.60	15,538,949.94
Nebraska	111.76	2,904,308.58			2,094,308.58
Nevada	662.91	1,023,080.10	84.00	5,447.37	1,028,527.47
New Mexico	24,700.23	6,661,542.95	288,602.71	984,231.42	7,645,774.37
North Dakota	564.43	12,218,658.77	15,016.29	152,721.78	12,371,380.55
Oklahoma	341.51	5,929,403.06			5,929,403.06
Oregon	8,941.62	11,972,330.26		10.28	11,972,340.54
South Dakota	1,510.40	7,731,616.90	212.67	1,849.26	7,733,466.16
Utah	8,273.25	4,239,302.59	68,144.95	533,726.36	4,773,028.95
Washington	1,325.66	7,447,065.79		33,749.63	7,480,815.42
Wyoming	23,975.78	8,644,615.80	826,036.02	34,374,280.19	43,018,895.99
Total	127,176.17	112,493,947.91	3,093,536.57	52,282,002.17	164,775,950.08
Proceeds, Federal water power licenses					[1] 759,733.37
Proceeds, potassium royalties and rentals					[2] 328,353.79
Grand total					165,864,037.24

[1] Proceeds for fiscal year, $19,400.83.
[2] Proceeds for fiscal year, $67,122.13.

REPAYMENTS

Under the reclamation law, project water users are required to contract to repay without interest over a period of years the cost of construction of the project works which serve them. Also, in instances where the project is operated by the Bureau, the water users pay annual operation and maintenance and water rental charges.

In excess of 98 percent had been collected of all moneys due and payable for repayment of construction, operation and maintenance, and water rental charges. Construction charges of $48,268,782.16 had become due, and $47,580,012.45 had been paid. Operation and maintenance charges of $31,622,231.32 had become due, and $31,392,552.88 had been paid. Water rental charges of $9,953,628.17 had become due, and $9,877,494.50 had been paid.

Another source of revenue was the sale of electric energy. Exclusive of the Boulder Dam power development, this source has yielded a net revenue of $8,446,806.43.

The following tables show the status of the reclamation fund and the situation with regard to collections.

STATUS OF RECLAMATION FUND

Accretions to the fund:		
Sales of public lands	$112, 493, 947. 91	
Royalties and rental under Mineral Leasing Act	52, 282, 002. 17	
Potassium royalties and rentals	328, 353. 79	
Federal water power licenses	759, 733. 37	
Total accretions		$165, 864, 037. 24
Loan from General Treasury		15, 000, 000. 00
Collections—construction and operation and maintenance repayments, water rents, power and light, etc		115, 006, 306. 45
Total cash available		395, 870, 343. 69
Disbursements		281, 856. 228. 52
Balance in fund June 30, 1937		14, 014, 115. 17

Accounts Receivable, Construction Water-Right Charges

State and project	Due		Collected			Uncollected June 30, 1937
			Cash		Other credits to June 30, 1937	
	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937		
Arizona:						
Salt River	$152, 490. 30	$6, 963, 725. 01	$152, 490. 30	$6, 963, 725. 01		
Yuma auxiliary	[1] 4, 159. 52	584, 640. 19	[1] 2, 931. 17	582, 316. 87	$1, 683. 67	$639. 65
Arizona-California: Yuma	152, 542. 48	3, 987, 325. 59	94, 442. 48	3, 364, 707. 59	595, 918. 32	26, 699. 68
California: Orland	3, 775. 35	826, 526. 19	8, 729. 90	787, 925. 71		38, 600. 48
Colorado:						
Grand Valley	27, 702. 05	197, 782. 94	10, 000. 00	90, 729. 94	107, 053. 00	
Uncompahgre	53, 552. 58	543, 822. 06	8, 125. 00	435, 407. 43	63, 652. 04	44, 762. 59
Idaho:						
Boise	26, 203. 62	4, 037, 789. 10	24, 025. 37	4, 008, 417. 56	27, 193. 29	2, 178. 25
Minidoka	142, 376. 13	8, 250, 680. 15	58, 166. 20	7, 304, 914. 11	905, 700. 54	40, 065. 50
Montana:						
Bitter Root	36, 122. 26	36, 122. 26	18, 025. 42	18, 025. 42		18, 096. 84
Huntley	10, 906. 90	571, 746. 86	9, 857. 83	477, 940. 14	93, 558. 38	248. 34
Milk River	26, 090. 17	97, 757. 73	9, 864. 49	12, 867. 25		84, 890. 48
Sun River	59, 181. 79	279, 601. 34	29, 473. 49	235, 971. 31	35, 249. 27	8, 380. 76
Montana-North Dakota: Lower Yellowstone	25, 760. 33	319, 521. 31	24, 364. 21	317, 160. 51	1, 311. 41	1, 049. 39
Nebraska-Wyoming: North Platte	166, 546. 40	4, 270, 894. 15	21, 663. 28	2, 812, 192. 06	1, 377, 815. 39	80, 886. 70
Nevada: Newlands	28, 579. 04	1, 235, 090. 58	21, 685. 31	1, 152, 994. 05	79, 525. 90	2, 570. 63
New Mexico: Carlsbad	1, 707. 21	887, 418. 10	1, 707. 21	887, 336. 85	81. 25	
New Mexico-Texas:						
Rio Grande	115, 425. 00	3, 207, 949. 45	96, 420. 38	2, 878, 019. 83	328, 387. 87	1, 541. 75
Baker	2, 884. 75	2, 884. 75	2, 884. 75	2, 884. 75		
Oregon: Umatilla	2, 985. 37	546, 042. 54	2, 761. 37	404, 690. 85	5, 190. 89	136, 160. 80
Oregon-California: Klamath	48, 244. 70	1, 195, 748. 89	21, 608. 12	1, 161, 911. 21	5, 127. 85	28, 709. 83
South Dakota: Belle Fourche	57, 457. 29	684, 091. 53	4, 620. 19	550, 818. 52	80, 921. 48	52, 351. 53
Utah:						
Salt Lake Basin	71, 749. 36	72, 971. 86	71, 749. 36	72, 971. 86		
Strawberry Valley	68, 803. 39	1, 385, 938. 35	68, 128. 39	1, 374, 350. 13	11, 588. 22	
Washington:						
Okanogan	5, 425. 94	142, 901. 80	425. 94	137, 901. 80		5, 000. 00
Yakima	54, 212. 67	6, 932, 974. 40	121, 164. 76	6, 762, 914. 66	36, 363. 75	133, 695. 99
Wyoming: Shoshone	22, 514. 02	1, 006, 835. 03	22, 600. 80	842, 919. 56	163, 674. 95	240. 52
Total	1, 359, 079. 58	48, 268, 782. 16	902, 053. 38	43, 642, 014. 98	[2] 3, 919, 997. 47	706, 769. 71
Paid in advance of due dates			[1] 302, 943. 97	610, 665. 44	[3] 188, 585. 93	
Refunds				98, 926. 60	3, 212. 84	
Total collections			599, 109. 41	44, 351, 607. 02		
Contributed funds applying to construction cost not included in above table			39, 265. 07	1, 816, 522. 40		

[1] Contra.
[2] Other credits for fiscal year, $290,189.52.
[3] Decrease for fiscal year, $32,461.47.

Accounts Receivable, Operation and Maintenance Charges

[After public notice]

State and project	Due		Collected			Uncollected June 30, 1937
			Cash		Other credits to June 30, 1937	
	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937		
Arizona: Yuma auxiliary	$15,854.79	$499,260.68	$18,275.95	$484,311.05	$11,804.81	$3,144.82
Arizona-California: Yuma	114,386.49	3,999,822.73	146,826.28	3,813,012.00	181,370.56	5,440.17
California: Orland	13,168.90	680,929.35	24,658.36	630,786.70	25,757.82	24,384.83
Colorado:						
Grand Valley	48,872.11	457,083.97	50,372.11	424,083.97	33,000.00	
Uncompahgre		1,008,683.69		977,809.79	30,873.90	
Idaho:						
Boise	11,483.25	2,201,650.02	11,483.25	2,149,000.30	52,649.72	
King Hill		60,711.27		59,192.22	1,519.05	
Minidoka	80,475.95	2,203,888.69	69,258.65	2,062,579.63	141,306.16	2.90
Montana:						
Frenchtown	2,000.00	2,000.00				2,000.00
Huntley		554,787.34		543,594.31	11,193.03	
Milk River	47,820.29	418,917.97	40,876.12	393,598.96	1,662.25	23,656.76
Sun River		168,718.50		164,366.28	4,352.22	
Montana - North Dakota: Lower Yellowstone		338,562.56		338,557.93	4.63	
Nebraska-Wyoming: North Platte	20,652.38	1,952,631.07	23,301.78	1,879,684.22	65,198.06	7,748.79
Nevada: Newlands		1,174,581.57		1,135,901.55	38,680.02	
New Mexico: Carlsbad	24,607.28	998,201.85	24,607.28	981,329.14	16,872.71	
New Mexico-Texas: Rio Grande	302,896.90	4,641,556.53	280,494.35	4,338,550.37	248,593.87	54,412.29
North Dakota:						
Buford-Trenton		2,317.41		2,317.41		
Williston		34,042.75		34,042.75		
Oregon:						
Umatilla	3,190.38	392,078.40	3,478.26	384,132.31	7,253.96	692.13
Vale	15,000.00	38,149.67	15,000.00	38,149.67		
Oregon-California: Klamath	32,541.23	1,373,510.50	32,874.36	1,338,873.62	30,536.22	4,100.66
Oregon-Idaho: Owyhee	30,318.09	30,818.09	30,318.09	30,818.09		
South Dakota: Belle Fourche	49,048.37	1,252,661.80	49,048.37	1,243,285.81	9,375.99	
Utah: Strawberry Valley		376,880.88		365,022.21	11,858.67	
Washington:						
Okanogan		371,441.72		368,788.67	2,653.05	
Yakima	223,456.98	5,830,214.97	239,164.55	5,657,994.36	69,338.24	102,882.37
Wyoming: Shoshone	1,843.05	558,127.84	1,776.93	533,209.69	23,705.43	1,212.72
Total	1,037,616.44	31,622,231.82	1,061,814.69	30,372,993.01	[1] 1,019,560.37	229,678.44
Paid in advance of due dates			28,548.81	150,748.02	[2] 323.41	
Penalties and interest			8,053.75	527,773.62	20,480.00	
Refunds				38,228.87	156.00	
Total collections			1,098,417.25	31,089,743.52		

[1] Other credits for fiscal year, $31,402.48.
[2] Increase for fiscal year, $65.07.

Accounts Receivable, Rental of Irrigation Water

State and project	Due		Collected			Uncollected June 30, 1937
			Cash		Other credits to June 30, 1937	
	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937		
Arizona:						
Salt River		$2,246,726.01		$2,246,726.01		
Yuma auxiliary	$439.90	13,836.83	$787.38	13,836.83		
Arizona-California: Yuma	9,743.23	566,656.25	9,347.72	553,606.55	$12,654.19	$395.51
California: Orland	38.88	121,489.73	38.88	121,489.73		
Colorado:						
Grand Valley	10,897.60	533,725.86	10,645.00	524,736.93	6,500.67	2,488.26
Uncompahgre	2,856.99	1,229,317.36	1,905.96	1,221,300.36		8,017.00
Idaho:						
Boise	8,050.00	814,088.57	8,050.00	809,368.07	4,720.50	
Minidoka	57,361.56	797,604.60	57,336.56	794,196.59	3,383.01	25.00
Montana:						
Huntley	517.23	12,957.48	517.23	12,957.48		
Milk River	159.75	238,487.25	174.75	228,140.47	1,208.14	9,138.64
Sun River	64.35	132,656.90	190.52	130,702.92	1,366.62	587.36
Montana - North Dakota: Lower Yellowstone	558.00	137,141.60	347.40	136,353.38		788.22
Nebraska-Wyoming: North Platte	2,003.45	348,759.97	1,994.45	348,740.97	10.00	9.00
Nevada: Newlands		28,291.16		22,114.31	6,176.85	

Accounts Receivable, Rental of Irrigation Water—Continued

State and project	Due		Collected			Uncollected June 30, 1937
			Cash		Other credits to June 30, 1937	
	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937		
New Mexico:						
Carlsbad	$242.01	$40,741.28	$187.26	$40,669.28		$72.00
Hondo		9,129.70		9,129.70		
New Mexico-Texas: Rio Grande	12,954.82	1,520,413.52	5,017.30	1,498,330.96		22,082.56
North Dakota:						
Buford-Trenton		31.75		31.75		
Williston		2,117.28		2,117.28		
Oregon:						
Umatilla	2,694.00	100,143.32	2,694.00	73,866.52		26,276.80
Vale	[1] 373.25	21,544.45	80.45	21,291.62		252.83
Oregon-California: Klamath	52,576.16	451,261.45	51,248.70	446,982.79	25.00	4,253.66
Oregon-Idaho: Owyhee	45,597.71	62,519.86	45,108.15	61,976.40		543.46
South Dakota: Belle Fourche	610.78	10,942.68	610.78	10,924.88	17.80	
Utah: Strawberry Valley		17,596.13		17,596.13		
Washington:						
Okanogan		110,645.28		108,061.09	2,584.19	
Yakima	2,096.75	180,079.32	2,856.60	179,449.42		629.90
Wyoming:						
Riverton	30,547.96	95,209.63	27,699.69	85,715.63	9,198.50	295.50
Shoshone	13,567.95	109,512.95	13,418.66	105,612.02	3,622.96	277.97
Total	253,205.83	9,953,628.17	240,257.44	9,826,026.07	[2] 51,468.43	76,133.67

[1] Contra.
[2] Other credits for fiscal year, $2,679.94.

Population of Projects

Population of the farms and towns served by the Federal projects exceeded this year that of any previous year.

There were 210,466 living on farms and 653,441 in towns on the projects, and serving these were 859 schools and 996 churches.

As an index to the prosperity of these people, an investigation was made of the bank deposits in banks on the projects. Deposits totaled $226,903,747. The following table shows the population and bank deposits of each of the projects in operation.

Population and Bank Deposits

State and project	Irrigated farms		Towns		Number of schools	Number of churches	Bank deposits
	Number	Population	Number	Population			
Arizona: Salt River	7,900	60,000	12	95,000	86	70	$54,343,000
Arizona-California: Yuma	829	3,744	5	10,000	13	26	1,357,480
California: Orland	656	1,919	1	1,200	9	10	1,051,898
Colorado:							
Grand Valley	463	1,389	6	14,570	17	38	4,414,420
Uncompahgre	1,590	5,985	3	8,350	28	35	3,332,093
Idaho:							
Boise	4,010	15,550	16	50,000	58	88	31,903,747
Minidoka [1]	2,425	8,418	6	7,775	22	50	[2]
Montana:							
Bitter Root	325	1,250	5	4,200	10	15	1,808,468
Frenchtown	34	120	3	17,150	15	23	8,764,093
Huntley	650	2,143	5	716	7	6	163,799
Milk River	599	2,267	17	11,015	33	34	4,903,031
Sun River	711	1,671	6	763	11	12	151,475
Montana-North Dakota: Lower Yellowstone	580	2,689	7	3,600	18	21	1,147,300
Nebraska-Wyoming: North Platte	3,137	9,706	18	21,503	70	51	7,132,142
Nevada:							
Humboldt	60	265	1	1,400	4	4	1,005,000
Newlands	802	2,751	4	2,020	16	12	800,000
Truckee River Storage	300	1,650	2	25,000	24	14	12,000,000

[1] In addition the Gooding division reported 985 farms with a population of 2,160 but no data relative to towns, schools, or churches.
[2] Individual data not available as 3 banks are members of a chain system.



THE YAKIMA PROJECT IN THE STATE OF WASHINGTON, ONCE A DRY AND BARREN AREA, HAS BEEN TRANSFORMED INTO ONE OF THE GARDEN SPOTS OF THE UNITED STATES.

Population and Bank Deposits—Continued

State and project	Irrigated farms		Towns		Number of schools	Number of churches	Bank deposits
	Number	Population	Number	Population			
New Mexico: Carlsbad	455	2,049	4	7,000	9	12	1,723,888
New Mexico-Texas: Rio Grande	5,750	26,500	37	130,000	88	124	30,000,000
Oregon:							
Umatilla	434	1,379	5	1,530	8	14	380,000
Vale	400	1,260	3	1,600	3	12	367,758
Oregon-California: Klamath	882	2,835	5	17,425	29	35	6,923,569
Oregon-Idaho: Owyhee	1,210	5,380	5	5,450	23	20	
South Dakota: Belle Fourche	900	2,735	5	3,550	28	17	2,320,000
Utah:							
Hyrum	370	1,480	3	[3] 3,500	5	6	
Moon Lake	600	2,500	10	4,300	17	15	308,000
Ogden River	1,195	4,800	4	53,962	25	56	14,000,000
Strawberry Valley	2,200	5,550	12	25,000	27	26	1,163,300
Weber River	2,100	10,000	10	48,000	46	50	20,500,000
Washington:							
Okanogan	391	965	3	4,500	10	8	1,248,781
Yakima	5,502	17,488	23	50,252	78	62	6,059,582
Wyoming:							
Kendrick (Casper Alcova)			4	20,000	17	18	7,713,582
Riverton	338	1,228	2	110	2	2	
Shoshone	975	2,800	5	3,000	3	10	543,288
Total, 1937	48,773	210,466	257	653,441	859	996	226,903,747

[3] Estimated.

CROP RESULTS: PROJECT WATER USERS PROSPER

The estimated gross value of crops produced on Federal reclamation projects during the calendar year of 1936 was $136,502,480, or $29,721,186 more than in 1935 and $36,713,477 more than in 1934. With an average of $47.10 for each of the 2,901,919 acres for which the Bureau of Reclamation furnished water in 1936, the figure represents a higher total than at any time since 1929.

During only 3 previous years, 1919, 1928, and 1929, has the gross crop returns been greater for Federal reclamation farmers. Since 1906, when the first Federal project went into operation, the grand total value of crops produced on these projects has been $2,311,983,242, approximately 10 times the cost of the Federal irrigation works serving the lands.

The average per acre return represents an increase of $9.80 an acre over that received in 1935, and was among the highest returns per acre in the history of the Bureau of Reclamation. The return obtained by the farmer on Federal reclamation projects for each acre he worked during 1936 was two and one-half times that received by the average farmer the Nation over.

Although the 1936 production from our projects represents only 1.1 percent of the value of all the crops harvested from farms in the United States, approximately 864,000 people on 48,773 farms and in 257 towns and cities which have sprung up in these areas were supported by the projects. With the exception of some fruits and vegetables, these crops do not reach eastern markets and more than one-half of the area is used in the production of hay and forage which is consumed on the farm and is an important factor in the support of the livestock industry of the Western States.

Irrigation and Crop Results on Government Projects, 1936

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts.				
	Irrigable acreage [1]	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River	242,405	234,704	229,450	$19,487,951	$84.93	93,967	73,658	59,264	$4,670,000	$78.80
Arizona-California:										
Yuma	69,960	52,515	49,077	3,364,003	68.60	165	165	158	26,286	166.89
Valley Division	49,762	43,818	40,822	2,653,387	65.10					
Reservation Division	7,744	2,604	2,499	99,653	39.87					
Bard Division	6,135	4,882	4,611	221,982	48.14					
Yuma Auxiliary (Mesa)	6,319	1,211	1,145	388,981	339.77					
California: Orland	20,633	13,781	13,016	441,689	33.93					
Colorado:										
Grand Valley	30,413	17,285	16,940	762,086	44.99	10,027	7,555	7,236	892,899	122.00
Uncompahgre	72,077	60,495	60,446	1,946,002	32.19	1,650	1,550	1,490	52,150	35.00
Idaho:										
Boise	175,128	148,758	147,130	4,613,704	31.36	143,343	135,600	128,385	3,927,806	30.59
New York Irrigation District	17,532	14,989	14,983	271,463	18.12					
Nampa-Meridian Irrigation District	40,813	35,004	34,965	927,056	26.51					
Boise-Kuna Irrigation District	48,602	43,234	43,157	1,205,267	27.93					
Wilder Irrigation District	59,469	47,819	46,351	1,901,272	41.02					
Big Bend Irrigation District	1,818	1,296	1,295	31,245	24.13					
Black Canyon Irrigation District—Notus Division	6,894	6,416	6,379	277,401	43.49					
Minidoka	179,354	164,649	158,485	5,449,770	34.46	742,703	685,514	658,506	26,364,691	40.04
Minidoka Irrigation District	69,697	59,402	55,397	2,218,476	40.05					
Burley Irrigation District	48,961	44,551	42,392	1,855,158	43.76					
Gooding Division	60,696	60,696	60,696	1,376,136	22.67					
Montana:										
Bitter Root	16,665	15,860	15,623	360,152	23.06					
Huntley	32,508	23,929	22,907	777,889	32.51					
Milk River	134,557	54,224	54,224	1,329,235	24.51					
Malta Division	56,652	21,523	21,523	405,385	18.84					
Glasgow Division	22,133	6,019	6,019	83,849	13.93					
Chinook Division	55,772	26,682	26,682	840,001	31.48					

Sun River	64,248	47,728	53,519	777,561	14.53					
Fort Shaw Division	8,975	7,964	7,929	166,913	21.05					
Greenfields Division	55,273	39,764	45,590	610,648	13.39					
Montana-North Dakota:										
Lower Yellowstone	58,248	43,111	42,042	1,600,652	38.07					
District No. 1 (Montana)	38,000	29,870	28,979	1,083,586	37.39					
District No. 2 (North Dakota)	20,248	13,241	13,063	517,066	39.58					
Nebraska-Wyoming:										
North Platte	234,604	206,518	182,540	7,190,056	39.39	123,550	108,445	96,342	3,387,384	35.16
Pathfinder Irrigation District	112,261	92,296	76,650	2,861,804	37.34					
Gering and Fort Laramie Irrigation District	54,805	53,970	52,125	2,632,552	50.50					
Goshen Irrigation District	51,368	47,851	42,530	1,507,827	35.45					
Northport Irrigation District	16,170	12,401	11,235	187,873	16.72					
Nevada: Newlands	57,971	52,901	42,554	977,823	22.98					
New Mexico: Carlsbad	25,055	21,712	19,391	1,148,526	59.23					
New Mexico-Texas:										
Rio Grande	175,102	138,802	131,645	9,665,675	73.42	78,000	45,825	45,825	1,909,291	41.66
Elephant Butte Irrigation District	100,176	78,443	74,281	5,297,220	71.31					
El Paso County Irrigation District no. 1	74,926	60,359	57,364	4,368,455	76.15					
Oregon:										
Umatilla	18,229	11,504	11,031	215,466	19.60	930	772	737	23,061	31.50
East Division	11,522	7,104	6,709	133,505	19.90					
West Division	6,707	4,400	4,322	81,961	18.97					
Vale	20,468	11,404	10,975	253,829	23.13					
Oregon-California:										
Klamath	60,337	50,780	50,168	3,911,045	78.10	63,410	34,780	34,613	1,488,752	43.01
Main Division	40,146	32,039	31,641	1,760,442	55.65					
Tule Lake Division	20,191	18,741	18,527	2,150,603	116.08					
Oregon-Idaho:										
Owyhee	31,801	8,609	7,951	253,264	31.85					
Mitchell Butte Division:										
Advancement Irrigation District	737	570	546	18,916	34.64					
Kingman Colony Irrigation District	1,531	1,268	1,264	40,999	32.44					
Owyhee Irrigation District	29,533	6,771	6,141	193,349	31.48					
South Dakota: Belle Fourche	73,093	37,546	37,546	978,142	26.05					

[1] Area for which the Bureau was prepared to supply water in 1936.

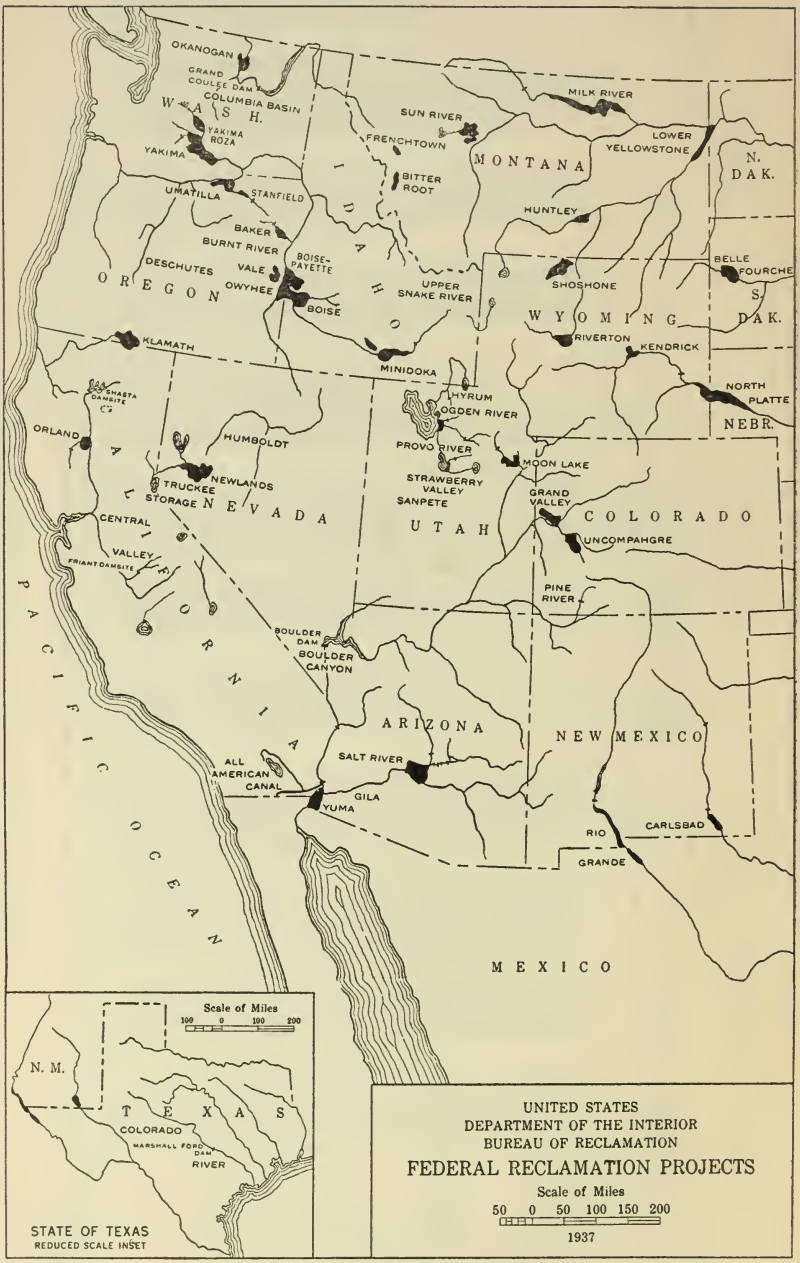
Irrigation and Crop Results on Government Projects, 1936—Continued

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts.				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Utah:										
Weber River (Salt Lake Basin)						89,000	86,500	85,243	3,876,329	45.46
Hyrum	8,000	8,500	7,488	215,827	28.82					
Strawberry Valley	53,889	39,255	36,132	837,941	23.19	7,544	6,950	6,838	161,594	23.63
High Line Division	21,856	17,694	15,120	288,002	19.05					
Spanish Fork Division	22,033	15,122	12,838	318,401	24.80					
Springville-Mapleton Division	10,000	8,439	8,174	231,538	28.32					
Washington:										
Okanogan	5,101	3,572	3,488	608,516	174.46					
Yakima	202,097	158,900	152,464	9,678,845	65.48	172,442	148,404	147,831	10,815,086	73.16
Sunnyside Division	102,117	80,023	75,553	4,528,015	59.93					
Tieton Division	29,794	25,146	24,218	3,405,500	140.62					
Kittitas Division	70,186	53,731	52,693	1,745,330	33.12					
Wyoming:										
Riverton	32,000	19,545	18,799	390,595	20.78	277	277	277	4,333	15.64
Shoshone	72,466	55,605	54,143	1,666,574	30.80					
Garland Division	41,627	31,754	31,754	1,250,861	39.39					
Frannie Division	20,031	15,194	14,154	235,350	16.62					
Willwood Division	10,808	8,657	8,235	180,363	21.90					
Grand total, 1936	2,166,409	1,702,192	1,629,174	78,902,818	48.40	1,527,008	1,335,995	1,272,745	57,599,662	45.20
Warren Act Lands	1,527,008	1,335,995	1,272,745	57,599,662	45.30					
Grand total of projects proper and Warren Act	3,693,417	3,038,187	2,901,919	136,502,480	47.10					
Grand total, 1935	3,614,095	2,935,616	2,861,136	106,781,294	37.30					
Increase	79,322	102,571	40,783	29,721,186	9.80					

Irrigated and Cropped Acreages and Accumulated Crop Values by Years, 1906–36 [1]

Year	Federal irrigation projects				Warren Act lands				Entire area			
	Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value	
			For year	Cumulative total			For year	Cumulative total			For year	Cumulative total
1906	22,300	[2] 20,100	244,900						22,300	[2] 20,100	$244,900	
1907	187,628	[2] 169,000	4,760,460	$5,005,360					187,628	[2] 169,000	4,760,460	$5,005,360
1908	289,549	[2] 260,500	7,635,888	12,641,248					289,549	[2] 260,500	7,635,888	12,641,248
1909	410,628	[2] 369,500	11,920,663	24,561,911					410,628	[2] 369,500	11,920,663	24,561,911
1910	471,423	413,000	12,944,639	37,506,550					471,423	413,000	12,944,639	37,506,550
1911	562,311	470,100	13,086,441	50,592,991					562,311	470,100	13,086,441	50,592,991
1912	614,477	540,000	16,007,134	66,600,125					614,477	540,000	16,007,134	66,600,125
1913	694,142	637,227	15,676,409	82,276,534					694,142	637,227	15,676,409	82,276,534
1914	761,271	703,424	16,475,517	98,752,051					761,271	703,424	16,475,517	98,752,051
1915	810,649	760,035	18,164,452	116,916,503					810,649	760,035	18,164,452	116,916,503
1916	922,821	858,291	32,815,972	149,732,475					922,821	858,291	32,815,972	149,732,475
1917	1,026,663	966,784	56,462,313	206,194,788					1,026,663	966,784	56,462,313	206,194,788
1918	1,119,566	1,051,193	66,821,396	273,016,184	[2] 501,100	[2] 481,600	$35,000,000		[2] 1,620,666	1,532,793	101,821,396	308,016,184
1919	1,187,255	1,113,469	88,974,137	361,990,321	916,313	880,613	64,368,468	$99,368,468	2,103,568	1,994,082	153,342,605	461,358,789
1920	1,225,480	1,153,820	66,171,650	428,161,971	981,940	950,890	47,836,750	147,205,218	2,205,420	2,104,710	114,008,400	575,367,189
1921	1,227,500	1,157,900	49,620,300	477,782,271	1,001,250	969,550	45,288,650	192,493,848	2,228,750	2,127,450	94,908,930	670,276,119
1922	1,202,130	1,169,100	50,360,850	528,143,121	983,290	951,270	33,240,840	225,734,688	2,185,420	2,120,370	83,601,690	753,877,809
1923	1,213,700	1,179,870	65,046,300	593,189,421	1,051,380	993,040	37,557,860	263,292,548	2,265,080	2,172,910	102,604,160	856,481,969
1924	1,290,890	1,216,610	66,488,560	659,677,981	930,670	889,460	43,237,470	306,530,018	2,221,560	2,106,070	109,726,030	966,207,999
1925	1,320,300	1,242,750	77,608,880	737,286,861	1,019,170	951,250	53,655,850	360,185,868	2,339,470	2,194,000	131,264,730	1,097,472,729
1926	1,411,020	1,328,810	60,369,620	797,656,481	1,097,190	949,590	49,750,040	409,935,908	2,508,210	2,278,400	110,119,660	1,207,592,389
1927	1,378,990	1,326,810	70,985,450	868,641,931	1,148,115	1,073,486	61,160,010	471,095,981	2,527,105	2,399,296	132,145,460	1,339,737,849
1928	1,442,080	1,385,560	80,238,800	948,880,731	1,235,020	1,192,030	62,495,320	533,591,238	2,677,100	2,577,590	142,734,120	1,482,471,969
1929	1,483,900	1,420,070	87,559,670	1,036,440,401	1,234,230	1,192,990	72,720,490	606,311,728	2,718,130	2,613,060	160,280,160	1,642,752,129
1930	1,504,810	1,467,097	64,418,940	1,100,859,341	1,286,046	1,252,493	54,654,550	660,966,278	2,790,856	2,721,590	119,073,490	1,761,825,619
1931	1,522,718	1,462,565	40,121,089	1,140,980,430	1,293,889	1,251,830	33,406,340	694,372,618	2,816,607	2,714,395	73,527,429	1,835,353,048
1932	1,555,144	1,506,320	31,165,752	1,172,146,182	1,214,461	1,196,400	18,627,219	712,999,837	2,769,605	2,702,720	49,792,971	1,885,146,019
1933	1,589,770	1,529,903	48,138,576	1,220,284,758	1,239,017	1,199,113	35,425,870	748,425,707	2,828,787	2,729,016	83,564,446	1,968,710,465
1934	1,552,124	1,464,405	59,628,327	1,279,913,085	1,285,081	1,229,594	40,160,676	788,586,383	2,837,205	2,693,999	99,789,003	2,068,499,468
1935	1,640,936	1,604,166	63,601,663	1,343,514,748	1,294,680	1,256,970	42,179,631	831,766,014	2,935,616	2,861,136	106,781,294	2,175,280,762
1936	1,702,192	1,629,174	78,902,818	1,422,417,566	1,335,995	1,272,745	57,599,662	889,365,676	3,038,187	2,901,919	136,502,480	2,311,783,242

[1] Revised and corrected June 1937. Does not include acreages of lands cropped without irrigation and crop values therefrom.
[2] Estimated.


OKANOGAN
GRAND COULEE DAM
COLUMBIA BASIN
W A S H.
YAKIMA
YAKIMA ROZA
UMATILLA
STANFIELD
BAKER
BURNT RIVER
DESCHUTES
VALE
BOISE-PAYETTE
OWYHEE
BOISE
O R E G O N
I D A H O
KLAMATH
SHASTA DAM SITE
ORLAND
HUMBOLDT
NEWLANDS
TRUCKEE STORAGE
CENTRAL VALLEY
FRIANT DAM SITE
N E V A D A
C A L I F O R N I A
PACIFIC OCEAN
BOULDER DAM
BOULDER CANYON
ALL AMERICAN CANAL
GILA
YUMA
SALT RIVER
ARIZONA
NEW MEXICO
SUN RIVER
FRENCHTOWN
BITTER ROOT
MONTANA
MILK RIVER
LOWER YELLOWSTONE
N. DAK.
HUNTLEY
BELLE FOURCHE
S. DAK.
SHOSHONE
UPPER SNAKE RIVER
W Y O M I N G
RIVERTON
KENDRICK
NORTH PLATTE
NEBR.
MINIDOKA
HYRUM
OGDEN RIVER
PROVO RIVER
STRAWBERRY VALLEY
SANPETE
MOON LAKE
GRAND VALLEY
U T A H
C O L O R A D O
UNCOMPAHGRE
PINE RIVER
CARLSBAD
RIO GRANDE
M E X I C O
Scale of Miles
100 0 100 200
N. M.
T E X A S
COLORADO
MARSHALL FORD DAM
RIVER
STATE OF TEXAS
REDUCED SCALE INSET
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
FEDERAL RECLAMATION PROJECTS
Scale of Miles
50 0 50 100 150 200
1937

SECONDARY INVESTIGATIONS

Because of inadequate precipitation for a number of years in many localities in the West where some irrigation or other farming was being practiced and because of the urgency that homes and new opportunities be provided for people from drought areas, the scope of the investigational work by the Bureau this year was greater than at any time previously.

Funds for investigation and studies of prospective projects were available from specific appropriations by the Congress, by allotments from the Public Works and Emergency Relief appropriations, and from contributions by States and other agencies for expenditure by the Bureau. Services of personnel and results of previous independent surveys and other information were furnished to the Bureau through cooperative arrangements by various States and agencies. Expenditures during the year amounted to $588,717, of which $11,060 were funds contributed to the Bureau.

Secondary investigations carried on during the year included the following principal features:

Preliminary reconnaissance surveys to determine the character and extent of the problems;

Horizontal and vertical control surveys over areas to be covered by succeeding detailed investigations;

Topographical surveys of reservoir and dam sites, canal and tunnel locations, and of lands susceptible of irrigation;

Geological examinations of dam and reservoir sites and of proposed tunnel and canal structure locations by test pits, diamond drilling, and other explorations;

Location or alinement surveys of canals and laterals;

Land classification, economic and irrigable area surveys to determine the extent and quality of the lands and their repayment ability;

Drainage investigations by test wells and other means to determine present and probable future ground water elevations;

Silt surveys of rivers and existing reservoirs to determine the probable rate of silting of the proposed reservoirs;

Stream measurements and establishment of gaging stations to determine run-off;

Assembly of information regarding existing water rights, past use of water, and crop production;

Study of the water supply available for irrigation, power, and other uses and for determination of reservoir, tunnel, pumping plant, and canal capacities, and power development and flood control possibilities;

Preliminary designs of dams and structures;

Preparation of general maps showing irrigated (if any) and irrigable lands and also showing features proposed for construction;

Preliminary estimates of quantities of earthwork and materials, and costs;

General report covering investigations.

All secondary investigations were conducted under the direction of the Chief Engineer. Projects examined are located in 11 States. Four of the investigations, namely the Rio Grande Basin, the Madison River diversion, the Green River-Bear River diversion, and the Colorado River Basin, involved the interests of several States. Several investigations involved proposed transmountain diversions within the same State.

In Colorado, four principal projects or groups of projects were investigated. These included:

The Blue River-South Platte transmountain diversion proposal upon which work was still in progress.

The eastern slope surveys, involving 11 more or less separate projects, contemplating irrigation, flood control, and power developments. These investigations still were in progress.

The western slope surveys, where work was continued on investigations of six projects; work was begun on investigation of four proposals, and a report was completed and issued on the Mancos project.

The Colorado-Big Thompson transmountain diversion project, upon which the final report was prepared. This project contemplates construction of the following works:

Replacement reservoir of 152,000 acre-feet capacity at the Green Mountain site on the Blue River near Kremmling; power plant of 26,000-kilowatt capacity at the Green Mountain Dam; storage reservoir of 482,000 acre-feet capacity on the Colorado River near Granby, with feeder ditches to bring the waters of Willow, Meadow, and Strawberry Creeks and Walden Hollow into the Granby Reservoir; a diversion dam on the Colorado River below the outlet of Grand Lake; pumping plant and canal along the Colorado River between the Granby Reservoir and the diversion dam; tunnel 13 miles long beneath the Continental Divide between Grand Lake and the Big Thompson River near Estes Park village; a power plant of 30,000 kilowatt capacity at Estes Park to utilize a net head of 705 feet available between the tunnel portal and power plant; 128 miles of transmission lines to connect the power plants with the Granby pumping plant; regulating reservoirs on the eastern slope at Carter Lake (110,000 acre-feet), near Lyons, Colo., Arkins (50,000 acre-feet) near Loveland, Colo., and Horsetooth (96,000 acre-feet) near Fort Collins, Colo.; diversion canals from the Big Thompson River to the regulatory reservoirs and

supply canals from the reservoirs to Cache la Poudre and Big Thompson Rivers and St. Vrain Creek.

The initial work is estimated to cost $33,500,000, of which $8,700,000 represents the investment in the initial power system, and will be repaid with income obtained from the sale of power produced at the power plants in excess of that required for operation of the Granby pumping plant. Water supply studies show a net annual yield of irrigation water of 310,000 acre-feet. On the basis of a 40-year repayment period, the cost per acre-foot of new water would be $2. The ultimate project will include four additional power plants, costing approximately $10,500,000.

A progress report on Rio Grande Basin investigations, of interest to Colorado, New Mexico, and Texas, was made to the National Resources Committee in February 1937, and at the end of the year a final report was in course of preparation. Investigations of storage possibilities in the Rio Grande Basin and for supplementing the water supply in that basin by transmountain diversion from other watersheds were continued.

In Idaho, investigations looking toward plans for the comprehensive development of the water resources of the Boise, Payette, Salmon, and Weiser Rivers were continued.

Most of the field surveys for the proposed Madison River diversion to serve lands in Montana and Idaho were completed.

In Montana, a preliminary report on Gallatin Valley investigations was issued, and final report was being prepared. A previous report on Buffalo Rapids investigations was supplemented by additional surveys and a further report was issued. A third investigation in Montana covered the Saco Divide unit of the Milk River project on which a report was prepared.

In New Mexico, a report on a plan to provide irrigation works to utilize flood waters conserved by the Conchas Dam, now being constructed by the War Department on the South Canadian River, was being prepared.

In Oklahoma, an investigation of the Altus project on the north fork of the Red River was in progress.

In Oregon, four projects or groups of projects were under investigation. Previous studies of the Canby project in the Willamette Valley, made by the War Department and Oregon, were reviewed and extended under a cooperative contract with Oregon. Investigations of the Grande Ronde project were in progress under a contract with the State, and examinations of the Butter Creek project were started. Investigations started in 1934 of the Deschutes project were completed, and reports on storage facilities, the Crooked River, and north unit, and on the Plainview project investigations were completed, while a

report on the south unit was in preparation, and investigations of the Waldo Lake was begun.

In South Dakota, the Black Hills investigations included surveys for the Angostura and Rapid City projects and completion of reconnaissance of the Belle Fourche River.

In Utah, cooperative work on Salt Lake Basin investigations, under a contract with the State, was continued on the Blue Bench, Dixie, Gooseberry, and Ouray projects, and a report on the Salt Lake aqueduct was issued. Investigations, using funds contributed by the Strawberry Water Users' Association, were continued on the proposed Currant Creek Canal diversion to increase the flow into Strawberry reservoir.

Preliminary investigations of the main features of possible plans for the utilization of the available waters of the Green and Bear River watersheds were commenced under a cooperative contract with the States of Utah, Wyoming, and Idaho.

Investigation of irrigation possibilities within the Colorado River basin were continued. The work this year consisted principally of surveys and mapping of irrigated and arable lands in Colorado and Utah.

Minor expenditures were made for investigations in the North Platte Valley, Nebraska, and southern Nevada.

EMERGENCY CONSERVATION WORK

An average of 34 Civilian Conservation Corps camps were in operation on Federal Reclamation projects, engaged in a program of reconstruction of the distribution systems by lining canals with concrete, replacing wooden water control structures with concrete structures, and realignment and restoration of canals to the original sections. Rodent control work was continued on nearly all projects. Demonstrational projects to educate project farmers to the best methods for eradication of weeds were started.

Civilian Conservation Corps construction work on the Midview Dam, on the Moon Lake project, and the Anita Dam, on the Huntley project, progressed rapidly, indicating their probable completion by the fall of 1937. The Apache Dam for erosion control on the Rio Grande project was completed and the nearby Box Canyon Dam placed under construction. Recreational developments at Elephant Butte, Guernsey, Minatare, and Lake Walcott Reservoirs had progressed sufficiently to permit partial use by the public. Cooperative work with the Bureau of Biological Survey for the development of wildlife refuges was inaugurated at the Lake Walcott Reservoir on the Minidoka project and at Tule Lake on the Klamath project.

Plans are under way for similar work at the Deer Flat Reservoir on the Boise project, and at Pishkun Reservoir on the Sun River project.

Enrollees from the camp on the Sun River project aided in combating a serious forest fire in central Montana in July and August 1936. In February, the most severe winter on record in western Nevada required C. C. C. assistance from the Humboldt project to open roads to isolated towns, ranches, and mines. In June 1937 three floods in rapid succession occurred on three widely separated projects. C. C. C. aid prevented the collapse of the McMillan Dam above Carlsbad, N. Mex., during the greatest recorded flood on the Pecos River. At Billings, Mont., C. C. C. men from the Huntley project aided in restoration of canals following floods resulting from heavy rains in the valley. At Austin, Colo., enrollees from the Uncompahgre project assisted in restoration of facilities destroyed when the nearby fruit growers dam failed.

ORGANIZATION

The Bureau of Reclamation, in administrative charge of a Commissioner appointed by the President, is under the supervision of the Secretary of the Interior. The administrative office in Washington has 100 officers and employees. Engineering and construction activities in the States are under the general supervision of the Chief Engineer at Denver, Colo., who is assisted by a staff in Denver of 800. In addition, each major project is in the charge of a construction engineer, who reports to the chief engineer. Of these there are 24.

When a project or division of a project is completed it is placed in charge of a superintendent. These operation and maintenance projects report to the General Supervisor of Operation and Maintenance at Washington.

The combined field offices, numbering 66, have a personnel of 4,750.

RECLAMATION TABLE 1.—Consolidated Financial Statement, June 30, 1937

DEBIT SIDE

Construction account:			
Primary projects:			
Cost of irrigation works:			
Original construction	$285,048,641.41		
Supplemental construction	12,669,115.03		
Value of works taken over	2,056,939.90		
Total construction cost		$299,774,696.34	
Operation and maintenance prior to public notice, net	$2,808,755.61		
Operation and maintenance deficits and arrearages funded with construction	5,512,653.07		
Penalties on water right charges funded with construction	2,250,456.17		
		10,571,864.85	
		310,346,561.19	
Less income items:			
Construction revenues	7,145,860.14		
Contributed funds	1,831,522.40		
Nonreimbursable appropriation, Rio Grande Dam	1,000,000.00		
		9,977,382.54	
		300,369,178.65	
Less abandoned works, nonreimbursable cost and charge-offs		17,118,714.60	
Balance payable			$283,250,464.05
Palo Verde flood protection, cost of reconstruction and repairs			48,806.46
Tennessee Valley Authority:			
Cost of designs		$484,994.94	
Less contributed funds		484,994.94	
Secondary projects and general investigations:			
Cost of surveys and investigations		4,218,215.85	
Less contributed funds		654,013.38	
			3,564,202.47
General offices' expense undistributed			450,227.42
Plant and equipment			1,600,193.06
Materials and supplies			2,341,997.38
Accounts receivable:			
Current accounts		$2,118,367.42	
Deferred accounts		211,626,725.56	
			213,745,092.98
Undistributed clearing cost accounts			104,148.36
Unadjusted debits, disbursement vouchers in transit			14,575.71
Cash:			
Balance on hand:			
Reclamation fund	$14,014,115.17		
Special funds	38,422.65		
National Industrial Recovery allotments	11,029,533.19		
Emergency Relief allotments	13,264,934.55		
Funds transferred from other departments	929,102.16		
Contributed funds	37,040.19		
Central Valley project	6,770,281.55		
Grand Coulee Dam	13,342,237.11		
		59,425,666.57	
In special deposit and in transit		75,653.26	
			59,501,319.83
Total debits			564,621,027.72

RECLAMATION TABLE 1.—Consolidated Financial Statement, June 30, 1937—Con.

CREDIT SIDE

Security for repayment of cost of irrigation works:			
Contracted construction repayments			$257,611,754.27
Current accounts payable			7,820,974.61
Deferred and contingent obligations			1,255,375.36
Reserves and undistributed profits			9,029,628.86
Operation and maintenance results, surplus			594,358.48
Unadjusted credits, collection vouchers in transit			8,884.93
Government aid for reclamation of arid lands:			
Reclamation fund		$165,864,037.24	
Advances to reclamation fund:			
Treasury loan (act of June 25, 1910)	$20,000,000.00		
Less amount repaid	10,000,000.00		
	10,000,000.00		
Treasury loan (act of Mar. 4, 1931)	5,000,000.00		
		15,000,000.00	
National Industrial Recovery allotments		47,601,000.00	
Emergency Relief allotments		46,922,000.00	
Funds transferred from other departments		1,560,000.00	
General fund—Central Valley project		6,900,000.00	
General fund—Grand Coulee Dam		20,750,000.00	
Special funds:			
Increase of compensation		2,797,960.33	
Rio Grand Dam		1,000,000.00	
Wind River Indian, Riverton		359,176.04	
Judgments, United States courts		602,814.38	
Drainage and cut-over lands		99,815.08	
General investigations, 1923 to Dec. 31, 1924		266,352.66	
Arid, semi-arid, swamp, and cut-over timber lands		35,923.75	
Columbia Basin irrigation project		11,634.28	
Colorado River levee system		495,110.59	
Palo Verde flood protection		48,806.46	
Claims for damages (act of Dec. 28, 1922)		293.23	
		310,314,870.04	
Less nonreimbursable appropriation, Rio Grande Dam		1,000,000.00	
		309,314,870.04	
Less impairment of funds:			
Abandoned works	$2,832,134.62		
Nonreimbursable construction cost	840,136.48		
Operation and maintenance cost uncollectible	453,272.39		
Charge-offs (act of May 25, 1926)	14,681,872.14		
Washington office cost since Dec. 5, 1924	1,930,256.96		
Attendance at meetings	1,815.90		
Giving information to settlers, cost	11,390.22		
Prepaid civil service retirement fund	2,340.33		
Returned to Treasury, miscellaneous receipts	47.74		
		20,753,266.78	
		288,561,603.26	
Less impounded funds, economy acts		261,552.05	
			288,300,051.21
Total credits			564,621,027.72

RECLAMATION TABLE 2.—Consolidated Statement by Projects, of Construction Cost of Irrigation Works, Other Items Reimbursable with Construction and Amounts Repayable

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages and penalties		Construction revenues, contributed funds, and nonreimbursable appropriation (contra)		Abandoned works, nonreimbursable cost and authorized charge-offs	Total repayable	
	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937		Fiscal year 1937	To June 30, 1937
Arizona:											
Gila	$888,463.32	$913,250.48					[1] $12.10			$888,475.42	$913,250.48
Salt River	1,990,677.10	15,029,245.81		$115,993.50		$43,428.40	[1] 61.65	$2,312,065.16	$382,097.31	1,990,738.75	12,494,505.24
Yuma auxiliary	902,297.50	902,297.50			$580.15	580.15	1,085.47	1,085.47		901,792.18	901,792.18
Arizona-California: Yuma		9,373,406.10		378,038.73	101.72	207,119.45	3,410.45	223,964.07		[1] 3,308.73	9,734,600.21
California:											
Central Valley	1,061,874.12	1,351,769.60					.75	.75		1,061,873.37	1,351,768.85
Orland	465.09	2,401,049.57		[1] 11,432.99	25,207.98	31,235.63		28,414.77		25,673.07	2,392,437.44
Colorado:											
Grand Valley	1,857.88	5,019,323.24		138,621.28	68.31	4,529.40		239,692.83	812,374.64	1,926.19	4,080,406.45
Pine River	49,250.85	49,250.85								49,250.85	49,250.85
Uncompahgre	682,334.55	7,653,183.21		311,103.02	110.84	196,506.05	408.20	24,804.25	1,230,791.93	682,037.19	6,875,196.10
Idaho:											
Boise	331,555.65	16,439,334.50		422,283.48	21.37	903,699.42	130,954.59	713,516.12	82,393.84	200,622.43	16,969,407.46
Boise-Payette	805,113.38	972,943.72								805,113.38	972,943.72
King Hill		1,905,918.80				110,122.51		28,187.27	1,987,854.04		
Minidoka	320.64	19,232,782.90	[1] $212.66	318,549.61	[1] 13,497.23	602,449.59	34.49	2,024,933.44	2,288.15	[1] 13,423.74	18,126,560.51
Upper Snake River	807,373.73	1,182,378.65					131.50	172.50		807,242.23	1,182,206.15
Kansas; Garden City		342,933.68		52,868.10				61,356.82	334,474.96		
Montana:											
Bitter Root	140,000.00	887,641.05			473,390.14	516,637.95				613,390.14	1,404,279.00
Chain Lakes	156,319.39	222,188.17								156,319.39	222,188.17
Frenchtown	167,274.45	253,739.04								167,274.45	253,739.04
Huntley		1,559,590.46		[1] 1,000.16	734.66	391,087.46		24,803.01	62,049.83	734.66	1,832,804.92
Milk River	9,480.62	6,922,996.07	[1] 30.25	437,072.69		101,032.03	50.00	74,355.81	1,735,969.31	9,400.37	5,650,805.67
Sun River	157,599.16	8,287,643.89	[1] 64.35	132,664.41		103,192.13	[1] 184.47	47,371.42	89,214.47	157,719.28	8,385,914.54
Montana-North Dakota: Lower Yellowstone		3,685,433.14	[1] 558.00	[1] 5,849.32		922,893.26		105,746.13	382,254.00	[1] 558.00	4,114,476.98
Nebraska-Wyoming: North Platte	44,329.34	19,330,258.95		743,294.42	200.49	1,516,486.08	44,335.34	617,554.58		194.49	20,972,484.87
Nevada:											
Humboldt	80,455.20	1,096,093.64					[1] 4.00			80,459.20	1,095,093.64
Newlands		7,956,907.07		[1] 2,155.44	453.63	44,976.32		52,347.53	4,437,820.00	453.63	3,509,550.42
Truckee storage	123,870.01	183,971.66						20,003.00	200,003.00	103,867.01	163,968.66
New Mexico:											
Carlsbad	1,422,772.99	3,057,195.08		[1] 17,751.77	10,580.19	93,395.50		29,108.08	374,883.58	1,433,353.18	2,728,847.15
Hondo		339,491.68		32,952.01				656.03	371,787.66		

New Mexico-Texas:												
Caballo Dam	619,212.29	659,908.59									619,212.29	659,908.59
Rio Grande	23,449.94	15,251,467.55		[1] 297,857.81		38,493.60	10,000.00	1,426,881.64	344,900.97		3,449.94	13,220,320.73
North Dakota:												
Buford-Trenton		223,423.06		[1] 31.75				1,967.62	221,423.69			
Williston		517,630.09		[1] 165.00			1,350.00	103,405.76	414,058.33			
Oregon:												
Baker		281,591.64						5,003.00				276,588.64
Burnt River	193,900.65	214,638.85									193,900.65	214,638.85
Stanfield	1,168.15	97,852.97									1,168.15	97,852.97
Umatilla		5,137,937.20				230,536.78	2,758.23	91,001.39	888,340.82	[1] 2,758.23	4,389,131.77	
Vale	80,132.59	4,668,845.39	373.25	39,738.26		3,027.24	242.50	9,949.61			80,263.34	4,701,661.28
Oregon-California: Klamath	86,889.25	6,444,670.35	1,731.14	89,036.58	[1] 111.33	85,506.16	8,643.00	271,521.75	7,499.72		79,836.06	6,310,191.62
Oregon-Idaho: Owyhee	806,950.90	16,716,094.51	[1] 5,151.39		72,630.83	72,630.83	936.80	8,397.20			873,493.54	16,780,328.14
South Dakota: Belle Fourche	1,328.88	4,524,829.39		[1] 1,989.03		676,577.53	456.00	31,563.26	379,031.58		872.88	4,788,823.05
Utah:												
Hyrum	9,098.07	914,227.54					[1] 26.50	9,986.13			9,124.57	904,241.41
Moon Lake	440,951.96	878,985.39					[1] 23.53				440,975.49	878,985.39
Ogden	1,512,489.60	3,908,125.95					[1] 288.40	200.00			1,512,778.00	3,907,925.95
Provo River	58,527.00	157,143.75									58,527.00	157,143.75
Salt Lake Basin		2,915,885.40			176.92	5,897.20	175.00	46,135.77			1.92	2,875,646.83
Sanpete	117,221.06	180,716.53					48.75	90.00			117,172.31	180,626.53
Strawberry Valley		3,507,423.49		10,744.06	44.63	89,635.49		258,379.12			44.63	3,349,423.92
Washington:												
Grand Coulee	18,496,707.60	45,251,752.85					31,335.08	110,115.69			18,465,372.52	45,141,637.16
Okanogan		1,452,129.45		[1] 47,766.87	12.33	26,882.64		7,493.28	997,861.70		12.33	425,887.24
Yakima	104,773.45	26,192,428.75		[1] 64,357.08	[1] 22,449.59	154,389.08	1,909.48	452,275.24	4,214.60		80,414.38	25,825,970.91
Yakima-Roza	1,415,156.69	1,525,021.94									1,415,156.69	1,525,021.94
Wyoming:												
Casper-Alcova	2,738,429.88	5,904,330.62					2,600.02	3,023.02			2,735,829.86	5,901,307.60
Riverton	552,881.74	4,779,119.00			6,191.03	122,915.45	885.00	21,707.65			558,187.77	4,880,326.80
Shoshone	22,354.65	10,085,762.89	[1] 1,291.07	36,152.68	.44	467,235.88	57,837.91	592,060.28	1,545,129.47		[1] 36,773.89	8,451,961.70
Shoshone-Heart Mountain	681,889.38	830,501.69									681,889.38	830,501.69
Total	37,787,198.70	299,774,696.34	[1] 5,203.33	2,808,755.61	554,447.51	7,763,109.24	318,990.91	10,111,300.45	17,118,714.60	38,008,801.97	283,116,546.14	

[1] Contra.

RECLAMATION TABLE 3.—Financial Statement, Boulder Canyon Project, June 30, 1937

ASSETS AND OTHER DEBITS

I. Investments

102. Fixed capital under construction	$105,436,620.33	
103. Other physical properties	1,355,574.04	
104. Investigations—Colorado River Basin	229,961.57	
104. Investigations—Parker-Gila project	61,913.14	
105. Other capital expenditures—Interest during construction	14,928,721.09	
Total investments (schedule 2)		$122,012,790.17

II. Current and Accrued Assets

121. Treasury cash:		
For advances to Colorado River Dam fund	$4,475,265.49	
Colorado River Dam fund	764,562.99	
N. I. R. A.—Parker-Gila project	5,168.92	
Collections in transit	60,421.63	
Total Treasury cash (schedule 1)	5,305,419.03	
122. Disbursing officers' cash (schedule 1)	753,294.90	
124. Accounts receivable	17,911.42	
Total current and accrued assets		6,076,625.35

IV. Deferred and Unadjusted Debits

141. Clearing and apportionment accounts	[1] $5,620.21	
143. Field cost adjustments	32,611.04	
145. Jobbing accounts	8,337.63	
146. Prepayments	794.31	
171. Unadjusted debits	989.83	
Total deferred and unadjusted debits		37,112.60
Total assets and other debits		128,126,528.12

LIABILITIES AND OTHER CREDITS

X. Capital and Long-Term Liability

205. Long-term liability—U. S. Treasury authorized appropriation	$126,500,000.00	
161. Less: Authorized but not appropriated	15,240,000.00	
Total long-term liability:		
205.2 Appropriated but not advanced	4,475,265.49	
205.3 Appropriated and advanced	106,784,734.51	
205.4 Less: Impounded, legislative economy act	[1] 137,653.66	
206. N. I. R. A. allotment—Parker-Gila project	93,000.00	
		$111,215,346.34

XI. Current and Accrued Liabilities

211. Audited accounts payable:		
211.1 Contractors earnings, current	9,956.72	
211.11 Contractors earnings, holdback		
211.2 Labor	$41,515.42	
211.3 Purchases	14,116.02	
211.4 Freight and express	104,279.92	
211.5 Passenger fares	675.31	
211.9 Miscellaneous	7,564.53	
Total audited accounts payable	178,107.92	
214. Matured interest	14,903,089.51	
219. Accrued interest		
Total current and accrued liabilities		15,081,197.43

[1] Contra.

RECLAMATION TABLE 3.—Financial Statement, Boulder Canyon Project, June 30, 1937—Continued

XII. Other Credits	
220. Consumers' meter deposits	$15.00
XIII. Deferred and Unadjusted Credits	
231. Unadjusted credits	1,257,777.17
XV. Appropriated Surplus	
251. Appropriated surplus not specifically invested	572,192.18
Total liabilities and other credits	128,126,528.12

RECLAMATION TABLE 4.—Appropriations and Cash Statement, Boulder Canyon Project, June 30, 1937

TREASURY CASH

	Regular appropriation	N. I. R. A. allotment	Total	N. I. R. A. Parker-Gila project
Appropriations and allotments	$73,260,000.00	$38,000,000.00	$111,260,000.00	$93,000.00
Advanced to Colorado River Dam fund	68,785,000.00	37,999,734.51	106,784,734.51	----------
Balance not advanced	4,475,000.00	265.49	4,475,265.49	----------
Colorado River Dam fund:				
Advanced from appropriation to fund	68,785,000.00	37,999,734.51	106,784,734.51	----------
Collections deposited in fund	1,305,172.93	21,508.13	1,326,681.06	5,168.92
Total advances and collections	70,090,172.93	38,021,242.64	108,111,415.57	98,168.92
Disbursements by General Accounting Office	4,979,642.87	54,723.63	5,034,366.50	----------
Advances to disbursing officers	64,346,427.98	37,966,058.10	102,312,486.08	93,000.00
Total withdrawals	69,326,070.85	38,020,781.73	107,346,852.58	93,000.00
Balance	764,102.08	460.91	764,562.99	5,168.92
Repay collections in transit	36.96	----------	36.96	----------
Miscellaneous collections in transit	60,384.67	----------	60,384.67	----------
Total Treasury cash (G. L. 121)	5,299,523.71	726.40	5,300,250.11	5,168.92

DISBURSING OFFICERS' CASH

Advances and appropriation transfer adjustments	$64,356,661.87	$37,972,687.98	$102,329,349.85	$93,000.00
Disbursing officers' disbursements	64,038,626.09	37,963,381.55	102,002,007.64	67,079.06
Disbursing officers' checking balance	318,035.78	9,306.43	327,342.21	25,920.94
Collections by disbursing officers	1,767,672.37	28,107.26	1,795,779.63	5,168.92
Collections deposited and appropriation transfer adjustment	1,367,635.17	28,112.71	1,395,747.88	5,168.92
Collections not deposited	400,037.20	[1] 5.45	400,031.75	----------
Total disbursing officers' cash (G. L. 122)	718,072.98	9,300.98	727,373.96	25,920.94

[1] Contra.

RECLAMATION TABLE 5.—Financial Statement, All-American Canal, June 30, 1937

ASSETS AND OTHER DEBITS

I Investments

102.	Fixed capital under construction		$15,942,269.17

II. Current and Accrued Assets

121.	Treasury cash:		
	For advances to Colorado River Dam fund	$4,975,000.00	
	Colorado River Dam fund	113,301.74	
	N. I. R. A. and E. R. A. allotments	2,352,057.07	
	Contributions—Imperial irrigation district	22,704.46	
	Collections in transit	814.13	
	Total Treasury cash	7,463,877.40	
122.	Disbursing officers' cash	2,877,739.29	
124.	Accounts receivable	3,928.64	
	Total current and accrued assets		10,345,545.33

IV. Deferred and Unadjusted Debits

141.	Clearing and apportionments	$14,968.74	
143.	Field cost adjustments	401,281.53	
171.	Unadjusted debits	25,723.83	
	Total deferred and unadjusted debits		441,974.10
	Total assets and other debits		26,729,788.60

LIABILITIES AND OTHER CREDITS

X. Capital and Long-Term Liability

205.	Long-term liability: U. S. Treasury authorized appropriation	$38,500,000.00	
161.	Less: Authorized but not appropriated	13,000,000.00	
	Total long-term liability:		
205.2	Appropriated but not advanced	4,975,000.00	
205.3	Appropriated and advanced	20,525,000.00	
			$25,500,000.00

XI. Current and Accrued Liabilities

211.	Audited accounts payable:		
211.1	Contractors' earnings, current	$364,863.85	
211.11	Contractors' earnings, holdback	589,599.20	
211.2	Labor	18,019.11	
211.3	Purchases	44,072.07	
211.4	Freight and express	166,632.14	
211.5	Passenger fares	216.41	
211.6	Rights of way		
211.9	Miscellaneous	616.21	
211.91	Refunds	358.47	
	Total current and accrued liabilities		1,184,377.46

XII. Other Credits

226.	Contributed funds—Imperial irrigation district		40,000.00

XIII. Deferred and Unadjusted Credits

231.	Unadjusted credits	$3,932.36	
231.3	Unadjusted credits—Yuma project	50.50	
	Total deferred and unadjusted credits		3,982.86

XV. Appropriated Surplus

251.	Appropriated surplus not specifically invested		1,428.28
	Total liabilities and other credits		26,729,788.60

RECLAMATION TABLE 6.—Appropriation and Cash Statement, All-American Canal, June 30, 1937

TREASURY CASH

	N. I. R. A. allotment	P. W. A. allotment	Emergency Relief allotment	Total	Regular appropriation	Contributed funds, Imperial irrigation district
Appropriations and allotments	$6,000,000.00	$3,000,000.00	$10,000,000.00	$19,000,000.00	$6,500,000.00	$40,000.00
Advances to Colorado River Dam fund					1,525,000.00	
Balance not advanced					4,975,000.00	
Advanced to Colorado River Dam fund					1,525,000.00	
Collections deposited	10,584.25	3,090.60	17,139.94	30,814.79	13,418.66	
Total advances, allotments, etc	6,010,584.25	3,003,090.60	10,017,139.94	19,030,814.79	1,538,418.66	40,000.00
Disbursements by General Accounting Office	61,164.24	16.17	551.97	61,732.38	3,116.92	
Advances to disbursing officers	5,498,703.36	2,618,321.98	8,500,000.00	16,617,025.34	1,422,000.00	40,000.00
Total withdrawals	5,559,867.60	2,618,338.15	8,500,551.97	16,678,757.72	1,425,116.92	40,000.00
Balance	450,716.65	384,752.45	1,516,587.97	2,352,057.07	113,301.74	
Repay collections in transit			814.13	814.13		
Total Treasury cash (G. L. 121)	450,716.65	384,752.45	1,517,402.10	2,352,871.20	5,088,301.74	

DISBURSING OFFICERS' CASH

Advances and appropriation transfer adjustments	$5,498,878.34	$2,618,321.98	$8,500,000.00	$16,617,200.32	$1,422,000.00	$40,000.00
Disbursements by disbursing officers	4,965,241.19	2,424,568.55	7,021,481.12	14,411,290.86	750,170.17	17,295.54
Disbursing officers' checking balance	533,637.15	193,753.43	1,478,518.88	2,205,909.46	671,829.83	22,704.46
Collections by disbursing officers	10,688.48	3,090.60	17,954.07	31,733.15	13,418.66	40,000.00
Collections deposited and appropriation transfer	10,688.48	3,090.60	17,954.07	31,733.15	13,418.66	40,000.00
Collections not deposited						
Disbursing officers' cash balance	533,637.15	193,753.43	1,478,518.88	2,205,909.46	671,829.83	22,704.46

THE NATIONAL PARK SERVICE

Arno B. Cammerer, *Director*

THE scope of the conservation activities of the National Park Service, and their effect upon the well-being of our citizens, are vast and diversified.

The Service endeavors to meet all requests for advice and assistance that will increase and conserve park lands everywhere; and its highest ambition is to make each area under its supervision fulfill to the utmost its destiny as a unit in the conservation plan of the United States.

Popular appreciation of this fact is demonstrated in the use made of the national park system. During the 1936 travel year, which ended September 30, travel to the various units of the national park system reached the unprecedented high of 9,929,432. The increase during the following fall, winter, and spring months, together with the heavy travel at the opening of the 1937 summer season, indicates that, when the 1937 travel season ends on September 30, a new record will have been made.

From throughout the system came reports of increased registration of the visitors from foreign countries. The scenic areas of world-wide fame and the military areas took precedence in the preference of these foreign visitors.

The 1936 increase was along all lines of travel and among users of all types of accommodations. Not only were hotel and lodge quarters generally filled to capacity during the summer season, but the increasing number of park visitors traveling in trailers, as determined by a survey made during August of that year, showed a demand for many new facilities in the public campgrounds, such as electric connections and piped running water. A study as to the advisability of providing more up-to-date trailer camps is now under way. Meanwhile, special sites for trailers are being provided in most of the new campground plans.

Public interest in the national parks was stimulated by the personal interest displayed by President Roosevelt, who on July 3, 1936,



A Driveway in the Shenandoah National Park, Virginia.



A Scene in the Proposed Big Bend National Park.

This photograph shows the mouth of Santa Helena Canyon where the Rio Grande breaks through the Mesa Angula. The bluff on the left is in Mexico and that on the right in the United States.

dedicated the Shenandoah National Park in Virginia, and who participated in the ceremonies commemorating the fiftieth anniversary of the dedication of the Statute of Liberty (a national monument) on Bedloe Island, in New York Harbor, on October 28, and dedicated the Jusserand Memorial in Rock Creek Park, Washington, on November 7. The President also visited the Great Smoky Mountains National Park, in North Carolina and Tennessee, on September 9 and motored 150 miles through the park.

Increases in the park and monument system brought the total number of areas from 135 to 140 and the total acreage from 15,496,-808.34 to 17,049,505.80 acres. As in the past, the National Capital Parks of the District of Columbia, consisting of 695 separate areas, were counted as one unit of the main park system.

In addition to its administration of park areas, the Service continued supervision of the 108 Federally owned or operated buildings and 7 memorials in Washington and of 13 buildings outside the District of Columbia; supervised plans for the Jefferson Memorial in St. Louis; supervised estimates and expenditures for the Mount Rushmore Memorial in Custer State Park, the George Rogers Clark Memorial in Indiana, and the Fine Arts Commission; supervised plans and construction of the Blue Ridge and Natchez Trace Parkways; and cooperated in the Public Works, Civilian Conservation Corps, Works Progress, and other emergency programs. The Thomas Jefferson Memorial Commission designated the National Park Service as its executive agency in the execution of the Thomas Jefferson Memorial, planned for erection in Washington, D. C., and the Director of the Service its executive officer to carry out the plans of the commission.

By Executive order, 46 recreational demonstration areas were transferred from the Resettlement Administration to the National Park Service.

To facilitate administration of the national park and monument system, which in the past 4 years expanded enormously in number of areas and functions, a plan of administration under four regions was devised. Put into effect early in the year as regards emergency activities, replacing the earlier C. C. C. seven-region plan of administration, late in the 1937 fiscal year extension of the regionalization to the National Park Service as a whole was approved by the Secretary of the Interior. Application and operation of the wider regionalization was deferred, however, until after the close of the fiscal year.

UNITED STATES TOURIST BUREAU ESTABLISHED

To fill a long-indicated need for a national clearing house of information on recreational and travel opportunities in the United States, and to stimulate interest therein both at home and abroad, the National Park Service early last winter established the United States Tourist

Bureau. This new agency began functioning in the Federal Building in New York City, but later was moved to ground floor offices at 45 Broadway, a more convenient location.

The Tourist Bureau is expected to receive the cooperation of the 48 States, the territorial and insular possessions, the District of Columbia, and various transportation and travel agencies in assembling, compiling, and disseminating tourist information. One of its purposes is to promote abroad an interest in travel to and within the United States.

A survey to determine the airport nearest to the various national and State parks was completed during the year. The purpose of the study was to keep the Service abreast of the rapid developments in transportation and to make available information on the location of existing airports for the benefit of air-minded travelers.

Radio played an important part in park operations during the past year. It was widely used for fire protection, and two rotary snow plows at Mount Rainier were equipped with sending and receiving sets so that the drivers might call for help if their machines were caught in snow slides.

Radio communication was established at Isle Royale National Park project in Lake Superior and in nine remotely located work relief camps on the North Carolina coast, where no other means of communication are available. With the cooperation of the United States Coast Guard, a radio communication system is being installed at Fort Jefferson National Monument on the Dry Tortugas Islands in the Gulf of Mexico.

Radio is regularly used for control of the annual national ski races on the slopes of Mount Rainier. Experiments are being conducted on use of ultra high radio frequencies at Grand Canyon and Death Valley, both areas particularly adapted to use of these frequencies.

FREE PARK LECTURE SERVICE

Popular acclaim of the Service's free illustrated lectures on the national parks and monuments and on specialized activities in connection therewith led to an expanding of the lecture service during the past year. Eighteen talks were given in the auditoriums of various Federal buildings, the majority in the departmental auditorium and the last three in the newly completed Interior Department Building. These lectures were attended by 11,017 persons, or an average of 612 per lecture. Plans are under way for a still further expansion of this lecture service during the 1937–38 season.

The Director of the National Park Service in his official capacity also served as a member of the National Capital Park and Planning Commission (of which he is vice chairman and ex-officio executive secretary), the District of Columbia Zoning Commission, the Alley

Dwelling Authority, National Park Trust Fund Board, Advisory Council for Emergency Conservation Work, Fredericksburg and Spotsylvania County Battlefields Memorial Commission, Petersburg National Military Park Commission, Washington-Lincoln Memorial-Gettysburg Memorial Boulevard Commission, and representative of the United States on the International Commission on Historic Monuments.

With a deep sense of sadness, and an acknowledgment of great loss, the Service reports the death on March 23, 1937, of Col. Charles Goff Thomson, superintendent of Yosemite National Park, Calif. In addition to his exacting duties as park superintendent, Colonel Thomson in his zeal for the good of the Service and in accordance with his tenets of service to humanity took on numerous other duties involving conservation of irreplaceable scenic assets which were threatened with destruction from one cause or another if not soon given the protection of the Department of the Interior.

Colonel Thomson had served as superintendent of Crater Lake National Park, Oreg., before his promotion to Yosemite, and before that had a record of excellent service for the Federal Government in the Philippines and in the World War.

The Service also suffered a serious loss in the death of Dr. Frank R. Oastler, member of the Advisory Board of National Parks, Historic Sites, Buildings, and Monuments. An ardent conservationist, Dr. Oastler for many years was keenly interested in national-park activities, especially wildlife problems, and his advice to the Service was invaluable.

VENTURE IN INTERNATIONAL COOPERATION

Amicable relations with Mexico, in the field of both conservation and international amity, were strengthened during the past 2 years through cooperation between the two countries on national-park matters.

This cooperation was the outgrowth of the suggestion of the Secretary of the Interior that the Government of Mexico be invited to consider the establishment of international parks along the frontier between Mexico and the United States. Meetings in both countries and studies of areas along the boundary have resulted in a broader understanding of the respective ideals and policies of these two North American republics.

Investigations of the Mexican portion of the proposed Big Bend National Park in Texas were made by Mexican and United States authorities, and during November tentative boundaries of the proposed park were agreed upon at joint sessions of commissions of the two countries. The plan is to link the two sections of the park, when established, by a bridge across the Rio Grande at Boquillas.

Especially interesting is the proposal, originating with Chief Forester John D. Coffman of this Service, that Mexican forestry students be detailed to forestry schools in the United States, and that fellowship awards be granted for that purpose. The matter was taken up with the Guggenheim Foundation, and that organization expressed its interest and offered its assistance, requesting that applications be obtained from promising candidates through the higher officials of the Mexican Forest Service. Applications furnished by the Foundation were transmitted through the National Park Service. It is sincerely hoped that this suggestion will lead to the establishment of Latin-American fellowships in forestry and other conservation subjects.

BOULDER DAM RECREATIONAL AREA

The value and national importance of the Boulder Dam recreational area was proved by the public use of the area during the past year and by the vast scientific interest in it displayed by specialists in many fields.

To permit development of these recreational values to the fullest extent, a cooperative agreement was entered into between the Bureau of Reclamation and the National Park Service. The agreement provides that while the Bureau of Reclamation retains complete jurisdiction and authority over and responsibility for Boulder Dam and all the engineering works connected therewith, also for the territory immediately adjacent thereto and for Boulder City and all activities located therein, the National Park Service has jurisdiction over the remainder of the Boulder Dam recreational area, including the airport on the outskirts of Boulder City and authority over and responsibility for all activities in such areas.

RECREATIONAL DEMONSTRATION AREAS

Recreational demonstration areas constitute a unique form of land use increasingly valuable to the American people, affording outlets for out-of-door recreation accessible to congested populations, and retiring from agricultural use unarable lands of no economic worth. They provide facilities for organized camping, picnics, hiking, bathing, swimming, and boating, by means of such projects as trail systems, campgrounds, beach clean-up, construction of swimming pools and dams for impounding streams, and making artificial lakes.

The National Park Service, by Executive order of November 14, 1936, was given sole responsibility for the acquisition and development of these recreational demonstration areas and is now completing acquisition of lands in the 46 areas being developed in 24 States. Funds allocated from the Emergency Relief Appropriation Act of 1935 enabled the acquisition of these areas under the Federal land program.

Forty-seven organized campgrounds are under construction in 24 recreational demonstration areas, of which 15 were completed in time to be put into use during the 1937 summer season.

Smaller areas known as waysides, contiguous to main highways, also are being developed in Virginia and South Carolina for the accommodation of those seeking 1-day outings.

Twelve thousand relief workers assigned to National Park Service projects and 4,500 C. C. C. enrollees are carrying on these developments.

While the majority of these areas will be turned over to the States for administration after development, it is planned to retain several under the jurisdiction of the National Park Service for demonstration purposes. A total of 99,513 acres of land for this purpose has been acquired; 3,607 acres during 1937.

CIVILIAN CONSERVATION CORPS WORK

The National Park Service completed 4 years and 3 months of participation in Civilian Conservation Corps work. During that period conservation projects of long-continuing benefit to the people of America have been carried on in several hundred camps located in national parks and monuments, State, county, and municipal park areas in the continental United States, the Territory of Hawaii, and the Virgin Islands.

The National Park Service supervised work programs of 91 Civilian Conservation Corps camps in national parks and monuments and 353 such camps in Federal, State, county, and municipal areas; and was responsible for camp management and work supervision over 800 Civilian Conservation Corps enrollees in Hawaii, including Hawaii National Park, and over the 400 enrollees in the Virgin Islands. Improvement both in quality and quantity of these conservation projects has been marked throughout the year. A summary of these accomplishments is shown in table 10.

EMERGENCY RELIEF ACT PROJECTS

The National Park Service derived funds both from the Emergency Relief Appropriation Act of 1935 and the Emergency Relief Appropriation Act of 1936 for land acquisition and development projects, operated on 46 recreational demonstration areas, 2 national monuments, 1 proposed national monument, 2 parkways, 2 State, 4 county, 10 municipal park areas, and 1 beach erosion control area.

These appropriations and projects gave employment to 19,000 relief workers of which 12,000 were local workers and 7,000 workers quartered in subsistence camps operated by the Service. In addition there were relief workers employed by contractors on some of the Service

projects. Three major projects included in this program are the Jefferson Memorial at St. Louis, the Natchez Trace Parkway project in Mississippi, and the North Carolina beach erosion control project.

PARK, PARKWAY, AND RECREATIONAL-AREA STUDY

A Nation-wide study of the park, parkway, and recreational-area programs in the United States was initiated. All Governors were advised to cooperate in the study. Provisions are being made for enlisting the aid and cooperation of other Federal departments and agencies.

The study is expected to result in the preparation and adoption of a comprehensive plan to serve as a guide to the States and be the basis upon which future cooperation will be extended to the States by this Department in the planning, acquisition, and development of park, parkway, and recreational areas. Similar studies also will be made on a regional basis—chiefly in areas near large population centers and frequently covering sections of two or more States—and on a national basis.

Increased consideration was given by States to the regional method of facilitating joint action in administering and developing park areas, where mutual interests and benefits are involved. During the year, by action of New York and New Jersey, the Palisades Interstate Park commission was created. At the request of Missouri and Illinois, the National Park Service is lending professional and technical aid in the formulation of plans for the creation of an interstate compact between those States for the administration and development of Alton Lake and adjacent lands, and the proposed interstate parkway leading to the lake. The Appalachian Trail conference referred to the Service its proposal for an interstate compact for the protection, extension, and development of the Appalachian Trailway from Maine to Georgia.

A three-volume digest of all laws relating to State parks was prepared and made available to park and conservation authorities. As a result of the study of these laws, principles were evolved which are now being incorporated in all new State legislation relating to parks and recreation. A compilation of all State laws relating to archeological matters also was prepared.

A municipal park study was conducted by the National Park Service in cooperation with the National Recreation Association. Material was received from 1,216 cities and 77 counties located in every State. Comparison with similar data secured in 1925 and 1930 shows the extent to which local park systems have expanded in recent years.

CONSERVATION ACTIVITIES

The National Park Service's conservation program for the protection of nature and the historic and prehistoric works of man made notable advances during the year.

As in the 2 preceding fiscal years, all forest-protection improvements, insect and tree disease control, type-mapping, and tree-preservation activities were financed from emergency appropriations. The meager allotment for forest protection and fire prevention for the fiscal year 1937 under the regular appropriation provided funds for only the most essential needs for forest protection personnel and equipment which could not be financed under the Civilian Conservation Corps program. The forest protection accomplishments of the past year are, therefore, largely represented in the report of the C. C. C. program.

The summer of 1936 was an outstandingly serious fire season with several disastrous fires within national park areas.

Extensive use of radio communication was made for protection against forest fires. Many fire lookouts have been equipped with radio sending and receiving sets, lightweight portable field sets provided for fire-fighting crews, and a few automobiles equipped with radio transmitters.

In the far West, the fire season was of unusual length, extending from early May to December in some of the parks. However, despite the high-danger weather conditions and a very material increase in the public use of the parks, the number of man-caused fires in the western parks declined and for the first time in the past 10 years was less than the number of lightning fires. Unfortunately for the National Park System as a whole, both the number of lightning fires and the number of man-caused fires showed a very material increase during the fire season of 1936 with an all-time high record total of 733.

The most disastrous of the season was the Heaven's Peak fire, in the most visited and one of the most scenic portions of Glacier National Park. Set by lightning on August 18, in spite of all reasonable precautions it was carried by a high wind across the Continental Divide, burning a total area of 7,642 acres.

Severe drought in the Lake States region, together with high winds, facilitated the spread of three fires on Isle Royale, resulting in a total burn of approximately 33,000 acres in the center of the island. As Isle Royale is as yet only a national park project, no regular protection organization was available and suppression of these fires was handled entirely by C. C. C. enrollees from national park, State park, and national forest camps, together with forestry personnel from regions I and II and the Washington office. Because of the

status of Isle Royale these fires do not appear in the annual fire statistics for the National Park System for the calendar year 1936.

During the spring of 1937 a very intensive fire protection training program was carried out in all C. C. C. camps under the jurisdiction of the National Park Service.

The taking of panoramic photographs from fire lookout stations and observation points within the National Park System was continued in an effort to improve forest fire detection and fire dispatching. Such photographs have been prepared to date for a total of 208 existing, proposed, and emergency lookout and observation points in 23 national parks and monuments.

Regular annual extensive surveys of forest insect conditions were continued during the year and a system of permanent sample plots was established in several parks to facilitate this study. The general situation in national parks within the Pacific Coast States appears fairly satisfactory as a result of the control program which has been carried on for a number of years.

The needle miner in the lodgepole stands of Yosemite still constitutes a serious menace, nevertheless, and the infestation by the mountain pine beetle in Yellowstone and Grand Teton National Parks continues to spread. The general program of control of the mountain pine beetle was abandoned several years ago because it was so widespread, affecting a number of national forests as well as parks. Some minor control is exercised in the neighborhood of developed areas.

A serious infestation by the Black Hills beetle was fought this past spring by control operations in Bryce Canyon National Park, and the Forest Service cooperated by extending operations to the adjacent national forest. There are indications that the infestation by this beetle is growing over a considerable territory and may seriously threaten the magnificent ponderosa pine forest on the north rim of Grand Canyon. Infestation in Douglas fir by the Douglas fir beetle was also combated in Bryce Canyon.

Insect conditions in the eastern parks have in general been of endemic character and where serious outbreaks of defoliators have occurred a satisfactory degree of control has been maintained through spraying. The Japanese beetle was found this spring in considerable numbers in George Washington Birthplace National Monument. The experimental autogiro spraying program for cankerworm at Morristown National Historical Park was continued with marked success. Blister rust control operations were continued in Mount Rainier, Acadia, and Shenandoah National Parks.

During the past year the C. C. C. itinerant tree-preservation crew provided the care necessary for the preservation and repair of important trees in 9 national cemeteries, 1 national park, 13 national

military and historical parks, 2 national monuments, and 3 national battlefield sites, pruning, fertilizing, installing lightning protection, removing girdling roots, bracing with rod and cables to strengthen structural weaknesses, treating wounds, and diagnosing disease and insect conditions. One additional tree-preservation bulletin was added to the series already published. Several research projects were initiated or continued in connection with callus splitting experiments, cavity filling materials, and lightning-struck trees.

The type mapping program, which provides a detailed inventory and map of the vegetative cover of the parks for use in planning protection, development, and use of the areas, was continued under C. C. C. Approximately 6,832,829 acres have been mapped to date, of which 1,236,829 acres were mapped during the past fiscal year. The data obtained in this work have provided much additional information relative to the flora of the parks and monuments covered, permitting the identification of new plants and their addition to the previous lists of known species within those areas.

Forest nurseries were operated in Sequoia, Yellowstone, Great Smoky Mountains, and Platt National Parks, raising planting stock for reforestation on burns where natural reproduction is lacking, for erosion control, and for landscape planting and replacements of dying trees in and adjacent to public campgrounds and other developed areas. In addition to the parks named, forest planting was conducted during the past year on a recent burn in Mesa Verde National Park, and on deforested areas in Scotts Bluff National Monument.

WILDLIFE CONSERVATION

As a part of the 1936 reduction program to relieve the congested northern range in Yellowstone National Park, 2 new plants of bison were made in the park, 71 animals being released in Hayden Valley and Fountain Flats as nuclei for new herds easily seen by visitors. Ten bison were shipped to zoos and seven slaughtered for use by the Crow Indian Agency.

The reduction of elk was carried on in Yellowstone National Park and vicinity in the winter of 1936–37, as in the past 2 years. Reduction of the herd by 4,000 animals was deemed necessary after exhaustive studies by park personnel and wildlife technicians indicated that, due to the extraordinary drought, the carrying capacity of the range was about one-third less than it was the previous winter.

This reduction program was undertaken by the park staff with the cooperation of the Montana Fish and Game Commission, with the understanding that as many elk as possible would be removed by live shipments and in open hunting areas outside the park. The reduction goal was not approached, since only 846 elk were removed. Mild weather in early winter and subnormal snowfall allowed range areas,

usually closed to grazing, to be used by elk. Movements of herds were slow and few elk migrated into open hunting territory. In Park County, Mont., where hunting was allowed, 256 animals were killed. Some deaths occurred from miscellaneous causes, 169 were live-shipped for restocking purposes and to zoos, and the remainder were slaughtered—the carcasses given to Indian and relief agencies. After the reduction, a census of the northern Yellowstone herd showed that 9,673 animals still remained on the range.

The past year has been one of important accomplishments in fish cultural activities within the national parks, based on the policy adopted in April 1936. There has been no further encroachment of exotic species of fish into national park waters. Lakes or streams where only native fish occur, as well as waters that do not contain any fish, received careful study with a view to protecting such waters against any artificial development.

Closer cooperation exists between the Service, the Bureau of Fisheries, and State game departments than ever before. Some 27,000,000 black-spotted trout eggs were taken in Yellowstone National Park by the Bureau of Fisheries last year, the Park Service receiving 70 percent. Smaller amounts of eggs were taken in a number of other national parks, all being returned to the waters of the park where taken. The State of Montana collected approximately 20,000,000 rainbow and Loch Leven trout eggs at the park boundary near West Yellowstone, hatched them, and returned more than 20 percent to park waters. Egg exchanges were effected by the Service with Utah, Oregon, and Idaho, whereby park waters have been stocked by these States with no cost to the Service. More than 30,000,000 of fish were planted in the national parks during the past year and there is evidence of improved fishing conditions in many waters.

HISTORICAL AND ARCHEOLOGICAL CONSERVATION

The National Park Service program for the conservation of historic sites and buildings was greatly expanded. The historic sites survey is now under way, the field of cooperation with State and local agencies has been extended, and an agreement with the Works Progress Administration requires National Park Service approval of all restoration projects financed by relief funds. Also, the total number of historic and archeologic sites authorized or established under custody of the National Park Service has been increased to 100 with the addition of Perry's Victory International Peace Memorial and the Ocmulgee National Monument, the latter, one of the most important areas in southeastern archeology.

Considerable progress was made in the past year in putting into effect the important and far-reaching national policy for historic preservation adopted by Congress in the act of August 21, 1935.

The most significant single step was the development, with the aid of the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments, of a comprehensive plan for systematic inventory, investigation, and classification of the great number of historic sites eligible for consideration under that act. Outstanding historic and archeologic sites will be selected for public protection through ultimate inclusion within the national park system. Sites of lesser importance will be recommended for State and local protection. A policy governing restorations was also worked out with the assistance of the advisory board.

Preliminary negotiations were made toward designating certain sites as national historic sites and assuring their permanent preservation for public benefit. Among these are the following five important areas:

Derby Wharf national historic site project.—Interesting maritime project in Salem, Mass., to commemorate the importance of New England shipping in the early history of our Nation. The National Park Service took formal possession last year of the customhouse, center of the project.

Hopewell furnace and village.—Revolutionary foundry included within the French Creek recreational demonstration project in Pennsylvania. A boundary study was completed last year and the area will probably be designated a national historic site.

Harpers Ferry site.—Harpers Ferry, W. Va., had great historic significance during colonial times and during the War between the States. The project as planned will include the Jefferson Rock, the stone steps, hewn by hand from solid rock up the face of the cliff under Robert Harper's direction; the arsenal site, associated with the story of John Brown; and certain Civil War remains on the heights surrounding the town. A detailed study of recommended boundaries, comprising an area totaling 1,300 acres, has been completed recently.

Old main building, Knox College.—The only building still standing associated with the Lincoln and Douglas debates. A cooperative agreement was entered into with Knox College, Galesburg, Ill., for establishment as a national historic site.

Manassas Battlefield site.—Site of Virginia battle important in War between the States. Land acquisition was nearly completed (1,476.19 acres) and detailed research studies made preparatory to its development.

Two cooperative agreements of the type authorized by the act of August 21, 1935, permitting the Federal Government to exercise a measure of control over the historic values of structures or sites at small cost and without disturbing ownership, were drafted with State and local agencies.

The Service, through its general program of State cooperation discussed elsewhere, has contributed in an important way to the

preservation of many historic sites and structures. Thirty-two projects on areas of primary historical or archeological interest widely distributed throughout the country were in progress during the past year.

Physical improvements to established areas were made throughout the year. Stabilization of the battlefield areas through erosion control has contributed further to their permanent preservation. Interesting among the developments are the restoration of such historic structures as the Wick and Guerin Houses in Morristown National Historical Park; the Lightfoot House, Yorktown, in Colonial National Historical Park; Fort Pulaski, Ga.; the customhouse at Salem, Mass.; and the Peach Orchard, Shiloh; and the opening of bridle and foot trails to important points in battlefields of the War between the States. Fifteen visitor-contact stations were constructed in battlefield areas this past year.

ADVISORY AND TRUST FUND BOARDS

Col. Richard Lieber, of Indianapolis, Ind., was appointed by the Secretary of the Interior to fill the vacancy on the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments, created by the death of Dr. Frank R. Oastler. Colonel Lieber, who is president of the National Conference on State Parks, is an outstanding conservationist and authority on park matters.

The advisory board as constituted at the close of the fiscal year was as follows: Mr. Edmund H. Abrahams, Savannah, Ga.; Prof. Herbert E. Bolton, Berkeley, Calif.; Dr. Hermon C. Bumpus (chairman), Duxbury, Mass.; Mrs. Reau Folk, Nashville, Tenn.; Hon. George de Benneville Keim, Edgewater Park, N. J.; Dr. Alfred V. Kidder, Cambridge, Mass.; Dr. Fiske Kimball, Philadelphia, Pa.; Dr. Waldo G. Leland, Washington, D. C.; Mr. Archibald M. McCrea, Williamsburg, Va.; Dr. Clark Wissler, New York, N. Y.; and Col. Richard Lieber, Indianapolis, Ind.

The National Park Trust Fund Board accepted a donation of $3,000 from the Universal Pictures Corporation for the privilege of taking motion pictures in Yellowstone and Grand Teton National Parks. That contribution, the only one received during the fiscal year, brought the donations credited to the national park trust fund account to a total of $8,000. No expenditures were made from the fund during the year. The membership of the National Park Trust Fund Board includes the Secretary of the Treasury, the Secretary of the Interior, the Director of the National Park Service, Mr. J. Horace McFarland, of Harrisburg, Pa., and Mr. Louis Hertle, of Gunston Hall, Va.

EDUCATION

Many new enthusiasts were enlisted in the cause of conservation last year through participation in the activities and use of the facilities provided in national parks and monuments by the National Park Service's educational program. The Service itself was able to expand this program through the availability of emergency funds and the cooperation of educational and scientific organizations.

A total of 4,550,516 educational contacts were made in the parks during the year July 1, 1936, to June 30, 1937. Visitors who listened to talks by ranger-naturalists and ranger-historians, visited museums, and participated in hikes and campfire circles gained far more than a quick-tripper's idea of the national parks.

Students under the sponsorship of various colleges and universities made tours of the different parks as part of their educational programs. Carlsbad Caverns' records of special school parties give some idea of the extent to which park areas are visited by school groups.

	Total school classes	*Number of students*
February 1937	6	148
March 1937	16	397
April 1937	63	1,150

National Park Service information desks were extremely busy, as visitors have come to depend upon these centrally located offices for information of every kind. A growing number of parks are giving early season training to company bus drivers so that the information which they give to the public will be accurate and in accord with scientific knowledge.

Although there have been some additions to the list of publications useful to the visitor, much remains to be done to furnish adequate printed material. Yellowstone has issued another number of Trailside Notes, providing the motorist and hiker with a guide from Fishing Bridge Museum to Mammoth Hot Springs. Yosemite has issued a self-guiding manual describing the auto tour on the floor of the valley, and a revised edition of High Waterfalls of the World. In press is a publication entitled "Birds and Mammals of Mount McKinley National Park" by Joseph S. Dixon. This has been issued by the Service designated as no. 3 in the fauna series.

MUSEUM DEVELOPMENTS

Probably the greatest progress of the year in the educational program was in museum development throughout the Service.

National Park Service museums do not present case after case of loosely organized, uncoordinated displays of documents, scientific specimens, isolated heaps of dry bones, or technical equipment.

Planned to illustrate ideas rather than exhibit collections of specimens, they tell a running story of the parks through pictures, charts, maps, models, and dioramas arranged in narrative sequence.

During the past year better housing and more effective presentation of exhibits were provided. Eleven administration buildings containing museum wings were built with P. W. A. funds. The new museum in the Interior Building is completed and exhibits depicting the aims and achievements of the Department's bureaus are in an advanced state of preparation.

Fireproof housing for the priceless exhibits already accumulated in field museums is the next important objective in museum development.

Two laboratories have prepared exhibits for displays in 31 different units of the park system, including many relief maps and models of the areas helpful to visitors in orienting themselves. Exhibits were furnished for 12 expositions and conferences during the year.

NATURALIST ACTIVITIES

Increased travel to the parks and the necessity for establishing several centers within a park to avoid overconcentration of visitors resulted in a perceptible increase in naturalist activities last year and revealed the necessity for an enlarged staff.

Campfire circles and amphitheaters suitable for evening gatherings were developed until every major park now has one or more to care for visitors who like to sit around a campfire and hear ranger-naturalists tell the story of the park and explain its major features. The smaller campfire circles encourage free and open discussion through questions and answers and entice volunteer entertainment talent, while the larger bring park wonders to life for hundreds of visitors, making them see the area with new eyes the next day. An inventory shows a total of 5 community buildings, 16 well-equipped amphitheaters, and 28 simple log circles in the parks. Lectures, as a whole, have been better planned and executed.

A gratifying number of all-day trips have been developed in practically every park and more knapsackers and pack-train parties were reported as using the trails into the back country. One of the most popular all-day guided trips was that to the top of Mount Lassen.

Campfire programs and nature hikes were inaugurated on an experimental basis in Shenandoah last year and the response by the public exceeded all expectations. The naturalist program in the National Capital Parks attracted wide attention and the attendance of 11,128 persons on field trips, 4,219 persons at campfire lectures, and ever-growing numbers on the nature trail proved the necessity for an augmented staff and additional campfire facilities.

New appointments and promotions have given added impetus to the naturalist staff. Naturalist positions have been newly established

at Boulder Dam recreational area, Death Valley National Monument, and Mesa Verde National Park, while new ranger-naturalist positions were established in Acadia, Rocky Mountain, General Grant, and at Devils Tower. More mature and better-trained men are to be found throughout the Service.

NATURAL HISTORY SCHOOLS

Excellent training for prospective national park personnel is given by the Yosemite School of Field Natural History, and its graduates are in demand for both seasonal and permanent naturalist positions.

The Secretary of the Interior has designated the field school and the Yosemite Junior Nature School as nonprofit scientific organizations engaged in a training enterprise helpful to the Service.

The field school is a full-fledged graduate school, with a college degree a prerequisite.

The instructional staff is strengthened by highly qualified professors from the University of California. The final field trip has been extended from 1 week to an expedition of 2 weeks' duration. Much flora and fauna specimen collecting is done, benefiting the Yosemite Museum through new discoveries and added scientific data. The 1937 session, constituting the thirteenth class, began its courses on June 21 with the selection of its 20 candidates (14 men and 6 women) from more than 100 applicants.

Eight graduates of the school are now employed in the Service permanently, and at least 25 more have been employed seasonally.

YALE FELLOWSHIPS

Yale University continued its cooperation with the National Park Service, furthering incentive for scholarship and training through its award of fellowships to Service employees. During each of the scholastic years of 1935–36 and 1936–37 one such fellowship was granted; and as this report is being written word has been received that two National Park Service fellowships will be awarded during the coming year.

The fellowships are open to employees of the National Park Service interested in pursuing advanced studies bearing upon the educational program of the Service or upon some special feature of interpretation activity such as field studies of wildlife, forestry, history, archeology, or museum display. A forester and an archeologist were the recipients of the previous fellowships; a historian and a geologist were selected to attend Yale next year.

HISTORICAL EDUCATIONAL ACTIVITIES

Constant efforts are being made to improve all types of educational facilities afforded the general public in the historical areas. Perhaps the most important progress last year was made in the development

of field exhibits of all kinds, including sample restorations, outdoor relief maps, orientation maps, trailside museums, and markers. Outstanding in this class was the reconstruction of the Continental Army hospital hut at Morristown in accordance with contemporary authentic records. This structure, together with reproductions of a soldier's hut and officer's hut, now presents an interesting group of sample restorations of the Morristown encampment.

As part of the educational program, public lectures sponsored by outside groups have been given by park historians and there are continued requests for this kind of service. Numerous radio broadcasts were given by the staff and opportunities offered for a series of park historical sketches.

The National Park Service cooperated with various civic organizations in conducting numerous commemorative celebrations during the year, among them being the fiftieth anniversary celebration at the Statue of Liberty, at which President Roosevelt and Secretary Ickes spoke, and reenactment of the Battle of the Crater at Petersburg, Va., attended by 50,000 people.

RESEARCH

ECOLOGICAL STUDIES

Perhaps the most notable observation to be made at the close of this third year of C. C. C. support of the wildlife division is the fact that recognition of the importance of a wildlife program in National Park Service activity has continued to grow. Maintenance of a staff of wildlife technicians through appropriations made by C. C. C. is assured for another 3-year period. During this time it is expected that provision for some permanent staff of ecologists can be made.

The work of the past year has kept the division fairly abreast of current administrative demands put upon it, but it has not been possible to enter upon the long-time program of research in wildlife needs so necessary to full understanding and adequate handling of biological assets in all areas now under the jurisdiction of the National Park Service. A satisfactory approach to the problem could be made if additional wildlife technicians were employed for the purpose of making appraisal of all biological values for which the Service is responsible.

Thirty papers covering the distribution, food habits, behavior, and taxonomy of mammals, birds, and amphibians, and management of mammals and fish in National and State parks were published.

An extended field trip was made by the supervisor of fish resources and two wildlife technicians and the most recent developments in warm water fish culture in the central United States was studied. This particular phase of the Service's fish cultural activities will be exceedingly important in the development of State park areas.

Following the spraying of woodland at Morristown National Historical Park with lead arsenate, a census of bird life was made to check possible detrimental effects. Observations indicated no material decrease of bird life but this may not yet be regarded as conclusive.

Range studies were continued at Grand Canyon, Rocky Mountain, and Yellowstone National Parks.

Studies of the nesting trumpeter swans at Yellowstone were continued. A census showed a total of 38 adults and 12 cygnets in the park in the summer of 1936, almost double the number recorded in 1935.

The survey of plants of the Great Smoky Mountains National Park was continued and about 20 species of the higher plants were added to the approximately 1,000 species represented by 4,000 specimens in the park collection.

At Glacier National Park an investigation was made of diseases and other causes of a decline in the park's bighorn population. Several bighorn have died of a disease described as *hemorrhagic septicemia* which has also caused serious losses in the Yellowstone bison herd.

Extensive wildlife studies were made in the proposed Big Bend National Park to provide data for proper management when the park is established.

Surveys were made at Oregon Caves and Fort Pulaski National Monuments with recommendations for extension of boundaries to protect native fauna and flora and historical sites, respectively.

A study of the economic food habits of the coyote at Lava Beds National Monument was started in an effort to determine the effect of that animal on the nearby Tule Lake Migratory Waterfowl Refuge.

HISTORICAL STUDIES

Research is a continuous major duty of historians in every national historical park and monument and consumes much of their time. Closer coordination of the general historical research program is being developed to assure the best possible professional standards. A master index of research subjects is being prepared and the Washington office made the clearing house for all reports. To assist the research staff, microcopying and projection equipment has been purchased for each regional office, permitting photographing of valuable documents and materials.

Among the major studies started during the past year and in progress are:

1. Fort Raleigh, Roanoke Island, Va.
2. Battle of Manassas, Virginia.
3. Battle of the Wilderness, Virginia.
4. Castle Pinckney, S. C.

5. Wakefield, George Washington Birthplace National Monument, Va.
6. Kenesaw Mountain, Ga.
7. The Second Battle of Fredericksburg, Virginia.
8. Catalog and index of Brady Civil War photographs.
9. Construction history of Fort Pulaski, Ga.
10. Brompton, Fredericksburg, Va.
11. Study of early Texas and Mexican manuscripts on Goliad Mission, Texas.
12. A study of medical practices in the Revolutionary War made in connection with the installation of exhibits at Morristown Continental Army hospital hut.

GEOLOGICAL STUDIES

The C. C. C. program made possible the continuance of geological work undertaken in previous years. The staff was kept busy supplying technical information for development of accommodations in the parks. Activities included research and advice regarding development of master and period plans; location of water supplies; appraisal of natural foundations for dams, reservoirs, bridges, and tunnels; quarrying operations for road metal, structural stone, gravel, and sand; location of roads and trails; and erosion control. Ninety-five formal reports on special projects of this type were prepared.

The geological map of the proposed Big Bend National Park was approximately 80 percent completed. The surveys show notable deposits of vertebrate fossils, including dinosaurs and a specimen believed to be the rare, toothed bird, *Hesperornis*. Invertebrate fossils, including a phenomenal 48-inch *Inoceramus Grandis*—a form of clam—were found in great profusion.

An exhaustive study was made of the stratigraphy in portions of the Boulder Dam recreational area and related territory, in an attempt to reconstruct the ecological conditions of the area in remote Permian time. In the course of this study, a den of the prehistoric ground sloth, *Northrotherium*, containing much excellent fossil material in an exceptionally fine state of preservation, was discovered in Rampart Cave.

Investigations of Meteor Crater led to the decision that the evidence favors the theory that the crater was formed by the impact of a great meteor, and hence should be included within the category of unusual and spectacular phenomena.

COOPERATIVE FIELD STUDIES

The Oberlander trust of the Carl Schurz Memorial awarded a fellowship to the Chief of the Wildlife Division enabling him to visit Germany from September to December 1936 to make special studies of administrative methods and field procedure in the central offices of the Bureau for Nature Protection and in four of the "national parks" of the Third German Reich.

Cooperation was extended to the Direccion de Parques Nacionales of the Argentine Republic and the Department of Forests, Game, and Fish of the Republic of Mexico. Conferences with the Mexican officials have continued coordinated planning of international parks, monuments, and game refuges.

By special arrangement with the United States Geological Survey, the assignment of three of its personnel to work in the national parks was continued. As a result of these assignments, material obtained in field studies in Sequoia and Yosemite National Parks was converted into museum exhibits, and portfolios are being made of park photographs descriptive of outstanding geologic features; a report describing the geology of certain routes of travel and areas of visitation in Glacier National Park was prepared; and field work in the Colorado Plateau is being transcribed into a report covering the parks of that area.

A number of additional field studies through the cooperation of interested agencies were conducted within the parks last year. The following is a partial list of some of the more noteworthy:

In Great Smoky Mountains National Park: Dr. W. H. Camp, assistant curator, New York Botanical Gardens, made extensive studies of the heath family of shrubs, trees, and herbs, preparatory to submitting a monograph on this group; Dr. W. M. Barrows, one of the leading spider authorities in the United States, made a study of the spiders of this park and estimated that there are between 700 and 800 species in the area, of which 100 to 200 are new species; Dr. L. R. Hesler, head of the botany department, University of Tennessee, collected more fungi to add to the list he has already prepared for this park; and Mr. Edwin V. Komarek of the Cooperative Quail Study Association of Thomasville, Ga., will soon publish a paper on his studies of the mammalian fauna of the Great Smokies.

In Yellowstone National Park: Dr. Leonard P. Schultz, in cooperation with the Bureau of Fisheries, investigated fish food conditions in Yellowstone Lake and other waters of the park and studied exotic fish to determine the possibility and advisability of their reduction as a menace to trout waters of the Madison River and to lakes on this river outside the park; Ranger-Naturalist James R. Simon conducted a study of fishes with cooperation of the University of Wyoming and plans to incorporate his findings in a paper on all game and forage fish of Yellowstone region; Dr. Harvey Schlundt continued his study of thermal waters and rock formations in the park; Miss Edan Lind of England devoted special attention to the plant life of Yellowstone, which she will describe to her students in botanical classes at the University of Sheffield.

Arrangements were made with Miss Elizabeth Morse of the University of California to study the fungi of Zion National Park.

Permission was given the Carnegie Institution of Washington, Department of Research in Terrestrial Magnetism, to carry on earth-current measurements in Shenandoah National Park. This institution also inaugurated a volcanological study of Crater Lake to be conducted by H. Williams of the University of California, and continued studies of the Archean rocks of Grand Canyon.

George Munro, Hawaiian ornithologist, working under the joint auspices of the Bishop Museum, Territorial Board of Agriculture and Forestry, Hawaiian Sugar Planters Association, Hui Manu, and others, conducted a survey of Hawaii National Park to compare the present status of native birds with the finds of 40 years ago.

An airplane reconnaissance of Mount McKinley was made by Bradford Washburn, Jr., in conjunction with the National Geographic Society.

Excavations in Dinosaur National Monument were continued and more of the fossil stratum uncovered to enable the American Museum of Natural History under the leadership of Dr. Barnum Brown to expose and develop a large dinosaur skeleton as an exhibit in place.

C. C. Presnall, park naturalist of Zion National Park, and Dr. E. Raymond Hall, mammalogist, University of California Museum of Vertebrate Zoology, made studies of the small animals and others indigenous to the southwestern national park region, over a 3-year period, followed by comparative studies at the Museum of Vertebrate Zoology, Berkeley, Calif., with the discovery of new facts indicating that the red bat and kangaroo bat are comparatively abundant in that area. Their findings have been published through the Utah Academy of Sciences under the title of "Ranges and Relationships of Certain Mammals in Southwestern Utah."

Recognition has been given 11 nonprofit scientific and historical organizations, engaged in cooperative park educational work through official designation by the Secretary of the Interior, in accordance with the Interior Department Appropriation Act for the fiscal year 1937, approved June 22, 1936, Public Law No. 741.

PLANNING AND CONSTRUCTION

Behind the successful handling of millions of visitors to national park areas lies a record of exact and careful planning and of construction activities that appear only incidentally, if at all, in the finished picture. The retention of primitive conditions, where use intrudes upon nature, would be impossible without the skill of the landscape planner and the engineer, who find means to install the necessary facilities and make the needed adjustments with the least possible disturbance of natural conditions.

Planning and construction activities continued under four major programs during the past year—the regular Interior Department

Appropriation Act's provision for road and trail construction, Public Works, the C. C. C., and Works Progress.

Under the Public Works program all general development, engineering, architectural, and landscape architectural plans for $2,150,000 worth of general physical improvements were prepared. Under the roads and trails appropriation of $6,500,000 carried in the 1937 Interior Department Appropriation Act, plans for and inspections of major road projects were made, and minor roads and trails were constructed.

Similar service was rendered by the engineering and landscape personnel under the Works Progress program, which included physical improvements, recreational developments, road and parkway construction, and land utilization work to the extent of $1,500,000, on a wide variety of areas—Federal, State, and local, including recreational demonstration areas.

In the contract plans for nearly all road projects were included plans and drawings for bridges, parking areas, guardrails, headwalls, special grading, and other essential items.

In addition to roads and trails, buildings, electric elevators, dam and intake structures, sea walls, reservoirs, pumping plants, water supply and distribution plants, drainage systems, sewerage systems and sewage disposal plants, telephone and power lines, cribbing, and retaining walls were constructed or improved. In Washington, construction projects included such diversified duties as altering the south front of the Civil Service Building to permit street widening, and elimination of fire hazards at the White House.

Considerable surveying and mapping of both old and new areas of the national park and monument system were accomplished.

PARKWAY DEVELOPMENT

The parkway projects, which are perhaps the most spectacular new phase of national park planning and development during recent years, continued to hold popular attention.

Two new sections of the Blue Ridge Parkway project, totaling 15 miles, were placed under contract, bringing the total mileage under contract in both Virginia and North Carolina to 135 miles. Development of two recreational areas along this parkway was also continued, as were location work and right-of-way developments for bridge and overpass structures. Additional studies were made of the parkway route in the vicinity of the Great Smoky Mountains National Park.

Contracts for the construction of 34 miles in three Mississippi sections of the Natchez Trace Parkway were awarded. Survey and location work was continued in collaboration with the Bureau of Public Roads.

ENGINEERING ACTIVITIES DIVERSIFIED

Data on soil mechanics for use in the field resulted from research carried on in the engineering laboratory. Most of the material so obtained was incorporated in the Manual for the Design of Low Dams prepared for the water resources committee. This work attracted such favorable attention that the laboratory was visited by the chief engineers of almost every Federal agency. It also received marked attention and interest at a recent meeting in New York City of the American Society for Testing Materials.

The value of soils investigations, particularly in the construction of earth dams, is rapidly becoming recognized, and the increasing number of samples submitted by the field for analysis is taxing the available laboratory personnel and space to the limit.

Routine engineering work included periodic inspections of Government-owned and rented buildings with a view to insuring the preservation of the buildings and the safety of the occupants, particular attention being paid to elevators and to floor loads imposed by safes, files, and storage.

Technical service on a broad range of problems was rendered other governmental and semigovernmental agencies by the engineering staff of the National Park Service, such work being done on a reimbursable basis. Typical examples of this cooperation were the construction of the Petroleum Experimental Station of the Bureau of Mines at Bartlesville, Okla., and the investigation of air-conditioning contracts effected under the jurisdiction of the Bureau of Agricultural Engineering of the Department of Agriculture.

All major road construction, both under the regular roads and trails appropriations and under Public Works allotments, was handled for the National Park Service by the Bureau of Public Roads of the Department of Agriculture, continuing the excellent cooperation initiated under the interbureau agreement established in 1926. Landscape planners and engineers of the National Park Service, in cooperation with Bureau engineers, checked and approved all preliminary locations, surveys, and plans for road construction.

HISTORIC AMERICAN BUILDINGS SURVEY

The survey of historic American buildings, for the purpose of measuring and recording all important examples of the builders' art erected in the United States and its possessions before the last quarter of the nineteenth century, went into its fourth year of cataloging, measuring, and recording such structures. The total product of the Historic American Buildings Survey to June 30, 1937, included approximately 14,000 measured drawings of 2,100 buildings and 16,000 photographs of 3,500 buildings, in addition to the data sheets and reference cards for these and additional structures. Most of the records have

been deposited in the Library of Congress, where they are available for public use and reprodution. In conducting the work of the Historic American Buildings Survey, the structures in each locality in greatest danger of destruction are measured first.

The result of a national plan sponsored by the Department of the Interior through the National Park Service, in conjunction with the Library of Congress and the American Institute of Architects, the Historic American Buildings Survey during the past year was conducted largely through the facilities of the Works Progress Administration. The Works Progress phase of the program necessarily was discontinued at the end of the fiscal year because of a sharp reduction in Federal projects of that nature, due to curtailment of funds, although in some of the States additional Works Progress Administration projects were set up.

SERVICES BY PARK CONCESSIONERS

Operations of accommodations for the public on the concession basis were continued and extended during the year. Two new major contracts were awarded. After advertising three times for bids for the construction and operation of tourist facilities in the Shenandoah National Park, a 20-year contract was awarded the Virginia Skyline Co., Inc., of Richmond, Va.

A 20-year contract also was awarded the Grand Canyon-Boulder Dam Tours, Inc., for the installation and operation of facilities for the accommodation of visitors to the Bolder Dam recreational area.

The number of contracts and permits for the furnishing of tourist accommodations in the national parks on June 30 totaled 139. These various operations are under the supervision and control of the Department of the Interior, to which are submitted annually, for review and approval, schedules of rates for accommodations or services rendered and annual reports showing the financial status, details of income and expense, and resulting profit or loss.

The contract of the Mesa Verde Park Co. was taken over by the Mesa Verde Co., with the approval of the Department. Ansel F. Hall, former Chief of the Field Division of Education, is a director in the new company and in active management of its affairs. It is believed that Mr. Hall's enthusiasm, and his experience based on 20 years' connection with the National Park Service, will result in the building up of an operation on a high standard.

Although operating expenses of the concessioners steadily increased during the past two seasons, substantially no increases in rates have been authorized by the Department. Nevertheless, the park operators were able, by reason of increased volume and lessons in economy learned in the depression days, to maintain generally standard rates for the various accommodations and services furnished.

As a check in the avoidance of excessive rates, orders were issued that no increases be made in salaries or other compensation of corporate officers, managers, or other employees of park operators working under profit-sharing contracts who receive compensation at a rate of more than $5,000 until approved by the Director of the National Park Service.

Field studies of rates for public-utility services in several of the parks resulted in establishing certain new rates and altering some old rates. At Yellowstone National Park charges that will reimburse the Government $11,000 annually are being set up for telephone, water, and garbage disposal service furnished to the park concessioners. A similar review of services and rates in Mount Rainier National Park, when its findings are put into effect, will return an additional $1,200 annually to the Government. The charges are based on depreciation, maintenance, and operating costs.

With the heaviest travel season in the history of the National Park Service in prospect during 1937, additions and improvements in facilities were made in all of the national parks and monuments. Since the improvements made in Yellowstone National Park, which were particularly noticeable and needed, were typical of those generally shown throughout the system, a résumé of betterments in that park will indicate progress generally.

In the Yellowstone, after a partial shut-down of several years, the old hotel at Mammoth Hot Springs was almost completely dismantled and rebuilt. A new dining room and grill combination commenced operation of the regular park season on June 20. During the coming year construction will begin on the new cabins and new recreation center, to be built between the hotel and dining room. This layout represents a new idea in the planning of facilities for the public in the Yellowstone, bringing all types of services into one center instead of having them scattered in more or less widely separated units, as in the past. Consolidation of the larger park operators into the present Yellowstone Park Co., effective at the beginning of the 1936 season, made possible this new line of development. The Lake Hotel, closed for several years, was again opened to the public.

The purchase of 41 new busses, representing the latest ideas in sightseeing equipment, marks the second step in the rehabilitation and modernization of the Yellowstone fleet of approximately 400 busses, probably the largest sightseeing fleet in any resort area in the world.

Authorization was given for remodeling the Government-owned Painted Desert Inn at the Petrified Forest National Monument, and work was continued on the concession buildings being erected at Bandelier National Monument by the Service. Operation of these facilities under the concession system is expected within another year.

The National Park Service undertook and is continuing supervision of the construction of a hotel at McKinley Park Station, at the entrance to Mount McKinley National Park, Alaska, under an allotment of funds by the Public Works Administration to the Alaska Railroad. In addition to the hotel structure itself, a complete utility plant must be constructed to provide heat, light, water, and sewage disposal facilities. This hotel, located along the line of the Alaska Railroad, will be operated by that organization, but will furnish much needed accommodations to McKinley Park visitors.

Cooperation and active participation was continued in the management of the concession operations of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., in Washington, D. C., and in the Mammoth Cave operating committee at Mammoth Cave, Ky., both nonprofit distributing agencies furnishing accommodations for the public. Charles L. Gable, chief of the park operators division of the branch of operations, continued to represent the Director of the National Park Service in these organizations. The entire profits from the Mammoth Cave operations are donated to the United States for the purpose of purchasing additional land to complete the Mammoth Cave National Park. The Welfare and Recreational Association pays one-half of its profits to the United States as revenue, using the remaining half for welfare and recreational purposes within the District of Columbia.

Constant vigilance was maintained, through inspections of fire hazards, to prevent fires in buildings throughout the national parks. An automatic sprinkler system was installed in El Tovar Hotel at the Grand Canyon and improvements made in the Mammoth Cave Hotel in the Mammoth Cave National Park.

A safety committee was established within the National Park Service for the purpose of establishing standards for fire protection and accident prevention.

A comprehensive study of the accident problem was made by the Secretary's committee on health and safety, and a report with recommendations submitted. The chief of the Service's safety division was chairman of the interbureau committee on health and safety.

PROTECTING THE PUBLIC HEALTH

Permanent all-year administrative and protective personnel in the major units of the national park system and a visiting list approaching 12,000,000 annually entail serious responsibilities toward the safeguarding of health. With the continued cooperation of the Public Health Service this phase of Park Service work was handled successfully.

Broadly speaking, the work was divided into two main channels, studies of water-supply problems, including examination of the sources

of drinking water and bacteriological tests of water used, and the development or continuation of adequate sewage-disposal facilities. Special attention was paid to sanitary facilities in automobile campgrounds and swimming pools were inspected regularly.

Among the more outstanding developments of the year in the field of sanitation were the design of sewage-disposal facilities for the areas of concentration in the Shenandoah National Park, the near completion of a sewage disposal plant for the Smokemont area of the Great Smoky Mountains National Park, and the preparation of plans for a temporary sewage-disposal plant at Upper Basin in Yellowstone National Park, and for improvements of sewage disposal facilities at the South Rim of the Grand Canyon, in Yosemite Valley, and at Carlsbad Caverns.

CHANGES IN THE NATIONAL PARK AND MONUMENT SYSTEM

The national park and monument system on June 30, 1937, consisted of 26 national parks, 2 national historical parks, 72 national monuments, 11 national military parks, 8 national battlefield sites, 8 miscellaneous national memorials, 11 national cemeteries, 1 national parkway, and the National Capital Parks unit. The total represented by the above areas is 17,086,671.31 acres, a gain of 1,594,733.31 acres during the past year. New national monuments account for 1,218,019.73 acres of this increase.

Five new national monuments were established during the fiscal year, and four memorial areas administered in connection with public buildings maintained were given the status of miscellaneous national memorials. These four are the Washington Monument, the Lincoln Memorial, the Ford Theater, and the house where Lincoln died, now the Lincoln Museum.

NEW NATIONAL MONUMENTS

The five new monuments are: Ocmulgee National Monument, Ga., established December 23, 1936, by Presidential proclamation under authority of the act of June 14, 1934 (Public, 350, 73d Cong.); Zion National Monument, Utah, established January 22, 1937, by Presidential proclamation; Joshua Tree National Monument, Calif., established August 10, 1936, by Presidential proclamation; Organ Pipe Cactus National Monument, Ariz., established April 13, 1937, by Presidential proclamation; and Perry's Victory and International Peace Memorial, Ohio, established July 6, 1936, by Presidential proclamation, in accordance with the act of Congress of June 2, 1936 (Public, 631, 74th Cong.).

ACQUISITIONS TO PARK AREAS

Net increase to the national park and monument system through adjustment of boundaries of existing areas, and lands acquired for authorized areas amounted to 378,867.77 acres, as follows:

Acadia.—Donation of 18.30 acres and the accurate compilation of the areas heretofore acquired resulted in increase of total acreage of the park to 15,940.09 acres.

Blue Ridge Parkway.—Donations of 1,781.52 acres of land, all in the State of North Carolina, bring to 4,147.36 the total acreage now deeded to the United States for the Blue Ridge Parkway.

Chickamauga and Chattanooga.—A conveyance by the United States of 44.62 acres to the county of Catoosa, Tenn., for a road reduced the total area of the military park to 8,584.48 acres.

Colonial.—Acquisition of 222.16 acres through donation and purchase and an accurate compilation of the area heretofore acquired resulted in a total area of 6,301.50 acres for this historical park.

Death Valley.—By proclamation of March 26, 1937, 305,920 acres were added to the monument, making a total of 1,907,720 acres.

Fort Pulaski.—Donation of 277.39 acres and transfer of 130 acres from the War Department increased the total area of the monument to 427.39.

Fredericksburg and Spotsylvania.—Donation of 9.29 acres of land increased the total area of the battlefield park to 2,285.28 acres.

Great Smoky Mountains.—Donation of 16,805.50 acres brought the total area of this park to 411,688.50 acres.

Guilford Courthouse.—Donation of 11.50 acres resulted in a total area of 136.84 acres for this military park.

Hot Springs.—Donation of 1.50 acres increased the total park area to 983.99 acres.

Isle Royale Project.—Acquisition of 28,810.20 acres and the transfer of 10,266.35 acres from the public domain bring the total to 39,076.55 acres available for this park project.

Kennesaw Mountain.—Acquisition of 110.10 acres through donation and purchase resulted in a total area of 170.10 acres for the battlefield park.

Mammoth Cave.—Acquisition of 5,488.24 acres through donation and purchase resulted in a total park area of 34,620.31 acres.

Montezuma Castle.—By proclamation of February 23, 1937, 320 acres were added to the monument, making a total of 521.41 acres.

Natchez Trace Parkway.—Donations of 3,788.14 acres of land, all in Mississippi, were made for this proposed parkway.

Ocmulgee.—Donation of 173.60 acres increased the total area of the monument to 688.48 acres.

Petersburg.—Acquisition of 151.64 acres through donation and purchase brought the total area of this military park to 1,850.10 acres.

Shenandoah.—Acquisition of 4,141.94 acres through donation and purchase resulted in a total park area of 180,571.38 acres.

Tonto.—By proclamation of April 1, 1937, 480 acres were added to this monument, making its total area 1,120 acres.

PROPOSED EXTENSIONS OF EXISTING NATIONAL PARK AREAS

The National Park Service is actively interested in the proposal to extend the boundaries of the Grand Teton National Park, Wyo., to include the Jackson Hole country and an area now lying within the Teton National Forest which surrounds Jackson Lake. This area includes Emma Mathilda and Two Ocean Lakes. Satisfactory adjustments have been made with reference to the administration of the proposed extension as it relates to the adjacent national forest, and efforts are now being made to adjust the remaining difficulties in the way of park extension.

An exceptionally beautiful forest of sugar pines adjacent to Yosemite National Park, and traversed by one of the main entrance roads, has been threatened with devastation by logging. Public protest resulted in the passage of legislation, June 1937, authorizing use of Federal funds for the purchase of approximately 7,000 acres of the finest section of this forest.

NOTE.—The Third Deficiency Act, approved August 25, 1937, appropriated $2,005,000 for the purchase of these sugar pines.

This extension would abolish the Grand Canyon National Monument, adding approximately 57 percent of its area to the Grand Canyon National Park, Ariz., returning the remaining area, comprising some 118,000 acres of private and public land, to the public domain, principally for grazing purposes. A bill (H. R. 7264) containing such provisions, was introduced in the first session of the Seventy-fifth Congress.

To bring into the Kilauea-Mauna Loa section of Hawaii National Park an area to the southeast containing a shoreline and one of the few remaining unspoiled native villages on the archipelago was the purpose of a bill (H. R. 1995) passed on April 19, 1937, by the House of Representatives.

STATUS OF NATIONAL PARK PROJECTS AUTHORIZED BY CONGRESS

A brief statement is given below regarding the progress made during the past year on some of the national park projects authorized by Congress:

NATIONAL PARKS

Early in 1937 a bill was introduced in the Texas Legislature providing for an expenditure of $750,000 for the purchase of lands for park purposes. The bill was not enacted.

The Everglades National Park Commission, appointed by the Governor of Florida, recently recommended that Florida Bay, Key Largo, and the Turner River section be eliminated from the proposed park. The Service has expressed its disapproval of the proposal and has

conferred extensively with the Everglades Park Commission. The Department is now studying the commission's recommendations.

Through an allocation of $705,000 from an emergency appropriation, and an appropriation of $100,000 by the State of Michigan, 28,810 acres have been purchased and the work by C. C. C. camps at this location has gone forward. The remaining funds make possible the acquisition of 76,210.83 acres now under contract or option, and 15,000 acres now in the course of condemnation.

NATIONAL MONUMENTS

The Badlands National Monument, South Dakota, was authorized by the act of March 4, 1929 (Public No. 1021). The State of South Dakota is now negotiating with the General Land Office of this Department for the exchange of the State lands within the project for Federal lands outside the area. The act of Congress of June 26, 1936 (Public No. 827), authorized an addition to include certain lands contiguous to the proposed Badlands National Monument, provided the entire monument area when established does not exceed 250,000 acres.

The act of March 19, 1936 (Public No. 480), provided for the establishment of the Homestead National Monument, Nebraska, and authorized the appropriation of $24,000 for the purchase of lands. That item was included in the 1937 Interior Department appropriation bill presented to Congress.

The act of June 29, 1936 (Public No. 840), authorized the establishment of the Whitman National Monument, Washington, as soon as the necessary lands are donated to the Federal Government. The National Park Service has been informed that the Whitman Centennial, Inc., and the Walla Walla Trust Foundation are now in a position to donate certain of the lands and to obtain scenic easements for the remainder.

PROPOSED ADDITIONS TO THE NATIONAL PARK SYSTEM

During the fiscal years 1935 and 1936 preliminary investigations of potential national park and monument areas reduced the number of proposed additions on the active list from 224 to 156.

Major areas now under consideration are summarized below:

PROPOSED NATIONAL PARKS

Rare examples of landscape beauty, unusual forest conditions, and vanishing species of wildlife will be preserved in the proposed Mount Olympus National Park in Washington. The forest of the Olympic Peninsula is the highest expression of the wilderness, once typical of the Pacific Northwest, but now shrinking so rapidly under the axe that protection should be extended to it at the earliest opportunity. The Wallgren bill (H. R. 4724) to establish the park, provides for

elimination of certain costly private lands included in the former bill, and of certain other areas of commercially available forest. It proposes adding some areas of scenic timber line country.

The Kings River region has been urged for many years as a national park. The chief opposition to park establishment was based upon the hydro-electric power potentialities of the canyon. Careful re-examination of the proposed park area in 1936 by the National Park Service in cooperation with other Federal agencies resulted in elimination of two important power dam sites. Thus the principal objections to the establishment of the park have been removed, without sacrificing any of the outstanding scenic features, auguring more favorable action on the proposal in the future.

Following investigation of the Green Mountains, Vermont, area in the autumn of 1936, the Department of the Interior has approved the submission to Congress of legislation authorizing its establishment as a national park.

At the request of the Governor of Maine, a preliminary investigation of the Mount Katahdin area was made in the spring of 1936. Representative Brewster, of Maine, introduced a bill (H. R. 5864) in Congress, authorizing the establishment of the Mount Katahdin National Park.

PROPOSED NATIONAL MONUMENTS

Following investigation of the Capitol Reef area in Utah a proclamation establishing it as a national monument was prepared for submission to the President.

Escalante, Green River, and the Kofa Mountains areas along the Colorado River watershed are being considered for establishment as national monuments, pending further study of power and grazing rights.

In the spring of 1937 the Wyoming State Legislature appropriated funds for the purchase of Fort Laramie, Wyo., on the Oregon Trail. Transfer of the fort to the Federal Government for establishment as a national monument is now under consideration.

The Tuzigoot ruins in Arizona, excavated and restored under the supervision of archeologists, indicate that three major southwestern cultures were present simultaneously in the prehistoric past. The owners of the property desire to donate it to the Federal Government for national monument preservation.

PROPOSED NATIONAL SEASHORES

Surveys were made in 1935 of 20 areas along the Atlantic, Gulf, Pacific, and Great Lakes shores to locate desirable areas for public recreation. At the end of the fiscal year a bill (H. R. 7022) was pending in Congress to authorize establishment of the Cape Hatteras National Seashore in North Carolina.

NATIONAL CAPITAL PARKS

During the fiscal year 1937 many of the major projects started in previous years under the authority of the Public Works Administration, the Works Progress Administration, and the Civilian Conservation Corps Administration were completed. These included several approved projects of many years standing, and as a result numerous major features of the ultimate plan for the development of the National Capital Parks system have become established. Chief among these projects were the Mall and Union Square, rehabilitation of small parks and triangles within the boundaries of the old city and of Meridian Hill Park, Fort Bunker Hill and Fort Dupont Parks, the Palisades Field House and Playground, and Pierce Mill. In addition to the foregoing, important progress was made toward the development of Theodore Roosevelt Memorial Island, the Fort Drive project and the Arlington Memorial Bridge approach. Work on the George Washington Memorial Parkway completed during the year included rough grading and drainage for the parkway extension between Arlington Memorial Bridge and Key Bridge and the preliminary development of the Leiter estate, which was acquired during the year. This property is located on the Virginia shore of the Potomac approximately 2 miles upstream of Chain Bridge.

Landscaping operations were continued in section 1, Rock Creek and Potomac Parkway, located between Constitution Avenue and K Street. A new bridle path paralleling the roadway was also constructed in this section and the height of the sea wall was raised 3 feet as a protection against minor floods. In section 2 of Rock Creek and Potomac Parkway, between K and P Streets, a program for the landscaping of side slopes was continued during the year.

The development of additional recreational facilities in accordance with the approved plan for the establishment of a recreation system for the National Capital was also an important accomplishment.

The Potomac River reached flood stages on April 27, threatening section 1, Rock Creek and Potomac Parkway, East and West Potomac Parks. Serious damage by the flood was averted through the erection of a sand bag dike. Four companies of Civilian Conservation Corps enrollees, 600 Works Progress Administration workers, and 300 regular employees of the office were utilized in the construction of the dike.

The White House greenhouses and propagating gardens for the National Capital Parks were maintained and operated. The total number of plants propagated was 298,731. Approximately 10,000 deciduous and evergreen shrubs, 20,000 deciduous and evergreen vines, 3,000 trees, 3,000 rose bushes, and 36,000 bulbs were planted. Included among the trees planted were 1,105 single-flowering Japanese cherry trees in East and West Potomac Parks.

The total attendance in the National Capital Parks during the fiscal year was estimated at 48,000,000. Permits totalling 23,809 were issued for the use of 445 recreational facilities established at 50 locations throughout the capital parks system. The facilities were used by 3,887,895 persons, of whom 2,381,644 were active participants and 1,406,250 were spectators. The naturalist activities, mentioned elsewhere in this report, drew a total attendance of 42,660 persons at 205 educational events.

MAINTENANCE OF FEDERAL BUILDINGS

Continuing the building-maintenance operations entrusted to it when the operations of the former Office of Public Buildings and Public Parks of the National Capital were consolidated with Federal park administration, the National Park Service at the close of the fiscal year was entrusted with the maintenance, operation, and protection of approximately 19,800,000 square feet of floor space, 17,500,000 of which were located in 45 Government-owned buildings and 2,300,000 in 63 rented buildings in the District of Columbia, and also of seven memorials; and similar service was provided in 13 Government-owned buildings outside the District with a total floor area of over 1,298,000 square feet. The old Custom House at Salem, Mass., comprising approximately 11,520 square feet, and the new Museum Building at Morristown, N. J., which has a floor area of about 19,000 square feet, are the latest acquisitions of out-of-town buildings. Employees required and funds expended incident to providing this service were as follows:

	Expenditures	Personnel
Buildings in the District of Columbia	$6,407,215	[1] 4,778
Buildings outside the District of Columbia	531,000	[2] 252
Total	[3] 6,938,215	5,030

[1] Includes 343 temporary and 32 intermittent.
[2] Includes three temporary.
[3] Does not include amount expended for physical improvements.

With an appropriation of $1,150,000 granted in the Deficiency Act approved June 22, 1936, a program of physical improvement, repair, and installation in the Federal buildings of the District of Columbia was undertaken in an effort to eliminate hazards to life and property.

The service of the Central Heating Plant was extended during the year to include additional sections of the Agriculture Building, South, the South Interior Building, Interior Garage, Agriculture Annex, Federal Home Loan Bank Board, Federal Reserve, and the building at 2115 C Street NW., occupied by the Headquarters Company, United States Army. The heating load was increased by

408,000 square feet equivalent radiation, or 102,000 pounds of steam per hour, as a result of these extensions. The Central Heating Plant now furnishes an uninterrupted supply of steam to most of the Federal buildings in the District of Columbia and to a few nongovernmental buildings such as the Corcoran Art Gallery, American Red Cross, and the Panama Canal Office. The connected load at the close of the year equalled the full capacity of the plant with five of the six boilers in operation. Actual output of steam for effective heating of all buildings connected to the mains of the plant is 840,000 pounds of steam per hour.

A total of 94,000 short tons of coal was consumed during the year, the total steam generated being over 2,000,000,000 pounds. Although the heating load was increased, the milder winter of 1936–37 resulted in the consumption of less fuel than during the previous season.

Operation of the guard school was continued. Two additional subjects were introduced—pistol practice and use of other firearms and first aid. The course of instruction was increased from 6 to 44 hours per week.

Another of the wartime structures, that known as Temporary Building No. 7, at 1800 C Street NW., was demolished. Headquarters Company, United States Army, formerly housed in the building, was transferred to the former Mayfair Apartment, at 2115 C Street NW. The Research Building, formerly located on the northeast corner of Nineteenth Street and Constitution Avenue, also was razed.

SPACE-CONTROL PROGRAM

Responsibility for the allotment of space to various Federal agencies in the District of Columbia continued to rest in the National Park Service. During the fiscal year 93 leases and 33 renewals of leases were authorized, and the amount of space leased by the Government in the District at the close of the year was 2,889,448 square feet in 128 buildings housing 21,837 employees, at an annual rental of approximately $2,720,786. Seventy-seven space allotments were made other than leases and 275 moves were accomplished. Less than half the buildings in which quarters were leased were maintained and operated by the National Park Service.

FEDERAL BUILDING PROGRAM

Under the direction of the Secretary of the Interior, who was appointed by the President as chairman of a committee to draft a 5- and 10-year Federal building program in the District of Columbia, a subcommittee collected data on present housing needs for Federal activities and estimated needs 10 years hence.

New Interior Department Building

At midnight on January 23, the Procurement Division of the Treasury Department which constructed the new Interior Department building, transferred that building to the National Park Service for maintenance, operation, and protection.

APPROPRIATIONS, DONATIONS, AND REVENUES

APPROPRIATIONS

Appropriations for the National Park Service for the fiscal year 1937 amounted to $18,962,903. Of that amount, the sum of $16,122,080 was included in the Interior Department Appropriation Act, 1937; $908,410 in the District of Columbia Appropriation Act, 1937; $143,098 in the Independent Offices Appropriation Act, 1937, for the maintenance of the Executive Mansion and grounds; a deficiency sum of $130,000 for emergency reconstruction and fighting forest fires; a deficiency sum of $421,315 for public buildings and grounds in the District of Columbia; a supplement of $10,000 for the improvement of the water system in Mesa Verde National Park; a supplement of $78,000 for improvements to the Executive Mansion and grounds; and a supplement of $1,150,000 for improvements to public buildings in the District of Columbia.

EMERGENCY RELIEF FUNDS

In addition to the regular appropriations, financing of activities under Public Works Administration, Works Progress Administration, and Emergency Conservation Work allotments was continued, the funds so available from the close of the 1937 fiscal year being as follows:

Public Works, 1933–37

Construction of roads and trails	$26, 762, 558. 20
Construction of physical improvements	12, 030, 475. 97
Land acquisition for recreational demonstration projects	1, 449, 657. 80
Total	40, 242, 691. 97

Works Progress, 1935–37

Administrative expenses	720, 800. 00
Administrative expenses of transient camps	601, 451. 00
Acquisition of land for recreational demonstration projects	894, 166. 28
Development of Federal recreational park projects	1, 562, 481. 61
Beach erosion control project, North Carolina (Federal)	679, 925. 00
Development of non-Federal recreatonal park projects	4, 144, 327. 00
Development of Federal recreational park projects	7, 418, 515. 00
Survey and construction of Natchez Trace Parkway	1, 425, 185. 00
Acquisition of site and development of Jefferson National Expansion Memorial	6, 750, 000. 00
Repair of 1936 flood damage, District of Columbia	77, 240. 00
Total	24, 274, 090. 89

Emergency Conservation Work, 1933–37

National parks	$18, 850, 620. 75
State parks	57, 404, 588. 00
Territory of Hawaii	2, 386, 167. 33
California-Pacific National Exposition exhibit	5, 153. 79
Acquisition of lands on Isle Royale for E. C. W	705, 000. 00
Virgin Islands	356, 187. 79
Acquisition of land, colonial	188, 000. 00
Acquisition of Crater property at Petersburg National Military Park for E. C. W	29, 750. 00
Purchase of lands for E. C. W	2, 325, 000. 00
Total	82, 250, 467. 66

CASH DONATIONS

Cash donations to the National Park Service for the fiscal year ended June 30, 1937, amounting to $265,543.91, were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditure of Federal appropriations. Donations for the 1936 fiscal year totaled $315,281.80.

REVENUES

The revenues received during the fiscal year 1937 amounted to $1,398,691.66, as compared with revenue receipts of $1,136,533.68 in the 1936 fiscal year.

PUBLIC WORKS

The allocation of Public Works funds allowed for the continuation during the fiscal year 1937 of road and trail construction work and various other types of physical improvements necessary in the administration, protection, and improvement of the park and monument areas under the jurisdiction of the National Park Service. Because of exercised care in the selection of projects together with their geographical distribution, there resulted the greatest possible financial spread and maximum of relief to the unemployed in the vicinity of the far-flung areas administered by the National Park Service in the United States, Hawaii, and Alaska.

The total allocation of Public Works funds to the end of the 1937 fiscal year, as compared with allocations for the fiscal year 1936, was as follows:

	Fiscal year 1936	Fiscal year 1937
Roads and trails	$26, 839, 415. 44	$26, 762, 558. 20
Physical improvements	11, 716, 414. 83	12, 030, 475. 97
Land acquisition for recreational demonstration projects		1, 449, 657. 80
Total	38, 555, 830. 27	40, 242, 691. 97

The increase of Public Works allotments for the fiscal year 1937 over the fiscal year 1936 is $1,686,861.70. The greatest portion of this increase is an allotment of $1,449,657.80 for the purchase of land for recreational demonstration projects.

CONCLUSION

The foregoing report is primarily a statement of what the National Park Service is doing to make the various units of the national park and monument system accessible to and comfortable for the visiting public, and to promote understanding of their priceless exhibits. Conservation of the areas without use could be obtained by a strict guardianship of the areas without development; but use combined with conservation requires a technique unique to national park work.

Through the availability of emergency relief funds and workers, great advances have been made in all lines of park conservation and development with the single exception of furnishing adequate informational service to visitors and prospective visitors through the printing and distribution of sufficient supplies of booklets and leaflets to meet the public demand.

Establishment of new Federal areas, and even more the consolidation of all Federal park areas under the National Park Service, would seem to presuppose the giving of service based upon that already proved so successful in the older western national parks. An integral part of that service is the furnishing of general information circulars. Yet with a greatly augmented system from the standpoint of areas, with phenomenally increasing interest in and visitation to the national parks, with more cooperating agencies desiring printed information upon the national park areas and upon National Park Service policies, and with the establishment of a new travel bureau destined to spread the gospel of national parks abroad and at home, the funds available for printing informational material are steadily decreasing. During the 1938 fiscal year actually less printing funds will be available for the National Park Service than were available in 1932, despite the fact that there were only 58 areas under the jurisdiction of the Service in that year as against 139 at the close of the 1937 fiscal year; and that during the 1932 travel year 3,754,596 persons visited the national park and monument system as against 9,929,432 for the 1936 travel year. An estimated increase of 25 percent is looked for during the present travel year, based upon attendance during its first 9 months.

Even the above does not give the whole picture, for, of the exceedingly limited printing funds, a much larger proportion must be diverted to administrative printing than in 1932, because of the expansion of the system both in number of areas administered and in new duties occasioned by increased size and use.

A degree of relief in this situation was obtained by the issuance of informal, exceedingly inexpensive leaflets primarily on the historic and archeological areas of the system through the Department's multilithing service. The ban placed on multilithing such leaflets through the Comptroller General's decision of August 3, 1936, has worked a serious hardship upon the Service in its furnishing of information, since printing of such leaflets is impossible with existing funds.

Too great emphasis cannot be given to the desirability of securing additional printing funds to enable the Service to meet the public demand for literature not only on the western scenic national parks, for most of which a very inadequate supply of booklets is available, but also for the newer eastern scenic parks and the many historical parks and monuments throughout the country for which there is practically no printed material for distribution.

NATIONAL PARK TABLE 1.—Holdings Acquired for National Park and Monument Purposes

Parks, monuments, and parkways	Holdings acquired from July 1, 1936, through June 30, 1937						Holdings acquired prior to July 1, 1936, in acres	Total holdings acquired through June 30, 1937, in acres
	Holdings acquired by purchase			Holdings acquired otherwise than by purchase		Total acquired in acres		
	Government funds	Donated funds	Area in acres	How acquired	Area in acres			
Acadia National Park				Donation	18.300	18.300	15,408.907	15,427.207
Black Canyon of the Gunnison National Monument				do	90.000	90.000	165.000	255.000
Blue Ridge Parkway				do	1,781.520	1,781.520	2,365.840	4,147.360
Colonial National Historical Park	$189,400.00		220.964	do	1.200	222.164	6,150.499	6,372.663
Fort Pulaski National Monument				do	407.390	407.390		407.390
Fredericksburg and Spotsylvania National Military Park				do	9.290	9.290	2,439.150	2,448.440
Glacier National Park	104,304.78	$104,304.78	1,056.350			1,056.350	3,950.210	5,006.560
Grand Canyon National Park				Exchange	3,018.850	3,018.850	31,748.870	34,767.720
Grand Canyon National Monument				do	5,542.310	5,542.310	3,737.500	9,280.710
Great Smoky Mountains National Park				Donation	16,805.500	16,805.500	394,883.300*	411,688.800
Guilford Courthouse National Military Park				do	11.500	11.500		11.500
Hot Springs National Park				do	1.500	1.500	79.200	80.700
Isle Royale National Park project	144,211.00		28,810.200			28,810.200		28,810.200
Kennesaw Mountain National Battlefield Park	8,080.00		100.100	Donation	10.000	110.100		110.100
Mammoth Cave National Park	79,247.48		2,820.300	do	2,667.944	5,488.244	24,537.760	30,026.004
Natchez Trace Parkway				do	3,788.136	3,788.136		3,788.136
Ocmulgee National Monument				do	173.600	173.600	514.880	688.480
Petersburg National Military Park	24,720.51		123.400	do	28.240	151.640	1,698.460	1,850.100
Petrified Forest National Monument	69,400.00		2,717.180			2,717.180	23,529.320	26,246.500
Shenandoah National Park	33,886.50		3,776.875	Donation	365.060	4,141.935	176,519.020	180,660.955
Yosemite National Park				do	159.900	159.900	30,547.480	30,707.380
Acreage acquired in other areas prior to July 1, 1936							189,359.885	
Total	653,250.27	104,304.78	39,625.369		34,881.140	74,506.509	907,635.281	792,781.905
Grand total								982,141.790

*Includes 10,729.50 acres outside of the minimum area required for the establishment of the park.

NATIONAL PARKS TABLE 2.—Automobile and Motorcycle Licenses Issued and Revenues Received, Fiscal Years 1936–37

Name of park	1936			1937		
	Automobiles	Motorcycles	Revenue	Automobiles	Motorcycles	Revenue
Crater Lake	30,718		$30,718	42,754		$42,754
General Grant	3,100		3,100	10,002		10,002
Glacier	23,896	50	23,946	30,662	86	30,748
Grand Canyon	55,721		55,721	65,601		65,601
Lassen Volcanic	8,947	10	8,952	14,051	11	14,062
Mesa Verde	5,008		5,008	6,093		6,093
Mount Rainier	39,187		39,187	53,693		53,693
Sequoia	38,289		38,289	33,908		33,908
Yellowstone	86,313	272	259,596	110,429	348	331,635
Yosemite	84,936	192	170,064	99,732	206	199,670
Zion	28,495		28,495	37,620		37,620
Total	404,610	524	663,076	504,545	651	825,786

NATIONAL PARKS TABLE 3.—Appropriations, Expenditures, and Revenues, Fiscal Year 1937

Name of park	Appropriated	Expenditures and obligations	Revenues received
Acadia	$46,000.00	$44,653.26	$405.50
Bryce Canyon	12,000.00	11,908.88	
Carlsbad Caverns	64,000.00	62,634.06	238,705.81
Crater Lake	62,600.00	66,595.62	45,384.72
General Grant	15,000.00	14,728.62	10,039.40
Glacier	175,000.00	172,339.68	39,621.91
Grand Canyon	113,500.00	114,228.52	82,055.89
Grand Teton	19,900.00	20,070.74	232.67
Great Smoky Mountains	59,900.00	56,924.94	8,097.44
Hawaii	45,600.00	44,687.84	1,725.62
Hot Springs	71,200.00	68,803.97	36,662.00
Lassen Volcanic	28,400.00	32,238.66	14,083.78
Mammoth Cave			117.50
Mesa Verde	47,250.00	48,016.48	6,903.11
Mesa Verde deficiency	10,000.00	105.92	
Mount McKinley	25,000.00	24,487.54	227.60
Mount Rainier	121,800.00	126,502.85	57,478.51
National Capital Parks, United States	166,000.00	163,654.44	11,182.54
National Capital Parks, District of Columbia	908,410.00	891,469.01	
Platt	20,600.00	20,251.17	2.00
Rocky Mountain	82,000.00	80,152.50	1,617.25
Sequoia	99,500.00	106,090.11	55,412.57
Shenandoah	39,800.00	38,615.55	1,437.98
Wind Cave	15,900.00	15,858.65	9,941.20
Yellowstone	391,250.00	407,067.69	412,983.27
Yosemite	284,000.00	292,301.57	309,085.20
Zion	39,800.00	45,668.60	37,841.67
National Historical Parks and Monuments	109,400.00	105,251.75	689.55
National Monuments	167,000.00	158,294.20	2,228.06
National Military Parks and Monuments	257,900.00	243,348.22	5,075.48
Blue Ridge Parkway			52.50
Boulder Dam recreation area	10,000.00	9,674.79	5.44
National Park Service	189,880.00	170,680.40	408.04
Public Buildings and Grounds	6,535,900.00	7,264,395.71	5,748.45
Public Buildings and Grounds, deficiency	1,150,000.00		
Do	421,315.00		
General expenses, N. P. S.	27,000.00	26,842.13	
Forest protection and fire prevention	90,000.00	77,063.66	
Emergency reconstruction and fighting forest fires	40,000.00	74,207.19	
Emergency reconstruction and fighting forest fires, deficiency	130,000.00		
Construction of roads and trails	6,500,000.00	[1] 1,886,550.55	
Executive mansion and grounds	143,098.00	141,256.43	
Executive mansion and grounds, deficiency	78,000.00	77,981.00	
Appomattox Court House, N. H. M.	[2] 100,000.00		
Historic sites and buildings survey	24,000.00	9,759.25	
Investigation and purchase of water rights	25,000.00	21,848.07	
Commission of Fine Arts	9,700.00	9,476.17	
Mount Rushmore	100,000.00	88,557.50	
Perry's Victory Memorial	4,000.00	2,744.25	3,239.00
P. W. projects, roads and trails, 1933–37	26,762,558.20	23,717,959.69	
P. W. projects, physical improvements, 1933–37	12,030,475.97	11,520,664.42	
P. W. land acquired for recreation demonstration projects	1,449,657.80	972,163.60	
E. C. W. (1933–37) (allotments program)	82,250,467.66		
W. P. A., 1935–37	24,274,090.89	13,638,312.00	
Total	165,843,853.52	63,187,087.85	1,398,691.66

[1] Represents expenditures only.

[2] Available until expended.

NATIONAL PARKS TABLE 4.—Summary of Appropriations for the Administration, Protection, and Improvement of the National Parks and National Monuments, together With the Revenues Received, for the Fiscal Years 1917 [1] to 1937, Inclusive

Year	Department	Appropriation		Revenues
1917	Interior Department	$537,366.67		
	War Department	247,200.00		
			$784,566.67	$180,652.30
1918	Interior Department	530,680.00		
	War Department	217,500.00		
			748,180.00	[2] 217,330.55
1919	Interior Department	963,105.00		
	War Department	50,000.00		
		50,000.00		
			1,013,105.00	196,678.03
1920			907,070.76	316,877.96
1921			1,058,969.16	396,928.27
1922			1,433,220.00	432,964.89
1923			1,446,520.00	513,706.36
1924			1,892,601.00	663,886.32
1925			3,027,657.00	670,920.98
1926			3,258,409.00	826,454.17
1927			3,698,920.00	703,849.60
1928			4,889,685.00	808,255.81
1929			4,754,015.00	849,272.95
1930			7,813,817.18	1,015,740.56
1931			12,113,435.00	940,364.79
1932			12,831,250.00	820,654.19
1933			10,640,620.00	628,182.06
1933–35			53,402,249.00	
1934			10,983,089.00	731,331.80
1935			12,461,513.00	907,189.96
1936			16,686,090.00	1,136,533.68
1937			18,190,490.00	1,398,691.66

[1] For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.
[2] The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, he revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 5.—Statement of Appropriations and Authorizations for Road and Trail Work in the National Parks and National Monuments

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act Dec. 5, 1924; 43 Stat. 686	1925	[1] $1,000,000		$1,000,000
Act Mar. 3, 1925; 43 Stat. 1179	1926	1,500,000	[2] $1,000,000	2,500,000
Act May 10, 1926; 44 Stat. 491	1927	2,000,000	[2] 1,500,000	2,500,000
Act Jan. 12, 1927; 44 Stat. 966	1928	2,000,000	[2] 2,500,000	
First Deficiency Act, Dec. 22, 1927; 45 Stat. 19		1,000,000		3,000,000
Act Mar. 7, 1928; 45 Stat. 237	1929	2,500,000	[2] 4,000,000	5,000,000
Act Mar. 4, 1929; 45 Stat. 1601	1930	5,000,000	[2] 2,500,000	3,500,000
Act May 14, 1930; 46 Stat. 319	1931	5,000,000		
Act Dec. 20, 1930; emergency construction		1,500,000	[2] 2,500,000	
Emergency construction funds transferred by the President		578,800		7,078,800
Act Feb. 14, 1931; 46 Stat. 1115	1932	5,000,000	[2] 2,850,000	
Second Deficiency Act 1931; Mar. 4, 1931		2,500,000		7,850,000
Act Apr. 22, 1932; 47 Stat. 126, 127	1933	4,500,000	[3] 2,500,000	7,150,000
Emergency construction and relief		3,000,000		
Act Feb. 17, 1933; 47 Stat. 852, 853	1934	2,435,700		−64,300
Emergency construction	1935	5,000,000		5,000,000
Act May 9, 1935; Public, No. 53, 74th Cong	1936	7,500,000		7,500,000
Act June 22, 1936; Public, No. 741, 74th Cong	1937	6,500,000		6,500,000
Total appropriated		58,514,500		
Total program to date				58,514,500

[1] Of this amount $4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and $510 on May 29, 1928 (45 Stat. 933).
[2] Funds appropriated in next year.
[3] $64,300 of this amount was not appropriated in 1934.

NATIONAL PARKS TABLE 6.—Forest-fire Statistics, Calendar Year 1936

Name	Classification				Point of origin				Causes of fires									
	A	B	C	Total	Inside parks		Outside parks											
	¼ acre or less	Between ¼ and 10 acres	10 acres or less	All classes A B C	On Government land	On private land	Entered park	Confined to outside areas	Lightning	Camp fires	Smokers	Debris burning	Incendiary	Lumbering	Railroads	Miscellaneous	Total man-caused	Grand total
National Parks:	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*
Acadia																		
Bryce Canyon	2			2	1			1	2									2
Carlsbad																		
Crater Lake	9	1		10	10				6		4						4	10
General Grant																		
Glacier	63	4	5	72	62	5		5	40	2	25	2				3	32	72
Grand Canyon	34	9		43	37	1		5	41		1	1					2	43
Grand Teton	2			2	2						2						2	2
Great Smoky	9	16	33	58	20	10	4	24	9	5	5	14	18	3	2	2	49	58
Hawaii	1			1	1						1						1	1
Hot Springs	6	9		15	11		2	2		3	9	2	1				15	15
Lassen	8	2	1	11	6			5	4		6		1				7	11
Mammoth Cave	46	187	53	286	156	127	1	2		2	36	38	209			1	286	286
Mesa Verde	5			5	5				5									5
Mount McKinley																		
Mount Rainier	3	1		4	4				1		3						3	4
Platt	1	5	1	7	6		1				4		1			2	7	7
Rocky Mountain	2			2	1			1			1					1	2	2
Sequoia	13	2	2	17	13			4	10		3					4	7	7
Shenandoah	6	15	11	32	21		2	9	4		7	3	14			4	28	32
Wind Cave			2	2	2							1				1	2	2
Yellowstone	50	9		59	58			1	31	6	17					5	28	59
Yosemite	37	11	2	50	48	1	1		24	8	15	1				2	26	50
Zion	1			1	1						1						1	1
Military and Historical Parks:																		
Chickamauga, Chattanooga		5	3	8	8						4	4					8	8
Colonial	1	3	3	7	2			5			6	1					7	7
Fredericksburg	1	1		2	1		1				2						2	2
Petersburg		3	1	4	1		1	2			2		2				4	4
Shiloh	2	5		7	4	1	1	1			2	2				3	7	7
Stones River		1	1	2	2						1		1				2	2
Vicksburg	6	6		12	8		4				9	1			2		12	12
Monuments:																		
Bandelier	1			1	1				1									1
Death Valley	1			1	1							1					1	1
Lava Beds	1		2	3	3						3						3	3
Pinnacles		1		1	1											1	1	1
Scotts Bluff		2		2	1		1				1	1					2	2
National Capital Parks		4		4	4						1					3	4	4
Total	311	302	120	733	502	145	19	67	178	26	171	72	247	3	4	32	555	733

NATIONAL PARKS TABLE 6.—Forest-fire Statistics, Calendar Year, 1936—Continued

Name	Burned area inside parks (nearest whole acre)				Timber destroyed inside parks			Cost of fire suppression (to nearest whole dollar)									
	Timber	Brush	Grass	Total	Government	Private	Total	Personal services	Supplies, transportation, etc.	Equipment	Indirect costs prorated	Total	Salaries of park employees not paid from F. F. F.	Grand total	C. C. C. man-days contributed	Value of C. C. C. contributed
National parks:	*Acres*	*Acres*	*Acres*	*Acres*	*M bd. ft.*	*M bd. ft.*	*M bd. ft.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*Dol.*	*No.*	*Dol.*
Bryce Canyon	1	1	1	3				34	22		14	70	54	124	568	852
Crater Lake	7,320		500	7,820	22,191	1	22,192	37,732	24,747	2,670	16,705	81,854	1,740	83,594	10,824	16,236
Glacier	12	1	3	16	17		17	41	5		156	202	133	335	275	412
Grand Canyon															2	3
Grand Teton																
Great Smoky	1,868			1,868				1,602	549	1,624		3,775	672	4,447	8,341	12,511
Hawaii													3	3	14	21
Hot Springs	11			11									3	3		
Lassen													110	110	101	152
Mamoth Cave	1,205		818	2,023	8	10	18								2,613	3,919
Mesa Verde													31	31	3	4
Mount Rainier	2			2	2		2	34				34	47	81	352	528
Platt			35	35					20			20	4	24	9	13
Rocky Mountains					2		2						1	1	60	90
Sequoia	3			3				26			2	28	150	178	215	323
Shenandoah	762	1	5	768	106		106			267		267		267	1,492	2,238
Wind Cave	3	8	276	287				13	14			27	23	50	364	546
Yellowstone	16	5	6	27	21		21	253	388	136		777	499	1,276	672	1,008
Yosemite	528	194		722	73		73	76	53	404	103	636	286	922	1,508	2,262
Zion													1	1	1	1
Military and historical parks:																
Chickamauga-Chattanooga	84	9	273	366											67	101
Colonial		1		1					7	15	17	29	22	51	66	99
Fredericksburg	1			1											28	42
Petersburg	8		1	9											36	54
Shiloh	4		10	14							2	2	7	9	19	29
Stones River	19		65	84									8	8		
Vicksburg			4	4											35	53

Monuments:																	
Bardelier																11	17
Death Valley													1	1			
Lava Beds			1,956	1,956				36		262	447	745	82	827	2,340	3,510	
Pinnacles			1	1									1	1	2	3	
Scotts Bluff			12	12											10	15	
National Capital parks			8	8									15	15	1	1	
Total	11,847	220	3,974	16,041	22,420	11	22,431	39,847	25,805	5,368	17,446	88,466	3,907	92,373	30,047	45,070	

NOTE.—C. C. C. labor valued at $1.50 per day used in above table. Emergency allotment from F. F. F. not included in fire suppression costs: Glacier, $296; Yellowstone, $101 total, $397.

COOPERATION

Park or monument	Number of fires	Man hours or days	Protection agency
Glacier		4,200 man-hours C. C. C.	Furnished by Office of Indian Affairs.
	1	10,872 man-hours C. C. C.	Furnished by U. S. Forest Service.
		9,552 man-hours C. C. C.	Furnished by Bureau of Reclamation.
	1	15 man-hours C. C. C.	Furnished to Canada.
	5	5,197 man-hours C. C. C.	Furnished to U. S. Forest Service.
Mount Ranier	4	9 man-days C. C. C.	Do.
		201 man-days C. C. C.	Furnished to Washington State Fire Association.
Platt	1	70 man-days C. C. C.	Furnished on nonreportable outside fires.
Sequoia	[1] 5	1,474 man-days C. C. C. 48 man-days E. C. W.	Furnished to U. S. Forest Service and to State of California.
Shenandoah	9	1,665 man-days C. C. C. 31 man-days E. C. W.	Furnished to Virginia Forest Service.
Wind Cave	[1] 5	100 man-days C. C. C.	Furnished to U. S. Forest Service.
Yosemite	9	6,728 man-hours C. C. C. 590 man-hours E. C. W.	Furnished on nonreportable outside fires.
Chickamauga-Chattanooga.	84	1,258 man-hours C. C. C. 42 man-hours E. C. W.	Do.
Colonial	1	60 man-hours C. C. C. 11 man-hours E. C. W.	Furnished to Newport News Waterworks Commission.
Shiloh	2	1 man-hour C. C. C. 2 man-hours N. P. S.	Furnished on nonreportable outside fires.
Chiricahua	[2] 3	217 man-days C. C. C.	Do.
Pinnacles	12	1,703 man-days C. C. C	Do.

[1] Class C.

[2] Class B; class C.

NATIONAL PARKS TABLE 7.—Buildings in the District of Columbia Maintained, Operated, and Protected by the National Park Service

Building	Location	Government-owned gross floor area	Rented net floor area
		Square feet	*Square feet*
Agriculture, Administration	The Mall at 13th St.	307,692	
Agriculture, Annex (Economics)	12th and C Sts. SW	86,000	
Agriculture, Mechanical Shops	13th St. and Constitution Ave. NW	32,058	
Agriculture (South)	12th, 14th and C Sts. and Independence Ave. SW.	2,056,430	
Archives	Constitution Ave. between 7th and 9th Sts. NW.	496,200	
Arlington	Vermont Ave. and H St. NW	575,000	
Army Medical Museum	7th St. and Independence Ave. SW	83,938	
Atlantic [1]	928–30 F St. NW		38,337
Barber & Ross [1]	11th and G Sts. NW		[2] 30,750
Barr [1]	910 17th St. NW		26,262
Bureau of Fisheries	6th St. and Independence Ave. SW	39,131	
C St. NW., 2115		35,000	
Capitol Courts SW., 43–49			[2] 2,500
Carry [3]	927 15th St. NW		8,872
Central Heating Plant	12th, 13th, C and D Sts. SW		
City Club [1]	1320 G St. NW		48,610
Civil Service	7th, 9th, F and G Sts. NW	246,244	
Commerce	Constitution Ave. between 14th and 15th	1,605,066	
Connecticut Ave. NW., 815			[2] 100,000
Connecting wing	Between new I. C. C. and Labor Bldgs	234,100	
Daily News	1322 New York Ave. NW		22,000
De Moll [3]	12th and G Sts. NW		15,243
E Building	6th St. and Main Ave. SW	231,771	
E St. NW., 1300		274,323	
E St. NW., 1345 [1]			7,544
Executive Office	West Executive Ave	40,000	
F Building	7th St. and Constitution Ave. NW	266,560	
F St. NW., 918–20 [1]			1,230
F St. NW., 1723–25		20,369	
F St. NW., 1724			[2] 46,946
Fed. Home Loan Bank Board	101 Indiana Ave. NW	278,700	
Florida Ave. NE., 60			27,200
G St. NW., 1328 [3]			4,000
G St. NW., 1712 (annex)		8,166	
G St. NW., 1712			[2] 84,981
Garage (Veterans' Administration.)	Kansas Ave. and Upshur St. NW		43,723
Garage	3d and Canal Sts. SW	48,000	
Garage (White House)	1126 21st St. NW		[2] 90,788
Garage (Interior)	21st St. and Virginia Ave. NW	36,000	
Garage	24th and M Sts. NW		[2] 48,800
General Accounting	Judiciary Square	196,554	
H St. NW., 1510			8,738
H St. NW., 1712 [1]			8,090
H St. NW., 1825			[2] 199,344
Hurley-Wright	18th St. and Pennsylvania Ave. NW		[2] 95,091
I St. NW., 1004			489
I St. NW., 1624			[2] 13,000
Independence Ave. SW., 816		4,239	
Independence Ave. SW., 908		17,408	
Interior	C, E, 18th and 19th Sts. NW	1,308,300	
Interior (North)	E, F, 18th and 19th Sts. NW	726,535	
Internal Revenue	Constitution Ave. between 10th and 12th Sts. NW.	1,281,000	
Interstate Commerce	12th St. and Constitution Ave. NW	456,700	
Investment [3]	15th and K Sts. NW		18,620
Justice	Constitution Ave. between 9th and 10th Sts. NW.	1,237,000	
K St. NW., 1415 [1]			5,374
K St. NW., 1435			15,000
K St. NW., 1437			[2] 20,000
K St. NW., 1518			10,632
Kalorama Rd. NW., 1700			28,000
Labor	14th St. and Constitution Ave. NW	447,000	
LaSalle [1]	1028 Connecticut Ave. NW		49,416
Lemon	1729 New York Ave. NW		25,975
Lenox [3]	1523 L St. NW		22,000
Lincoln [1]	514 10th St. NW		13,938
M St. NW., 2214–16			9,317
McCrory [1]	824–26 7th St. NW		10,683

[1] Either maintenance, operation, or protection or all three classes of service provided only for a portion of the building. All other buildings except 1001 Vermont Ave., NW., maintained, operated, or protected in their entirety.

[2] Gross area.

[3] Protection service only is provided.

NATIONAL PARKS TABLE 7.—Buildings in the District of Columbia Maintained, Operated, and Protected by the National Park Service—Continued

Building	Location	Government-owned gross floor area	Rented net floor area
		Square feet	*Square feet*
McKinley Park buildings	19 buildings, American University Park		65,633
Massachusetts Ave. NW., 2000			[2] 24,309
Massachusetts Ave. NW., 2020			19,242
Mather [3]	916 G St. NW		12,323
Moses [1]	11th and F Sts. NW		97,378
Munitions	Constitution Ave. between 19th and 21st Sts. NW.	851,940	
National Theater [3]	1325 E St. NW		16,000
Navy	Constitution Ave. between 17th and 19th Sts. NW.	949,182	
Ouray [1]	801 G St. NW		17,557
Pennsylvania Ave. NW., 1778			[2] 207,550
Post Office (new)	Pennsylvania Ave. between 12th and 13th Sts. NW.	840,000	
Post Office (old)	12th St. and Pennsylvania Ave. NW	377,951	
Potomac Park Apartment	306 21st St. NW	108,000	
Procurement Division	8th, 9th, C and D Sts. SW	886,750	
Public Health	Constitution Ave. between 19th and 20th Sts. NW.	79,931	
Rizik [3]	1737 L St. NW		15,983
South Capitol St., 401			55,080
Standard Oil [3]	261 Constitution Ave. NW		36,762
State Department	17th and Pennsylvania Ave. NW	440,250	
Storage Building & Vault	Missouri Ave. between 4½ and 6th Sts. NW.	5,949	
Tariff Commission	7th, 8th, E and F Sts. NW	140,118	
Tempo No. 2	19th and D Sts. NW	78,240	
U Street NW., 1331–41			[2] 85,725
Vermont Ave. NW., 1001 [3]			[2] 119,000
Vermont Ave. NW., 1020 [3]			3,693
Vermont Ave. NW., 1025			54,696
Vermont Court NW., 1126			13,631
Walker-Johnson	1734 New York Ave. NW		[2] 110,312
Wilkins	1514 H St. NW	54,000	
Willard	513–15 14th St. NW		26,543
Winder	17th and F Sts. NW	63,880	
7th St. NW., 425			7,000
8th St. SW., 215		5,970	
10th St. NW., 1918			48,799
12th St. SW., 224		13,204	
14th St. NW., 509 [1]			6,540
14th St. NW., 1840			30,500
15th St. NW., 821			10,446
18th St. NW., 718			[2] 41,330
19th St. NW., 1220			[2] 44,100
21st St. NW., 1503			[2] 5,500
26th St. NW., 501–13 [3]			22,200
Total		17,570,899	2,399,325

NATIONAL PARKS TABLE 8.—Buildings Outside the District of Columbia Maintained, Operated, and Protected by the National Park Service

Building	Location	Government-owned gross floor area
		Square feet
Broadway, 45	New York City, N. Y	142,500
Courthouse	Aiken, S. C	17,474
Do	New York City, N. Y	655,787
Do	Parkersburg, W. Va	34,900
Do	Santa Fe, N. Mex	47,600
Federal Office	Des Moines, Iowa	64,200
Do	Galveston, Tex	15,000
Immigration Station	Baltimore, Md	98,000
Museum	Morristown, N. J	[1] 19,000
Old Customhouse	Denver, Colo	72,500
Do	Salem, Mass	[1] 11,520
Old Post Office	Sacramento, Calif	47,600
Sub-Treasury	New York City, N. Y	72,000
Total		1,298,081

[1] Approximate gross floor areas.

NATIONAL PARKS TABLE 9.—Memorials Maintained, Operated, and Protected by the National Park Service

Memorial	Location	Gross floor area
		Square feet
Columbus Fountain	Union Station Plaza	
District of Columbia War Memorial	West Potomac Park	
Lee Mansion	Arlington, Va	7,252
Lincoln House	516 10th St. NW	4,234
Lincoln Memorial	West Potomac Park	
Lincoln Museum	511 10th St., NW	30,510
Washington Monument	The Mall between 14th and 17th Sts	
Total		41,996

NATIONAL PARKS TABLE 10.—Statement Showing Work Accomplished at Civilian Conservation Corps Camps Under the Jurisdiction of the National Park Service July 1, 1936 to June 30, 1937

Item	Total work accomplished July 1, 1936–June 30, 1937				
	New construction				Maintenance
	Unit	National parks and monuments	State parks	Combined total national parks and State parks	National parks and monuments
Foot bridges	Number	23	122	145	22
Horse bridges	Number	18	9	27	8
Vehicle bridges	Number	11	103	114	28
Buildings, barns	Number	2	5	7	8
Buildings, bath houses	Number	3	20	23	
Buildings, cabins, overnight	Number	10	286	296	
Combination buildings	Number		51	51	
Buildings, contact station	Number	11	14	25	4
Dwellings	Number	55	50	105	343
Equipment and supply storage houses	Number	32	117	149	20
Garages	Number	22	143	165	5
Latrines and toilets	Number	99	216	315	86
Lodges	Number		20	20	7
Lookout houses	Number		14	14	5
Lookout towers	Number	10	4	14	4
Museums	Number	3	1	4	8
Shelters, trailside	Number	3	98	101	
Shelters, other	Number		94	94	6
Other buildings	Number	34	205	239	65
Cribbing, including filling	Cubic yard	2,875	19,087	21,962	5,081
Dams, impounding and large diversion	Number	5	32	37	3
Dams, concrete for	Cubic yard	220	32,718	32,938	
Dams, earth fill for	Cubic yard	13,690	598,794	612,484	150
Dams, rock fill for	Cubic yard		4,662	4,662	
Dams, earth excavation for	Cubic yard		325,144	325,144	1,404
Dams, rock excavation for	Cubic yard	30	20,215	20,245	
Dams, masonry for	Cubic yard	130	11,286	11,416	
Dams, riprap for	Square yard	48	38,062	38,110	30
Dams, steel for	Pound		576,258	576,258	
Fences	Rod	26,900.4	65,317	92,217.4	76,175
Guard rails	Rod	2,647	23,423.3	2,607.03	1,573
Levees, dykes, and jetties	Cubic yard	8,000	185,923	193,923	
Power lines	Mile	6.3	50.7	57.0	20.9
Sewage and waste disposal	Square yard		55,148	55,148	
Sewage and waste disposal tanks and pools.	Number	21	171	192	2
Incinerators	Number	9	42	51	
Sewer lines	Linear foot	37,060	106,554	143,614	6,531
Other sewage disposal	Man-days	5,429	4,590	10,019	596
Telephone lines	Mile	124.5	109	233.5	1,973.1
Drinking fountains	Number	18	162	180	
Water supply, open ditches	Linear foot	1,200	4,730	5,930	
Water supply, pipe or tile lines	Linear foot	105,055	345,267	450,322	18,734
Springs, water holes	Number	30	105	135	
Water storage facilities (omit last 000)	Gallon		632.3	632.3	
Wells	Number	13	110	123	2

NATIONAL PARKS TABLE 10.—Statement Showing Work Accomplished at Civilian Conservation Corps Camps Under the Jurisdiction of the National Park Service July 1, 1936 to June 30, 1937—Continued

Item	Total work accomplished July 1, 1936–June 30, 1937				
	New construction				Maintenance
	Unit	National parks and monuments	State parks	Combined total national parks and State parks	National parks and monuments
Other water supply	Man-days	2,718	7,335	10,053	2,745
Camp stoves, etc	Number	429	2,268	2,697	72
Cattle guards	Number	----------	31	31	1
Corrals	Number	9	6	15	2
Portals	Number	6	34	40	----------
Seats	Number	280	5,993	6,273	77
Signs	Number	6,670	4,521	11,191	2,418
Stone walls	Rod	1,578.5	3,986.8	5,565.3	70
Table and bench combinations	Number	684	4,394	5,078	22
Tool boxes	Number	5	105	110	----------
Miscellaneous structural improvements	Number	203	4,357	4,560	3
Radio stations	Number	3	----------	3	43
Airplane landing fields	Number	----------	1	1	----------
Truck trails	Mile	98.8	210.7	309.5	955.4
Minor roads	Mile	99.3	----------	99.3	1,274.3
Highway maintenance	Mile	----------	----------	----------	1,731.4
Park roads	Mile	----------	344.3	344.3	----------
Foot trails	Mile	93.8	301	394.8	305.3
Horse trails	Mile	119 3	153.6	272.9	1,926.8
Stream and lake bank protection	Square yard	23,194	235,797	258,991	----------
Erosion treatment of gullies; area treated	Acre	3,758.7	2,259.2	6,017.9	307.2
Gullies, bank sloping	Square yard	409,680	236,589	646,269	192,248
Gullies, permanent check dams	Number	345	2,514	2,859	----------
Gullies, temporary check dams	Number	791	1,946	2,737	1,526
Gullies, seeding and sodding	Square yard	193,542	494,116	687,658	170,793
Gullies, tree planting	Square yard	220,972	83,500	304,472	----------
Gullies, diversion ditches	Linear feet	108,209	22,582	130,791	4,680
Terracing	Mile	1	5.1	6.1	----------
Sheet erosion planting	Acre	----------	1,005	1,005	----------
Limestone quarrying	Ton	----------	700	700	----------
Miscellaneous erosion control	Man-days	----------	65,491	65,491	----------
Clearing and cleaning, channels	Square yard	----------	86,820	86,820	----------
Clearing and cleaning, reservoir sites	Acre	60	284.7	344.7	----------
Excavation, canals, channels, ditches, earth.	Cubic yard	24,242	1,082,105	1,106,347	----------
Excavation, canals, channels, ditches, rock.	Cubic yard	370	45,773	46,143	----------
Pipe lines and conduits	Linear feet	6,104	500	6,604	----------
Riprap or paving, rock or concrete	Square yard	5,281	42,188	47,469	----------
Riprap or paving, brush or willows	Square yard	1,388	----------	1,388	----------
Water control structures, concrete or or masonry for.	Cubic yard	725	3,681	4,406	----------
Water control structures, wood for	Ft. b. m	5,504	42,450	47,954	3,831
Water control structures, other than dams, number.	Number	62	185	247	11
Field planting or seeding (trees)	Acre	4,259.7	6,713.6	10,973.3	5,366.7
Forest stand improvement	Acre	64	1,203	1,267	----------
Nurseries	Man-day	16,694	39,477	56,171	2,583
Tree seed collection, conifers	Bushel	177	102	279	----------
Tree seed collection, hardwoods	Pound	4,269	14,510	18,779	----------
Fighting forest fires	Man-day	34,281	127,749	162,030	----------
Fire breaks	Mile	12.8	331.2	344.0	37.9
Fire hazard reduction, roadside	Mile	146.9	153.7	300.6	----------
Fire hazard reduction, trail-side	Mile	51.5	162.5	214.0	----------
Other fire hazard reduction	Acre	7,146.2	19,601.3	26,747.5	----------
Fire presuppression	Man-day	39,814	51,190	91,004	----------
Fire prevention	Man-day	1,355	2,758	4,113	----------
Tree and plant disease control	Acre	5,269	33,338.6	38,607.6	----------
Tree insect pest control	Acre	16,530.9	61,497	78,027.9	4,314
Beach improvement	Acre	56	230.1	286.1	1.3
Fine grading, road slopes	Square yard	1,194,093	3,260,906	4,454,999	2,521
Lake or pond site clearing	Acre	1,021	2,144.2	3,165.2	----------
Landscaping, undifferentiated	Acre	11,151.6	3,883	15,034.6	486.6
Moving and planting trees and shrubs	Number	522,716	1,995,402	2,518,118	488,548
Obliteration, roads	Mile	44.1	72.5	116.6	----------
Obliteration, trails	Mile	3	11.7	14.7	----------
Obliteration, borrow pits	Man-day	15,206	65,428	80,634	----------
Parking areas and overlooks	Square yard	86,370	774,578	860,948	2,000

NATIONAL PARKS TABLE 10.—Statement Showing Work Accomplished at Civilian Conservation Corps Camps Under the Jurisdiction of the National Park Service July 1, 1936 to June 30, 1937—Continued

Item	Total work accomplished July 1, 1936–June 30, 1937				
	New construction				Maintenance
	Unit	National parks and monuments	State parks	Combined total national parks and State parks	National parks and monuments
Public camp ground development	Acre	158.7	204.5	363.2	460.2
Public picnic ground development	Acre	63.9	364.3	428.2	406.7
Razing undesirable structures	Number	776	2,006	2,782	
Seed collection, flowers, grasses, shrubs	Pound	2,599	4,367	6,966	
Seeding or sodding	Acre	519.1	1,993.5	2,512.6	5,126.7
Soil preparation (fertilizing, etc.)	Acre	393	1,109	1,502	2
Vista or other selective cutting	Acre	230.7	2,086.6	2,317.3	
Walks; concrete, gravel, cinder, etc	Linear foot	21,342	52,468	73,810	7,306
Fish rearing ponds	Number	9	29	38	25
Food and cover planting	Acre	15	7,414.6	7,429.6	1,725
Lake and pond development	Man-day	81	28,345	28,426	
Stocking fish	Number	1,196,820	156,237	1,353,057	
Stream development	Mile	11.1	12.8	23.9	
Other wildlife activity	Man-day	8,548	6,666	15,214	
Emergency wildlife feeding	Man-day		116	116	
Education, guide and contact station work.	Man-day	51,700	38,610	90,310	
Searching for or rescuing persons	Man-day	1,608	4,395	6,003	
Other emergency work	Man-day	9,271	132,024	141,295	
Eradication of poisonous weeds or exotic plants.	Acre	5,009	1,633.4	6,642.4	
Experimental plots	Number	12	8	20	1
Insect pest control	Acre		600	600	
Type and topographic maps	Man-day	3,160	5,444	8,604	
Relief maps and models	Man-day	2,193	540	2,733	
Marking boundaries	Mile	136.5	134.1	270.6	
Mosquito control	Acre	40	5,391.2	5,431.2	
Preparation and transportation of materials.	Man-day	83,964	562,396	646,360	
Archaeological, reconnaissance and investigation.	Man-day	13,854	20,525	34,379	
Reconnaissance and investigation, other	Man-day	2,417	21,620	24,037	
Restoration of historic structures	Number	934	58	992	
Rodent control	Acre		2,050	2,050	
Grade line surveys	Mile	120.1	488.7	608.8	
Ground water surveys	Acre		410	410	
Lineal surveys	Mile	701.5	1,683.9	2,385.4	
Topographic surveys	Acre	5,208.4	265,341.6	270,550	
Type surveys	Acre	715	50,710.4	51,425.4	
Other surveys	Man-day	4,734	9,092	13,826	
Tree preservation	Man-day	21,140	27,605	48,745	
Unclassifiable	Man-day	5,898	1,092	6,990	

GENERAL LAND OFFICE

Fred W. Johnson, *Commissioner*

SINCE the passage of the act of June 28, 1934 (48 Stat. 1269), known as the Taylor Grazing Act, as amended by the act of June 26, 1936 (49 Stat. 1976), and the withdrawal of the public lands from entry by Executive orders of November 26, 1934, and February 5, 1935, nos. 6910 and 6964, respectively, the work of the General Land Office has undergone a very decided change. Conservation rather than disposals is the dominant note in the administration of the public lands under existing laws. With some exceptions, which hereinafter will be noted under the heading "Present Status of Public Lands in Connection With General Withdrawals", the public lands may now be disposed of only after appropriate classifications.

While formerly the public lands were open range, subject to unrestricted grazing use, more than 110,000,000 acres of such lands have been included within grazing districts established under the above-mentioned acts, and grazing leases have been issued under the supervision of this Office regulating the grazing use of approximately 5,643,000 acres outside of such grazing districts. Such regulation will tend to prevent overgrazing of the lands and consequent soil deterioration.

In order to secure the more economical administration of the remaining lands both within and outside of grazing districts, the Taylor Grazing Act provides for exchanges of lands with the States and with individuals. The States and individuals making the exchanges will also benefit through the consolidation of their respective holdings. Applications for such exchanges were pending at the close of the year involving more than 2,375,000 acres of public land. The present status of such applications will be given under appropriate titles.

In connection with the oil and gas resources, it may be noted that on June 30, 1937, there were pending 4,237 applications for oil and gas leases under the act of August 21, 1935 (49 Stat. 674), amending the mineral leasing act of February 25, 1920 (41 Stat. 437), in the

interest of conservation. Further reference to these and other applications under the mineral leasing acts will be made under the title "Mineral Leases and Mining Claims."

The area included in original entries, selections, and filings made during the year was 124,530 acres, as against 425,834 acres for the preceding year. For the most part, such entries, selections, and filings were based on applications filed or rights initiated prior to the withdrawal of the public lands from entry by Executive orders of November 26, 1934, no. 6910, and February 5, 1935, no. 6964. However, 155 reclamation homestead entries were made for 17,463 acres of public lands and 24 forest homestead entries were made for 1,655 acres, the said Executive orders having been construed by the Department not to prohibit the allowance of such entries. In addition, 26 reclamation homestead entries were made for 3,561 acres of ceded Indian land, which was subject to such disposition.

The area embraced in final entries, selections, and filings made during the year was 2,026,203 acres, an increase of 88,677 acres over the area included in such entries during the preceding year.

Altogether, 6,279 patents were issued for 2,114,142 acres, while during the preceding year 8,238 patents were issued for 2,216,684 acres. Minerals in some form were reserved in 69 percent of all land patented. Under State grants, 74,420 acres were certified to States as indemnity school selections and as quantity selections under grants for specific purposes.

The area which, on June 30, 1937, was embraced in unperfected entries upon which final proof of compliance with the law was not due or had not been presented, was 9,555,102 acres.

There were furnished during the year 41,364 certified and uncertified copies of entry papers, plats, field notes, patents, etc., for which there were received amounts aggregating $11,961.70. In addition, there were furnished for official use by this and other departments and agencies, 53,900 copies of such items. The total number of copies furnished shows a decrease of 1,650, or about 1½ percent under the preceding year; the receipts from such copies show an increase of $1,134.95, or more than 10 percent over the preceding year.

Reports were submitted on 128 Senate and House bills, and necessary orders and instructions have been prepared or are in course of preparation in connection with 24 bills, public and private, affecting the public lands, which are enacted into law. Reports were made on five enrolled bills.

Twelve cases have been found in which, through inadvertence, patents have been issued without mineral reservations required by law and more than 6 years have elapsed since the patents were issued. In all of such cases field investigations have been requested by this Office with a view either to obtaining appropriate reconveyances from

the patentees or, if not obtainable, for the purpose of securing data needed as a basis for civil proceedings in the courts, looking to the recovery of the erroneously patented mineral deposits.

Three hundred and eleven letters were written in connection with pending and proposed suits, application of agents or attorneys for admission to practice before the Department, and charges preferred against United States Commissioners, registers, attorneys, and others.

Twenty civil suits were recommended to cancel leases for oil and gas, coal, potash, borax, and sodium; to cancel patents issued through fraud; and in connection with timber trespass. Eighteen cases were reported won and six lost. As a result of such suits, judgments and compromises have been reported amounting to $11,629.11, of which $11,353.45 was paid, and 240.63 acres were recovered.

Seventy-one applications of agents and attorneys for admission to practice before the Department were considered, of which 69 were approved and 2 rejected.

The number of letters and reports received for consideration or answer from all sources during the year was 135,106, and 68,432 letters and decisions were written. The latter figure does not include letters prepared for signature in the Department.

There were decided on principles of equity and referred to the Board of Equitable Adjudication and confirmed 1,652 homestead entries of public lands, 35 homestead entries of ceded Indian lands, 25 reclamation homesteads, and 37 desert-land entries.

Descriptions of lands were furnished for orders establishing grazing districts, and diagrams to accompany the orders, showing the exterior boundaries of each district and other pertinent data, were prepared. Estimates were submitted giving the area of the unappropriated, unreserved public lands in each established grazing district.

In land exchanges made for the benefit of other bureaus, this Office examined abstracts of title covering about 150,000 acres.

On June 30, 1937, there were 252 employees of the General Land Office in Washington, 72 in the district land offices, 136 in the field surveying service, and 3 in the Chippewa logging service.

EMERGENCY CONSERVATION WORK

The work of controlling the coal fires that for years have been destroying the irreplaceable federally owned coal beds in the vicinty of Little Thunder Basin, Wyo., was resumed on May 9 and continued to October 15, 1936, from two C. C. C. camps located at Gillette, Wyo., and operated under the jurisdiction of the General Land Office.

The report for the year again shows that not a single lost-time accident has resulted to any enrollee notwithstanding the fact that the work is perhaps the most hazardous carried on by any C. C. C. camp.

During the season work was conducted on 14 different projects, involving 11 separate and distinct underground coal fires, 1 emergency forest fire, 1 emergency prairie fire, and a miscellaneous undertaking.

PRESENT STATUS OF PUBLIC LANDS IN CONNECTION WITH GENERAL WITHDRAWALS

General withdrawals.—By Executive order of November 26, 1934, no. 6910, issued under authority of the act of June 25, 1910 (36 Stat. 847), as amended by the act of August 24, 1912 (37 Stat. 497), the vacant, unreserved, and unappropriated public lands in the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Wyoming were temporarily withdrawn from settlement, location, sale, or entry, subject to existing valid rights. This order was amended by Executive order of May 20, 1935, no. 7048, so as to make it applicable to all lands within the States mentioned upon the cancelation or release of prior entries, selections, or claims, or upon the revocation of prior withdrawals, unless expressly otherwise provided in the order of revocation, and so as to authorize the Secretary of the Interior, in his discretion, to accept title to land offered in exchange under the provisions of section 8 of the Taylor Grazing Act. The order of November 26, 1934, was further amended by Executive order of November 26, 1935, no. 7235, so as to permit sales under section 14 and the issuance of leases under section 15 of the Taylor Grazing Act, and so as not to debar the recognition or allowance of bona fide nonmetalliferous mining claims. The order of November 26, 1934, was further amended by Executive order of January 14, 1936, no. 7274, so as to exclude from the operation thereof all lands which were then or might thereafter be included within grazing districts established pursuant to the provisions of the Taylor Grazing Act, so long as such lands remain a part of any such grazing district.

By Executive Order No. 6964, of February 5, 1935, issued under authority of the said act of June 25, 1910, as amended, all public lands in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, Washington, and Wisconsin were temporarily withdrawn from settlement, location, sale, or entry subject to valid existing rights. This order was amended by Executive order of May 6, 1936, no. 7363, so as to permit exchanges under section 8, sales under section 14, and the issuance of leases under section 15 of the Taylor Grazing Act.

Classification for entry under any law authorized.—Section 7 of the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended by section 2 of the act of June 26, 1936 (49 Stat. 1976), authorizes the Secretary of the Interior, in his discretion, to examine, classify, and open to appropriate entry any lands withdrawn by the Executive

order of November 26, 1934, as amended, or the Executive order of February 5, 1935, or any lands within a grazing district, which are more valuable or suitable for the production of agricultural crops than for the production of native grasses and forage crops, or more valuable or suitable for any other use than for the use provided for under said act, or proper for acquisition in satisfaction of any outstanding lien, exchange, or scrip rights or land grant, except that homestead entries may not be allowed for tracts exceeding 320 acres in area. Revised instructions governing the filing of applications for entry, selection, or location under said section 7 were approved June 29, 1937, Circular No. 1353.

The said section 7, as amended, further provides that locations and entries under the mining laws, including the act of February 25, 1920 (41 Stat. 437), as amended, may be made upon such withdrawn and reserved areas without regard to classification and without restrictions or limitation by any provision of the act.

UNAPPROPRIATED PUBLIC LANDS

The area of the unappropriated and unreserved public lands as of June 30, 1934, the date on which a computation was last made, was approximately 165,695,479 acres, not including Alaska, and not including small areas remaining undisposed of in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, and Wisconsin. Of such areas 119,341,782 acres were surveyed, and 46,353,697 acres were unsurveyed. The area of the unappropriated and unreserved public lands in Alaska was approximately 346,174,242 acres, of which 2,044,421 acres were surveyed.

In computing the areas which were vacant and unreserved on the date mentioned, lands in pending, unallowed applications were considered as appropriated; but lands in applications for oil and gas prospecting permits, or in permits granted, or in applications for coal, phosphate, sodium, and/or sulphur, oil shale, or potash permits or leases, or in permits or leases granted, were considered as unappropriated. In view of the fact that the lands affected by the oil-shale order of withdrawal of April 15, 1930, or in designated geological structures of producing oil or gas fields, or in approved oil and gas leases, were then subject to disposition under the stock-raising homestead act, such lands were treated as unappropriated.

The areas which were included in original entries, selections, filings, etc., during the fiscal years 1935, 1936, and 1937, were 2,281,253 acres in the public-land States, and 28,189 acres in Alaska, a total of 2,309,442 acres. No computation has been made showing the areas restored to the public domain during said years through the rejection of applications or the cancelation of entries.

The area of the unappropriated and unreserved public lands in grazing districts established under the provisions of the Taylor Grazing Act was about 110,152,000 acres as of June 30, 1937.

LANDS PATENTED WITH MINERAL RESERVATIONS

The following table shows the areas patented during the year and the total areas heretofore so patented in which minerals in some form have been reserved to the United States:

	Fiscal year	Total reserved
	Acres	*Acres*
Stockraising act, all minerals reserved	1,419,778	29,113,272
Other acts:		
All mineral reserved	3,782	444,192
Coal only reserved	9,941	10,785,468
Some named mineral reserved	26,035	1,758,386
Total	1,459,536	42,101,318

CADASTRAL ENGINEERING SERVICE

The Cadastral Engineering Service of the General Land Office is charged with the execution of cadastral surveys and resurveys of the public lands of the United States proper and Alaska, the supervision of mineral surveys for patent, and the preparation of the technical and legal records of the work performed.

During the year field projects were executed in 22 States and the Territory of Alaska under 227 separate groups, 69 of which in 14 States were of resurveys. In these areas, 37,662 linear miles, embracing 6,756,225 acres, were surveyed and resurveyed, exclusive of engineering investigations and many types of miscellaneous and special projects not measurable on a quantity basis.

Office work in all branches was maintained on a current basis. Two hundred and eighty-nine township base plats, 154 color overlay sheets, 27 supplemental diagrams, 45 amended and segregation plats, and 101 special plats of miscellaneous surveys were constructed, the field notes in connection therewith being prepared in final form for the permanent record. In addition, 132 mineral surveys, embracing 543 locations, were examined, platted, and approved.

Requests by other Federal agencies for surveys and resurveys to meet the requirements of administration, conservation, and rehabilitation of the National estate, continued in increasing number and geographic scope. Such applicants included the Forest Service, Division of Grazing Control, Bureau of Reclamation, National Park Service, Geological Survey, Office of Indian Affairs, and the Soil Conservation Service.

Accepted surveys and resurveys.—There were accepted and placed on file plats representing 966,057 acres of original surveys of public

lands, and in addition 720,777 acres of lands resurveyed, comprising an aggregate area of 1,686,834 acres.

Maps, plats, and diagrams.—The wall map of the United States has been revised to show changes since the publication of the 1934 edition. The 1936 edition has been printed and delivered.

A new map of New Mexico has been issued, and a new map of Utah is in the hands of the contractor for printing.

A revised copy of the large United States map, showing the railroad grants, is being prepared for exhibit purposes in the new Interior museum.

Three hundred and thirty-nine miscellaneous maps, plats, diagrams, and tracings have been prepared.

Photolithographic copies, etc.—There were sold 7,595 photolithographic copies of township plats, for which $3,824.50 was received; and 10,749 copies were furnished other Bureaus for official use. There were 595 maps mounted and distributed for official use, and appropriate distribution was made of 3,143 map publications and 95,453 circulars.

RECEIPTS AND EXPENDITURES

The total cash receipts from sales, leases, and other disposals of public lands (including receipts from copies of records, sales of Government property, etc.) were $7,333,915.89 and from sales of Indian lands $65,924.05, an aggregate of $7,399,839.94, all of which was deposited in the Treasury. The total expenditure from appropriations made for the conduct of the Office was $1,503,010.23. The excess of receipts over expenditures was $5,896,829.71. The receipts were the largest in any year since 1927, exceeding last year's receipts by $2,205,540.32.

Receipts under mineral leasing acts.—Receipts from bonuses, royalties, and rentals under laws providing for the leasing rights on the public domain (including royalties and rentals on potash deposits and royalties on coal leases in Alaska) aggregated $5,773,681.89, of which $5,622,366.18 was received under the act of February 25, 1920 (41 Stat. 437). The largest receipts under this act were from lands in California, the amount being $3,107,987.77. Wyoming was second, $1,503,743.29. Receipts from other States follow: New Mexico, $521,311.34; Colorado, $144,813.94; Utah, $139,350.05; Montana, $106,317.25; Louisiana, $64,667.53; North Dakota, $22,823.42; Alabama, $7,586.40; Idaho, $3,137.25; South Dakota, $427.31; Nevada, $160; Kansas, $40; and Arizona, 63 cents. Under the provisions of the Mineral Leasing Act cited, each State receives 37½ percent of the receipts thereunder from the public lands within its borders, the reclamation fund receives 52½ percent, and the other 10 percent remains in the Treasury of the United States as miscellaneous receipts.

Receipts under the Taylor Grazing Act.—The amounts received as fees on grazing licenses, by grazing districts, and by States, and the receipts for fees and rentals under section 15 of the act, are as follows:

	Fees on licenses from grazing districts		Fees and rentals under sec. 15	State totals
	District	Amount		
Arizona	1	$15,317.95		
	2	4,511.34		
	4	6,462.75		
		26,292.04	$12,637.44	$38,929.48
California	1	4,437.04		
	2	13,101.21		
		17,538.25	2,637.09	20,175.34
Colorado	1	17,854.65		
	2	3,002.85		
	3	13,056.83		
	4	7,741.83		
	6	8,157.70		
		49,813.86	1,748.36	51,562.22
Idaho	1	20,871.70	2,600.27	23,471.97
Montana	4	764.31		
	5	11.00		
		775.31	10,846.51	11,621.82
Nevada	1	30,375.75		
	2	21,140.75		
	3	35.00		
	5	141.90		
		51,693.40		51,693.40
New Mexico	3	12,215.93		
	4	12,044.99		
	5	4,101.06		
	6	19,780.56		
		48,142.54	3,801.70	51,944.24
Oregon	1	2,325.80		
	2	15,842.73		
	3	16,646.14		
	4	13,902.66		
	5	5,163.96		
	6	5,495.90		
		59,377.19	5,053.13	64,430.32
South Dakota			113.01	113.01
Utah	1	7,307.34		
	2	22,345.53		
	3	32,877.97		
	4	13,517.82		
	5	15,960.66		
	6	18,308.89		
	7	16,536.12		
	8	14,618.25		141,472.58
		141,472.58		
Washington			1,849.41	1,849.41
Wyoming	1	19,548.91		
	2	470.90		
	3	3,760.19		
		23,780.00	48,242.65	72,022.65
Grand total		439,756.87	89,529.57	529,286.44

Distribution of receipts.—Receipts from all sources, aggregating $7,399,839.94, as shown above, are distributed under the law approximately as follows: Reclamation fund, $2,947,045.09; for range improvements in grazing districts, $110,359.92; to public-land States and certain counties within such States, $2,919,241.05; general fund, $1,357,269.83; and to various Indian tribes, $65,924.05.

Under the provisions of the Taylor Grazing Act the States within which the lands are situated receive 50 percent of the receipts, and 25 percent thereof when appropriated by Congress may be expended for construction, purchase, and maintenance of range improvements within the grazing districts from which the receipts came.

Five percent of the net proceeds from cash sales of public lands is paid to the public-land States within which such sales were made, and the balance of such receipts from States named in the Reclamation Act are credited to the reclamation fund; the reclamation fund and the States involved receive (on the percentages shown above) 90 percent of the receipts under the Mineral Leasing Act and of receipts from potash deposits leased under the act of February 7, 1927; receipts from sales of reclamation town sites and camp sites and from royalties and rentals from potash deposits leased under the act of October 2, 1917, are credited to the reclamation fund; all of the receipts from proceeds of land and timber in the forfeited Oregon and California railroad grant will be paid to certain counties in Oregon in lieu of taxes; 25 percent of the proceeds of land and timber in the forfeited Coos Bay wagon road grant will be paid to Coos County; the receipts from Indian lands (except 37½ percent of royalties from Red River oil lands, payable to the State of Oklahoma in lieu of taxes) are deposited in the Treasury to the credit of the various Indian tribes. All other moneys are deposited in the Treasury to the credit of the general fund.

The following table shows in detail the distribution of the receipts, insofar as is possible before final settlement of all accounts by the General Accounting Office.

Source of receipt	Distribution in the Treasury			
	General fund	Reclamation and range improvement	State and county fund	Total
Sale of public lands	$20,258.63	$50,983.15	$2,968.40	$74,210.18
Fees and commissions	26,701.30	94,271.90		120,973.20
Receipts from mineral leases	981,935.69	2,722,466.53	1,944,618.95	[1] 5,649,021.17
Revested Oregon and California railroad lands and timber			634,075.25	[2] 634,075.25
Revested Coos Bay wagon road lands and timber	113,783.86		36,923.24	[3] 150,707.10
Receipts under Taylor Grazing Act	154,283.30	[4] 110,359.92	264,643.22	[4] 529,286.44
Potash deposits, royalties, and rentals	9,603.20	72,301.26	36,011.99	[5] 117,916.45
Copying fees	17,812.20			17,812.20
Power permits	13,016.00			13,016.00
Reclamation town sites		7,022.25		7,022.25
Miscellaneous (including proceeds of standing timber, coal leases, and town lots in Alaska, rent of land, etc.)	19,875.65			19,875.65
Total	1,357,269.83	3,057,405.01	2,919,241.05	7,333,915.89
Sales and leases of Indian lands				[6] 65,924.05
Aggregate				7,399,839.94

[1] First and fourth columns contain $26,654.99 royalties received in Wyoming under act of June 26, 1926.
[2] This amount will be paid to certain counties in Oregon in lieu of taxes.
[3] 25 percent, exclusive of commissions, is payable to Coos County.
[4] 50 percent is payable to the several States and 25 percent of receipts from licenses within grazing districts is available for range improvements. All other items in the second column go to the reclamation fund.
[5] All of the $21,884.48 received under the act of Oct. 2, 1917, and 52½ percent of the $96,031.97 received under the act of Feb. 7, 1927, go to the reclamation fund. 37½ percent of that amount is payable to the State and 10 percent remains in the general fund.
[6] Included in receipts from Indian lands is $21,362.85, royalties on oil and gas from Kiowa, Comanche, and Apache lands, south half of Red River, Okla., of which the State receives 37½ percent in lieu of all taxes on tribal funds.

REPAYMENTS

Under the repayment laws there were stated 89 accounts, allowing repayment of $6,956.72, and 28 claims were denied. The claims allowed include three accounts granting repayment of $935 received in connection with sales of Indian reservation lands and repaid from Indian trust funds.

HOMESTEAD ENTRIES

Actions.—Actions were taken in homestead cases as follows: On final homesteads, 7,086; on second-entry applications, 187; on applications to amend, 97; on applications for leaves of absence and for extensions of time to establish residence, 1,066; on original entries, 6,118; and on appeals from actions of district land officers and this Office, 9,260.

PUBLIC SALE AND TIMBER AND STONE APPLICATIONS

Actions.—Five hundred actions were taken on public sale applications, 15 of which were approved for patenting; and 23 actions were taken on timber and stone applications, 9 of which were approved for patenting.

FILING OF PLATS OF SURVEY

Letters of instruction were issued for the filing of 306 plats of survey for lands in States in which there are district land offices. Thirty plats were directly filed by this Office in connection with which 13 public notices were prepared, for lands in States in which there are no district land offices.

NATIONAL FOREST HOMESTEAD LANDS

Nine thousand one hundred and eighty-three acres in national forests which had been listed for homestead entry under the act of June 11, 1936 (34 Stat. 233), were returned to national forests by revocation of the listing orders and 235 acres were restored to homestead entry under said act.

CONTESTS, OTHER THAN MINERAL CONTESTS

Nine hundred and twenty-one contests, including both Government and private, were considered. Approximately 123 hearings were held in Government cases. At the close of the year about 40 contest cases were pending.

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—One thousand and twenty-eight cases were acted upon in connection with the issuance of leases pursuant to section 14 of the act of February 25, 1920 (41 Stat. 437), as a reward for the

discovery of oil or gas on permit areas. Sixty-three leases, embracing 43,329.90 acres, were delivered to the lessees. In addition, 7 leases were sold under section 17 of the act, embracing 1,302.48 acres, on which the total amount of bonus received was $85,668.10. One lease was canceled.

On July 1, 1936, there were pending 2,389 applications for oil and gas leases under the act of August 21, 1935 (41 Stat. 674). Two thousand and eighty-three additional applications were received, making a total of 4,472. Of these, 176 were finally rejected in their entirety and 29 in part. Fifty-nine leases were issued, embracing 57,831.04 acres, 1 lease was canceled, 9 appeals were transmitted to the Department, and 554 other actions were taken. Altogether, 235 applications were disposed of, leaving 4,237 applications pending on June 30, 1937.

Oil and gas prospecting permits.—Eight hundred and ninety-eight oil and gas permits were granted, embracing approximately 564,849.43 acres. Four permits were reinstated. There were 567 assignments acted upon and 1,986 actions were taken on applications for extension of time. Eight hundred and forty-one permits were held for cancellation and 224 were canceled; 709 applications were rejected in entirety and 475 in part. There were 5,172 other actions taken.

Lease of water wells.—Four applications to lease water wells were received under section 40 of the mineral leasing act, which section was added by the act of June 16, 1934 (48 Stat. 977). The issuance of two leases has been approved by the Department.

Coal.—There were issued 32 coal prospecting permits covering 31,071.22 acres; 31 leases involving 4,877.38 acres; and 11 licenses for 440 acres. The total number of cases disposed of was 1,982.

Potash, sodium, sulphur, and phosphate.—Pursuant to departmental orders nos. 799, 817, 854, and 914, there were no potash permits or leases issued during the year under the act of February 7, 1927 (44 Stat. 1057.) One hundred and forty-four potash permits were canceled. There were issued 24 sodium prospecting permits, involving 29,763.82 acres. Nineteen sodium permits expired by limitation and one lease was canceled. Eighteen sulphur permits, involving 11,525.80 acres were granted and 26 permits expired by limitation. Altogether, there were 807 cases disposed of.

There were issued a total of 118 leases, licenses, and permits for coal, sodium, and other minerals, involving 78,438.22 acres.

Mineral applications and entries.—There were 99 mineral applications disposed of and 23 mineral entries were approved for patent.

Mineral contests.—Exclusive of oil-shale, Boulder Dam and Reservoir project and the San Gabriel Canyon claims, there were 235 mineral contests disposed of.

Proceedings against mining locations.—Final action has been taken on all the reports submitted on mining claims in conflict with the right-of-way for reservoir purposes in the San Gabriel Canyon. All cases, except one contest, have been disposed of in the Boulder Dam and Reservoir project. In the MetropolitanWater District appropriate action was taken on 44 field reports. Action was taken on 250 field reports on mining claims in the All-American Canal project.

RIGHTS-OF-WAY

Nine railroad right-of-way applications were approved and 31 stock watering reservoir applications were disposed of. In addition, in other cases, 306 right-of-way applications were approved and 39 rejected. Eight hundred and ninety-five other actions were taken.

FEDERAL RECLAMATION PROJECTS

There are 46 Federal reclamation projects in 14 western States, 22 of which are operated in whole or in part by irrigation districts and water users' associations. There are in addition five Indian reclamation projects, the irrigation features of which are under the supervision of the Office of Indian Affairs.

During the year 420 original reclamation homestead entries and 225 assignments of such entries were received; and 235 reclamation entries were approved for patenting.

DESERT-LAND ACT

One hundred and fourteen entries were approved for patenting under the desert-land act.

CAREY ACT

Carey Act segregations amounting to 51,340.23 acres were considered, on which either final or interlocutory action was taken.

PITTMAN ACT

Twenty-eight cases were received under the Pittman acts of October 22, 1919 (41 Stat. 293), and September 22, 1922 (42 Stat. 1012). Action has been taken in all but 16 cases.

SWAMP AND OVERFLOWED LANDS

Under the swampland acts, there were approved and patented to the States 1,846.51 acres and claims for 2,464 acres were finally rejected. New claims were asserted during the year for 738.54 acres.

STATE GRANTS AND SELECTIONS

New indemnity school-land selections, embracing 1,937.37 acres were received during the year and selections amounting to 43,729.81 acres were approved and title conveyed to the States. Such selections

involving 14,984.99 acres were canceled. Pending selections under quantity grants to States, for specific purposes, embracing 30,690.17 acres, were approved and title conveyed to the States.

Selections under the exchange provisions of the act of May 23, 1930 (46 Stat. 378), as amended by the act of February 21, 1931 (46 Stat. 1204), were approved and title conveyed to the State of Arizona, embracing 2,809.61 acres, and selections under the exchange provisions of section 2 of the Arizona Navajo Boundary Act of June 14, 1934 (48 Stat. 960), were approved and certified to said State, amounting to 19,196.24 acres.

Applications for patents for granted school sections under the provisions of the act of June 21, 1934 (48 Stat. 1185), were approved for patent, amounting to 1,000,678.62 acres. Such applications pending at the end of the year embrace 1,806,822.47 acres.

New applications under the Taylor Grazing Act by the various States for exchanges of lands were received, numbering 193 and embracing a total area of approximately 800,000 acres. The area in pending applications at the close of the year was 2,180,212 acres. In 71 cases field examinations were requested. Publication was ordered in the case of 20 applications, involving approximately 94,800 acres. The rejected and relinquished applications embraced 220,500 acres. Patented selections included 6,230.28 acres.

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections were received embracing 2,084.14 acres; 727.14 acres were certified or patented in satisfaction of such grants; and 221.19 acres of selections were rejected.

REVESTED OREGON AND CALIFORNIA RAILROAD AND RECONVEYED COOS BAY WAGON ROAD GRANT LANDS

Transactions concerning revested Oregon and California Railroad and Coos Bay Wagon Road grant lands for the fiscal year follow:

Restored to entry, etc.—No revested Oregon and California railroad grant land was restored to homestead entry and 944.96 acres were reclassified as timber land.

Timber sales.—Ninety-eight sales of timber on the revested Oregon and California railroad grant lands were made during the past year, involving 9,939.10 acres of land, containing 363,459,000 feet, board measure, of timber, for which the sum of $598,548.65 was received. Total sales to June 30, 1937, 1,138, involving 134,634.73 acres, containing 3,331,087,980 feet, board measure, of timber, for which a total of $7,469,481.14 has been received.

Eleven sales of timber on the reconveyed Coos Bay Wagon Road grant lands were made during the past year, involving 1,440 acres

of land, containing 67,265,000 feet, board measure, of timber, for which the sum of $144,303.05 was received. Total sales to June 30, 1937, 122, involving 19,740.78 acres, containing 798,377,000 feet, board measure, of timber, for which a total of $1,835,664.67 has been received.

Timber rights terminated.—Rights under timber patents were terminated in 120 cases.

ABANDONED MILITARY RESERVATIONS

The sum of $2,897.19 was received from entries and sales of lands in abandoned military reservations. Eight homestead entries and 10 cash sales were approved for patenting.

ALASKA

Leases of public lands in Alaska for fur-farming required 42 actions. Four leases were canceled, 2 were issued, and 2 expired and were not renewed.

Leases of public lands in Alaska for grazing required 14 actions. One lease application was rejected.

Seventy-nine actions were taken in connection with the sale of small tracts in Alaska for homesites or headquarters, and 1 patent was issued. Thirteen actions were taken in connection with trade and manufacturing site applications and 1 patent was issued.

AVIATION LEASES

Two applications for lease of public lands for aviation fields were rejected, 1 lease was reinstated, 10 leases were canceled, and 41 other actions were taken.

COLOR OF TITLE

Sixteen applications for the sale of improved or cultivated public lands held under color of title for more than 20 years were approved for patenting. One hundred and eighty-three actions were taken in such cases, from which the sum of $1,085.22 was received.

Twenty applications for lands formerly involved in the boundary dispute between the States of Texas and New Mexico were approved for patenting.

EXCHANGES

Various acts of Congress provide for exchanges in order to effect consolidations of Federally or privately owned lands or for other specified purposes. Eighteen patents were issued in such cases and title was accepted to about 150,000 acres of land for inclusion in national forest and other reservations.

The Secretary of Agriculture was notified in 64 cases that a timber permit might issue to the exchange applicant.

Ninety-four applications have been received under section 8 of the Taylor Grazing Act, involving 299,196 acres of public land. Of such number, 75 were received during the year. Twenty-three await reports from the Division of Investigations, 39 await reports from the Division of Grazing, 11 await additional evidence to be supplied by the applicants, 3 are under consideration by this Office, and 15 have been finally rejected and closed. The pending applications involve 197,238 acres of public land.

GRAZING LEASES UNDER TAYLOR GRAZING ACT

Five thousand nine hundred and twenty-four applications for grazing lease were filed; 2,736 were rejected and closed and 2,871 original and 661 supplemental grazing leases were issued, embracing approximately 5,642,915.98 acres.

INDIAN LANDS AND CLAIMS

Sales of pine timber on ceded Chippewa Indian lands in Minnesota resulted in the logging of 13,409,220 feet of white and Norway pine, spruce, cedar, and aspen timber and of 15,618.2 cords of spruce and balsam pulpwood. These operations resulted in the collection of $137,681, which was deposited to the credit of the Chippewa logging fund.

Entries and sales of ceded Indian lands required 3,574 actions and resulted in the issuance of 154 patents. The sum of $44,139.76 was received from such transactions.

The matter of the issuance or reissuance of fee and trust patents on Indian allotments was considered in 385 instances. One hundred and sixty-one cases were approved for patenting.

Claims by non-Indians within confirmed Indian pueblos in New Mexico were considered in 979 cases, all of which were approved for patenting.

Extensive reports were submitted with reference to the claims of the *Choctaw and Chickasaw Indians* v. *United States* and the *Northwestern Band of Shoshone Indians* v. *United States*, which claims are now pending in the United States Court of Claims.

One thousand three hundred and seven and forty-eight hundredths acres of land were added to the Western Navajo Indian Reservation through the medium of exchanges which required 52 actions. Five patents were issued in such cases.

PRIVATE LAND CLAIMS

Private land claims which were recognized or confirmed by many acts of Congress in the early history of the Government required 198 actions. Twenty-two patents were issued for such claims.

TIMBER

Sales of dead, down, or damaged timber were considered in 101 instances. The sum of $3,746.95 was received from such timber sales.

Permits for the free use of timber required special consideration by this Office in 14 cases.

TOWN LOTS

Town lot matters required 244 actions. One hundred and nine town lot patents were issued and payments aggregating $18,689.50 were received from town lot sales.

TRESPASS

Coal trespass was considered in 76 cases, in which $942.80 was accepted in settlement; and timber trespass in 391 cases, in which $8,997.05 was accepted in settlement. Other trespass cases considered were as follows: Gravel, 8; fire, 3; rock and turpentine, 1 each; and grazing, 1.

MISCELLANEOUS CASES CONSIDERED

Other actions were taken and patents issued as follows: Arkansas drainage, 111, with 3 patents issuing; cash and credit entries, 30, with 9 patents issuing; cemetery sites, 4, with 1 patent issuing; park applications, 8; preemptions, 3, with 3 patents issuing; quitclaims, 10; scrip 27, with 3 patents issuing; small holding claims, 40, with 5 patents issuing; and soldiers' additional, 639, with 4 patents issuing. Mud Lake, Minn., claims for relief were approved in 3 cases.

TRACT BOOK NOTATIONS

More than 100,000 notations were made on the tract books. This includes 13,650 appeals and other miscellaneous cases, 2,383 grazing applications, 6,042 final and cash certificates, 2,295 oil and gas applications, 174 coal applications, 542 original entries, and 407 plats.

Withdrawals and classifications.—Five hundred and forty-two Executive and other orders were noted. These include withdrawals for stock driveways, national forests, restored lists, power site reserves and classifications, grazing districts, and mineral and other classifications and revocations thereof.

Relinquishments.—Entries numbering 1,099 were relinquished and noted.

Supplemental patents.—Supplemental patents numbering 160 under the act of April 14, 1914 (38 Stat. 335), eliminating coal reservation because land was classified as noncoal, were directed to be issued.

Status cases.—Status was furnished in 18,036 cases for adjudicating clerks.

Township diagrams.—Diagrams showing disposals and status, in 864 townships and fractional townships, were made for this and other Bureaus.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

A summary of the outstanding mineral withdrawals and classifications as of June 30, 1937, is as follows:

	Withdrawn	Classified
Coal	26,971,813	33,276,103
Oil	5,168,593	71,884
Oil shale	5,989,949	4,081,208
Phosphate	1,889,601	302,219
Potash	9,411,906	
Total	49,431,862	37,731,414

The area of the withdrawn oil land, shown above, includes 13,578 acres withdrawn as a helium reserve. The figures given include much land which has been patented with or without a reservation of minerals. The areas so patented have not been computed. However, some or all minerals have been reserved in patents aggregating 42,101,318 acres issued under the stock-raising and other laws, for lands not withdrawn or classified as valuable for minerals, as well as for lands so withdrawn or classified.

WITHDRAWALS AND RESTORATIONS

Three new national monuments were established and 3 enlarged, involving the reservation of 1,511,937 acres. The area of the national forests was increased by 14,077,784 acres, largely through the creation of 12 new forests. Eleven new wildlife refuges were established and 6 were enlarged, and a new cooperative game range within a grazing district was created, while small areas were released from existing refuges, resulting in a net increase of 566,909 acres.

Withdrawals amounting to 65 acres were made for air navigation sites for the Department of Commerce, while 3,037 acres were released from former withdrawals for such use. A tract of 160 acres was sold to the State of Florida under the recreation law, 3 recreational petitions were denied and 160 acres released from recreational withdrawal. Three new stock driveways were established and 5 enlarged and 16 reduced, resulting in a net decrease of 520,438 acres.

A withdrawal of 110,764 acres of public land was made for use by the Resettlement Administration; 49 acres were withdrawn as lookout sites in Federal and State cooperative fire-protection work; 40

acres were withdrawn as an experiment station, and a small tract in Arizona was withdrawn for town-site purposes. Withdrawals for lighthouse purposes, amounting to 1,208 acres, were revoked and public water reserves were reduced by 240 acres.

TABLES

The following tables show the facts as to entries made, patents issued, etc., during the fiscal year.

Original Entries

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising	156	67,956	18	6,953
Enlarged	14	3,118		
Reclamation	155	17,463	26	3,561
Forest	24	1,655		
Section 2289, et al	212	20,729	4	342
Total homesteads	561	110,921	48	10,856
Deserts	8	1,242		
State selections	2	966		
Railroad selections	2	107		
Applications and filings	176			
Miscellaneous	21	376	10	62
Total	770	113,612	58	10,918
Indian land as above	58	10,918		
Grand total	828	124,530		

Final Entries

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising	3,623	1,668,119	111	47,338
Enlarged	433	110,302	80	12,649
Reclamation	183	17,835	45	4,036
Forest	48	5,286		
Commuted	23	2,017	19	1,531
Section 2289, et al	1,131	113,264	70	6,327
Total homesteads	5,441	1,916,823	325	71,881
Deserts	129	16,927		
Public auction	17	2,077		
Timber and stone	5	169		
Mineral	112	4,906	1	41
Miscellaneous	1,696	12,362	66	1,017
Total	7,400	1,953,264	392	72,939
Indian land as above	392	72,939		
Grand total	7,792	2,026,203		

Patents and Certificates

	Number	Acres
Homesteads:		
Stock raising	2,887	1,419,778
Enlarged	430	105,765
Reclamation	219	18,850
Forest	37	3,679
Section 2289, et al	1,075	117,346
Total homesteads	4,648	1,665,418
Deserts	131	17,347
Public auction	15	1,638
Timber and stone	7	359
Mineral	29	1,307
Railroad	6	851
Miscellaneous	1,443	427,222
Total patents	6,279	2,114,142
Certified to States		96,426
Grand total	6,279	2,210,568

State Grants—Areas Patented or Certified

State	Swampland patents	School section indemnity certifications	Other grants confirmed [1]
	Acres	*Acres*	*Acres*
Arizona		43,690	28,236
California	38		
Florida	47		
Iowa			1,000,679
Louisiana	1,703		
Michigan	40		
New Mexico			30,690
Oregon		40	
Wisconsin	18		
Total	1,846	43,730	1,059,605

[1] Includes quantity grants, exchange selections, and patented school lands in place.

Railroad Grants—Land Approved for Patent or Certification

	State	Acres
To Corporations:		
Central Pacific	California	428
Central Pacific (California & Oregon)	do	299
Total		727
To States:		
St. Paul, Minneapolis and Manitoba (Great Northern)	Washington	91
Grand total		818

DIVISION OF GRAZING

F. R. Carpenter, *Director*

THE Division of Grazing was entering its third year of operation under the Taylor Grazing Act at the beginning of the fiscal year 1936–37. Whereas the first 2 years of the administration were principally occupied in acquainting the people of the West with the provisions of the law, building and perfecting an organization, and establishing rules and regulations governing the issuance of grazing privileges, the third year has been occupied mainly in enlarging that program and stressing activities which would lead to a solution of the many problems attendant upon the issuance of term permits.

In the preamble of the act, "To stop injury to the public grazing lands by preventing overgrazing and soil deteriorization, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range, and for other purposes", the mission of the Division of Grazing is aptly defined. In the beginning of the administration, there was a very limited amount of specific information available, and it was, therefore, necessary to operate under a plan that would afford the least injury to the livestock industry which the act was designed to help and at the same time, "to preserve the land and its resources." This was accomplished through the authority of section 2 of the act which provides that the Secretary of the Interior shall "do any and all things necessary to accomplish the purposes of this act and to insure the objects of such grazing districts, namely, to regulate their occupancy and use, to preserve the land and its resources from destruction or unnecessary injury, to provide for the orderly use, improvement, and development of the range." To regulate the use of the range, revocable licenses for grazing privileges were issued pending the time when sufficient data would be available upon which to issue term permits. The livestock in each grazing district were licensed to use public lands in conformance with general rules of the range approved March 2, 1936, as later amended, and local rules of fair range practice which provide for the recognition of local customs and administrative details.

The third year of administration developed in the Division a definite program of wildlife conservation and constructive means of bringing about through cooperative agreements the proper utilization of public ranges and a harmony of purpose involving this great natural resource. The range survey program was expanded in all grazing districts. In one grazing district, field work was completed and data compiled. Through cooperation with other Federal agencies, an enormous amount of information on this subject and conservation activities resulted.

Section 3 of the act prescribes that "Preference shall be given in the issuance of grazing permits to those within or near a district who are landowners engaged in the livestock business, bona fide occupants or settlers, or owners of water or water rights, as may be necessary to permit the proper use of lands, water, or water rights owned, occupied, or leased by them." Inasmuch as there is insufficient range available to grant privileges to everyone, the range survey program must of necessity assist in the determination of the preference properties upon which grazing permits can be based.

Of the outstanding accomplishments during the year, noteworthy are the determination of the proper relationship of the private and public lands involved, the study in range-carrying capacities, and the far-reaching cooperative agreements with local associations of stockmen and with Federal and State agencies, having as their objectives the preservation and rehabilitation of the land.

THE AMENDMENT TO THE TAYLOR GRAZING ACT

The Taylor Grazing Act was amended June 26, 1936, providing a number of changes and additions to the original act of June 28, 1934, which was the first law ever passed by the Congress to regulate grazing on the public domain. One of the important changes in the law is the provision increasing the 80,000,000-acre limit to 142,000,000 acres, permitting an additional 62,000,000 acres of public land to be included within grazing districts.

A new section, 17, was added to the law, providing that the President shall have power, with the advice and consent of the Senate, to select a Director of Grazing. Other personnel are appointed by the Secretary of the Interior from the civil service rolls. Practical range experience is taken into consideration by the Civil Service Commission in passing upon eligibles. The Director of Grazing, Assistant Director, and all graziers at the time of appointment must be bona fide citizens or residents, for 1 year immediately preceding their appointment, of the State or of one of the States in which they are to serve.

The amendment modifies sections 7, 8, 10, and 15 of the original act. The administration of these sections dealing with the sale, lease, and exchange of lands rests largely with the General Land Office.

ADVISORY BOARD CONFERENCE

At the invitation of Secretary of the Interior, Harold L. Ickes, the general chairmen of the advisory boards of the 37 grazing districts then established and administered by the Division of Grazing met in Washington on July 8 and 9, 1936, to confer with the Secretary, officials of the Division of Grazing, and the heads of bureaus whose work is connected with that of the Division. The purpose of the meeting was to discuss matters of general policy concerning the regulation of the present grazing districts and to decide whether the same methods of administration should be used to control the new grazing districts. These new districts were to be created from the 62,000,000 additional acres of public domain placed under the jurisdiction of the Division by the Taylor Grazing Act as amended June 26, 1936. In general, the stockmen endorsed the administration of the provisions of the Taylor Grazing Act and approved the continuance of the present policies. At a conference with Robert Fechner, Director of Emergency Conservation Work, the livestock leaders appealed for additional Civilian Conservation Corps camps to carry out necessary range rehabilitation. Mr. Fechner expressed his desire to give all assistance possible to this work but indicated that it would be practically impossible to allocate more camps for it before April 1, 1937.

The advisors were received by President Roosevelt, who complimented them on the work being done to conserve the public domain, and showed not only a great interest in, but also a keen understanding of their problems.

Immediately following the conference with the advisory board chairmen, the Director conducted State-wide meetings in the West to consider the placing of additional lands within grazing districts. As a result, 12 new districts were established.

In accordance with the Rules for Administration of Grazing Districts which provides that an election of district advisors shall be held in each grazing district within 90 days after the promulgation of the order establishing said district, elections for choosing advisory board members were held in each of the new districts. As rapidly as possible thereafter, the districts were brought under administration.

SECOND ANNUAL CONFERENCE

The second annual conference of members of the Taylor Grazing Act advisory boards was held in Salt Lake City from December 9 to December 11 with nearly 1,000 interested stockmen in attendance. In an open forum, there were discussed at length each of the topics to be taken up later by State committees and whipped into shape by national committees for presentation to the Secretary of the Interior.

The delegates met by States and considered each of the topics. Two representatives from each State were selected to serve on six

major national committees, which drafted resolutions to be presented to the assembly. The representatives were instructed by stockmen from their respective States as to the State sentiment.

The six national committees drew up resolutions covering the following-named general topics: Licenses, permits, fees and finances, improvements, legislation, and range surveys. At the final session, the resolutions were presented to the assembly and acted upon as recommendations to assist the Secretary of the Interior in the administration of the act during 1937.

Among other resolutions, one called for an increase in the number of C. C. C. camps assigned to the Division of Grazing. It was pointed out by the committee that the Division now has only 45 camps carrying on improvements in the vast public domain of 140,000,000 acres. The resolution urged that every grazing district be given at least one camp and as many more as are necessary.

The delegates recommended that the personnel engaged in range surveys be enlarged and went on record as approving the standards of work and the methods established by the range surveys branch of the Division of Grazing.

LICENSES

Fifteen thousand sixty-seven temporary licenses were issued during the year for 7,434,416 head of livestock, a detailed summary of which is shown in the following table. These licenses were issued on a temporary basis, pending the completion of land-classification studies and a determination of the commensurate ratings of properties dependent on the public ranges, and are revocable for violation of the terms thereof.

Grazing Licenses Issued by the Division of Grazing, 1936

State	Dist. No.	Cattle	Horses	Sheep	Goats	Number of licenses	Number of stock
Arizona	1	30,752	146	147,962	10,235	258	189,095
	2	7,827	19	12,360	1,115	83	21,321
	4	18,445	164	348	15,119	183	34,076
		57,024	329	160,670	26,469	524	244,492
California	1	16,831	433	141,445	210	174	158,919
	2	41,274	2,215	114,940	102	478	158,531
		58,105	2,648	256,385	312	652	317,450
Colorado	1	53,173	3,419	154,362	79	478	211,033
	2	31,049	629	42,762	----------	218	74,440
	3	66,735	2,656	188,814	349	663	258,554
	4	20,541	715	142,653	423	338	164,332
	6	7,023	983	94,690	30	164	102,726
		178,458	8,402	623,236	881	1,861	811,085
Idaho	1	65,141	6,824	439,347	26	1,093	511,338
Montana [1]	2	19,944	11,868	167,257	14	387	199,083
	3	25,798	3,183	133,783	249	318	163,013
	4	4,449	516	27,379	----------	80	32,344
		50,191	15,567	328,419	263	785	394,440

[1] No license issued in Montana district no. 1 in 1936.

Grazing Licenses Issued by the Division of Grazing, 1936—Continued

State	Dist. No.	Cattle	Horses	Sheep	Goats	Number of licenses	Number of stock
Nevada	1	139,294	8,438	389,796	3	377	537,531
	2	63,538	4,966	283,870	70	332	352,444
		202,832	13,404	673,666	73	709	889,975
New Mexico [2]	3	130,450	5,324	16,020	40,702	896	192,496
	4	40,516	3,272	75,770	36,772	520	156,330
	5	14,855	1,872	27,131	8,626	126	52,484
	6	153,293	8,865	359,283	14,104	1,013	535,545
		339,114	19,333	478,204	100,204	2,555	936,855
Oregon	1	4,401	144	11,429	----------	37	15,974
	2	57,572	5,292	264,270	----------	387	327,134
	3	38,564	4,783	189,464	----------	376	232,812
	4	20,191	2,739	90,760	----------	138	113,690
	5	15,295	1,494	45,095	----------	158	61,884
	6	22,098	1,399	52,845	----------	291	76,351
		158,121	15,851	653,873	----------	1,387	827,845
Utah	1	25,346	3,123	218,272	----------	368	246,741
	2	15,924	1,320	395,896	235	635	413,375
	3	32,869	1,620	506,996	2,629	1,407	544,114
	4	26,934	1,518	224,313	25,085	905	277,850
	5	21,669	2,061	103,004	240	541	126,974
	6	26,096	1,842	192,932	----------	290	220,870
	7	23,762	2,529	143,857	2,530	617	172,678
	8	15,407	1,120	182,902	----------	298	199,429
		188,007	15,133	1,968,172	30,719	5,061	2,202,031
Wyoming	1	36,929	3,289	258,687	----------	440	298,905
Total	37	1,333,985	100,780	5,840,704	158,947	15,067	7,434,416

[2] No license issued in New Mexico district no. 2 in 1936.

ORGANIZATION

Following the principle of decentralizing administration as far as consistent, an administrative office was established in Washington, D. C.; a regional field headquarters office in Salt Lake City, Utah; and 10 regional offices located in Salt Lake City, Utah; Reno, Nev.; Burns, Oreg.; Boise, Idaho; Billings, Mont.; Grand Junction, Colo.; Albuquerque, N. Mex.; Phoenix, Ariz.; and Rawlins, Wyo.

Each regional office is in charge of a regional grazier, who is assisted by one or more graziers and office personnel. At the close of the year, the Division had in its employ a total of 91 permanent employees, 16 in the Washington office and 75 in field offices.

Each of the 49 districts now functioning has a board of district advisors whose duties as provided in the Rules for Administration of Grazing Districts are as follows:

District advisors shall make recommendations on the following-named matters:

1. The carrying capacity of the public range of the district.

2. The issuance of grazing licenses. (District advisors shall not make any recommendations upon their own applications, but such applications shall be acted upon by the Director of Grazing.)

3. Proper rules for fair range practice.

4. Temporary range allotments by classes of livestock or for community or individual use.



SHEEP GRAZING ON THE PUBLIC RANGE.



A NOW FAMILIAR SCENE IN ONE OF THE GRAZING DISTRICTS WHICH HAVE BEEN SET UP TO PROTECT THE RANGE.

5. Seasonal use of the public-domain range, or any part thereof.
6. Approval or rejection in whole or in part of recommendations of local associations of livestock men in the district.
7. Other matters upon which their opinion may be requested by the Secretary of the Interior.

The advisory boards, whose members total 678, have worked diligently, and their recommendations and the almost limitless fund of information as to local conditions and requirements have contributed greatly to the principles of conservation and prudent usage adopted by the Division. In carrying out the duties assigned to them, the advisory boards have materially assisted in the details of administration.

RANGE SURVEY PROGRAM AND LAND CLASSIFICATION

The range survey program of the Division of Grazing, which was inaugurated in March 1936, has geared its activities to the needs of the administration in harmony with section 3 of the act. The scope of this survey includes not only the determination of the carrying capacity and proper seasonal use of the public range but also the examination of the private lands and water within these districts and the ascertainment of the right relationship of each to the other. Base maps must be prepared and ownership status assembled. The essential facts of private control of private lands are also ascertained.

In New Mexico Grazing District No. 5, field work is completed and data assembled for the determination of preferences for permits, and it is expected that this district will be on a permit basis by January 1, 1938. Likewise, in Colorado Grazing District No. 6, the field work is practically completed, and it is anticipated that permits will be issued also in that district beginning with the 1938 grazing season. The intensive studies in these two widely divergent districts will serve as a basis for the determination of preferences for grazing permits where such preferences are based primarily on (1) water, as in the Southwestern States, and (2) land, as in the Northwestern States. In all other districts, the work is progressing at a remarkable pace considering the magnitude of the task.

Plans are under way to step up the range survey program by means of additional personnel qualified in that field. By coordinating the range survey program with that of the many agencies with which the Division has worked out cooperative agreements, it is anticipated that sufficient data to have all districts on a permit basis will be made available by 1940.

The classification of lands with respect to their value for agricultural purposes as required by the various land laws is a duty of the Division of Grazing. This classification involves all lands located within or without the boundaries of grazing districts which are applied

for as homestead entries under section 7 of the Taylor Grazing Act as amended June 26, 1936.

It is also the duty of the Division to make determinations as to the propriety of approving applications under section 7 for other purposes than agriculture and applications under sections 8, 14, and 15 of the Taylor Grazing Act from the standpoint of public benefit where the lands involved are located within grazing districts.

The recommendations for designations of lands applied for under the enlarged and stock-raising homestead acts and determination of the value of watering places for public purposes, together with the preparation of appropriate orders, are other functions of the Division of Grazing. The designations under the enlarged and stock-raising homestead acts are made principally for the purpose of permitting the adjudication of homestead entries having valid claims established prior to the Executive orders of November 26, 1934, and February 5, 1935, withdrawing public lands for classification.

The work of classification is performed on the basis of information and records available to the Division and in cooperation with the Division of Investigations and General Land Office.

At the beginning of the present fiscal year, there were 1,080 cases pending under sections 7, 8, 14, and 15. During the year, 2,130 cases were received, making a total of 3,210 cases to be acted upon. Of this number, 2,598 were acted upon, leaving 612 cases pending at the end of the year. One hundred fifty-six cases under the enlarged and stock-raising homestead acts were acted upon, and, on June 30, there were 80 cases pending action by the Division; 1,360 acres were designated under the enlarged homestead act in nine States, increasing the total acreage so designated to 268,470,225 acres; 3,520 acres of land were designated under the stock-raising homestead act in eight States, increasing the outstanding area to 102,440,062 acres. During the fiscal year, 1,775 acres in 7 States were included in water reserves, and 280 acres in 1 State were excluded from such reserves, increasing the gross public water reserve areas in 12 States to 511,523.

RANGE IMPROVEMENT

Authority is granted the Secretary to rehabilitate overgrazed and eroded areas. Construction, purchase, and maintenance of range improvements are authorized under section 10 of the act from the 25 percent of all moneys received when appropriated by Congress. Up to July 1, 1937, $53,281.56 had been allotted for expenditure under the provisions of this section.

This money was apportioned according to the amount of grazing fees collected in each district, and the resulting improvements consisted mainly of fencing; posting stock driveways; extermination of rodents, insects, and predatory animals; purchase of poison mix and

fence material; maintenance of water development; and construction of stock trails.

The Department, on October 20, 1936, formally accepted 183 watering facilities developed on the public domain of Utah under the Utah Emergency Relief Administration range-improvement program. These improvements consisted of spring developments, reservoirs, and wells, the latter equipped with engines, pumps, windmills, storage tanks, and troughs. Local stockmen, through properly selected representatives, took an active part in this range-improvement program. Had there been no regulation or control of grazing in the areas served by these waters, their inestimable value to the range and to the public would indeed have been short lived. Under this program, a skeleton distribution of stock water was developed on 25,000,000 acres of public domain. This has since been augmented by auxiliary and primary improvements under Emergency Conservation Work projects in the Division of Grazing. All of these facilities contribute to beneficial and orderly use of the range. To operate properly and administer many of the wells, it is necessary to maintain well operators during the season of use, not only for the protection of the well equipment but also in order that sufficient water may be available when needed. This is particularly true of wells located on stock driveways. Various associations of stockmen have offered to enter into agreements to operate wells of this character. On June 30, 1937, a form of agreement was approved by the Department which is of sufficient scope to afford ample protection to the public and to the Government property involved. It will open the way for maximum enjoyment of these facilities and at the same time relieve the Division of the expense that its otherwise necessary direct supervision would entail.

EMERGENCY CONSERVATION WORK

The purpose of the Emergency Conservation Work activities of the Division of Grazing is to rehabilitate the public domain and to convert thousands of acres of formerly unused range into good grazing land for livestock. During the fiscal year 1937, there were a total of 45 C. C. C. camps assigned to the Division. The enrollees of these camps are supervised by the Army when in the camp and by the Division of Grazing, E. C. W., when engaged in the construction of improvements on the public land.

The work projects of the 45 C. C. C. camps being operated under the jurisdiction of the Division in the 9 Western States of Arizona, California, Colorado, Nevada, New Mexico, Idaho, Oregon, Utah, and Wyoming are those recommended by the advisory boards of the grazing districts in which the camps operate and in each case are planned to relieve the most acute need of the area whether it be water develop-

ment, fence construction, definition of stock boundaries, rodent control, or some other work of vital importance to proper range management. While the work accomplished has in each case proved of immediate benefit, construction was planned for future benefits as well and with the object not only of relieving present range conditions but also of providing future means of conservation and protection of the more than 110,000,000 acres of range land administered by the Division.

Water is the prime requisite of the public domain. Sections of the national range used partially or not at all in past years are being made available for grazing purposes largely through conservation and distribution of water. Dams have been built to impound the water from mountain streams and to preserve the early run-off, and water check-dams have been built in dry creeks for the purpose of arresting soil erosion in the wet seasons. The development of springs wherever they could be located has been accomplished, and, in many cases, wells have been sunk in an endeavor to provide watering places within close proximity of each other in order that the range may be more properly serviced and thus bring about a better distribution of stock. In connection with this water development, storage facilities such as troughs and tanks have been constructed. This not only conserves the water but also provides much better watering facilities.

Closely allied with the water program is the work of opening truck trails into the grazing regions and the building of stock trails for the movement of animals from winter to summer range or to market. This trail construction opens up large areas of grazing lands formerly inaccessible and not only furnishes much needed new pasture but also aids in the elimination of overgrazing in other areas. The holding corrals constructed along these trails allow stock to be held overnight on the way to market and are of great advantage to stockmen. A sufficient water supply is included in the construction of each corral. Bridge and cattle-guard construction are an important part of these trails and are of great assistance in expediting the movement of cattle and reducing losses of livestock.

An extensive rodent control program has proved of great benefit to stockmen in conserving forage. More than 2,000,000 acres have been treated for control of ground squirrels, gophers, prairie dogs, kangaroo rats, and jack rabbits. Eradication of poisonous weeds has proved very important in saving livestock, and 119,514 acres have been treated for infestations of poisonous larkspur, death camas, and other weeds which cause the death of hundreds of head of livestock.

EDUCATIONAL PROGRAM

The chief objectives of the educational program are vocational, character, and citizenship development with specific consideration given to job training. The enrollees are given every opportunity to

learn to operate the machinery used on the work projects, and, through the daily work in connection with classroom instruction, many skilled workers have been developed from completely untrained men. Systematic instruction on the job includes practice on the job in the the field and at least 2 hours per week of systematic basic instruction underlying the work off the job. This basic instruction includes a general course in conservation. The effectiveness of the education and training on the job program of these C. C. C. camps and the interest of the enrollees in it may be judged from the fact that much of the difficult construction has been done under the supervision of foremen who were formerly enrollees. Their work has been approved by those competent to judge, and the value of this instruction to the enrollees themselves is immeasurable.

SAFETY PROGRAM

The safety program outlined by the Director of Emergency Conservation Work is being followed, and, through its application, the Division of Grazing, E. C. W., has maintained one of the best safety records in Emergency Conservation Work. One camp, DG–35, Milford, Utah, which has been operating since October 22, 1935, has not from its inception up to the present time had one lost-time accident.

The following table shows the accomplishments of the work projects of the Division's Emergency Conservation Work program:

Bridges	54
Fences (miles)	588
Reservoirs	68
Springs	57
Wells—fully equipped	44
Cattle guards	37
Corrals	49
Truck trails (miles)	1, 208
Stock trails (miles)	106
Check dams	13, 319
Other flood-control structures	139
Acres treated for poisonous plant eradication	119, 514
Acres treated for insect pest eradication	31, 599
Acres treated for rodent eradication	2, 376, 417
Diversion dams	194

COOPERATION

1. Local Associations of Stockmen

To remedy the situation of interspersed land ownership, where State, county, tax-default, and privately owned lands are checkerboarded and intermingled with public domain lands, the Department early realized the necessity for some coordinated plan of management with a system of unified control for all these lands if economic and

sane use were to be established. To make possible this form of administration, the Secretary on March 17, 1936, approved a general form of cooperative agreement to be used in entering into agreements with local associations of stockmen. During the fiscal year ending June 30, 1937, the number of these cooperative agreements was increased by eight, and six more are pending. The total number of these agreements approved to date is 17.

Economic and sane use require orderly regulation and occupancy of the range and provide for proper utilization of the forage, all of which results in the rehabilitation and conservation of the natural forage resources which is the primary purpose of the Taylor Grazing Act and the chief objective of the Department. Administration under a cooperative agreement is designed to accomplish these purposes and permits a coordinated use of Federal, State, county, railroad, and tax-default lands which are so intermingled that the proper use of one cannot be had without use of the other. Under the terms of such an agreement, the Secretary of the Interior determines the proper season of use of all lands and fixes the fee to be charged for grazing public domain lands included in the agreement, and the association is required to acquire by lease or otherwise all State, county, tax-default and other privately owned grazing lands obtainable within the area covered by the agreement. The actual administration of the lands included in the agreement is vested in the board of directors of the association under general supervision of the Secretary. Through an agreement of this sort, thus, there is brought about a harmony of purpose and a constructive means of again placing these otherwise burdensome non-Federal lands on a self-supporting basis and effecting a plan for the conservation of all lands involved.

The Division of Grazing has no doubt reached an all-time high among agencies of the Federal Government in the matter of cooperation. Regulation of grazing on the public domain put into effect less than 3 years ago to "preserve the land and its resources" has crystallized opinion and effort as to the position this great resource occupies nationally and locally. The result has been amicable relations with all agencies in the interest of the natural resources and the welfare of 2½ million agricultural and industrial people who pioneered and built a civilization in its midst.

WILDLIFE

A program of wildlife management has been instituted by the Division as an important part of the administration of all grazing districts. The program may be divided into four parts: Cooperation with the stockmen and district advisory boards; range improvements through the Emergency Conservation Work of the Division; cooperation with the Bureau of Biological Survey in setting aside game

ranges to be used jointly by domestic livestock and game; and State plans for wildlife such as the New Mexico and Oregon plans.

The New Mexico plan as approved by the Secretary of the Interior has met with the approval of the varied interests in New Mexico where stockmen have always been very active in conserving wildlife. Under State supervision and control with the very effective cooperation of local stockmen, New Mexico has built up one of the finest mountain sheep herds in the United States.

The advisory board of Oregon Grazing District No. 3 adopted and recommended a wildlife program which has now been adopted by the advisory board of each of the six grazing districts in Oregon. It involves the cooperation of the Bureau of Biological Survey, the Fish and Game Commission, and the Forest Service in the formulation and enforcement of a practical, scientific wildlife program.

ENFORCEMENT

Enforcement under the Rules for Administration of Grazing Districts of March 2, 1936, and amendments thereto, has been maintained with satisfactory results. A large number of alleged trespasses have been investigated, trespass notices served, and trespasses abated. Administrative officers of the Division, assisted by temporary range riders during concentrated seasonal livestock movement on the range, have been successful in promoting orderly migration of stock over designated routes. The accomplishment has been mainly one of education and understanding. Considering the magnitude of the area and great number of migratory operators together with the fact that many of the operators were unfamiliar with the trails, allotments, and district lines, and the regulations, the result of enforcement activities is regarded as an exceptional achievement. The principal accomplishment is the prevention of a violation rather than the arresting of a violation after it has occurred.

HEARINGS AND APPEALS

Of the total number of applications for grazing licenses received and acted upon, comparatively few of the applicants were dissatisfied with the decisions of the regional graziers. Only 607 applicants, or 4 percent, filed motions for review before the regional graziers. In 284 cases of this number, it was necessary to hold a formal hearing; 130 cases were withdrawn or adjusted without the necessity of a formal hearing; and 193 cases are pending on appeal from the decision of the regional graziers. It may be seen that 96 percent or the vast majority was satisfied with the action taken by the field officers.

BUREAU OF MINES

John W. Finch, *Director*

FEW Government establishments are authorized as explicitly as the Bureau of Mines to undertake conservational activities. Section 2 of the organic act under which it operates (37 Stat. 681) states, in part:

> That it shall be the province and duty of the Bureau of Mines, subject to the approval of the Secretary of the Interior, to conduct inquiries and scientific and technologic investigations concerning mining, and the preparation, treatment, and utilization of mineral substances with a view to improving health conditions and increasing safety, efficiency, and economic development, and *conserving resources through the prevention of waste in the mining, quarrying, metallurgical, and other mineral industries.*

In accordance with the duties delegated to the Bureau by the enabling act, many of its technologic and economic investigations are designed to conserve mineral wealth, and all of its work in health and safety is devoted to the conservation of human life.

The early history of our petroleum and natural-gas industry is a classic example of wasteful mineral exploitation. Incident to the development of one Texas field alone, billions of cubic feet of natural gas were lost in the atmosphere, and the old-time practice of letting new wells blow wild undoubtedly advanced the day when our oil reserves will be exhausted. Formerly only a small portion of the oil and natural gas underground was recovered, and although today perhaps half is recovered in best practice it is still the object of modern petroleum engineering to raise the percentage as much as possible. The Bureau has given technical assistance toward the realization of that ambition by work on the following important phases of oil conservation: (1) Prolonging the producing life of wells through application of better engineering practice; (2) estimating the probable life of wells by working out relations between rate of fluid production and pressure drop in the producing formation; and (3) avoiding wastes in transportation and storage.

The results of these studies as applied in actual practice have been of value not only to oil companies but to State commissions charged with regulation of production. A further service, particularly to the latter group, has been the Bureau's monthly forecast of the demand for petroleum products, which serves as a guide in controlling production.

America's supplies of solid fuels are estimated to be tremendous; nevertheless, depletion of high-grade coals in certain parts of the country, accompanied by such factors as high freight rates and more exacting standards of domestic consumers built up by intense competition from oil and gas, have led to studies by the Bureau that will not only result in more economical use of this fuel but in larger sales of the lower grades when offered in cleaner, more attractive condition than in the past.

The Bureau's service work as consulting fuel engineer to the Government has saved thousands of dollars in Washington alone and exemplifies the type of fuel economy possible not only in large heating installations but in small domestic boilers as well.

Great Britain, Germany, France, and Japan are preparing to supplement their inadequate petroleum stocks with gasoline obtained by the hydrogenation of lignite, tar, and bituminous coal. Germany can produce 800,000 tons of gasoline annually by this process and France 50,000 tons; Great Britain has produced 100,000 tons a year, and Japan soon will be able to manufacture 105,000 tons. Anticipating the time when America's petroleum reserves begin to fail and prices rise, the Bureau of Mines is operating a continuous hydrogenation plant at its Pittsburgh station to test the adaptability of various domestic coals to the process.

A continuing study of the Bureau has been research on methods for making America self-sufficient in strategic minerals, particularly those of importance in warfare. Many of our known deposits of chromite, manganese, nickel, and antimony ores have hitherto been considered of too low grade to justify development. The Bureau for some years has been attempting to devise low-cost methods of extracting a product of commercial grade from these minerals, in order to build up a potential source of supply and eventually to preclude the necessity of importation. Already the development of an electrolytic method of recovering pure metallic manganese indicates that this country may be able to produce all of its requirements of that important metal. Satisfactory methods have also been developed for concentrating western chromite ores and for producing pure chromium chloride cheaply.

The treatment of pegmatite tin ores is another metallurgic project that, if successful, may make it possible for this country to produce at least a part of its tin supplies now obtained from foreign countries.

Beneficiation of Southwest potash ores is progressing successfully, and tests in the Experimental mine on the bearing strength of potash ores are proving helpful, as the American potash mines become more extensive.

During the past few years there has been an insistent demand for larger supplies of lithium salts. Spodumene, one of the principal sources, occurs in large quantity in North Carolina. The Bureau has developed a cheap method of concentrating low-grade spodumene ore that promises to help establish a paying industry in the South.

More than 6,000,000 dozen pieces of ceramic wares are imported annually. It seems to have been a tradition that American clays were unsuitable for whiteware; but the Bureau has been proving that clays of the South and the Pacific Northwest can be fabricated into fine-quality ceramics, and is testing the firing of minerals locally available at the new experiment station at Boulder City.

A report of especial value in any study of strategic minerals was prepared. It discusses the occurrence, production, and international flow of 32 important mineral commodities and covers the mineral resources and demands of 12 major industrial countries, with recent legislation affecting control of the mining industries in them.

The industrial dislocations that accompanied the depression evicted many people permanently from their former occupations. Faced with the necessity of earning a living, numbers of persons tried mining, especially gold mining, which promised the most lucrative returns. The methods employed frequently were ingenious, but more often impractical and wasteful. Engineers of the Bureau covering mining districts often have been of practical assistance to these mining tenderfeet, showing them how to avoid wasteful practices, pointing out simpler methods, and indicating hazards. The revival of the small prospector has been an interesting feature of the present-day mining industry. Some of the publications prepared by the Bureau are written especially for these small operators, to give them information on mining and milling methods. Results of a special investigation of gold placer mining, undertaken in cooperation with the Works Progress Administration, were published during the year.

A number of years ago the Bureau established—and is continuing—a series of circulars, usually written by mine operators, describing methods of mining and milling at some of the country's most important mines. These are distributed on request, and comprise an abundant reservoir of data on the successful handling of mining and milling problems. In numberless instances application of the procedures described has permitted profitable exploitation of a mining property that otherwise might have failed. The flow sheets and

working drawings of specialized equipment that accompany these papers are no small factor in their usefulness.

The metallurgical industry has long struggled with the problem of smelter-smoke disposal; not only has smelter smoke polluted the atmosphere, with consequent injury to health and damage to vegetation, but escape of volatiles has wasted valuable constituents of ores. Moreover, in many cities coal smoke is an undesirable feature during the winter. Smelting companies and city governments alike are evincing keen interest in a device for precipitating solids from air or other gases, developed by the Bureau on a laboratory scale during the year and demonstrated successfully on a number of occasions.

Much attention has been focused on the scrap-metal industry. At one time exports to countries that are increasing their armaments attained proportions that many considered alarming, and stocks of this important source of metals were being rapidly depleted. So intense was the interest of the industry that, in addition to the seven nonferrous metals ordinarily included in the annual surveys of secondary material, the Bureau was encouraged to make consumption studies of iron and steel scrap. The canvass of the use of both primary and secondary tin was resumed at the request of tin consumers, anxious to note the effect on the industry of the Faddis-Barbour bill providing for licensing exports of scrap tin.

The Bureau makes annual studies of 109 minerals of commercial importance for its yearly publication, Minerals Yearbook. This volume, containing about 70 chapters reviewing trends in production and consumption of individual minerals or logical groups of minerals, is the outgrowth of more than 50 years of similar compilations, first delegated to the Geological Survey and later to the Bureau of Mines. A single book this year replaces the two-volume combination of the Yearbook and its complementary supplement, the Statistical Appendix.

During the year the Bureau received and made available to the public about 3,100 consular reports; many of these were collated for use in monthly compendiums: Mineral Trade Notes, International Coal Trade, and International Petroleum Trade. The Bureau's foreign-mineral specialist acted as advisor to many American consular officers stationed in Europe, and supplied information to the Bureau on the status of the mineral industries in a number of countries, relaying information obtained in personal visits.

Catastrophes, as the destruction of the *Hindenburg* and the New London (Tex.) schoolhouse disaster were followed by calls for technical advice; Bureau experts on explosions, helium, natural gas, and safety collaborated in making exhaustive studies and determining the cause of the New London explosion. In consequence, other localities

have asked the Bureau to examine schoolhouses and other public buildings to judge whether explosion hazards existed and to suggest remedies.

Explosions in the coal-mining industry have grown so infrequent that during the year it was necessary to stage "artificial" explosions in the Bureau's Experimental mine so that safety engineers could be given some experience in coping with conditions accompanying actual disasters. When this is contrasted with the years immediately preceding the creation of the Bureau of Mines, when there were 17 disasters, on an average, each year, causing 562 fatalities, the past fiscal year's record of 6 major disasters causing 56 deaths in all represents a tremendous and encouraging improvement.

Training courses conducted by the Bureau of Mines that not only teach men how to treat injuries but what to do in emergencies, inspections and recommendations for improvement of practices at mines, first-aid meets, and other means of promoting education in safety among the 2,000,000 employees of the mining industry have contributed largely to the conservation of our national resources, not only in the sense of preventing economic waste and loss in consequence of destructive fires and explosions but also in the preservation of life and prevention of human suffering.

FUTURE NEEDS

A more detailed review of the past year's work will be found on succeeding pages. However, due to limitations of available funds, the Bureau of necessity was forced to restrict the scope of some of the studies there described and has been unable even to initiate many other important and highly commendable investigations designed to improve health conditions, increase safety, promote efficiency, foster economic development, or conserve resources in the mineral industries. The Bureau believes that it can render worth-while service if funds are provided for conducting the work outlined in the following brief summary of principal needs.

The Bureau's data on the properties of coal have been of great use to the National Bituminous Coal Commission in the proper classification of coals as a basis for price fixing, and to other Government agencies as a guide in the economical purchase of coal for their own use. Because the analyses now on file unfortunately do not cover most of the various coal fields adequately, complete surveys similar to those conducted recently in Alabama and Washington should be made in all of the other fields.

Accidents caused by falls of roof and coal are responsible for approximately one-half of the deaths and a large proportion of the injuries now occurring in coal mines. Moreover, the behavior of the mine roof, as influenced by the nature of the strata and method of mining, affects

appreciably the percentage of coal recovery. Investigation of this problem of roof behavior would produce advantageous results in increased safety and prevention of waste.

The amount of harmful sulphurous gases emitted into the atmosphere varies considerably with different types of coal-burning power-plant equipment and different operating conditions. A field survey should be made to determine the variations, and a laboratory investigation should be conducted to determine the allowable limitations.

There is an increasing demand which the Bureau is unable to meet for research in fundamental mining problems, such as seismic investigations of rock vibrations caused by blasting and the vibration rate of rocks under stress; mine ventilation; and elimination or control of dust produced during mining operations.

The mechanization of coal mines has proceeded so rapidly during the past few years that additional personnel is needed to determine the safety and "permissibility" of the electrical and mechanical equipment being used.

Additional personnel is also needed to meet the widespread demand for reports on mining and milling methods and costs, to keep abreast of improvements in mining technology, and to aid small-scale operators and prospectors through technical reports, mineral-industries surveys, and personal visits by Bureau field engineers.

The number of nonmetallic minerals is so great, and the variety of things that might be done with them by using cheap electric power is so numerous, that a study of the processes using hydroelectric power in preparing them for market is urgently needed, especially in view of the Government's interest in a number of projects where such power is available.

There is also need for facilities with which to develop laboratory metallurgical processes devised by the Bureau to the pilot-plant scale of operations. This would make it possible to demonstrate commercial applicability of the processes and thus provide an incentive for their adoption by industry. The laboratory process using sound waves to precipitate solids from smelter fumes or smoke from chimneys is a case in point.

The petroleum industry and regulatory bodies realize that the difficult problem of oil and gas well spacing is one of major importance. Information as to how wells should be spaced to assure maximum recovery through prolonged flowing life is far from complete. A thorough, unbiased study of present-day conditions would aid greatly in conserving and prolonging the life of the Nation's oil supply by showing the fallacies of ruthless offset drilling.

As new oil reserves are sought in deeper reservoir rocks the cost of removing the oil becomes excessive unless full use is made of the energy of the high-pressure gas associated with the oil. As an aid in the solu-

tion of this increasingly serious problem, factual data as to quantities of oil now left in the ground, better utilization of available gas energy, recycling of gas, and storage of gas in partly depleted fields should be collected and widely published.

Results of the survey of crude oil storage made during the past year show that further technical studies are needed on the physical and chemical properties of various types of crude petroleum if data obtained in the survey are to be used advantageously to obtain optimum refinery yields of required products. Equally important is the collection of statistical information regarding underground reserves so that relationships may be established between desirable volume of oil in storage above ground and the rate at which oil can be produced from underground reserves when a sudden demand arises.

To meet an increase in the demand for helium that will ensue when legislation is enacted permitting the sale of helium to commercial aviation companies and for medical use, two additional wells should be drilled in the Government-owned helium-bearing structure at Cliffside, and one of the existing wells, which is in faulty mechanical condition, should be repaired.

To find nonmetallic minerals that will be acceptable to the trade it frequently is the practice to seek desposits of satisfactory minerals at a great distance, or even abroad, when material near at hand might be available if purified or properly treated. Tests by the Bureau in a number of instances have developed such purification or treatment processes, but the field is so large that additional personnel and equipment, particularly in the new experiment station at College Park, Md., are urgently needed if the growing demand for this work is to be met.

Recent disasters have resulted in many requests to the Bureau for information and aid in overcoming hazards due to accumulations of explosive gas and vapor, which cannot be complied with by the present staff.

State regulations that demand a limitation on the amount of fumes emitted by explosives used in mining have created a need for additional research on the production of poisonous gases by all the classes, grades, and sizes of industrial explosives used underground.

The present highly competitive situation in the coal industry makes production of the maximum amount of lump coal imperative. The "cushioned blasting" method has been proposed as a means for attaining this end. The Bureau has been asked for an opinion as to the safety of this method but is not in a position to render one because funds are not available for the necessary investigation.

The use of Diesel engines on mine locomotives offers a means of avoiding recognized hazards that result from the use of trolley locomotives in coal mines, but the possibility of introducing other hazards,

from carbon monoxide in the exhaust gas or from flame or sparks emitted by Diesel engines, has not been determined. The Bureau has been requested to investigate this matter, but has been unable to do so for lack of personnel.

In the transfer from the Bureau of Mines to the National Bituminous Coal Commission of funds and personnel formerly employed by the Bureau in work on bituminous coal, the fact was apparently overlooked that the Bureau also dealt with anthracite, coke, fuel briquets, lignite, peat, and international trade in coal. All of these still remain as Bureau functions but cannot be kept current by the force that can be maintained with the reduced funds. Much of the value of the economic information supplied to industry on these subjects lies in the promptness with which it is made available. Unless additional personnel is provided, important features will have to be postponed indefinitely or dropped entirely, and the completeness and continuity of statistical and other economic data to which the anthracite, coke, and other fuel industries are accustomed and entitled will be destroyed, to the material prejudice of their interests and those of the public as well.

Additional funds are needed to permit collection of data on interstate movements and distribution of gasoline and other finished petroleum products, which are essential to the studies and forecasts of market demand. These forecasts are invaluable to the petroleum industry, the several State regulatory bodies, and the Federal Government itself in the development of a sound program for oil conservation.

Outstanding achievements in mineral technology during the past 30 years have greatly changed the quantity of minerals that can ultimately be made available, have had a sharp effect upon competitive positions of different mining areas, and have reduced mining costs. In consequence, the Bureau of Mines is called upon constantly to advise mineral producers as to the amount of a specific mineral that can be produced economically or consumed at a specific price, and as to the effect of price fluctuation upon the stability of various branches of mining. In order to answer these questions, and to provide mineral producers with authentic price data for their guidance, new research must be undertaken to develop information on mineral prices comparable to that available in the fields of commerce, manufacturing, and agriculture.

The Bureau has been asked to continue on an annual basis the survey of iron and steel scrap consumption, which was originally made possible by funds provided by the Works Progress Administration and other cooperating agencies. Statistical and economic data on scrap is essential to the public interest, for it is gradually being realized that the stock of metals in use and the scrap returning to industry constitute a great national resource and that a thorough

understanding of the secondary-metal problem is vital to the formulation of any sound national policy with respect to raw-material supply.

There is a fast-growing recognition of the importance of nonmetallic minerals, but in perhaps no other field of mineral production is market research so necessary, because the value of the minerals is created by effective market demand; and in probably no other field has such research been so completely neglected by the Government, and by private agencies. Provision for additional personnel would enable the Bureau to undertake fundamental studies of consumption trends, marketing problems, and reviews of industries that would permit intelligent analysis of industrial needs and thus promote better utilization of the Nation's vast reserves of nonmetallic minerals.

Additional personnel is also needed to review and prepare for publication the constantly increasing volume of information and data on mineral commodities received from abroad, and to conduct regional studies of the mineral industries in the more important foreign countries.

The Mine Inspectors' Institute of America in a formal resolution has asked the Bureau of Mines to maintain facilities at the Experimental mine for creating controllable mine fires and other disaster conditions in order that theoretically trained key men may obtain actual experience in mine rescue and recovery work and thus be equipped to serve as leaders when real emergencies arise. Additional funds are needed for personnel and expenses of such work.

The demand for first-aid training is greater than at any other time in the history of the Bureau because of the demonstrated value of this work as an effective method of preventing accidents. There is good reason to believe that if the funds available for this work were doubled the accident occurrence in American mines would be reduced at least 50 percent within the next 5 years. Additional personnel is also needed to meet the demand for accident-prevention education for mine officials and safety workers, which represents the best defense of the operating companies against the mounting costs of accident compensation.

The increasing pollution of streams, due to mineral substances that are injurious or a menace to health, creates the need for a study of these pollutions to determine a means of controlling or removing them. There is also a need for resuming the study, in cooperation with the United States Public Health Service, of health and sanitary conditions in mining communities, which was recessed several years ago.

The seriousness of the dust-health problem in mining has created an urgent demand for field studies in coal, metal, and nonmetallic mineral mines to determine what can be done to protect the mine worker from the menace of this occupational disease, to help the employer protect himself from the heavy expense it causes, and to save

the general public from the costs of charity or relief that are often consequent.

A study of air conditioning in mines should be made to determine means for preventing hot, humid, and frequently dust-laden air which is the cause of much ill health, inefficiency, and accident occurrence, particularly in deep metal mines.

REVIEW OF THE YEAR'S WORK

During the fiscal year 1937, the work of the Bureau of Mines was administered under the Technologic, Economics and Statistics, Health and Safety, and Administrative Branches from offices in Washington, but most of the activities were conducted in mining districts throughout the entire country. Fourteen experiment stations (at Bartlesville, Okla.; Berkeley, Calif.; Boulder City, Nev.; College Park, Md.; Laramie, Wyo.; Minneapolis, Minn.; New Brunswick, N. J.; Pittsburgh, Pa.; Reno, Nev.; Rolla, Mo.; Salt Lake City, Utah; Seattle, Wash.; Tucson, Ariz.; and Tuscaloosa, Ala.) studied problems connected with mining, utilization, and conservation of the Nation's mineral resources in their localities, a number of field offices were assigned special duties, and the safety instructors moved on a flexible schedule, visiting mining establishments on request.

TECHNOLOGIC BRANCH

The Technologic Branch, which conducted research and technologic investigations covering all phases of the mining industry, included the Coal, Mining, Metallurgical, Petroleum and Natural Gas, Nonmetals, and Explosives Division.

COAL DIVISION

The Coal Division, formerly called the Mechanical Division, studied the properties, preparation, and utilization of coal, acted as consultant in the purchase and use of fuel by the Government, and operated the Bureau's coal-hydrogenation plant and Experimental mine.

Coal carbonization.—Carbonization tests to determine gas and coke-making properties have been completed on 50 typical American coals, including one noncoking subbituminous coal from Colorado. The results to date have been correlated with the proximate analyses, and relationships have been found that permit reasonably good estimation of the yield of coke, gas, and byproducts for a given coal from its proximate analysis.

Laboratory equipment designed for studying the expanding properties of coking coals was used to determine the expanding or contracting properties of various coals and blends of coals. This infor-

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mation is of great value to coke-oven operators in helping to avoid destruction of ovens by expanding mixtures of coal.

A comprehensive study of the properties of coking coal indicated that the structure of the coke from very plastic coals is improved by mild oxidation.

Coal analysis.—During the year, 7,712 coal analyses were added to the Bureau's already voluminous records, which are available to Federal agencies as well as to the public to aid in purchasing solid fuels. Two especially equipped coal-sampling trucks collected 701 samples at 147 mines in 4 States; a special survey was made of 47 mines in Alabama.

Miscellaneous analyses.—Laboratory distillation tests to determine yields of gas, coke, and byproducts were made on 46 typical coals from various States, including a special survey of 28 samples from Alabama

Carborundum has been found to be a suitable inert material for mixing with coal in the Bureau of Mines agglutinating-value test for determining the caking properties of coals. This material is readily available on the market, and different lots have uniform surface characteristics and give similar results with the same coal.

Physical chemistry.—Completion of another series of experiments on the rate and mechanism of the thermal decomposition of ethane has provided more fundamental data for further development of the new gas-polymerization theory, which is reducing greatly the quantity of natural and refinery gases heretofore lost.

Coal preparation.—Gradual improvement is taking place in the coal fields where washing has been adopted. Bureau experts kept in touch with the operators and unobtrusively pointed out various inefficient and wasteful practices until they were corrected. Studies were made on decreasing the cost of drying washed coal. In the past year the Bureau made an intensive study of the coagulation of silt from washery waste waters so that the latter will cease to be obnoxious in streams. Better and cheaper coagulants are in prospect.

Use of fuels.—The investigation of the effect on combustion of treating coal with small amounts of chemicals has been completed, and the results have been prepared for publication as a bulletin, now in press. Data assembled during studies on the relation of ash composition to the formation of clinker and slag have been found of value in connection with the operation both of industrial furnaces and small domestic stokers.

Fuel economy service.—The fuel costs at Government power and heating plants have been decreased in consequence of recommendations made after efficiency tests to determine fuels and equipment. Feed-water conditioning service was continued, with marked improvement in economy and safety of boiler operation. A handbook for

operators of fuel-burning equipment was published, and advice on smoke abatement was given to the public and to the officials of certain cities.

Coal hydrogenation.—The new continuous hydrogenation plant at the Pittsburgh Experiment Station was completed recently and has been operated six times in tests lasting 10 to 24 hours. Pittsburgh-bed coal was liquefied at 420° C. and 3,000 pounds hydrogen pressure. The hydrogen was produced from natural gas and steam by a process developed by the Bureau. New methods have been developed for determining the composition of tar and oil from the hydrogenated coal, and analyses of neutral oils have been improved by successive extractions with increasing concentrations of sulphuric acid. With the completion of the plant, the Bureau is prepared to conduct comprehensive studies on the composition and properties of the various kinds of American coals, as they affect the utilization of these coals for combustion, carbonization, gasification, and liquefaction.

Experimental coal mine.—Studies of the bearing strength of potash salt from the mines near Carlsbad, N. Mex., conducted in the Bureau's Experimental mine at Bruceton, Pa., indicated that if proper mining methods are pursued under careful control there is little danger of sudden shearing breaks of the roof that might admit water and cause loss of the mines.

After mine explosions in Colorado and Pennsylvania the explosibility of coal dusts from the districts concerned was determined by tests in the Experimental mine, and the rock-dusting requirements for mines working these coals are now accurately known.

MINING DIVISION

The Mining Division continued its investigation of metal-, nonmetal-, and coal-mining methods and mine ventilation, extended the mineral-industries survey, and tested and inspected electrical equipment for "permissibility" in mines.

Metal-mining methods.—The investigation of metal-mining methods comprised a detailed field study of mining and milling methods and costs, with reports thereon; a part of the mineral-industries survey; and technical assistance to small operators and prospectors. Field work was continued throughout the year in nine Western States. Ten information circulars were published, including four contributions to the mineral-industries survey; in addition, manuscripts for a comprehensive bulletin Copper Mining in North America, and 15 information circulars were completed and are ready for publication. Field engineers gave technical assistance to numerous prospectors and small-scale mine operators who obviously were unable to employ competent consultants.

Metal-mining research.—Facilities for independent research on the fundamentals of mining practice were established during the year when a testing adit was driven 300 feet on the Government reservation at Mount Weather, Va., and completely equipped for the purpose. Previously the work was limited to investigations of improved metal-mining practices developed at individual mines by operators. A research program was set up, comprising rock-drilling tests with various kinds of steel and steel alloys and with different types of bits; ventilation studies; explosives investigations, including production of noxious gases in blasting; research on the formation, means of elimination, or control of dust production in mining; development of apparatus and technique for determining the strength and predicting the failure of mine roofs and pillars; and related problems.

During an investigation of rock-drilling practices a national survey of metal mines was made, from which an empirical index for the use of detachable bits was derived. A comprehensive technical survey was made of the use of mechanical loaders in metal mines, and an analytical report thereon was partly completed. Four information circulars were published.

Nonmetal mining.—Studies of mining and preparation methods and costs were conducted at 28 mineral-wool plants, 5 clay mines, 2 gypsum mines, and 1 silica-sand plant. Screen tests were made at four rock quarries to determine the relation between size gradation of primary crusher feed and size gradation and shape of the products. A new technique was developed for measuring vibrations caused by blasting in quarries and their effect on artificial structures; to determine the characteristics of ground vibration from quarry blasts and the effect of various charges and kinds of explosives, and tamped and untamped charges, 125 field tests were made in 19 quarries and 1 mine.

Seven information circulars and one report of investigations were published. Three papers were completed for publication in the technical press or by technical societies, and five manuscripts were completed and are ready for publication as information circulars.

Coal mining.—Studies were begun on multiple-shaft mechanized mining in coal mines to develop data designed to increase efficiency and promote safety and conservation in coal mining. An information circular, Mining Methods Used in the Grundy Coal Field of Buchanan County, Va., was published. Field studies were completed and manuscripts prepared on Shaft-Bottom Lay-Outs in Coal Mines, and Some Aspects on Strip-Mining of Bituminous Coal in the Central and South Central States; both await publication.

Mine ventilation.—An investigation of causes, behavior, and control of anthracite mine fires was continued throughout the year; a preliminary report was prepared and discussed with the cooperating mine officials. The results developed by laboratory research were applied

to a particular fire, for which a complete history is being obtained. Material was assembled as a basis for a report on the present status of mechanical cooling in mines and the limits of its economical application to the mines in the United States.

Mineral-industries survey.—A field examination of the noted Mojave gold-mining district, Kern County, Calif., was completed, and an information circular, The Golden Queen and Other Mines of the Mojave District, California, was published. A study of the mineral industry in the southern Mother Lode counties of California was undertaken. The survey of Calaveras County was 60 percent complete, and a report thereon is in preparation. Tuolumne and Mariposa Counties, also in California, have also been studied in part and will be coverd in separate reports.

Electrical equipment.—Inspection and tests for permissibility under Bureau of Mines schedules, conducted in the electrical laboratories at the Pittsburgh Experiment Station, resulted in formal approval of 9 coal-cutting machines, 13 coal loaders and conveyors, 1 drill, 3 storage-battery locomotives, and 2 electric cap lamps. Four motors, three starters, and one headlight were found suitable for use in permissible outfits, and over 600 changes in design of permissible compartments were reviewed and approved. Nearly 700 persons witnessed demonstrations of electrical ignition of gas-and-air mixtures by the staff of the section in a campaign to impress on the mining public the hazards of faulty electrical equipment and improper installation. Problems relating to the voltage of mine circuits, installation of transformers underground, and cables in roadways, shafts, and slopes were studied. Six reports of investigations, three information circulars, and two schedules were published during the year.

METALLURGICAL DIVISION

The Metallurgical Division conducted investigations on the treatment of mineral raw materials from the condition as mined to the finished product, starting with highly theoretical implications, working logically through laboratory development of new methods, and concluding with plant testing to the point of demonstrative practical application. This procedure provides incentive for the establishment of new industries; examples of recent new commercal operations based on results obtained by the Division are the installation of a flotation unit to treat scheelite and slimes and the construction of a mill to separate talc and magnesite by flotation.

Metallurgical fundamentals.—Selenium glass, selenium crystals, tellurium, and one form of calcium hemihydrate were investigated by low-temperature specific-heat measurements for the first time in history. When further thermodynamic data on the calcium sulphate hydrates have been obtained, they will permit an understanding of the

present unsatisfactory behavior of some lots of carefully prepared plaster and will provide information that should insure a uniform and superior product.

A study was made and a manuscript prepared on the thermodynamic properties of metallic carbides and nitrides. Consideration of the data offers a satisfactory insight regarding the theoretical basis for the use of calcium carbide in debismuthizing lead bullion, the gaseous case-hardening of ferrous materials, the direct synthesis of ammonia from methane and air, the behavior of manganese in mild steels, and the synthetic production of cyanide from ammonia and carbon monoxide.

Preliminary experiments indicated that a cyclic process for removing hydrogen chloride from the hydrogen used in the reduction of chromium chlorides by active carbon—a step in the production of chromium from ores by the new process developed in the Division—will operate effectively. The possibility of producing chemically pure chromium for somewhat less than 20 cents per pound appears to be good.

A small experimental demonstration unit was evolved which operated with an efficiency of 85 to 95 percent of the theoretically maximum possible concentration for the separation of gases of different density or molecular weight by diffusion. More than 400 tests have confirmed the belief that this device, which provides a mechanical means for separating gases in a manner just as simple as the conventional separation of mineral particles by gravitational methods, may be converted into a new tool for the metallurgist or chemist applicable to a wide variety of technical processes.

Papers were published during the year as follows: A Revision of the Entropies of Inorganic Substances; Heats of Fusion of Inorganic Substances; Sponge-Iron Experiments at Mococo; Reduction of Zinc Ores by Natural Gas; Chemistry of Anhydrous Chromium Chlorides; The Thermodynamic Properties of Sulphur and Its Inorganic Compounds; and The Thermodynamic Properties of Metal Carbides and Nitrides.

Metallurgy of steel.—Special equipment for determining magnetic susceptibility at elevated temperatures and a vacuum furnace capable of operating at 1,300° C. were developed, constructed, and operated in the course of a study of the constituents of open-hearth slags of various types.

Blast-furnace studies.—As a step in assisting steel manufacturers to meet the very rigid requirements demanded by consumers, investigations were made on removal of the maximum amount of sulphur and other impurities in the blast furnace. It has been found that the oxides in basic pig iron bear no direct relation to those in the basic open-hearth steel produced from it, but that there is a definite relation be-

tween the silicon and sulphur content and the temperature of iron in the runner.

Special studies.—The most spectacular achievement of the division during the year was the devising of apparatus for applying high-frequency standing sound waves to the flocculation and removal of dust and smoke from gaseous suspensions. This process appears to have good possibilities for the solution of these problems and only awaits a practical method for the production of suitable standing waves. The various factors that control the flocculation and removal of dust, smoke, and fume from gaseous suspensions by high-frequency sound waves were studied with three types of laboratory machines, constructed and operated on various aerosols. This method has aroused the interest of a wide variety of industries that desire to recover valuable products that now are wasted up the stack and of communities that must handle the problem of preventing air pollution. A description of these machines and their operation has been published.

Ore-dressing.—Grinding studies were continued, and the results described in the following publications: Ball-Mill Grinding; Relation of Ball Wear to Power in Ball Milling; Observations from Some Crushing and Grinding Tests; Analogy Between Size-Analysis of Droplets in Emulsions and Particles in Crushed Ore; and Use of the Coercimeter in the Study of Grinding.

Some success was achieved in magnetic-roasting studies, in investigations on the chemistry of flotation, and in tests of new flotation reagents. Data obtained on the flotation of nonsulphides were published in three papers—Flotation of Complex Molybdenum-Vanadium Ores, Flotation of Vermont Talc-Magnesite Ores, and Flotation of Langbeinite.

Precious metals.—Results of an investigation of the recovery of tungsten from slimes previously wasted has resulted in the commercial installation of a 75-ton flotation plant, which is recovering more than 91 percent of the tungsten.

A paper was published giving the findings of a preliminary investigation on the loss of gold in dredging and its prevention.

Nonferrous metallurgy.—A method was devised for recovering lead and silver from oxidized siliceous ores that resisted attack by usual ore-dressing routines. By grinding with iron balls, the lead becomes metalized and can be removed by gravity treatment or flotation, and the silver becomes associated with finely divided abraded iron and can be separated magnetically or floated with the lead. Two papers, entitled "Smelting in the Lead Blast Furnace" and "Treating Drosses in Lead Smelters", were prepared for publication.

Ore-testing.—Work was actively continued on the standardization of testing methods, the development of new methods of analysis, and the determination of recommended processes for the treatment of

representative ores from various mining districts. Results of the work are published yearly as a progress report of the division.

Electrometallurgy.—Plant-scale furnaces and testing equipment were installed in the Boulder City Experiment Station, and active work was done on the development of methods to use surplus power for treating ores that should promote the establishment of new industries, in the vicinity of large western dams.

Methods of purifying solutions used in a cyclic process in which manganese is recovered by electrolysis from the treatment of low-grade ores were perfected, and production of metallic manganese progressed on a moderate scale.

PETROLEUM AND NATURAL-GAS DIVISION

The Petroleum and Natural Gas Division studied technical and engineering problems relating to the production, recovery, and transportation of oil and natural gas and the refining and storage of crude oils. It also operated a helium-production plant at Amarillo, Tex.

Production and recovery of petroleum and natural gas.—The spacing of wells so that oil is drained from a producing formation with greatest efficiency and economy is one of the most important, complex problems of the petroleum industry. As a contribution to the solution of this problem, engineers of the Division have established an empirical relation between the mass rate of fluid production (gas, oil, and water) and the drop in pressure in the producing formation.

That the Division's research activities are yielding practical benefits is shown by the special reports on producing oil and gas fields that have been made by the Bureau upon request of operators desiring to conserve and utilize efficiently the energy in naturally producing structures and of Government organizations concerned with regulation of oil and gas production in various States. During the current year, data reports were made by Bureau engineers on the Fitts pool (Oklahoma), the Tepetate oil field (Louisiana), and the Laredo and Otis fields (Kansas), which aided the oil companies in controlling and the authorities in regulating oil and gas production in these fields by supplying needed information from a competent, unbiased source on conditions in the producing formations that affect efficient and economical rates of withdrawal from the natural underground reservoirs.

Transportation of natural gas.—Another example of cooperative work is the study of freezing in natural-gas pipe lines. This study, which is being conducted in cooperation with the natural-gas department of the American Gas Association, relates to the conditions under which hydrocarbon hydrates are formed in pipe lines containing natural gas under high pressure, with a view of devising means of preventing them. During the year an apparatus for determining the

dew point of gases under pressure was constructed, and it is believed that better understanding of dew-point determinations—an essential consideration—will be obtained.

Engineering field studies.—Engineering reports on the Big Spring and other West Texas fields and on the Oklahoma City oil field were compiled. Results of studies of gas reserves in the Oklahoma City oil field and in the Michigan "stray" sands were published.

Special engineering problems.—Three reports on brine disposal in oil fields, one on results of oxidation of oil in place due to repressuring oil-producing formations with air and air-gas mixtures, and one discussing causes and prevention of blow-outs during drilling were issued. An information circular prepared jointly by this division and the Health and Safety Branch covered some problems of respiratory protection in the petroleum industry, with suggestions for their solution. An ingenious method for determining compressibility of natural gas was described in a paper published in a technical journal.

Chemistry and refining of petroleum.—The second and third gasoline-survey reports in cooperation with the Cooperative Fuel Research Committee were published. This series is to continue during the coming year. A report giving analyses of crude oils from some Michigan fields attracted unusual attention. Two papers were printed in a technical journal reporting results of experiments on determination of so-called molecular weights of petroleum fractions of relatively large molecular weight. An apparatus and method for continuous isothermal separation of the major fractions of petroleum were developed, and the application of the principle to a routine method of analysis of crude petroleum was studied.

Crude-oil stock survey.—At the request of the Interstate Oil Compact Commission and pursuant to a special Congressional appropriation a quantitative and qualitative survey of all crude petroleum in storage in the United States was made. The need and purpose of this survey were based upon the possibility that crude oil held in storage for many years had lost much of its gasoline content. The physical condition of the crude oil in storage was considered by the Commission an essential factor in forecasting demand for petroleum from the standpoint of equitable balance between demand and quantity of oil in storage. A preliminary report of results and conclusions was made at a meeting of the Commission at Santa Fe, N. Mex., July 10, 1937.

Helium plant.—The helium production of the Amarillo plant was increased to 4,800,000 cubic feet; it was taken by the Army and Navy for use as a lifting agent for nonrigid airships. The Bureau also supplied about 8,000 cubic feet of helium to the United States Public Health Service, which is cooperating with hospitals in the use of helium mixed with oxygen in treating asthma and other respiratory diseases.

Other activities.—Two engineers from the petroleum field office, Dallas, Tex., cooperated with two engineers of the Bureau's Safety Division in investigating the causes of an explosion of natural gas used to heat the consolidated school buildings at New London, Tex. Conclusions and recommendations to prevent future occurrence of such catastrophes were embodied in a report for publication.

As a result of the burning of the German airship *Hindenburg*, the division was called upon for advice and technical data regarding the use of helium in dirigibles.

A comprehensive report on petroleum and natural-gas conservation was prepared for the Third World Power Conference.

NONMETALS DIVISION

The work of the Nonmetals Division was concerned with the beneficiation, processing, and utilization of nonmetallic mineral substances, and with fundamental studies, such as embrittlement of boiler steel and the application of new research tools.

Potential increase in supply of lithium salts.—Demands for larger supplies of cheaper lithium salts are now answerable; the division's study of concentration methods for low-grade spodumene ores and its chloride-volatilization process for extracting the lithium from spodumene in the form of lithium chloride point the way to increase production at low cost. Research on application of beta spodumene concentrate in pottery and glassmaking has been accelerated in consequence.

Improving quality of talc.—Froth flotation for the treatment of talcs is also being applied commercially. Last year magnesite was removed from a Vermont talc and this year tremolite was separated from a New York talc by flotation methods. In this latter instance it is desirable merely to control the ratio of talc to tremolite in talcs intended for use in ceramics. Pure talc is needed for the higher-grade uses, such as in cosmetics and special porcelains.

Hydration of lime.—Studies of the hydration of limes show the importance of controlling hydrating temperature, as reflected in the behavior of hydrated lime. Sufficient plasticity to class many limes as finishing lime is obtained if enough care is taken to hydrate completely most of the magnesia present.

Concentration of kyanite.—Samples of kyanite from large, low-grade deposits in all parts of the Nation were under investigation, and more are to be collected. Froth-flotation and agglomerate-tabling methods, using the more modern cationic and anionic reagents as collectors, have proved most successful so far; however, the impurities in kyanite deposits vary in character and dispersion, and not all the concentration problems have been solved.

Treatment of clays.—Tests on fractionation of clay by froth flotation were made at the Tuscaloosa laboratory. It would appear that the process can be used with advantage to remove the colloidal fraction of the clay first of all. This is done without any mineral selection, which is obtainable only on the more granular fractions of clays. Removal of mica, feldspar, and quartz from clay seems to be in sight. There are thousands of clays, no two alike, and the field of research is far larger than the force available to investigate it.

Studies of the olivine obtainable in dunities of the Pacific Northwest have shown that they are of unusual refractory grade; therefore, their adaptability to various uses was investigated. Similar encouraging results were obtained with the chromites of the same region. The soapstone of the Northwest has been tested for several years and is now actively developed commercially. Studies of the effect of structure of the soapstone shapes on firing behavior were made during the year.

Seasoning of cement.—The work of the division on the possibility of substituting anhydrite for gypsum as a retarder for portland cement was finished. The amount of anhydrite that can be substituted is a function of the condition of the cement clinker, especially the water vapor that has been absorbed from gases at the proper temperature.

Studies of particle size.—A mathematical law of size distribution in crushed materials was derived and tested on numerous minerals; from it can be deduced such important constants as total area per unit weight, number of particles, and uniformity of coefficient.

Boiler-water studies.—One of the outstanding results attained by the division during the year concerned treatment of boiler feed-water in connection with research on causes and mitigation of "embrittlement" cracking of boiler steel. Last year, silica dissolved in the caustic boiler water was found to be an important factor in the cracking of the steel. Since then, the presence of dissolved lead, titanium, antimony, and a few rare metals in the alkaline water has also been found very important, lead being particularly harmful. The addition of proper amounts of lignin or tannins, or their derivatives, affords the best protection against embrittlement. Studies of the mechanism of this cracking and its prevention are being continued.

New research tools.—Very successful application has been made of the newer cationic flotation reagents in separating feldspar and quartz, both by flotation methods and by table agglomeration. The coming year should see important adoption of these methods.

The quartz spectrograph as an instrument for quantitative chemical determinations has been diligently adapted to the analysis of silicate and carbonate rocks. These are fields of analytical chemistry where existing methods are long and tedious.

EXPLOSIVES DIVISION

The Explosives Division conducted research on the explosibility and inflammability of gases and vapors and tested explosives and blasting devices.

Gas explosions.—An important continuing problem is the development of information relating to the causes and elimination of gas explosions from accumulations in confined spaces. A member of the Division assisted in the investigation of the terrible school disaster at New London, Tex., and drew up recommendations for practice that should prevent other similar disasters. Since 1929, work done in cooperation with public utility companies in and near Boston, Mass., has reduced the explosibility of manhole atmospheres to about one-ninth that shown when the study was begun.

Inflammability of gases and vapors.—Fundamental studies of chemical compositions and related conditions governing the burning or explosion of gas were extended to certain organic compounds upon which data have not hitherto been available. A bulletin containing information available on the subject, for which the supply has been exhausted, is being revised to meet the continuing demand.

Detection and elimination of mine fires.—A chemical method was developed for locating incipient anthracite mine fires and for following the progress of those in inaccessible workings, together with much information on the behavior of anthracite and associated combustible material when subjected to heat. This study has proved useful in diagnosing the cause of such hazards and determining appropriate measures for minimizing them.

Mechanism of flame propagation.—Cooperative studies have developed many important kinetic considerations involved in the propagation of flames and explosions.

Methods of testing explosives.—Many striking phenomena were noted in the study of variables governing the ignition of gassy atmospheres by explosives. The danger zones in the spaces near boreholes were mapped. Evidence was accumulated to show that unusual concentrations of energy in the products of detonation may cause dangerous ignitions.

Permissible explosives and blasting devices.—To simulate severe service under dangerous gas or gas-plus-dust conditions, 1,254 tests were made within the Bureau's testing gallery; 1,280 other important control tests of a physical or performance character were conducted, and 195 explosives were analyzed chemically. The active permissible list of explosives at the end of the fiscal year comprised 195 brand names, and the list of blasting devices included 8 models.

OFFICE OF CHIEF MINING ENGINEER

The Chief Mining Engineer acted as liaison officer in international cooperation in mine-safety research, served as chairman of the Bureau's Mine Safety Board, and investigated special problems relating to mining.

International cooperation in mine-safety research.—Interchange of quarterly progress reports and data with the research stations of Great Britain, Belgium, France, and Germany was continued. A conference at the Pittsburgh Experiment Station with representatives of the British Safety in Mines Research Board who had attended the Third World Power Conference was devoted to discussion of problems concerning gases, harmful dusts, and dust explosions. Demonstration coal-dust explosions were made at the Experimental mine.

Mine Safety Board.—The Mine Safety Board continued regular meetings and reviewed reports on mine accidents. Although no new recommendatory safety decisions were made during the year, a number were under consideration. Schedules of explosives were studied, with especial reference to emission of fumes. Data were obtained on a liquid-oxygen explosive disaster in France and a serious explosion in an open-cut mine in Chile. A revision of the circular citing all Safety Board decisions, with explanatory text, was prepared and submitted for publication.

Ground Movement and subsidence in mining.—Studies on ground movement and subsidence were continued by the American Institute of Mining and Metallurgical Engineers committee which cooperates with the Bureau. The chief mining engineer, as chairman of the committee, prepared a review of the studies of the committee since it was formed in 1923. Studies on prevention of coal-mine bumps, such as occur in eastern Kentucky, were continued, and recommendations by the chief mining engineer were followed with success.

Conservation of potash salt in mining.—Investigations were made in June 1936 in mines on Government lands at Carlsbad, N. Mex., with a view to reducing the loss of potash salt by changing the mining method. Blocks of potash salt from these mines were tested later in a compression machine at the experimental mine.

Diesel mine locomotives.—Diesel locomotives have not yet been used in American mines, but it is believed that they are safer for coal mines than trolley locomotives. The study of their use in Germany, France, and England was continued, additional data were obtained by correspondence, and a report was published as Information Circular 3320.

Experimental mine tests.—A report on coal-dust tests in the experimental mine since 1932 was in preparation, to be published as one of a series of bulletins on the subject. A review of a quarter

century of successful tests in the experimental mine, which have shown that major mine explosions are preventable by rock dusting, was completed.

European mining methods.—A bulletin covering data on European mining methods obtained on trips abroad was being prepared for publication.

ECONOMIC AND STATISTICS BRANCH

The Economics and Statistics Branch assembled and published data on the production and consumption of mineral commodities and prepared reports of special economic studies; it also was responsible for the annual publication entitled "Minerals Yearbook." The Branch comprised the Coal Economics, Petroleum Economics, Mineral Production and Economics, Metal Economics, Nonmetal Economics, and Foreign Minerals Divisions.

COAL ECONOMICS DIVISION

The work of the Coal Economics Division concerned itself with statistical and economic problems relating to the solid-fuel industries.

Service to industry.—The division procured statistics and studied economic trends with respect to anthracite, bituminous coal, lignite, peat, coke, and fuel briquets. As a service to producers, distributors, and consumers the division issued weekly and monthly reports that reviewed short-time movements of supply and demand; many of these data were summarized in annual reports for Minerals Yearbook that provide a background for current service and trace basis changes in the coal and related industries.

Special investigations.—A detailed and historical study of unemployment in coal mines, undertaken in cooperation with the Works Progress Administration, was practically completed during the year. Data regarding expenditures for supplies and materials, colliery fuel, purchased electric power, and salaries and wages in bituminous-coal and anthracite mines in 1935, collected in cooperation with the Bureau of the Census as a feature of the Census of Business, were prepared for publication. Special reports were also completed on the mechanical mining and cleaning of bituminous coal and anthracite, the conservation of coal resources, technology and the mineral industries, and mechanical loading in metal and nonmetal mines.

International trade in fuels.—The monthly report on international coal trade included special studies of coal-market control abroad and trends of the American coal market in Canada. A separate publication on competitive conditions in the international coal trade was released.

Economies in publication.—The collection of statistical reports through trade agencies, inaugurated several years ago to reduce costs, was continued in the fiscal year 1937.

PETROLEUM ECONOMICS DIVISION

The Petroleum Economics Division collected statistics on petroleum and natural gas, prepared monthly forecasts of demand for petroleum products, made special studies of crude-oil stocks and of factors affecting productivity in the oil and gas industry.

Forecasts of demand.—The monthly forecasts of demand for motor fuel and crude oil were a major feature of the work of the division during the year. These forecasts have been issued regularly by the Bureau since June 1935, and they represent an impartial projection of the trends of current demand. They constitute a useful service, essential to the information of the petroleum industry, of the several State agencies, and of the Federal Government itself in developing a sound oil-conservation program. Enlargement of the staff engaged in collecting the necessary basic statistical data has resulted in progressive improvement in the scope and accuracy of the forecasts during the past year.

Survey of crude-oil stocks.—One of the most important objectives of oil conservation is to avoid the waste resulting from the unnecessary storage of oil above ground. At the request of the Interstate Oil Compact Commission, the Petroleum Economics Division in cooperation with the Petroleum and Natural-Gas Division of the Bureau undertook a survey of crude-oil stocks as of June 30, 1936. The main objectives of this survey were to determine the age and origin of crude held in storage, the extent of deterioration from the standpoint of straight-run gasoline production, and the relations between necessary working stocks and surplus reserves.

The economic results of the survey indicate the necessity for a continuous check of the liquidation of older stock accumulations in contrast to the changes in current or working stocks. The amount of older stocks desirable is directly related to the extent of underground reserves from which current production can be increased quickly. This segregation of older stocks will make possible an adequate check of the fluctuations of current stocks and their proper relation to market demand.

Special studies.—A survey in cooperation with the Bureau of the Census resulted in completion of a census of oil and gas production that had not been undertaken since 1919. A special study of factors affecting productivity in the oil and gas industry was undertaken by the division in cooperation with the Works Progress Administration, and the results indicate the great technical advances that have been made in the discovery, production, and refining of oil.

MINERAL PRODUCTION AND ECONOMICS DIVISION

The Mineral Production and Economics Division procured and published production statistics for metal mining, supervised the compilation of the Minerals Yearbook, continued statistical studies of

employment, accidents, and explosives, and assisted in a census of mines and quarries and in a study of technologic changes in the mineral industry.

Metal-mine statistics.—Following the Bureau of Mines policy of publishing production statistics as soon as possible after the close of the calendar year, the first of the preliminary reviews covering metal mining in the western States was released early in January, and by the end of the month summary reports covering the 13 States that produced nonferrous metals had been issued. By the end of June, statistics for metal mining were virtually completed, and the State mine-review chapters (except those for Arizona, Montana, and Nevada) in Minerals Yearbook 1937 contain final figures for 1936 as well as details for 1935 that were incomplete in the previous volume.

Minerals Yearbook.—Minerals Yearbook 1936 was issued in August 1936. The volume included 69 mineral-commodity chapters and comprised 1,136 pages, including a comprehensive index. The demand for this annual official review of the mining industry has grown rapidly in recent years, and nearly 10,000 copies of the 1936 volume were distributed. As with others of the series, orders for Minerals Yearbook 1936 had virtually exhausted the edition shortly after delivery by the printer.

The entire manuscript for Minerals Yearbook 1937 was submitted for transmittal to the Public Printer on June 22, 1937. This volume is substantially larger than its predecessors, for it includes detailed statistics on coal, petroleum, and certain other commodities previously published in the Statistical Appendix. Thus, for the first time in more than 30 years, a single volume contains complete data on the entire mining industry.

Employment and accidents.—The division conducted its usual statistical investigations of employment and accidents in the mining, quarrying, smelting, milling, and coking industries of the United States. Bulletins showed the progress made in promoting safety in the mineral industries. Four safety contests, based upon reports of accidents and man-hours of employment, were conducted during the year. The division also prepared and published reports covering the quantity of explosives produced in the United States and the amounts of nitrogen and other materials used in their manufacture.

Joint conduct of census of mines and quarries.—During the fiscal year 1936 a canvass of the mining industry for 1935 was conducted by the Bureau of Mines in cooperation with the Bureau of the Census. This work was undertaken with the advice of the Central Statistical Board, and questionnaires of the two Bureaus were consolidated into a single schedule. Returns have been received that are believed to be accurate enough to indicate the volume of employment as well as expenditures for supplies, salaries, and wages paid by the mineral

industries, but in no instance do they justify computation of unit costs. Detailed preliminary data for 1935 for most of the mineral fuels, metals, and nonmetals have been compiled and made public through the office of the Census of Business.

Changes in mineral technology and output per man.—In cooperation with the Works Progress Administration the division studied technological changes and output per man in selected mineral industries in the United States. Two reports were published, "Technology and the Mineral Industries" and "Small-Scale Placer Mines as a Source of Gold, Employment, and Livelihood in 1935." These initiate a series intended to show technological changes in the extractive industries and their effect on production and employment.

METAL ECONOMICS DIVISION

The Metal Economics Division was created July 1, 1936, to effect a more logical organization of the economic and statistical work in metals. The division also conducted special studies of the consumption of iron and steel scrap and tin.

Statistical reports.—Forty-five marketing and production canvasses of the metal industries were completed; the results were made available to the public promptly in 30 mineral market reports. Fifteen chapters were prepared for Minerals Yearbook 1937 by division specialists. Two information circulars were published, 3 articles were written for technical journals, and 32 large-scale charts depicting the international flow of minerals were prepared for printing. The division also compiled the metals section of Mineral Trade Notes. Over 2,000 requests for information from the public and from various Government agencies were answered during the year.

Consumption studies of iron and steel scrap and tin.—An outstanding accomplishment of the division during the year was the completion of the first comprehensive survey of the consumption of iron and steel scrap. The usefulness of this new service was attested by the wide publicity given to the Bureau's publications in trade journals, and the following statement from a spokesman of the scrap iron and steel industry.

> For the first time in the history of the industry, an authoritative and reliable contribution to the literature of the scrap industry was made by the Bureau of Mines. * * * I would strongly urge the continuation of this survey as a necessary function of the Bureau of Mines, which, because of the respect earned by it from industry because of impartiality and thoroughness in its work, has been able to secure the complete cooperation of both the scrap industry and the steel industry.

The canvass of the uses of tin, discontinued in 1931, was resumed upon request from tin consumers. The new survey included secondary tin and complete data on plant inventories and the flow of scrap and other byproducts.

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NONMETAL ECONOMICS DIVISION

The Nonmetal Economics Division is essentially a service organization supplying economic and statistical data on nonmetallic mineral commodities to a group of industries having a total annual production valued at more than $600,000,000.

Statistical reports.—The statistical canvass and compilation of chapters for Minerals Yearbook is an important function of the division, which prepared 19 chapters for the 1937 volume, covering more than 80 commodities. These chapters reviewed the outstanding activities in each industry, and the statistical data were supplemented by a wealth of current information. Supplementing the yearbook chapters, monthly reports were issued on cement and quarterly reports on gypsum—compilations much appreciated and in active demand. Current statistical data were issued as mineral market reports giving preliminary estimates or advance final figures. Data were prepared for joint reports of the Census of Business, as well as for those on employment and productivity issued in cooperation with the Works Progress Administration.

Special studies.—Special reports covering significant economic features of the nonmetallic mineral industries included papers on trends in the use of various building materials, economic significance of high-grade concentrates, and economies resulting from the use of wire saws in working slate and building-stone. Other reports included an annotated bibliography of 450 references covering all work of the Bureau of Mines on building materials of mineral origin and a comprehensive bulletin describing all phases of the asbestos industry, with particular emphasis on foreign supplies and international trade. The division prepared a review of technical progress in the entire field of industrial (nonmetallic) minerals during 1936 for publication in an outside mining journal. Chapters on refractories, minor industrial minerals, and dimension stone were written for inclusion in a forthcoming volume on industrial minerals and rocks. Reports on the salt and gypsum industries were nearly completed.

Mineral trade notes.—The division continued the monthly publication of Mineral Trade Notes, the chief function of which is to present abstracts of consular reports. The circulation has increased steadily and has been supplemented by a loan service of consular reports and by the issuance of five special supplements. Intimate acquaintance with mineral developments in foreign countries is thus made possible.

Service work.—Hundreds of inquiries on mineral subjects were answered monthly; during the year these included requests from over 30 Government agencies. The marketing of minerals was promoted by furnishing inquirers with lists of buyers. Extensive data files, which are constantly augmented, furnished a reservoir of detailed informa-

tion. The series of information circulars built up during recent years was of great assistance, but many of them are out of print, and only loan copies could be supplied. The welfare of the nonmetallic mineral industries was promoted also by close cooperation of staff members with the activities of the American Institute of Mining and Metallurgical Engineers, particularly in establishing its Industrial Minerals Division, and in serving on the editorial board responsible for publication of a 700-page volume on industrial minerals.

FOREIGN MINERALS DIVISION

The Foreign Minerals Division completed the survey of the international flow of mineral raw materials, collaborated with American consular officers abroad in conducting mineral-economics surveys, and developed arrangements to make consular economic and commodity reports available to American industries.

Mineral raw-materials survey.—The survey of mineral production, distribution, and consumption of 32 minerals, preparation of which was begun in the fall of 1935, was completed in June 1937. This study covers in detail world occurrences of the 32 major industrial minerals and reviews the position as producer and consumer of these minerals held by the 12 major industrial countries. The finished volume comprises 342 pages of text, tables, and international flow charts and has been published by the McGraw-Hill Book Co., due to lack of adequate printing funds in the Bureau.

Foreign mineral specialist.—During the past fiscal year the Bureau's foreign mineral specialist, detailed as vice consul to European posts, has made comprehensive mineral-economics surveys of 10 European countries (Italy, Germany, Poland, Czechoslovakia, Bulgaria, Rumania, Austria, Hungary, Yugoslavia, and Greece). These studies were prepared in collaboration with American consular officers. Only 4 of the 14 major reports prepared by this specialist have been published, because of lack of funds. The material not as yet released is being prepared as a regional survey covering southeastern Europe, and it is anticipated that a report can be published during the coming fiscal year.

Consular reporting service.—During the year the division developed to a very satisfactory degree cooperative arrangements with the American consular service whereby the latter now furnishes the Bureau regularly with economic and commodity reports essential in the preparation of the three monthly bulletins covering international trade in minerals, petroleum, and coal and very helpful in the preparation of the various commodity chapters for Minerals Yearbook. During the past year the Bureau received approximately 3,100 consular reports all of which were used for current publications or made available for loan.

HEALTH AND SAFETY BRANCH

The Health and Safety Branch, which consisted of the Safety and Health Divisions, was responsible for safety training, answered emergency calls for aid after disasters at mines or mineral plants, and studied conditions relating to the health of workers.

SAFETY DIVISION

The Safety Division supervised first-aid and mine rescue training, investigated mine fires and explosions, studied safety conditions at mines, and carried on various other safety activities. During the past year the division personnel included 25 engineers, 26 safety instructors, 15 clerks, and 10 other employees, a total of 76. Members of the division were scattered fairly evenly through the various mining States, being headquartered at 17 different cities.

Training courses.—In the past year the Safety Division gave the full Bureau of Mines course in first-aid or in mine-rescue training to 69,662 persons in the mining and allied industries in 616 communities in 39 States. Much of this work was done at smaller mines, as may be seen from the fact that it was given in 616 communities—many more than the 489 of the previous year, when 72,038 persons completed the courses of instruction. Since the inception of the Bureau in 1910, full Bureau first-aid or mine-rescue courses have been given to the following numbers of persons in the mining industries: Coal mining, 756,776; metal mining, 114,551; petroleum industry, 77,067; metallurgical plants, 29,320; nonmetallic mining, 13,202; cement plants, 13,290; tunnel work, 4,750; and miscellaneous mining activities, 23,903; a total of 1,032,859. It is now conceded that this phase of the Safety Division's work alone enables at least 200 lives to be saved annually.

Those engaged in actual field work of the Safety Division (about 50 in all) ordinarily come in contact with more than 300,000 persons in the mining and allied industries annually, conveying to them the Bureau's safety knowledge and teachings; it is estimated that during the past year, however, the work of the field personnel reached 500,000 persons. Only 2 of the 10 all-steel mine safety cars were in active use, but 36 passenger automobiles and 14 automotive trucks were employed, and traveled 622,283 miles.

Mine fires and explosions.—In the course of the year 22 mine explosions in 10 States and 21 mine fires in 13 States were investigated, and the Bureau's personnel aided in rescue or recovery work at practically all of them where life was involved. There were 6 major fire or explosion disasters (a major disaster being one in which 5 or more lives are lost); in these, 56 were killed, a tremendous improvement compared to the average of 17 major disasters and 562 fatalities annually in the 4 years preceding the establishment of the Bureau. However, the past year's record as to disasters was by no means as

good as that in the previous fiscal year, when only 2 major disasters occurred and the total loss of life was only 17. Without doubt, much of the relative immunity from mine fires and explosions in the United States is due to various phases of safety work promoted by the Bureau, especially its advocacy of rock dusting. This practice prevents the occurrence of many widespread explosions every year; it is estimated that for the past 8 or 10 years rock dusting alone has prevented several hundred fatalities annually.

Sixty-two miscellaneous accidents in 21 States (including those from roof falls, explosives, electricity, and other causes) were investigated; the Bureau was called upon to investigate numerous surface explosions of black powder, dynamite, pulverized fuel, and gas. A Safety Division engineer was one of the experts dispatched to investigate the New London (Tex.) school disaster.

Mine reports.—One hundred and eighty-two reports on safety conditions at individual mines or plants in the mineral industries in 30 States were made during the year; some of these were transmitted confidentially to the operating company, with constructive criticism of existing conditions and definite recommendations for improvement. These reports, with verbal suggestions by Bureau men during or after the inspections on which the reports were based, resulted in hundreds of important alterations in operating conditions (equipment, methods, and practices), with a resultant definitely favorable influence on the prevention of accidents. Large numbers of these changes have been reported by field men, and several hundred letters were received during the year from mining officials voicing appreciation of the service.

Other activities.—During the past year, 1,009 persons in 32 States were qualified to teach first-aid courses and given provisional first-aid instructors' certificates, bringing the total number to 7,552 issued since 1930. Certificates of 100-percent first-aid training were issued to 135 mines or plants (representing 22 States), wherein every person had taken the Bureau of Mines first-aid course; to June 30, 1937, these certificates had been issued to 1,654 plants.

In the course of the year, 269 expert mine rescue men took the Bureau advanced course in mine rescue and recovery operations and earned certificates, bringing the total to 3,029. The Bureau accident-prevention course for higher officials in bituminous-coal mining was given in 8 States to 1,288 officials, of whom 608 took the complete course, lasting several weeks, and received certificates. In all, 6,632 certificates have been issued in 16 States since 1930. Twelve new safety clubs (Holmes Safety Association chapters) were organized in four States, bringing the total to 462 clubs in 28 States. Numerous special studies were made of rock dusting, ventilation, electricity, haulage, air conditioning, wetting methods, detecting gases, testing roof, and reducing air dustiness.

HEALTH DIVISION

The activities of the Health Division were concerned largely with means of controlling occupational-disease hazards from dust or gas, and consisted of studies of factors governing the formation of atmospheric contaminants and development of simple devices and procedures for determining and preventing them.

Dust investigations.—A midget impinger dust-sampling apparatus has been developed that is light, compact, and hand-operated and yields essentially the same results as the standard instrument. The small size and self-contained feature of this device are very desirable, especially for use in mines. The microprojection apparatus developed for particle-size determinations had been modified to permit counting impinger samples, thus increasing the ease and speed of counting dust particles. Instructions were given to 57 persons in the technique of dust sampling and counting.

Petrographic examination was made of 236 samples collected in the mineral industries, to ascertain their composition, particularly with regard to free-silica content. The spectrograph and X-ray apparatus were used to ascertain the composition of material collected in dust investigations.

Studies were made in metal mines to obtain information on the determination, generation, and control of atmospheric dust. It was found that drilling vertical holes produced more dust than drilling horizontal holes; the amount of dust generated in drilling decreased with the depth of the hole; and wet drilling with sharp bits caused higher dust concentrations than with dull bits. The following procedures were found to be beneficial in reducing the dissemination of dust into the air: Increased flow of water through the drill; reduction of air leakage through drill steel; use of compressed air-water blasts during and after blasting; generalized sprinkling of active workings; use of water curtains; and increased ventilation. Several brief papers describing these investigations are being prepared for publication in the fiscal year 1938.

Analysis of mine gases.—In connection with studies on the cause of mine explosions, the control and extinguishing of mine fires, and the promotion of safe and hygienic working conditions, 1,243 samples of gases taken in mines and tunnels were analyzed.

ADMINISTRATIVE BRANCH

The administrative branch contained the Information and the Office Administration Divisions.

INFORMATION DIVISION

The work of the Information Division included the editing and distribution of publications, supervision of motion-picture production and circulation, maintenance of the Bureau library, and preparation of exhibits.

Editorial.—During the fiscal year 13 bulletins, 8 technical papers, 3 miners' circulars, 72 separate chapters comprising Minerals Yearbook, 1937, 1 economic paper, and 4 miscellaneous reports were edited and sent to the printer—a total of 101 printed publications. Moreover, during the year 48 chapters from Minerals Yearbook, 1936, were prepared for publication as reprints, and 9 other publications were reprinted. Owing to lack of printing funds, however, only a part of the Bureau's output could be printed at Government expense; consequently, 222 papers were submitted for publication in the technical and trade press.

The division also edited 37 reports of investigations and 63 information circulars—papers that supply promptly to the mining industry and general public results of Bureau investigations that are usually described in detail in later printed reports or that give salient facts on the mineral industries in concise form suitable for use in reply to queries. In addition, 17 periodical reports were edited.

These publications—497 in all—involved the editing of 28,709 pages of manuscript.

Publications.—During the past fiscal year 124,000 copies of the free editions of printed Bureau publications and approximately 280,000 reports of investigations, information circulars, and monographs were distributed by the division. These were sent, however, only as the result of a direct request either for a specific publication or for all publications on a particular subject. In addition, the Superintendent of Documents sold about 100,000 copies of the Bureau's printed reports.

Numerous brief statements announcing the issuance of new publications or describing current investigations were supplied to the daily and technical press. These short items were printed widely, and they effectively acquainted the public with the results of the Bureau's work.

More than 66,000 letters requesting publications or information on the Bureau's activities and general mining subjects were answered.

Motion-picture production.—As a means of disseminating information on safety and efficiency in the mineral industries, the Bureau maintains what is perhaps the largest library of educational motion-picture films in the world. These films are prepared under the supervision of the division, through the cooperation of industrial concerns that bear the entire cost of production and that of providing copies for distribution.

During the year 3 new film subjects were added, 7 revised, and 594 additional reels obtained for circulation. Through a cooperative arrangement between the National Park Service and the Bureau of Mines, the division obtained the assistance of one of the country's largest industrial organizations in the sponsorship of films depicting the Bryce Canyon and Zion National Parks.

Motion-picture circulation.—Circulation of the Bureau's motion-picture films, and other graphic services, such as drafting and photography, are centralized at the Pittsburgh Experiment Station, but there are 16 subdistributing centers for films throughout the country, selected with regard to accessibility. The films are loaned to schools, churches, clubs, civic and business organizations, miners' local unions, etc. No charge is made for use, but exhibitors are asked to pay transportation charges. On June 30, 1397, the Bureau had 1,981 sets of films, including 3,775 reels, aggregating 2,098,000 feet. During the year the films were shown on 100,342 occasions, before an estimated audience of 8,809,000. The attendance was 31 percent higher than in the last fiscal year.

Library.—The year's accessions to the library comprised 3,782 books and pamphlets, 326 periodicals were received currently, and 3,135 books were loaned for use outside the library.

Exhibits.—The division prepared, installed, and supervised nine exhibits illustrating Bureau activities at expositions and conventions.

OFFICE ADMINISTRATION DIVISION

The Office Administration Division is charged with handling personnel matters, property records, accounting, multigraphing and mimeographing, and general administrative routine.

Property.—Records as of June 30, 1937, show the following valuation of Bureau property:

Automobiles and trucks	$85, 353. 51
Canvas and leather goods	3, 876. 74
Drafting and engineering instruments	11, 192. 83
Electrical equipment	68, 197. 00
Hardware and tools	35, 288. 36
Household equipment	20, 800. 78
Laboratory apparatus	515, 770. 00
Medical equipment	9, 551. 99
Office furniture and equipment	356, 512. 99
Photographic apparatus	31, 792. 54
Machinery and power-plant equipment	1, 034, 214. 44
Land, buildings, and improvements	2, 464, 880. 92
Rescue cars and specialized apparatus	406, 470. 00
	5, 043, 902. 10

This property is located in Washington and at various field stations and offices of the Bureau.

Personnel.—On June 30, 1937, there were 698 full-time employees on duty in the Bureau, distributed as shown in the following table:

	Classification and number of appointees				
	Professional	Subprofessional [1]	C. A. F.	Custodial [2]	Total
Washington	[3] 40	3	149	6	198
Pittsburgh	[4] 93	52	56	46	247
Field	[5] 142	46	47	18	253
Total	275	101	252	70	698

[1] Includes instrument makers, safety instructors, laboratory aids, assistants, etc.
[2] Includes laborers, mechanics, messengers, etc.
[3] Engineers, 17; chemists, 1; miscellaneous, 22; total, 40.
[4] Engineers, 44; chemists, 33; miscellaneous, 16; total, 93.
[5] Engineers, 68; chemists, 29; miscellaneous, 45; total, 142.

In addition to the foregoing full-time employees, the following employees held appointments on a when-actually-employed basis: 54 Consultants; 94 excepted; 12 classified; 17 unclassified; and 39 employed on field agreements.

FINANCES

The total funds available to the Bureau of Mines for the fiscal year ended June 30, 1937, including direct appropriations, departmental allotments, reappropriated balances, and sums transferred from other departments for service work, were $2,229,261.15. Of this amount $2,223,022.17 was spent, leaving an unexpended balance of $6,239.28. On the regular work of the Bureau, $2,162.714.37 was expended. This figure is subject to slight corrections due to unpaid obligations.

Table 1 presents classified and complete information regarding the financial history of the Bureau since its establishment in 1910.

Table 2 gives a statement of the distribution of Congressional appropriations to the branches and divisions and the expenditure of these funds in 1937, by Bureau divisions.

TABLE 1.—Bureau of Mines Appropriations and Expenditures, Fiscal Years Ended June 30, 1911–37

Fiscal year	Appropriated to Bureau of Mines	Departmental allotments[1]	Funds transferred from other departments[2]	Total funds available for expenditure	Unexpended balances	Total expenditures	Expenditures exclusive of service items[3]
1911	$502,200.00	$34,200.00		$536,400.00	$22,818.27	$513,581.73	$513,581.73
1912	475,500.00	45,640.00		521,140.00	6,239.77	514,900.23	514,900.23
1913	583,100.00	47,850.00		630,950.00	4,087.20	626,862.80	626,862.80
1914	664,000.00	57,307.79		721,307.79	4,678.29	716,629.50	716,629.50
1915	730,500.00	55,424.60		785,924.60	4,178.11	781,746.49	781,746.49
1916	757,300.00	48,710.87		806,010.87	9,058.63	796,952.24	796,952.24
1917	981,060.00	52,400.00		1,033,460.00	48,588.10	984,871.90	984,871.90
1918	1,467,070.00	51,901.98	[4] $3,062,000.00	4,580,971.98	395,745.10	4,185,226.88	1,172,939.64
1919	[5] 3,245,285.00	49,542.86	[6] 8,600,000.00	11,894,827.86	2,452,236.78	9,442,591.08	1,137,471.37
1920	1,216,897.00	52,800.00		1,269,697.00	9,592.18	1,260,140.82	1,145,891.36
1921	1,362,642.00	62,618.72	666,720.00	2,091,980.72	13,985.89	2,077,994.83	1,412,923.15
1922	1,474,300.00	59,800.00	182,200.00	1,716,300.00	52,120.45	1,664,179.55	1,483,038.47
1923	1,580,960.00	70,814.30	97,100.00	1,748,814.30	10,959.08	1,737,855.22	1,640,840.57
1924	1,784,959.00	50,710.00	347,820.00	2,183,489.00	38,085.43	2,145,403.57	1,804,800.41
1925	2,028,268.00	57,500.00	236,465.86	2,322,233.86	107,743.20	2,214,490.66	1,998,669.20
1926	1,875,010.00	81,220.00	510,501.15	2,466,731.15	28,891.78	2,437,839.37	1,841,150.80
1927	1,914,400.00	94,443.39	325,000.00	2,333,843.39	44,871.29	2,288,972.10	1,926,910.12
1928	3,025,150.00	113,266.45	328,000.00	3,466,416.45	[7] 736,235.62	2,730,180.83	1,997,270.66
1929	2,725,118.60	103,000.00	205,500.00	[7] 3,753,094.67	[8] 152,701.34	3,600,393.33	2,280,960.68
1930	2,274,670.00	123,300.00	166,200.00	[8] 2,684,386.38	[9] 135,714.93	2,548,671.45	2,216,995.72
1931	2,745,060.00	120,680.91	166,500.00	[9] 3,134,595.10	[10] 195,534.37	2,939,060.73	2,304,121.45
1932	2,278,765.00	137,866.48	194,500.00	[10] 2,770,712.18	[11] 344,689.43	2,426,022.75	2,186,799.92
1933	1,860,325.00	75,100.00	184,000.00	[11] 2,361,138.96	[12] 475,895.41	1,885,243.55	1,710,949.42
1934	1,574,300.00	50,230.00	17,000.00	[12] 1,872,586.04	[13] 397,131.28	1,475,454.76	1,254,846.72
1935	1,293,959.07	50,090.00	126,513.10	[13] 1,520,472.17	[14] 34,154.47	1,486,317.70	1,349,490.11
1936	1,970,311.00	69,500.09	47,570.00	[14] 2,114,966.51	[15] 12,817.54	2,102,148.97	2,058,175.91
1937	2,093,200.00	69,000.00	65,600.00	[15] 2,229,261.45	[16] 6,239.28	2,223,022.17	2,162,714.37
1938	2,222,450.00	83,600.00	60,000.00	[16] 2,368,868.32			[17] 2,305,450.00

[1] Includes printing and binding, stationery, and contingent funds.
[2] Includes proceeds from sales of residue gas.
[3] Service items include Government fuel yards, helium, and other investigations and services for other departments.
[4] Includes gas investigations for War Department.
[5] Includes $1,586,388 for Government fuel yards.
[6] Includes War Minerals Relief Commission, $8,500,000.
[7] Includes $719,476.67 unexpended balance reappropriated.
[8] Includes $120,216.38 unexpended balance reappropriated.
[9] Includes $102,354.19 unexpended balance reappropriated.
[10] Includes $159,580.70 unexpended balance reappropriated.
[11] Includes $241,713.96 unexpended balance reappropriated.
[12] Includes $231,056.04 unexpended balance reappropriated.
[13] Includes $50,000 unexpended balance reappropriated.
[14] Includes $27,585.51 unexpended balance reappropriated.
[15] Includes $2,612.45 unexpended balance reappropriated.
[16] Includes $3,418.32 unexpended balance reappropriated.
[17] Estimate.

TABLE 2.—Bureau of Mines Expenditures, Fiscal Year 1937

Branch or division	General expenses	Operating rescue cars and stations and investigation of accidents	Testing fuel	Mineral mining investigations	Oil and gas investigations	Expenses, mining experiment stations	Economics of mineral industries	Helium production	Buildings and grounds, Pittsburgh, Pa.	Gas production	Printing and binding	Contingent expenses	Special funds	Total
Office of the Director	$11,100					$1,268								$12,368
Office of Assistant to the Director	9,660					1,811	$775							12,246
Administrative Branch:														
Office Administration Division	30,204	$25,540	$2,514		$1,125	2,183	5,784	$3,580	$5,309		$1,410	$12,966		90,615
Information Division	4,961	12,865	8,163	$14,943	13,534	8,803	13,227				2,578			79,074
Total	35,165	38,405	10,677	14,943	14,659	10,986	19,011	3,580	5,309		3,988	12,966		169,689
Office of Chief Mining Engineer		8,922									390			9,312
Technologic Branch:														
Coal Division		127,541	174,059			2,412			82,262		8,101			394,375
Explosives Division		61,506				1,447								62,953
Metallurgical Division				113,413		163,764					6,564			283,741
Mining Division		44,171		111,775		9,603					65			165,614
Nonmetals Division				2,461		86,981					1,855			91,297
Petroleum and Natural-gas Division					251,104	1,447		55,614		$8,987	2,202			319,354
Principal mineral technologist				7,698										7,698
Total		233,218	174,059	235,347	251,104	265,654		55,614	82,262	8,987	18,787			1,325,032
Economics Branch:														
Coal Economics Division							47,623				894			48,517
Mineral Production and Economics Division							97,227				25,862			123,089
Nonmetal Economics Division							51,716				839			52,555
Foreign Minerals Division							24,850				162		$4,447	29,459
Metal Economics Division							36,188							36,188
Petroleum Economics Division							62,548				1,001			63,549
Total							320,152				28,758		4,447	353,357
Health and Safety Branch:														
Safety Division		271,504									13,077			284,581
Health Division		56,437												56,437
Total		327,941									13,077			341,018
Total appropriations	56,000	609,365	185,400	250,860	265,866	279,850	339,990	62,612	87,690	9,179	65,000	13,000	4,449	2,229,261
Total expenditures	55,925	608,486	184,736	250,290	265,763	279,719	339,938	59,194	87,571	8,987	65,000	12,966	4,447	2,223,022
Balances	75	879	664	570	103	131	52	[1] 3,418	119	192		34	2	6,239

[1] Available for expenditure in 1938.

The following table covers expenditures by the Bureau of Mines to June 30, 1937, from allotments from National Industrial Recovery and Public Works appropriations:

Project no.	Description	Allotment	Balance	Expenditure
1	Repair mine rescue station, McAlester, Okla	$1,000	----------	$1,000.00
2	Plans for building for experiment station, College Park, Md	16,800	----------	16,800.00
3	Buildings and grounds, Pittsburgh and Bruceton, Pa	172,000	$4.48	171,995.52
4	Roads, Pittsburgh and Bruceton	13,000	1.16	12,998.84
5	Repairs to experimental mine	15,000	.17	14,999.83
6	Repairs to building and equipment, Bartlesville Experiment Station	45,000	.52	44,999.48
7	Paving around Bartlesville Experiment Station	10,000	3.75	9,996.25
8	Building and equipment, experiment station, Tuscaloosa	200,000	6.50	199,993.50
9	Locating underground water resources in Nevada	4,950	41.59	4,908.41
10	Extension of Petroleum Experiment Station, Bartlesville	269,500	5.31	269,494.69
11	Fence, electric circuits put underground, roads, etc., at experimental mine, Bruceton	43,450	2.99	43,447.01
12	Building for mining experiment station, College Park, Md	350,000	----------	(1)
13	5-car garage, Vincennes	7,500	----------	(2)
14	Construction of bombproofs, protective partitions, and testing floors, for study of hydrogenation of coal, etc	17,000	----------	17,000.00
15	Enlarging hydrogenation laboratory	30,000	1.92	29,998.08
	Total	1,195,200	68.39	837,631.61

[1] Transferred to Procurement Division, Treasury Department, for supervision of construction.
[2] Transferred to Post Office Department for construction in connection with new post-office building.

GEOLOGICAL SURVEY

W. C. Mendenhall, *Director*

DURING the fiscal year 1937 the Geological Survey continued its systematic work in investigating, mapping, and reporting on the geology, the mineral and water resources, and the physical features of the United States. The results of this work are basic in all conservational activities, as those who plan and direct the conservation policies toward the wise development and use of the Nation's resources must first have the facts about the quantity, quality, distribution, and availability of those resources and adequate maps with which to pursue and record further studies. Through its technical supervision of prospecting, mining, and producing operations on public and Indian lands under permits, leases, and licenses, the Survey was directly engaged in the practical application of conservation policies.

During the year the aggregate expenditures for which the Geological Survey was responsible amounted to about $4,222,000, as compared with about $4,620,000 during the preceding year. These aggregates were made up of the regularly appropriated funds, the cooperative funds from States, counties, and municipalities, the funds transferred from other departments of the Government for types of work falling within the Survey's field, and the emergency funds derived chiefly from the Public Works Administration and devoted largely to mapping of various types, to river-utilization surveys of power and storage resources, to conservation work on public lands, and in a lesser degree to the study of mineral resources.

Although there was a decline from the preceding year in aggregate funds available, the fiscal situation has nevertheless improved, because the Congress, in view of the decreasing availability of emergency funds, had increased the regular appropriation to $2,807,000, from the $2,285,000 of the preceding year.

As a part of our informal service to the public, more than 4,500 tests of mineral and rock samples were made and more than 2,200 chemical analyses were completed.

More than 14,500 square miles of new area was surveyed in the field topographically. This work will yield 102 contoured topographic maps of areas in 36 States and in Puerto Rico. In addition, by the aid of aerial photography, 4,780 square miles was surveyed in 5 States for the production of planimetric maps without contours.

Fifty-seven book publications of the Survey's regular series, aggregating nearly 6,000 pages of printed matter, dealing with geology, mineral resources, and water supplies were issued during the year, and about 673,000 copies of 296 topographic and other maps were printed. The geologic map of Texas was completed.

There were 59 geologic parties in the field in 33 States. The field investigations on several continuing projects were completed, and work was begun on new projects including geologic studies of areas in Idaho, Arizona, and in the Big Horn Basin in Wyoming and the geologic aspects of the Ohio River flood.

Measurements of stream flow were maintained at 3,379 stream-gaging stations. All the States, the District of Columbia, and Hawaii are affected by this work. Drought and flood studies were continued during the year.

The work on underground waters, so important in the drought-stricken areas, was continued, much of it in cooperation with the States, and 75 reports on this topic were released for public use.

In the land-classification and mineral-leasing activities of the Survey more than 9,000 formal findings of technical fact were made regarding the mineral resources, water power, or storage possibilities of public land, and the Government's ownership of great reserves of coal, oil and gas, potash, phosphate, and other minerals was safeguarded. Technical supervision was given to more than 9,000 properties containing oil and gas and more than 600 containing coal, and 100 containing other minerals. On Indian lands more than 5,300 oil and gas leases were supervised, as well as more than 100 properties containing coal, asphalt, and lead and zinc.

GENERAL SUMMARY OF THE YEAR'S ACTIVITIES

Geologic work.—Fifty-nine field parties were active during the year, and work was done in 33 States. Work was continued throughout the year in metal-mining districts of Colorado, Idaho, and New Mexico and in the oil fields of Kansas and Michigan. Cooperative work was also done in Arizona, Florida, Mississippi, and Virginia. The geologic map of Texas was completed. Physiographic and geologic studies were continued in the Yosemite and Sequoia National Parks, Calif., Zion National Park, Utah, and Glacier National Park, Mont., in cooperation with the National Park Service. Geologic examinations of areas in the Carolinas, Georgia, and Alabama were made for the Forest Service, and of dam and reservoir sites for the Office of Indian Affairs and the War Department. Work on many projects was completed in 1937, and work was begun on new projects including studies of the areal and economic geology of the Irwin quadrangle, Idaho, the Pearce quadrangle, Ariz., and the Big Horn Basin, Wyo.,

and of the geologic aspects of the Ohio River flood. The determination and compilation of the physical properties of rocks, as part of the "borderland" field between geology and chemistry and physics, received increasing attention. More than 4,500 tests of mineral and rock samples were made, including 1,587 chemical analyses in connection with the Geological Survey's projects and 1,570 tests for persons not officially connected with the Survey. Many tests were made of activable bleaching clays, two deposits of which are now in commercial production, largely as a result of study and tests made in the Survey's laboratory. Temperature measurements of wells were made in two States. The section of geophysical prospecting continued work on projects in hand and made new field studies related to ores and ground water in Nevada and oil and gas in Michigan. It also continued laboratory studies of the construction and operation of geophysical apparatus.

Explorations in Alaska.—In the field season of 1936 seven field projects were carried on in Alaska. Of these projects, four were principally concerned with geologic investigations relating to the mineral resources of the Territory, two were primarily topographic, and one was a general survey of recent mining developments in the more important camps. In addition, an assay laboratory was maintained at College, Alaska. The general collection of statistics regarding the production of mineral commodities was continued. For the field season of 1937, three field projects had been started before the end of the fiscal year, and two additional field projects were to be undertaken as soon as practicable. All these field projects will be continued throughout the open season as late as conditions permit.

Topographic mapping.—The area covered by new topographic surveys, resurveys, and revision amounted to 14,502 square miles, representing 102 topographic maps with contours. The topographic mapping was done in 36 States and in Puerto Rico. The area covered by planimetric maps without contours, resulting from aerial photography, covered 4,780 square miles in five States. In addition, aerial photographs were used as bases for topographic mapping in 26 quadrangles. Stereoscopic plotting apparatus, utilizing single-lens aerial photographs, as a practical demonstration of the use of such equipment in connection with topographic mapping, is being extensively applied in the mapping of the Tennessee River Basin in cooperation with the Tennessee Valley Authority and in special areas in Virginia, in cooperation with the Conservation and Development Commission of Virginia, Geological Survey. The transportation map of the United States, in sections, which is being made for the Bureau of Public Roads was continued with increased output. The maps of Delaware, in two sections; Washington, in nine sections; Rhode Island, in one section; Connecticut, in one section; and South Carolina, in five sections, were published. The maps of Massachusetts , in three sections; New York, in seven sections; and Maryland, in three sections, are in course of publication.

Investigations of water resources.—The water-resources branch collected and made available for publication stream-flow records at 3,379 river-measurement stations on rivers in the 48 States, the District of Columbia, and the Territory of Hawaii, thus obtaining authentic information on the behavior of streams in drought in flood, and under normal conditions—information that is invaluable for planning of projects for use or control of the surface water supply. It investigated underground water supplies in 22 States and in Guam and Hawaii and obtained basic information on the occurrence, quantity, and quality of underground water supplies, which is essential for the development, conservation, and use of ground water upon which a large part of the population of the country must depend. Drought studies have been continued. Investigations of stream-flow and silt movement of streams in eight projects of the Soil Conservation Service and similar

studies on the Colorado River have also been continued. The annual report on the capacity of water wheels in water-power plants of 100 horsepower or more in the United States on January 1, 1937, was released in April 1937. Engineers of the branch had general supervision of operation under permits and licenses of the Federal Power Commission in connection with 150 projects. Investigations of the water problems along the international boundary between the United States and Canada were continued for the State Department. The collection of information on recent outstanding floods was continued. Partial or complete analyses were made of 1,754 samples of water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural use and for domestic use (not related to questions of health).

Classifying and leasing public land.—The Conservation Branch made 9,036 formal findings of technical fact involving the mineral resources, water power, or storage possibilities of public lands; added 100,699 acres to outstanding water-power reserves and eliminated 17,507 acres therefrom; defined the "known geologic structure" of 2 producing oil and gas fields amounting to 9,354 acres; completed 1,261 miles of river-utilization surveys and 155 square miles of reservoir surveys in public-land States, and made geologic and geophysical studies of formation materials and conditions at 61 dam sites; supervised activities and operations under 166 power projects licensed by the Federal Power Commission and 172 permits and grants from the Interior Department; supervised on public lands 9,052 oil and gas holdings involving 4,112 productive wells and 657 coal properties, 39 potash properties, 44 sodium properties, 18 sulphur properties, 11 phosphate properties and 1 oil-shale property; supervised on naval petroleum reserves 22 leaseholds involving 538 productive oil and gas wells; and on Indian lands 5,342 leaseholds involving 4,397 oil and gas wells, 40 lead and zinc properties, 108 coal properties and 1 asphalt property; assisted hundreds of oil and gas permittees and operators in preparation of unit plans of development and operation; formulated the revised Oil and Gas Operating Regulations, effective November 1, 1936.

Publications.—The publications of the year consisted of 57 reports in the regular series, making a total of 5,760 pages; 96 new or revised topographic and other maps; 199 reprinted topographic and other maps; and several pamphlets for administrative use. Among the book publications were reports on the mineral resources of the region around Boulder Dam, the Bayard area, New Mexico, and the Butler and Zelienople quadrangles, Pennsylvania; fuel resources of Pike County, Ky., the San Juan Basin, N. Mex., and areas in Alaska, Arkansas, Montana, and Oklahoma; spirit leveling in Connecticut and Massachusetts; records of water levels and artesian pressure in observation wells in the United States in 1935; records of wells on the Snake River Plain, Idaho; ground-water resources of the Florida Peninsula, the Elizabeth City area, North Carolina, and of the San Antonio, area and Duval, Kleberg, Medina, and Uvalde Counties, Tex.; and several stratigraphic and paleontologic papers, notably a comprehensive report on the Tertiary floras of Alaska by the outstanding authority on the subject. Besides these printed reports 30 brief papers were issued in mimeographed form as memoranda for the press.

The engraving and printing division printed more than 673,000 copies of maps and did repay work amounting to about $220,000 for 68 other units of the Federal and State Governments.

NOTE.—Detailed tabular statements are given at the end of the report.

GEOLOGIC BRANCH

SUMMARY

Fifty-nine parties were active in the field during the year and work was done in 33 States. Work was continued throughout the year on metal-mining districts in Colorado, Idaho, and New Mexico, and in the oil fields of Kansas and Michigan. Cooperative projects were also conducted in Arizona, Florida, Mississippi, and Virginia. The geologic map of Texas, embodying the results of many years of work by the Federal and State surveys and by oil companies and private geologists, was completed and was available for distribution early in July 1937. The section of geologic map editing also aided the State surveys in the preparation and proofreading of geologic maps of California, Washington, and Iowa. Physiographic and geologic studies were continued in the Yosemite and Sequoia National Parks, Calif., Zion National Park, Utah, and Glacier National Park, Mont., in cooperation with the National Park Service, and geologic examinations of selected areas in the Carolinas, Georgia, and Alabama were made for the Forest Service. Dam and reservoir sites were examined for the Office of Indian Affairs and the War Department, and information was furnished on request to several other Federal organizations.

New projects begun in 1937 included studies of the areal and economic geology of the Irwin quadrangle, Idaho, the Pearce quadrangle, Arizona, and the Big Horn Basin, Wyo., and of the geologic aspects of the Ohio River flood.

More attention given to the determination and compilation of the physical properties of rocks, as part of the "borderland" field between geology, chemistry, and physics, and correlations between the physical properties of minerals and their chemical composition, many of which were completed during the year, will make the future identification of these minerals more rapid and more exact. More than 4,500 tests of mineral and rock samples were made, including 1,587 chemical analyses in connection with the Geological Survey's projects and 1,570 tests for persons not officially connected with the Survey. Many tests were made of activable bleaching clays, two deposits of which are now in commercial production, largely as a result of study and tests made in the Survey's laboratory. Temperature measurements of wells were made in two States.

The section of geophysical prospecting, transferred from the Bureau of Mines to the Geological Survey on July 1, 1936, continued work on projects in hand and made new field studies related to ores and ground water in Nevada and oil and gas in Michigan. It also continued laboratory studies that may lead to reduced cost in the construction and operation of geophysical apparatus.

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WORK OF THE YEAR BY STATES

Alabama.—Geologic mapping was continued in the Russellville iron-ore district in Franklin, Colbert, and Lauderdale Counties, and geologic examinations were made of some other deposits of brown iron ore in the eastern part of the State and of some manganese deposits in Blount and Etowah Counties. Reports on the brown iron ore in the Russellville district and on iron ore in the Red Mountain formation in northeastern Alabama were in progress. A paper on Foraminifera of Choctaw Bluff was completed for Survey publication. Work on gold in Alabama is mentioned under "Southern Appalachians." Examinations were made for the Forest Service of proposed additions to the Black Warrior National Forest and Akmulgee division and the Talladega unit of the Talladega National Forest, and a report was prepared for the Forest Service on proposed additions to the Chattahoochee National Forest in Georgia and Alabama.

Arizona.—A field study of the geology and ore deposits of portions of the Benson and Pearce quadrangles, including the Gleeson, Courtland, Black Diamond, and Pearce mining districts, was begun. The report on the geology and ore deposits of the Ajo quadrangle was completed for Survey publication, and a paper on the physiography of the Ajo region was submitted for publication by the Geological Society of America. Progress was made on a report on the geology and mineral resources of the Tucson quadrangle and on a report on detailed mapping of the ore deposits of the Tombstone district, in cooperation with the Arizona Bureau of Mines.

Arkansas.—The report on the geology and ore deposits of the southwestern Arkansas quicksilver district was transmitted for Survey publication. The report of the western portion of the Arkansas coal field was issued as Bulletin 847–E. Reports on the fauna and stratigraphy of the Morrow group of Arkansas and Oklahoma and on recent developments in the carbonate ores of the Batesville manganese district are in preparation for official publication. Papers on the mineral taeniolite from Magnet Cove and on Pennsylvaniar sedimentation in the Arkansas coal basin are in preparation for publication in some scientific magazine, and one on the lead and zinc ore-bearing formations of northern Arkansas was submitted for inclusion in the volume on the ore deposits of the Mississippi Valley to be published by the National Research Council.

California.—A comprehensive report on the general geology, oil resources, physiography, paleontology, stratigraphy, and economic phases of the Kettleman Hills and a report on the geology and ore deposits of the Grass Valley region were nearing completion for Survey publication. Field studies were made of the diatom-bearing deposits of the Temblor formation in Kern County, and a paper on comparison of diatom floras of the Temblor formation of California and the Calvert formation of Maryland and Virginia was in preparation. Investigations of the geology of the San Andreas rift; of the Death Valley region; and of the structure, stratigraphy, and oil resources of the lower Tertiary strata in Reef Ridge, in the Kettleman Plains and Dudley no. 2 quadrangle in the Coalinga region, were continued. Oil centers in California were visited to obtain data in connection with a study of source of beds of petroleum carried on in cooperation with the American Petroleum Institute. Studies of the geomorphology of the Sequoia National Park and adjoining areas in Inyo National Forest and of the northern portion of Yosemite Valley were made in cooperation with the National Park Service, and a report giving an outline of the geology of the Sequoia National Park was in preparation. Reports on Pliocene diatoms from the Kettleman Hills and on lower Pliocene mollusks and echinoids from the Los Angeles Basin and their inferred environment have been completed. Reports are in preparation on the siliceous rocks of the Monterey formation, the geology of the Palos Verdes

Hills, and the geomorphology of the San Joaquin Basin. A paper on the geologic history of Mount Whitney was submitted for outside publication. Papers in preparation for outside publication cover vein filling at Nevada City; calcium carbonate content of California Cretaceous and Tertiary sediments; significance of wet, lean, and dry gas to absence or presence of petroleum; and Nevada City-North San Juan granodiorite.

Colorado.—In continuation of the cooperative program carried on with the State of Colorado and the Colorado metal mining fund in investigations of the mining regions of the State, studies were continued of the Ouray, Red Mountain, and Sneffels-Camp Bird districts in the San Juan region and of districts in the La Plata Mountain region; in the mineral belt of the Front Range, including mapping in the vicinity of Boulder, Nederland, Central City, Ward, Idaho Springs, Jamestown, Gold Hill, and in the Cripple Creek district; in the Mosquito Range, the Sugar Loaf-St. Kevin district, and the Butte mine and other mines in the vicinity of the London fault. Studies of the geology and ore deposits of the Chattanooga district and of the Kokomo-Robinson area were begun. The report on the Snowmass region is now in press as Bulletin 884. A report on the ore deposits in the vicinity of the London fault was transmitted for Survey publication. A geologic map of the Leadville district and a geologic map of the Front Range mineral belt, both with brief explanatory text, have been prepared and will be published in advance of the comprehensive reports on these districts. A paper on the Laramide igneous sequence and differentiation in the Front Range will be published by the Geological Society of America, and one on the geology of the Neglected mine, La Plata district, by the American Institute of Mining and Metallurgical Engineers. A preliminary report entitled "Resurvey of the La Plata District" was published in volume 13, no. 9, of the Proceedings of the Colorado Scientific Society, and one on the mode of igneous intrusion in the La Plata Mountains was prepared for the section of volcanology of the American Geophysical Union. A paper on the petrologic results of a study of the minerals from the Tertiary volcanic rocks of the San Juan region was also completed for outside publication. A report on the geology of the Pine River dam site was prepared for the Reclamation Service. Geologic mapping was done in a portion of the Yampa coal field, in the Elkhead Creek, Pilot Knob, Daton Peak, and Mount Harris quadrangles.

Delaware.—See Maryland (Chesapeake & Delaware Canal).

District of Columbia.—A geologic map of the District of Columbia, with descriptive text, is in preparation for Survey publication.

Florida.—An investigation of the physical geography of Florida was made in cooperation with the Florida Geological Survey. A report on the fauna of the Alum Bluff group of Florida was completed for publication and the report on phosphate investigations in Florida, is nearing completion for official publication. A paper on mollusks of the Tampa and Suwannee limestones of Florida was transmitted to the Florida Geological Survey, and a description of seven new species and one new subspecies of mollusks from the Choctawhatchee formation of Florida was prepared for publication in some outside journal. A paper on Government prospecting for phosphate in Florida will be published by the American Institute of Minng and Metallurgical Engineers.

Georgia.—A detailed geologic study of the geology and mineral resources of the Pine Log quadrangle, including manganese ores, ocher, limonite, and barite, was begun. A report on the Coastal Plain of Georgia is being prepared in cooperation with the Georgia Division of Mines, Mining, and Geology, Department of Natural Resources. A paper on some gold deposits of Georgia was prepared for the committee on processes of ore deposition, National Research Council.

Idaho.—In cooperation with the Idaho Bureau of Mines, investigations of the geology and ore deposits were made in the Atlanta-Rocky Bar mining district, the Florence mining district, the Coeur d'Alene dry belt, and Kootenai County, and a study of the placer deposits of central Idaho was continued. The paleontology and stratigraphy of the Carboniferous formations of south-central Idaho were studied. The report on the Edwardsburg-Thunder Mountain district was sent to the Idaho Bureau of Mines and Geology for publication. Reports on the Atlanta, Warren, Florence, and Murray mining districts and on the Boise Basin were nearing completion at the end of the year, and one on the geology and mineral resources of an area around Freedom was begun. Papers on the significance of amygdules in Columbia River lava, "Modern Forty-Niners", the influence of structure on deposition in the Boise Basin, the Clark Fork-Sandpoint porphyry belt, and the genetic features of the Idaho batholith were prepared for publication outside of the Survey, and one on bedding veins near Murray was prepared for the volume on ore deposition to be published by the National Research Council. Studies of the glacial geology and physiography of portions of eastern Idaho and of the geology and ore deposits of the Borah Peak quadrangle were continued. Mapping in the Irwin quadrangle was begun, and progress was made on reports on the geology and ore deposits of south-central Idaho, on Idaho mining districts, and on the geology and mineral resources of the Paradise and Ammon quadrangles, in southeastern Idaho.

Illinois.—A geologic investigation was made in the southern part of Illinois and Indiana included in the flood area in the Ohio Valley. A report on geologic factors in the interpretation of fluorspar reserves in the Illinois-Kentucky field, was published by the Geological Survey as Bulletin 886–B. One of the Cave in Rock fluorspar district, prepared in cooperation with the Illinois Geological Survey Division, was transmitted to that organization for publication. A paper on the origin of bedding replacement deposits of the Illinois fluorspar field was published in Economic Geology.

Work on the late David White's report on the Pottsville flora of the Eastern Interior Basin, mainly in Illinois, was continued. Preparation of a paper on the Fusulinidae of the Pennsylvanian formations of Illinois, for publication by the State, was continued.

Indiana.—A report to be known as part 3 of the flora of the New Albany shale of Indiana and Kentucky and one on new crinoid genera from the Mississippian of Indiana were in preparation. The Ohio Valley investigation and the report on the Pottsville flora of the Eastern Interior Basin are mentioned under Illinois.

Kansas.—In cooperation with the Geological Survey of Kansas, an investigation of the rocks generally designated the "Mississippi lime" that are found in deep wells in the oil and gas fields in southeastern Kansas was continued. A report on the geology and coal resources of the southeastern Kansas coal field in Crawford, Cherokee, and Labette Counties and one on Pennsylvanian invertebrate faunas were transmitted to the Kansas Geological Survey. Some oil centers in Kansas, Oklahoma, and Texas were visited to collect data in connection with a comprehensive report on source beds of petroleum. Studies of the lead and zinc deposits of southeastern Kansas included in the Tri-State district are mentioned under Oklahoma.

Kentucky.—See Indiana (New Albany shale) and Illinois (Ohio Valley investigation and report on the Pottsville flora).

Maine.—A paper on Graftonite from Greenwood, Maine, was published in the American Mineralogist.

Maryland.—A report on the Upper Cretaceous deposits of the Chesapeake & Delaware Canal of Maryland and Delaware was completed for publication by the Maryland Geological Survey. Examinations of the geology of the Savage

River dam sites were made for the district engineer of the War Department. In informal cooperation with the Maryland Geological Survey, geologic examinations were made in portions of Frederick County, and the geology of the Westminster quadrangle was reviewed. A paper on *Crassatellites* from the St. Marys formation was submitted for outside publication.

Massachusetts.—In connection with a general study of the granites of New England, investigations were made of areas around Chelmsford, Westford, and Graniteville.

Michigan.—A resistivity survey in some of the oil districts near Lansing was made by members of the geophysical section in cooperation with the State geologist, division of geology, Department of Conservation of the State of Michigan. Studies of Devonian fossils and stratigraphy of Michigan were continued.

Mississippi.—Studies of the Upper Cretaceous deposits of northern Mississippi in connection with a revision of the geologic map and a report on the stratigraphy of the State were in progress. A report on the geology of the Jackson area was in preparation for Survey publication. Examinations were made in connection with the drilling of a deep test well (State of Mississippi fee no. 2 well) for oil and gas by the State on State-owned land near Jackson, and a report on cores and cuttings from the well was prepared for the Mississippi Mineral Lease Co nmission, Jackson. A report on the well was also prepared for the Mississippi Geological Survey. A report on the gas reserves and probable life of the Jackson gas field was made to the Public Works Administration. A paper on the Prairie Bluff chalk and Owl Creek formation was prepared for publication by the American Association of Petroleum Geologists.

Missouri.—Progress was made on an official report on the stratigraphy and fauna of the Louisiana limestone and on a paper for outside publication on the Warsaw fauna (Mississippian) of the Joplin district.

Montana.—Geologic mapping of the geology and mineral resources of the Little Rocky Mountains and adjoining regions in Phillips and Blaine Counties was continued, and an investigation made of the geology of the Fort Belknap Indian Reservation. General reconnaissance studies of the physiography and glacial geology of portions of western Montana, northwestern Wyoming, and eastern Idaho were continued, and in cooperation with the National Park Service an investigation of the geologic features of Glacier National Park was made and a report prepared for the Park Service. The study of the Fort Union and associated formations of North Dakota, Montana, and Wyoming was continued. A study of scarps and other evidences of Pleistocene and Recent faults in southwestern Montana was in progress. The report on the geology and ore deposits of the Libby quadrangle was nearly completed, and one on the structure and stratigraphy of the Black Hills rim, Montana and Wyoming, was in progress. The report on the geology and mineral resources of north-central Chouteau, western Hill, and eastern Liberty Counties was issued as Bulletin 847–F. Work on a paper on suggested correlations of the Lance and Fort Union formations in Montana, North Dakota, and South Dakota was continued. Papers on the following subjects were submitted for outside publication: Quartz monzonite and related rocks of the Libby quadrangle; a new locality for Middle Cambrian fossils near Noxon; helvite from the Butte district; amphibolization of sills and dikes in the Libby quadrangle; asymmetric distribution of stream terraces in southeastern Montana; and fossil plants from the Colgate sandstone and adjacent strata.

Nevada.—Geologic field mapping was completed and reports were in progress on the Comstock lode at Virginia City and on the general geology and ore deposits of the Hawthorne and Tonapah quadrangles. Geophysical studies were made at Mineral Hill, Spring Valley, Caliente, Delamar,. Hawthorne, and Comstock.

Preparation of a report on the Basin Ranges was continued. An abstract of a paper on the Slumbering Hills was published in Economic Geology, and a paper on the geology of the Searchlight district, Clark County, was transmitted to the Nevada State Bureau of Mines for publication. Other papers were prepared on early Jurassic orogeny in west-central Nevada; Triassic and Jurassic rocks of the Hawthorne and Tonopah quadrangles; and recent fault scarps in the western part of the Great Basin, Nevada and California, for the Geological Society of America; and on the Pennsylvanian-Permian boundary in southern Nevada, for the American Association of Petroleum Geologists.

New Hampshire.—In connection with a study of the granites of the New England States, investigations were conducted at Concord.

New Jersey.—Papers on bentonite in the Upper Cretaceous of New Jersey and on the stratigraphic significance of *Kummelia*, a new Eocene bivalve genus from New Jersey, were submitted for publication in outside periodicals.

New Mexico.—Study of the geology and ore deposits of the Little Hatchet Mountains, in cooperation with the New Mexico Bureau of Mines, was continued. An area in Rio Arriba County not previously mapped, on the east side of the San Juan structural basin, including land-grant and Indian lands, was studied with particular reference to coal and oil resources, including the coal-bearing Cretaceous rocks of the Lumberton-Monero area. Official reports covering these recent investigations, together with earlier investigations in this basin and on the geology and potash resources of the Potash Mines area, were in progress. A report on the geology of the Zuni Dam was made for the Office of Indian Affairs. A paper on the geologic significance of a geothermal gradient curve for the Dooley No. 7 well will be published by the American Association of Petroleum Geologists.

New York.—Reports on the structure and gas possibilities of the Oriskany sandstone in Steuben, Yates, and parts of adjacent counties, and on Pleistocene diatoms from Long Island were completed for Survey publication. Progress was made on a report on talc in the Gouverneur district, field work for which was done under Public Works allotment in 1934. Other papers were in preparation on the geology of the Clove and Millbrook quadrangles for Survey publication, on the structural petrology of these quadrangles for outside publication, and a paper on fossil plants inclosed in pyrite nodules from the Tully (Devonian) limestone, also for outside publication.

North Carolina.—A report for Survey publication on Mollusca from the Miocene and lower Pliocene of Virginia and North Carolina, with notes on the stratigraphy, was advanced; and one on Foraminifera, diatoms, and mollusks from test wells near Elizabeth City was completed. Papers were submitted for outside publication on a new subspecies of *Pecten* from the upper Miocene of North Carolina; sphalerite from a pegmatite near Spruce Pine; and the molluscan fauna of the Pliocene Croatan sand of North Carolina. Others were in preparation on Pleistocene fossils from a well at Hatteras and Miocene diatoms from Hamilton Wharf.

North Dakota.—For work on the Fort Union and associated formations, see Montana. Progress was made in the compilation of material for a geologic and topographic map of the State. The report on the geology and coal resources of the Minot area was in preparation.

Ohio.—Several places along the Ohio River were visited in connection with a geologic investigation of the flood area in the Ohio Valley. A paper on Devono-Carboniferous stratigraphy and faunas from Ohio and Pennsylvania was in preparation. Deep-well drilling is reported under Pennsylvania.

Oklahoma.—An investigation was begun of the geologic structure, stratigraphy, and petroleum possibilities of an area adjoining Black Knob Ridge in and near the west end of the Ouachita Mountains. Field and office work on an investigation of the subsurface geology and oil and gas resources of Osage County was

continued, and a report covering Tps. 22 and 23 N., Rs. 10 and 11 E., was completed for Survey publication. The report on the geology and mineral resources of the Howe-Wilburton district was completed for publication as Bulletin 874–D. A report on the geology and fuel resources of the McAlester district was issued as Bulletin 874–A, and one on the Quinton-Scipio district is in press as Bulletin 874–C. Reports were in progress on the stratigraphy and fauna of the Morrow formation, the stratigraphy and Mississippian faunas of the Wyandotte quadrangle, the fauna of the Moorefield formation, and the flora of the coal beds of eastern Oklahoma. Work in the Missouri, Kansas, and Oklahoma lead and zinc areas, including detailed areal mapping, studies of mines and stratigraphy, and structure contour mapping, was continued. Papers on the Black Knob Ridge and on the Verden sandstone, an exposed shoestring sand of Permian age, were prepared for the American Association of Petroleum Geologists. An abstract of a paper on the stratigraphy of the pre-Carboniferous rocks of Black Knob Ridge was published in the Digest of the Tulsa Geological Society. Papers on the origin and distribution of the Bartlesville and Burbank shoestring oil sands in parts of Oklahoma and Kansas and on new shoestring oil fields expected in Osage County, Okla., and Cowley and Butler Counties, Kans., were submitted to the American Association of Petroleum Geologists for publication, and one on physical characteristics of the Bartlesville and Burbank sands in northeastern Oklahoma and southeastern Kansas was published in the bulletin of the American Association of Petroleum Geologists. Work on source beds of petroleum is mentioned under Kansas.

Pennsylvania.—Reports are in preparation on the geology and mineral resources of the Honeybrook and Phoenixville quadrangles and, in cooperation with the Pennsylvania Geological Survey, on the York and Hanover quadrangles. Studies of the regional metamorphism in the lower Kittanning coal beds of western Pennsylvania were continued. Studies were also made of the stratigraphy and flora of the Pocono formation of West Virginia and Pennsylvania; the structure of the northern anthracite coal basin; and deep-well drilling in the Appalachian region. A paper on the structure of the Honeybrook uplift will be published by the Geological Society of America.

South Carolina.—A paper on massive low-fluorine topaz at the Brewer mine was submitted to the American Mineralogist, and one on an extraordinary topaz replacement body in the Brewer mine was submitted to the American Geophysical Union for publication. A paper on Pliocene and Pleistocene mollusks from the Intracoastal Waterway in South Carolina was prepared for publication, and one on the Pleistocene Horry clay and Pamlico formation near Myrtle Beach was submitted to the Washington Academy of Sciences. (See also Southern Appalachians.)

Southern Appalachians.—The report on gold deposits of the southern Appalachians, including areas in Virginia, North Carolina, South Carolina, Georgia, and Alabama, was completed for Survey publication.

Tennessee.—A report on limestone for concrete aggregate for a dam near Chattanooga was prepared for the Tennessee Valley Authority.

Texas.—Studies of the structure, stratigraphy, and fossils of the Navarro group; the faunas of the Rio Grande embayment of Texas and adjacent regions in Mexico; the geology of the Sierra Diablo region, west Texas; and the stratigraphy, geomorphology, and structure of the southern Guadelupe Mountains were continued. A geologic map of Texas was issued. The report on the brown iron ores of east Texas was transmitted for Survey publication, and reports on the geology and ore deposits of the region around Terlingua and of the Shafter silver district were completed. Reports on new fusulinids from the Cisco group (Pennsylvanian) of the Brazos River region, on Guadalupe faunas, a revision of

Professional Paper 58, and on water possibilities in the El Paso district as determined by geophysical methods were in preparation. A correlation chart of the Cretaceous formations of the Atlantic and Gulf Coastal Plain and west Texas was completed for the National Research Council. Papers were prepared for outside publication on structural features of the quicksilver lodes of the Terlingua region, for the committee on processes of ore deposition of the National Research Council; braunite from Mason County, for the American Mineralogist; a sphenolith in the Terlingua district, for the American Geophysical Union; a microscopic study of geothite and hematite in the brown iron ores of east Texas, for the American Mineralogist; and an abstract on Permian rocks of the southern Guadalupe Mountains, for the Digest of the Tulsa Geological Society. Work on source beds of petroleum is reported under Kansas.

Utah.—Geologic mapping of the greater part of the Strawberry Valley quadrangle for the purpose of classifying land as to oil shale, coal, oil, gas, and phosphate, and a study of the stratigraphy was begun. Investigations of the coal resources and oil and gas possibilities of the Hanksville-Caineville district and detailed studies of the structure, igneous rocks, mineral resources, and physiography of the Henry Mountains were continued. Geologic studies of the Marysvale district were continued, and a preliminary report on the alunite deposits of the region was submitted for Survey publication. A general geologic reconnaissance of the plateau country of southern Utah, including Zion Canyon, was in progress. A report on the geology of the area between the Green and Colorado Rivers in Grand and San Juan Counties was completed for Survey publication. The report on the geology and mineral resources of the Randolph quadrangle, Utah and Wyoming, is nearing completion. Reports on the geology of the Green River Desert-Cataract Canyon region; the structure of southeastern Utah; the Cretaceous-Eocene boundary in cental Utah; and iron ores of Bull Valley were in preparation.

Vermont.—Progress was made on the study of the metamorphic rocks in east-central Vermont, in cooperation with the Geological Society of America. Granites of Vermont were studied in connection with the general investigation of granites of the New England States.

Virginia.—The report on the titanium deposits in Nelson and Amherst Counties was nearly completed. Geologic work was done in the Galax and Independence quadrangles and adjoining portions of the Max Meadows and Speedwell quadrangles in connection with the cooperative report on the geology of the Gossan Lead, to be published by the Virginia Geological Survey. For work on gold deposits, see Southern Appalachians.

Washington.—Investigation of the areal geology, mineral resources, and mines of the Metaline quadrangle, Pend Oreille County, was continued. A paper on inesite from Quinault was submitted for outside publication.

West Virginia.—Studies of the flora of the Pocono formation of West Virginia and of the Pottsville floras along the New River were in progress. Deep-well drilling is mentioned under Pennsylvania.

Wyoming.—Areal and structural geologic mapping of portions of Park and Hot Springs Counties on the west side of the Big Horn Basin, with particular reference to coal and petroleum resources, and a study of the coal, oil, and gas resources of portions of the northeast side of the Big Horn Basin in Big Horn County, Wyo., and Carbon County, Mont., were in progress. Further investigations of the Tertiary rocks of the Green River and Bridger Basins and Fossil syncline and of the geology and mineral resources of the Afton quadrangle were begun. Reports on the geology and oil and coal resources of the Cody-Pitchfork area, the geology of the northeastern part of Big Horn Basin, and the geology of the Shoshone area, Park County, were in preparation. Work on the Randolph quadrangle is men-

tioned under Utah; on the Black Hills rim, on the Fort Union and associated formations, and on the physiography and glacial geology, under Montana.

General studies.—General investigations included studies of types and ranks of coal; source beds of petroleum; salt-dome cap rock; Foraminifera of the Cretaceous formations of the Gulf coastal region; Globigerinidae; the genus *Ceratopea;* fossils from the Eocene of the Gulf Province; borderland problems of geology, physics, and chemistry; clay minerals; deep-sea cores collected in 1936 across the North Atlantic Ocean; and a core sample from the deep-sea bottom southeast of New York City.

WORK IN CHEMISTRY AND PHYSICS

Work in chemistry and physics applied to geology is designated geochemistry and geophysics. Much of the chemical work in the Survey consists necessarily of analyses to determine the composition of the rocks, ores, and minerals involved in projects under study by geologists, and the remainder deals with the particular problems of geochemistry. These problems are to determine the abundance and distribution of different chemical elements in the crust of the earth, to explain the origin of natural products, including gases and ores, to classify rocks and minerals, and to describe the decomposition of rocks under weathering agencies. The physical work deals with the physical properties of minerals or of strata in place, such as their thermal or electrical conductivity, their temperature, their porosity, grain size, radioactivity, and compressibility.

The discovery of isotopes—that is, elements of similar chemical properties but of different physical properties—has considerably enlarged the field for chemical and physical study, particularly as related to geology. The results may affect the estimation of geologic time based on the transformation of one element into another, as such estimates require that the particular isotopes undergoing change be determined rather than the total quantities of the elements involved. This field is being developed as rapidly as possible. The use of X-rays, likewise, is now required to explain the real atomic structure of minerals, and hence their physical properties and chemical behavior.

Among materials analyzed in the laboratory during the year were clays from California and other States, alunite from Utah, oil from New Mexico, mercury ore from Kansas, silver ore from Idaho, phosphate rock from California, ocean-bottom samples from the North Atlantic, garnet from North Carolina, alkali brine from Wyoming, and silicate rocks and limestone from many different States. Complete analyses were also made of the minerals actinolite, allanite, biotite, feldspar, graftonite, halloysite, prehnite, rhodochrosite, samarskite, and sodalite. Several drill cores were examined and well cuttings logged. Spectrographic tests were made on different minerals and ores. Crystallographic measurements were made of a number of unusual minerals.

Altogether 4,576 examinations or tests of minerals and rock samples were made. These included tests and identifications of 1,570 specimens for persons not officially connected with the Survey; 1,587 chemical analyses made for geologists and 615 similar analyses made in connection with studies of methods of analysis and geochemical investigations; and 804 tests relating to core samples, well cuttings, and similar materials.

Special mineralogic work included the analysis of several varieties of zinc carbonate (smithsonite). "Fairy stones" from Virginia were investigated; only the altered crystals are usable commercially, as ornaments. The investigation of the stability relations of sodium and ammonium borates was continued with reference to their geologic occurrence. Many samples of garnet, lepidolite, and spinel were purified and prepared for analysis, 16 rocks and minerals from Guam were identified, and 20 crystals of quartz from Arkansas were measured and rare faces and unusual combinations determined.

Among the more important items of work in physics were the testing of activable bleaching clays in several States and geothermal surveys of wells in Oregon and southeastern Illinois. The investigation of bleaching clays has led to a rationalization of that industry. At least two deposits previously extensively surveyed by numerous tests are now in commercial production, and other deposits have been found which will eventually effect a more economical use of the raw materials available.

Dam sites in Oregon were surveyed by electrical conductivity methods.

The geothermal surveys in the lava beds of Oregon revealed the possibility of water-bearing beds of unusual thickness. From the data of existing geothermal surveys, it was estimated roughly that a temperature of 1,000° C. (1,832° F.) would be found at a depth of about 30 miles (48 kilometers) in the crust of the earth.

Many correlations of the physical properties of minerals with their chemical composition were completed during the year, which will make future determinations more rapid and more exact.

The work in chemistry and physics is mainly confined to laboratory investigations. However, field trips were made in New York, Pennsylvania, Virginia, North Carolina, South Carolina, Georgia, Tennessee, Ohio, Illinois, Utah, Wyoming, and Oregon, and papers were presented at regular meetings of the American Chemical Society, the Society of Economic Geologists, the American Geophysical Union, Geological and Mineralogical Societies in Ohio, the American Institute of Mining Engineers, the Virginia Academy of Sciences, and the American Association of Petroleum Geologists.

The following papers were completed during the year:

Fahey, J. J. Determination of mercurous chloride and mercury in mercury ores: Ind. Eng. Chemistry, analytical ed.

Fahey, J. J., with J. J. Glass. Graftonite from Greenwood, Maine: Am. Mineralogist.

Milton, Charles. Contributions to the petrology of the Franklin Furnace quadrangle, New Jersey: Jour. Geology.

Milton, Charles. Open hearth slags (preliminary paper): Am. Inst. Min. Met. Eng. 19th Open Hearth Proc.

Murata, K. J. Hydrogen ion concentration and the formation of copper complexes: Washington Acad. Sci. Jour.

Nutting, P. G. Study of bleach-clay solubility: Am. Assoc. Petroleum Geologists Bull.

Schaller, W. T. Lithium: Industrial Minerals, vol. 2, Am. Inst. Min. Met. Eng.

Schaller, W. T. Borates: Idem.

Schaller, W. T. Crystallography of valentinite and andorite from Oregon: Am. Mineralogist.

Stevens, R. E. Bibliography of reagents for potassium, rubidium, and cesium: Am. Chem. Soc. Jour.

Stevens, R. E., with F. L. Hess, Rare alkali biotite from Kings Mountain, N. C.: Am. Mineralogist.

Stevens, R. E., with J. T. Pardee and J. J. Glass, Low-fluorine topaz from Brewer mine, N. C.: Am. Mineralogist.

Van Orstrand, C. E. Temperatures in the lava beds of east-central and south-central Oregon: Am. Jour. Sci.; abstract: Washington Acad. Sci. Jour.

Van Orstrand, C. E. On the estimation of temperatures at moderate depths in the crust of the earth: Am. Geophys. Union Trans.; abstract, with additional notes: Science Service.

Wells, R. C., with R. E. Stevens. The analysis of pollucite: Ind. and Eng. Chemistry (read at spring meeting of Am. Chem. Soc., Chapel Hill, N. C.).

ALASKAN BRANCH

The work of the Geological Survey in Alaska is directed primarily toward aiding in the development of the mineral resources of the Territory and involves field examinations of the various factors that pertain to these resources, and laboratory and office studies by which the field observations are analyzed and the results made available to the public through reports, maps, and other media. The product of this work is used extensively by Government organizations engaged in other special fields of investigation within Alaska, such as the Forest Service, the Alaska Road Commission, and the Biological Survey. The Survey's maps of Alaska are indispensable in any enterprise concerned with the development of the Territory.

Manuscripts and publications.—During the year seven reports and five maps, including two new editions and two reprints, and four memoranda for the press have been published. Nine reports including maps, one separate map, and reprints of four maps are in course of publication. In addition three manuscript

reports, including maps, are in various stages of preparation for publication. At the end of the year one manuscript report and three maps were partly completed.

Work of the year.—In addition to the routine duties of serving as a central station, seven projects involving new field investigations were carried on during the season of 1936. These field projects included four that were directed primarily to the geologic phases of the investigation of the Territory's mineral resources, two that were primarily topographic, and one that was a general study of recent mining developments in the principal producing camps of the Territory. The areas in which the principal new geologic projects were undertaken were the Glacier Bay district, in the northwestern part of southeastern Alaska; the Alaska Range region, including especially portions of the valleys of the Slana, Tok, and Robertson Rivers; the region adjacent to the Alaska Railroad, including some of the mining camps as remote from that general tract as the Nuka Bay district, in the extreme southern part of Kenai Peninsula, or the quicksilver showings in the Kuskokwim River Valley near Sleitmut; and the mining developments in the Eagle, Fortymile, and Circle districts, in the Yukon region not far from the international boundary. The general study included visits to many of the more important mining centers from southeastern Alaska to western Seward Peninsula, where such diverse deposits as gold placers, tungsten lodes, and tin placers were examined. The topographic projects included semidetailed mapping of extensive areas on Admiralty Island, in southeastern Alaska, and reconnaissance and exploratory mapping in the Alaska Range region at the head of the Copper River, including portions of the valleys of the Robertson and Gerstle Rivers and areas adjacent to the Richardson Highway in the valley of the Delta River and Donnelly Dome.

Two projects not directly involving new field work were the maintenance of a testing laboratory at College, Alaska, where mineral specimens sent in by prospectors can be identified or can be assayed and the results made available for the information of the general public, and the annual statistical canvass of the production of mineral commodities.

In the field season of 1936 the late passage of the Interior Department Appropriation Act for 1937 prevented full utilization of the open season, so that several of the parties were forced to delay beginning effective work until nearly the first of July. Similar conditions existed in 1937. As a consequence, for the field season of 1937 only three parties had been started prior to June 30, though others were organized as soon as practicable after funds became available. Two of the projects are concerned primarily with topographic mapping and one with geologic investigations. One of the topographic projects is in the Copper River region north of the highway between Slana and Nabesna and is planned to cover the tract east of Batzulnetas and north of the Nabesna River, in continuation of the mapping that has been in progress for the last 3 years in this general region. The other topographic project includes detailed mapping of the more productive portions of the known platinum-bearing areas in the vicinity of Goodnews Bay, near the mouth of the Kuskokwim River, followed by reconnaissance mapping of more remote parts of the district continguous to those areas. The geologic project involves study of the known platinum-bearing areas adjacent to Goodnews Bay, with the view of determining the geologic facts as to the origin and character of the mineralization by which the valuable metals were introduced into the country rock, the processes that have subsequently acted on these deposits so as to produce workable placers, the character of the platinum minerals, and the distribution and extent of the deposits that may warrant commercial exploitation.

Among the additional field projects authorized to be undertaken are a geologic examination of the northern and western part of Admiralty Island, in southeastern Alaska, an area that is now yielding gold from its lodes and that may contain

significant deposits of nickel-bearing ores, and a general study of recent mineral developments in the larger, more accessible, mining camps throughout the Territory.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topograhic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

In addition to the routine adjustment of primary control, there has been in progress a general adjustment of both horizontal and vertical control to agree with the standard datums of the United States.

During the year 157 new topographic maps were edited and transmitted for engraving. Editing was also completed on 753 miscellaneous maps, making a total of 910, and 1,848 proofs of maps in course of publication were read.

On June 30, 322 new maps were in preparation for reproduction and 239 were in process of engraving and printing.

In addition to the work incidental to the field work of the branch the compilation of planimetric maps from aerial photographs amounted to 2,765 square miles.

For the conservation branch of the Survey the work of inking, assembling, and preparing for publication was done on 78 maps of river surveys. Twelve such maps were completed and transmitted for lithography during the year.

For the Tennessee Valley Authority the work of inspection and preparing for lithography was done on 450 maps and 561 proofs were read.

For the Bureau of Public Roads the work of preparing the Transportation Map of the United States was continued. Compilation and inking were in progress on 48 sheets, 10 of which were completed. Proofreading and checking was done on 31 sheets. Maps of 5 States, comprising 18 sheets, were published.

FIELD SURVEYS

Abbreviations for projects used below: Federal Emergency Administration of Public Works, "P. W."; Tennessee Valley Authority, "T. V. A." Cooperation with States was continued in about the same amount as in recent years. Topographic surveys were accomplished in 36 States and in Puerto Rico. The mapping of Los Angeles County, Calif., on a large scale was completed.

The status of topographic surveys shows that the United States is now 47.4 percent mapped, the year's increment amounting to 0.3 percent.

Alabama.—In preparation for geologic mapping, Greasy Cove project completed.

Arizona.—At the request of the Office of Indian Affairs, Silver Bell No. 3 15′ quadrangle completed. Payson No. 4 15′ quadrangle continued at the request of the Forest Service. In preparation for geologic mapping, Aravaipa No. 2 15′ quadrangle begun.

Arkansas.—In cooperation with the Geological Survey of Arkansas, Blakemore 15′ quadrangle begun. Poteau Mountain No. 1 15′ quadrangle begun at the request of the Forest Service. Benton No. 4 15′ quadrangle (P. W.) begun.

California.—In cooperation with the State engineer of California, Tobias Peak 30′ quadrangle and Avenal 15′ quadrangle completed. In cooperation with the county surveyor of Los Angeles County, Crystal Lake, Mount Baden-Powell, Swarthout, and Mount Waterman 6′ quadrangles completed. Kramer No. 1, Kramer No. 2, and Kramer No. 4 15′ quadrangles (P. W.) completed. In preparation for geologic mapping, Downieville No. 1 15′ quadrangle begun.

Colorado.—East Denver 2c and East Denver 3b 7½′ quadrangles completed. Mapping without contours from aerial photographs completed for West Denver 4a 7½′ quadrangle and continued for West Denver 1d 7½′ quadrangle in cooperation with the city of Denver. In cooperation with the Colorado Metal Mining Fund, Ward-Sunset mining area begun. In preparation for geologic mapping, Platoro mining area and Summitville mining area completed and Gold Hill area begun. Chattanooga mining area (east), Chattanooga mining area (west), Chattanooga mining area (Ophir and vicinity), Chattanooga mining area (Alta Basin and vicinity) and Chattanooga mining area (Hanson Peak and vicinity) completed (P. W.). At the request of the Forest Service, Bardine No. 2 15′ quadrangle begun. Great Sand Dunes National Monument begun for the National Park Service.

Florida.—St. Augustine 15′ quadrangle (P. W.) completed.

Georgia.—For the Forest Service, Spring Place 15′ quadrangle begun. East Ridge 7½′ quadrangle continued, and Fort Oglethorpe and Coosa Bald 7½′ quadrangles (T. V. A.) begun.

Idaho.—For the Forest Service, Boehls Butte 15′ quadrangle and Newport 30′ quadrangle completed. At the request of the Office of Indian Affairs, Pocatello No. 2 15′ quadrangle continued. Logan No. 3 and Yellow Pine No. 2 15′ quadrangles (P. W.) continued. In preparation for geologic mapping, Wallace special area begun.

Illinois.—Ashmore 15′ quadrangle (P. W.) completed. Lena and New Douglas 15′ quadrangles continued, and Oilfield, Alto Pass, and Monticello 15′ quadrangles begun in cooperation with the Department of Registration and Education of Illinois, Geological Survey.

Louisiana.—The Louisiana Board of State Engineers cooperating, mapping without contours from aerial photographs completed for 7½′ quadrangles within De Ridder, Juanita, Lees Mill, Starks, and Mystic 15′ quadrangles.

Maine.—For the Forest Service, Gorham 15′ quadrangle completed.

Massachusetts.—In cooperation with the Department of Public Works, Division of Waterways, Blue Hills, Norwood, Mansfield, Brockton, Onset, Woods Hole, 7½′ Falmouth, Marion, 7½′ New Bedford, Apponagansett, Sconticut Point, Northfield, Millers Falls, and 7½′ Middleboro 7½′ quadrangles completed and Warwick No. 1, Warwick No. 4, Middleboro No. 1, and Middleboro No. 3 7½′ quadrangles begun.

Michigan.—In cooperation with the State Highway Department of Michigan, Smiths Creek and Goodells 7½′ quadrangles begun and mapping without contours from aerial photographs completed for Marine City, Algonac No. 2, Algonac No. 3, Algonac No. 4, Lake Orion, Romeo, Ray Center, Richmond, Dundee

No. 1, Dundee No. 4, Grosse Pointe No. 2, Grosse Pointe No. 3, Smiths Creek, Goodells, Adair, Rattle Run, Davisburg, Milford No. 1, Wixom, Monroe No. 1, Monroe No. 2, Monroe No. 3, Monroe No. 4, New Haven, Waldenburg, Mount Clemens No. 3, Selfridge Field, Pontiac No. 1, Pontiac No. 2, Pontiac No. 3, Pontiac No. 4, Port Huron, St. Clair, Romulus No. 1, Romulus No. 2, Romulus No. 3, Romulus No. 4, Washington, 7½′ Rochester, Rochester No. 3, Rochester No. 4, Ortonville, Oxford, South Lyon No. 1, South Lyon No. 2, Redford, Wayne No. 2, Wayne No. 3, Wayne No. 4, Wyandotte No. 2, Wyandotte No. 3, Ypsilanti No. 1, Ypsilanti No. 4, and Estral Beach 7½′ quadrangles and begun for Detroit No. 1, Detroit No. 2, Detroit No. 3, and Detroit No. 4 7½′ quadrangles.

Mississippi.—In preparation for geologic mapping, Terry 15′ quadrangle completed.

Missouri.—In cooperation with the Geological Survey and Water Resources of Missouri, Bradleyville, Elmer, Edgar Springs, Fielden, Franks, Hannibal, Springfield 3 S. ½ 15′ quadrangles and Tiffin, Springfield 3b, and Warsaw 2c 7½′ quadrangles completed; Big Piney, Bolivar No. 2, Fordland, Gatewood, Long Lane, Middlebrook, Protem, Richland, Springfield No. 4, Topaz, Vienna, Warsaw No. 3, and Warsaw No. 4 15′ quadrangles continued; Bolivar No. 1, Cabool, Cedar Gap, Doniphan, Exeter, Knoblick, Louisiana No. 4, Macomb, Mountain, Noel, and Raymondville 15′ quadrangles and De Soto SW. ¼, Manchester NW. ¼ and Springfield 4b 7½′ quadrangles begun. Warsaw 3b 7½′ quadrangle (P. W.) completed.

Montana.—Silvertip 30′ quadrangle (P. W.) completed.

Nebraska.—For the National Park Service, Scotts Bluff National Monument completed.

Nevada.—For the Forest Service, Mountain City 15′ quadrangle completed. In preparation for geologic mapping, Mineral Hill No. 4 15′ quadrangle begun.

New Hampshire.—For the Forest Service, Gorham 15′ quadrangle completed.

New Mexico.—In preparation for geologic mapping, Taos 30′ quadrangle completed. At the request of the National Park Service, Bandelier National Monument completed. Jemez No. 1 15′ quadrangle begun for the Forest Service.

New York.—Poughkeepsie and West Point 15′ quadrangles and Tarrytown No. 1 7½′ quadrangle completed in cooperation with the Department of Public Works of New York. Binghamton No. 4 and Saratoga No. 2 7½′ quadrangles (P. W.) completed.

North Carolina.—Blowing Rock 15′ quadrangle (P. W.) completed. Hayesville 7½′ quadrangle (T. V. A.) completed and Peachtree and Andrews 7½′ quadrangles (T. V. A.) begun.

North Dakota.—In preparation for geologic mapping, Lake Upsilon 15′ quadrangle completed. McVille 15′ quadrangle (P. W.) completed.

Oklahoma.—At the request of the Forest Service, Cache 15′ quadrangle and Cache No. 2 7½′ quadrangle completed.

Oregon.—In preparation for geologic mapping, Troutdale 15′ quadrangle completed. For the Forest Service, Mapleton 15′ quadrangle continued.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, Mattawana, Marienville, and Delaware Water Gap 15′ quadrangles completed and Slatington and Coburn 15′ quadrangles begun.

Puerto Rico.—In cooperation with the Commissioner of the Department of the Interior of Puerto Rico, San German, Puerto Real, and Sabana Grande 7½′ quadrangles completed, Moca and Aguadilla 7½′ quadrangles begun.

South Carolina.—In preparation for geologic mapping, Nixonville and Myrtle Beach 15′ quadrangles completed.

Tennessee.—Oswald Dome 7½′ quadrangle (T. V. A.) completed and East Ridge, Charleston, Wauhatchie, Calhoun, East Chattanooga, Fort Oglethorpe, Hooker, 7½′ Chattanooga, Goodfield, Riceville, Parksville, Caney Creek, and Benton 7½′ quadrangles (T. V. A.) begun. For the Forest Service, Spring Place 15′ quadrangle begun. Mapping without contours from aerial photographs completed for Lyles, Texas Hollow, Nunnelly, and Littlelot 7½′ quadrangles (T. V. A.) completed.

Texas.—In preparation for geologic mapping, Tyler No. 4 15′ quadrangle completed. Tyler No. 1 15′ quadrangle (P. W.) begun.

Utah.—In preparation for geologic mapping, the revision and extension of Cottonwood quadrangle completed. At the request of the National Park Service, Cedar Breaks National Monument completed. For the Forest Service, Delano Peak No. 2 15′ quadrangle begun.

Vermont.—In cooperation with the State geologist of Vermont, Barnet 15′ quadrangle continued.

Virginia.—Gerrardstown and Capon Bridge 15′ quadrangles completed and Middletown and Stephens City 15′ quadrangles begun in cooperation with the Conservation and Development Commission of Virginia, Geological Survey.

Washington.—In cooperation with the Director of the Department of Conservation and Development, Union Gap and Hog Ranch Buttes 15′ quadrangles completed. For the Forest Service, Newport 30′ quadrangle completed and Pomeroy 30′ quadrangle begun. Marcus 30′ quadrangle (P. W.) completed.

West Virginia.—Culture revision begun for Wellsville 15′ quadrangle (P. W.).

Wisconsin.—Arkansaw 15′ quadrangle (P. W.) completed.

Wyoming.—Cokeville 30′ quadrangle (P. W.) completed and La Barge 30′ quadrangle (P. W.) continued. For the Forest Service, Leckie No. 1 15′ quadrangle begun.

WATER-RESOURCES BRANCH

The importance of water and of systematic records related to the quantity, chemical quality, and availability of both surface and ground waters becomes greater each year. The growth of the country in population and industry, with consequent increases in demands for water, and especially the continued series of dry years that included the disastrous and widespread droughts of 1934 and 1936, and the recent disastrous floods in different parts of the country, have impressed on the people the controlling importance of water in our surface streams and in underground basins in relation to many of man's activities. The information collected by the Geological Survey is used extensively by many Federal, State, and private agencies. The Public Works Administration, the National Resources Committee, and related activities have found the Survey records and information with respect to water to be invaluable in studies of projects of all classes and in all sections of the country.

Reliable information with respect to supplies of water, both on the surface and in the ground, and to their fluctuations with variations in rainfall is essential to orderly, sound, and economic development along many lines, as in domestic water supplies, irrigation, flood protection, control of pollution, recreational uses, and water-power development.

The investigations by the branch are conducted largely in cooperation with Federal bureaus; State, county, municipal, and other governmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

Federal bureaus.—Investigations of ground and surface water and of the quality of water were conducted for the following Federal bureaus:

Department of Agriculture:
- Bureau of Biological Survey.
- Bureau of Plant Industry.
- Soil Conservation Service.
- Weather Bureau.

Department of the Interior:
- Office of Indian Affairs.
- Bureau of Mines.
- Bureau of Reclamation.
- Division of Grazing.
- National Park Service.
- Division of Territories and Island Possessions.

Department of Justice; Bureau of Prisons.
Department of State.
Federal Power Commission.
National Resources Committee.
Resettlement Administration.
Tennessee Valley Authority.
War Department:
- Office of Chief of Engineers.
- Mississippi River Commission.
- Schofield Barracks.

States.—Amounts aggregating approximately $630,000 were made available by States and municipalities for cooperative investigations of surface water, ground water, and quality of water. In addition to the data obtained as a result of this cooperation, other data having an estimated value of over $140,000 were furnished by individuals and other organizations.

Permittees and licensees of the Federal Power Commission.—At the request of the Federal Power Commission, 30 engineers of the branch have been designated as representatives of the Commission to perform such field work as may be assigned to them by the Commission. The operation of about 290 gaging stations was conducted by the branch or was performed by permittees and licensees under the supervision of the branch in connection with 115 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operation under permits and licenses of the Federal Power Commission in connection with 150 projects.

Division of Surface Water.—The division of surface water conducts investigations of surface water, which consist of the measurement of

the flow of rivers in the 48 States, the District of Columbia, and Hawaii at selected gaging stations where the volume of water is measured and records of stage and other data are collected. In this work 45 States, the Territory of Hawaii, several Federal bureaus and several individuals cooperated in the maintenance of the 3,379 regular gaging stations that were in operation at the end of the year. Records for about 108 additional gaging stations were received from Federal bureaus and from individuals. There were 47,398 regular and miscellaneous discharge measurements made during the year.

Division of Ground Water.—The division of ground water investigates the waters that lie below the surface of the zone of saturation (from which wells and springs are supplied); the source, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected areas where problems of water supply are urgent, and the results are prepared and released to the public. Each year a water-supply paper is published that gives the current records of water levels or artesian pressure in observation wells in different sections of the country. During the fiscal year 75 technical reports or papers relating to ground water or reservoir sites were released to the public. Work was done in 30 States and in Guam and in Hawaii. Nearly all the work was done in cooperation with Federal, State, Territorial, or local governmental agencies.

Division of Quality of Water.—The division of quality of water analyzes water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health), so far as use is affected by the dissolved mineral matter. The partial or complete analysis of 1,754 samples of water was completed during the year. Close cooperation was continued with the division of ground water in the study of problems relating to quality of ground water and the preparation of the parts of ground-water reports that involve consideration of the chemical character of the waters.

Division of Power Resources.—The work of the division of power resources comprised the compilation and publication of the annual report on the capacity of water wheels in water-power plants in the United States of 100 horsepower or more on January 1, 1937. The report was released in April. The report on the capacity of water wheels January 1, 1938, will be prepared and published by the Federal Power Commission. The compilation and publication of the monthly and annual reports of the production of electricity for public use and the consumption of fuel in generating the electricity reported, which

had been done by the power-resources division from 1919 to 1936, were transferred to the Federal Power Commission on July 1, 1936. A study is being made of the records of power production from 1920 to 1935. These studies are based on the records compiled by the Geological Survey and published by the Federal Power Commission as Power Series No. 6 of the National Power Survey.

Division of Water Utilization.—The division of water utilization investigates problems affecting the utilization and control of the waters of streams, makes studies for the interpretation of records of stream flow, and performs administrative work relating to supervision and investigation of these problems and to activities conducted by the field organization of this branch pertaining to power projects of the Federal Power Commission and of the Interior Department. The division supervised and coordinated the collection by the district offices of the division of surface water of special stage and discharge information relative to the outstanding floods of March 1936 in the Northeastern States and to notable floods in Texas. The division assembled these flood data, together with data for other recent notable floods, and prepared reports thereon for publication as water-supply papers. The reports that were completed during the year are listed below:

Water-Supply Paper 796–B. Flood on the Republican and Kansas Rivers in May and June 1935, by Robert Follansbee and J. B. Spiegel.

Water-Supply Paper 796–C. The New Year's flood of 1934 in La Cañada Valley, California, by H. C. Troxell and J. Q. Peterson.

Water-Supply Paper 798. Floods of March 1936, Part 1, New England rivers.

Water-Supply Paper 799. Floods of March 1936, Part 2, Hudson River to Susquehanna River region.

Water-Supply Paper 800. Floods of March 1936, Part 3, Potomac, James, and upper Ohio Rivers.

Water-Supply Paper 816. Major floods in Texas in 1936, by Tate Dalrymple and others.

The Division has been active during the year in investigations of water problems along the international boundary between the United States and Canada for the State Department and also in the collection of information on recent outstanding floods in the Ohio and Mississippi Valleys.

CONSERVATION BRANCH

The work of the Conservation Branch involves surveys and investigations precedent to an inventory of the water and mineral resources of the public domain, supervision of private operations for development of power and production of minerals from public and Indian lands, and supplying information and advice to numerous land-administrative agencies of the Government.

The first of these activities remained nearly at a standstill for lack of funds for field explorations, but a small increase of appropriation

permitted better and quicker service to be given to land-administrative agencies, there being a decrease of 33 percent in cases pending at the end of the year, though the annual volume of work had increased 23 percent.

An increase in appropriations for mineral-lease supervision permitted reasonably prompt action to be taken on proposed plans for cooperative or unit development of oil fields and somewhat better supervision of production operations. At the end of the year 1,343 plans of development and operation had been received and only 42 of these were awaiting original technical consideration in the branch. The volume of work under field supervision, which has regularly shown an annual increment, again advanced materially. On public land alone 85 operating properties were added to the total number under supervision, production increased between 5 and 10 percent, and revenue increased to about $6,300,000. The funds available have never been adequate for supervision of these vast operations, and during this year, as in other years, revenue far in excess of the appropriation has been lost because of inability to make timely inspection of field properties and make sure that operations are so conducted as to accomplish the greatest ultimate production and effective current beneficial use of the mineral resources involved.

In addition to their regular activities members of the Branch were engaged on related projects under the auspices of the Public Works Administration. Useful conservation work was thus accomplished, employees who otherwise must have been furloughed for lack of funds were continued in service, and emergency employment was given to many engineers, clerks, and laborers.

MINERAL CLASSIFICATION DIVISION

The work of the Mineral Classification Division, restricted largely to office procedure, although less than in previous years, was delayed in part by lack of geologic information due to scanty field investigations. The activities of the Division were directed in considerable part to determining the areas subject to inclusion in plans for unit or cooperative development submitted by holders of Government oil and gas prospecting permits and leases.

In the aid of mineral classification pertinent information relating to the occurrence of carbon dioxide gas in California, New Mexico, and Utah; of coal in Montana, New Mexico, Utah, and Wyoming; of oil and gas in Alabama, Arkansas, Colorado, Florida, Kansas, Louisiana, Mississippi, Montana, New Mexico, Oklahoma, South Dakota, Utah, and Wyoming; and of phosphate in Wyoming was obtained either by the personnel of the Mineral Classification Division or through the geologic branch.

In the routine work of the Division, 8,937 cases requiring technical consideration were disposed of during the fiscal year.

In addition to the preceding work, revisions of the definitions of the known geologic structure of two producing oil and gas fields were prepared and promulgated as follows:

Definitions of Known Geologic Structure, Fiscal Year 1937

State	Field	Date promulgated	Acres
New Mexico	Eaves	Apr. 10, 1937	8,074
Wyoming	Rex Lake	Apr. 5, 1937	1,280

The aggregate area of the outstanding definitions of the known geologic structure of oil and gas fields on June 30, 1937, amounted to 1,155,253 acres in California, Colorado, Montana, New Mexico, North Dakota, Oklahoma, Utah, and Wyoming.

WATER AND POWER DIVISION

The work of obtaining basic information as to the water-power resources and storage possibilities of public lands and of making it available for use in the administration of public-land laws and by Federal and other agencies engaged in planning, constructing, and operating water-power projects was continued in the field, being made possible by the extended availability of Public Works funds. River-utilization surveys covering 1,261 miles of important streams and tributaries were made in 11 public-land States. Surveys of reservoir and dam sites embracing an area of 155 square miles were also completed. Supplemental geologic and geophysical studies of foundation materials and conditions were made at 61 dam sites.

Office activities included action resulting in the addition of 100,699 acres to outstanding water-power reserves in 12 public-land States and the elimination of 17,507 acres from such reserves in 7 States, with a net increase of the total reserved area in 22 States to 6,583,439 acres. The elimination of 260 acres from reservoir-site reserves left a net total of 133,444 acres withdrawn. One restoration of lands withdrawn under the act of October 2, 1888, was also made. Field supervision of power projects for the Federal Power Commission involved investigations and reports on 9 projects, supervision of construction and operation on 148 projects, and studies of cost accounting on 9 projects. Field supervision of power projects holding permits and grants from the Interior Department involved 172 projects, making a total of 320 projects for the Interior Department and the Federal Power Commission.

Statistics compiled by the division show that the holders and users of rights of way granted by the Secretary of the Interior for power

purposes had, for the calendar year 1936, an aggregate installed capacity of 4,852,841 horsepower, including 3,300,704 horsepower at hydraulic plants and 1,552,137 horsepower at fuel plants, and an aggregate energy generation of 11,468,380,623 kilowatt-hours, which is an increase of 44 percent over the production in the next preceding year. The energy generated by water power increased 3,118,916,918 kilowatt-hours, or about 45 percent, and that generated by fuel increased 388,074,113 kilowatt-hours, or about 38 percent. Revenues accrued to the Government from these grants aggregated $236,211 from 1912 to 1936, and $12,814 additional has been assessed for the calendar year 1937. Payments for unauthorized occupancy of public lands by power projects prior to the issuance of license therefor by the Federal Power Commission amount to $101,633 additional.

MINING AND OIL- AND GAS-LEASING DIVISIONS

The work of the mining and oil- and gas-leasing divisions consists of inspectional and regulatory supervision of mineral prospecting and development on public lands, Indian lands, and naval petroleum reserves.

The mining division is charged with supervision of all operations for the discovery and development on public lands of deposits of coal, phosphate, sodium, potassium, and oil shale; in New Mexico and Louisiana of sulphur; on certain land grants of gold, silver, and mercury; and on restricted allotted and tribal Indian lands of all minerals except oil and gas. This supervisory and regulatory work during the fiscal year was accomplished through six field offices in Colorado, Montana, New Mexico, Oklahoma, and Utah, and through a cooperative agreement approved May 4, 1935, with the Department of Mines, Territory of Alaska.

The work of the Oil and Gas Leasing Division includes inspectional and regulatory supervision of all operations for the discovery and development of petroleum and natural gas on public lands of the United States, on naval petroleum reserves, and on all Indian lands subject to departmental jurisdiction, both tribal and allotted, except the Osage Reservation, Okla. The work was accomplished in the fiscal year 1937 through the agency of 13 field offices and sub-offices at Taft, Calif.; Roswell and Farmington, N. Mex.; Tulsa and Oklahoma City, Okla.; Wichita Falls, Tex.; Denver, Colo.; Casper, Midwest, and Thermopolis, Wyo.; Billings and Shelby, Mont.; and Salt Lake City, Utah.

Public lands.—The number of public-land properties under supervision of the Oil and Gas Leasing Division increased 8.6 percent, to a total of 9,052, involving 12,485,167.59 acres in 17 States and Alaska.

With the aid of funds allotted by the Public Works Administration the Division was enabled to continue important conservational and

remedial measures through the proper plugging and conditioning of many old abandoned wells. The results of this work are outlined more fully under the heading "Public Works projects."

A substantial part of the time of the personnel of the Division was devoted to assisting oil and gas permittees in fulfilling departmental requirements for the submission of unit or cooperative plans of operation and development involving permit acreage, and to reviewing and revising the engineering and royalty features of such plans after their submission. At the end of the fiscal year 1937 a total of 1,343 plans of unit or cooperative development for oil or gas pools, fields, or areas involving public land had been filed with the Geological Survey, of which 47 had been given final approval by the Secretary of the Interior, 1,145 had been rejected, withdrawn, or suspended, 201 had been reviewed and returned to their proponents for revision and consummation, and 161 were pending final action, including 42 which were awaiting technical consideration in the Conservation Branch.

The Oil and Gas Leasing Division formulated the revised oil and gas operating regulations, effective November 1, 1936, which established a uniform basis of regulation for the development and production of the oil and gas resources on reserved and unreserved public lands of the United States, including naval petroleum reserves, and on all restricted Indian lands, tribal and allotted, except those of the Osage Indian Reservation.

Drilling activity on public lands during the fiscal year 1937 included the commencement of 333 new wells and the completion of 344 wells, of which 257 were rated as productive of oil and gas and 87 as barren. The total number of wells under supervision on June 30, 1937, was 7,934 in 17 States and Alaska, including 4,112 capable of oil or gas production. The production of petroleum, natural gas, and natural gasoline from public lands in 1937 was substantially greater than in other recent years, and the revenues accrued therefrom were materially increased.

Coal properties under supervision in 14 States and Alaska decreased 37, to 657; potash properties in 8 States decreased 56, to 39 in 3 States; sodium properties in 9 States increased 4, to 44; sulphur properties in 1 State decreased 8, to 18; phosphate properties increased 2, to 11; and the oil-shale lease remained at 1 in 1 State. The total number of properties under supervision was 770, a decrease of 95, substantially all of which were inactive. The reduction in coal properties resulted indirectly from the Secretary's instructions of January 24, 1934, and that in potash properties from the Secretary's orders 799, 817, 854, and 914, all of which tended to slow down the issuance of new permits and leases. In prospecting for the above-named minerals 16 bore holes were drilled during the year.

Accidents to employees working in mines under departmental leases are generally fewer than in competitive mines not on Government lands, and it is gratifying to note that of the 33 awards made to coal mines or to operators by the Joseph A. Holmes Safety Association for the calendar year 1936 two were made to departmental lessees. The use of safety appliances and safety clothing is increasing generally throughout mines on Government lands.

Indian lands.—The Secretary's order 1112, approved September 4, 1936, which relates to oil and gas operations and which constitutes a new cooperative agreement between the Geological Survey and the Office of Indian Affairs, extended the cooperative technical supervision and the royalty-accounting duties of the Geological Survey to embrace all tribal and restricted allotted lands within the limits of all Indian reservations except the Osage Nation. Oil and gas supervision involved 5,342 leaseholds, 4,463 wells, and aggregate bonus, royalty, and rental accruals estimated at $2,665,000 for Indian beneficiaries in 10 States and 30 different tribes. The cooperative duties involved royalty accounting, appraisals of bonuses, royalty offers, and pollution damages, assistance to lessees of Indian land on operating problems and in the preparation of unit plans of development, and assistance to agency officials and tribal councils on technical phases of leasehold development and administration.

Mining supervision involved 40 lead and zinc leaseholds in the Quapaw Reservation, Okla., with aggregate royalty accruals of $568,299.94, an increase of 57.54 percent from the preceding year; 57 coal leaseholds involving Choctaw, Chickasaw, and Five Tribes lands in Oklahoma, with an aggregate production decreased from 568,725.92 tons in 1936 to 527,579.75 tons in 1937; and revenue accruals from royalties, bonuses, and sale of coal lands amounting to $89,308.31; one asphalt lease involving segregated Choctaw and Chickasaw lands in Oklahoma; and 51 properties in other States, 18 of which are agency mines. It included also special investigations of 18 properties for minerals other than fuels.

Naval petroleum reserves.—On behalf of the Navy Department supervision was continued during the fiscal year over operations for the production of oil and gas within Naval Petroleum Reserves Nos. 1 and 2, in California, and for the conservation of shut-in production within Naval Petroleum Reserve No. 3, in Wyoming. Production from 538 wells on the reserves aggregated 3,567,213.54 barrels of petroleum, 2,816,073,000 cubic feet of natural gas, and 11,076,165,000 gallons of natural gasoline and had an aggregate royalty value of $787,906.64.

PUBLIC WORKS PROJECTS

Under the supervision of the conservation-branch personnel, aggregate expenditures of $165,286.47 were made during the fiscal year 1937 from funds allotted by the Administrator of Public Works for field investigation in conservation work pertinent to branch functions. On 11 projects $109,423.36 was expended for river-utilization surveys of power and storage resources of important streams in 11 States. On 12 projects $55,863.11 was expended in 9 States in the plugging and abandonment or conditioning for use as a source of water of numerous wells drilled for oil and gas on public lands and theretofore improperly abandoned or merely deserted; in extinguishing or controlling coal-outcrop fires and in filling, bulkheading, or otherwise safeguarding abandoned mines or prospective openings on public and Indian lands; and in surface studies of coal occurrence and subsurface studies of oil and gas occurrence in Indian lands in Oklahoma.

SUMMARY OF FIELD ACTIVITIES, BY STATES

Alabama.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification. Examined 1 tract in Franklin County for purposes of mineral classification. Supervised 1 coal lease.

Alaska.—Supervised 1 power project, 144 prospecting permits for oil and gas, and 2 leases, 2 licenses, and 9 prospecting permits for coal.

Arizona.—Completed 162 miles of river-utilization surveys on Black Creek, the Little Colorado River, and the Rio Puerco, and surveyed in detail 44 square miles in the Cottonwood Wash, Leroux Wash, Lyman, and Zuñi reservoir and dam sites. Made geologic studies of foundation materials and conditions at 6 dam sites. Supervised 25 power projects, 72 prospecting permits for oil and gas, and 3 for coal, 6 for sodium, and 5 for potash on public land, and 4 coal mines on Indian land.

Arkansas.—Investigated oil and gas prospecting operations in northeastern and northwestern Arkansas in aid of mineral classification. Supervised 1 power project and 9 prospecting permits for oil and gas.

California.—Investigated occurrence of carbon dioxide gas in Brawley area, Imperial County. Completed 140 miles of river-utilization surveys on the Carson (including East and West Forks). Trinity, and Yuba (including Middle North and South Forks) Rivers and tributaries, and surveyed in detail 24 square miles in the Beno, Steiner Flat, Trinity Center, Fairview, and Bullards Bar reservoir and dam sites and the Silver Queen, Washington, Governor Stevens, and Spaulding dam sites. Supervised 89 power projects, 223 leases and 1232 prospecting permits for oil and gas on public land and 22 leases on Naval Petroleum reserves, 4 prospecting permits for coal and 23 for sodium, and 1 sodium lease and 2 potash leases.

Colorado.—Completed structural and stratigraphic investigations in the South Park area, Park County. In cooperation with the geologic branch made a reconnaissance investigation of land in southeastern Archuleta County. Completed 111 miles of river-utilization surveys on Buzzard Creek, the Gunnison River, the Little Snake River, Troublesome Creek, and the Yampa River and tributaries; and surveyed in detail 5 square miles in the Buzzard Creek, Columbus

Mountain, and East Fork reservoir sites and the Black Mountain, Middle Fork, North Fork, Stonewall, Three Forks, Walker, and Yampa Nos. 1, 2, 3, and 4 dam sites. Made geologic studies of foundation materials and conditions at 11 dam sites. Supervised 12 power projects, 32 leases, and 691 prospecting permits for oil and gas on public land and 5 oil and gas leases on Indian land; 90 leases, 13 licenses, 38 permits, and 9 awarded lease applications for coal, and 1 sodium lease on public land; and 2 Indian agency coal mines. Dug out and re-covered 2 coal-mine and outcrop fires in Rio Blanco County, under Public Works allotments.

Florida.—Investigated oil and gas prospecting operations throughout the State, including inspection of two drilling operations in Hillsborough County and one each in Lake and Nassau Counties.

Idaho.—Completed 90 miles of river utilization surveys on the North Fork of the Coeur d'Alene and Weiser Rivers and tributaries; and surveyed in detail the Leland Glen reservoir and dam site and the Bumble Bee, Evanville, Hultman Creek, Spion Kap, Teddy Creek, Brown, Lost Valley, and Squaw Flats dam sites. Supervised 32 power projects, 74 prospecting permits for oil and gas, 1 lease and 17 permits for coal, and 2 phosphate leases.

Kansas.—Investigated oil and gas prospecting operations in western Kansas in aid of mineral classification. Supervised 3 leases and 18 prospecting permits for oil and gas.

Louisiana.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised 17 leases and 2 prospecting permits for oil and gas.

Mississippi.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification and examined 1 tract each in Attala, Choctaw, Leake, Montgomery, and Webster Counties.

Montana.—Examined land in the Rattlesnake Butte area, Petroleum County, for mineral classification. In cooperation with the geologic branch initiated structural and stratigraphic investigations in the Little Rocky Mountains area, Phillips and Fergus Counties. Completed 173 miles of river-utilization surveys on the Middle, North, and South Forks of the Flathead River and tributaries and surveyed in detail 14 square miles in the Glacier View and Big Prairie reservoir and dam sites. Supervised 38 power projects; 117 leases and 859 prospecting permits for oil and gas on public land; and 99 leases, 32 permits, and 45 licenses for coal; 7 phosphate leases; 47 oil and gas leases, 2 Indian agency coal mines, and 26 coal and 3 silver-lead-gold leases on Indian land; continued important conservation measures through the plugging and conditioning of abandoned oil wells under Public Works allotments.

Nevada.—Completed 17 miles of river surveys on the Carson River (including East Fork) and Marys River and made detailed surveys of the Heenan Lake, Silver King Nos. 1 and 2, Silver Queen, Soda Springs, Chalk Basin, and Hanks Creek dam sites. Supervised 24 power projects, 81 prospecting permits for oil and gas, 4 coal permits, 1 phosphate lease, 6 sodium permits, and 7 potash permits.

New Mexico.—Continued an areal, stratigraphic, and subsurface structural investigation in Lea County. In cooperation with the geologic branch initiated an investigation of coal and oil resources of the Lumbarton and Monero districts Rio Arriba County. Completed 158 miles of river utilization surveys on the Pecos River, Rio Chama, and San Juan River; surveyed Dead Man's Wash in connection with erosion studies; surveyed 16 square miles in Los Osteros, Cañon de Chama, El Vado, and Lower Abiquiu reservoir and dam sites; and made detailed surveys of the Tecolote and Los Osteros No. 2 dam sites. Made geologic studies of foundation materials and conditions at 5 dam sites and of Dead Man's Wash erosion area; continued operations in connection with plugging oil wells and reconditioning water wells under Public Works allotment. Supervised 3 power

projects; 193 leases and 1,862 prospecting permits for oil and gas on public land; 5 oil and gas leases on Indian land; 24 leases and 23 prospecting permits for coal; 9 prospecting permits for sodium; 9 leases and 70 prospecting permits for potash; and 44 sulphur permits. Supervised on Indian land 73 agency coal mines.

North Dakota.—Supervised 1 lease and 25 prospecting permits for oil and gas; 67 leases, 1 permit, and 18 licenses for coal; and 1 permit for sodium.

Oklahoma.—Investigated oil and gas operations in western Oklahoma for purposes of mineral classification. Supervised 3 power projects, 15 leases, and 93 prospecting permits for oil and gas on public land and 5,252 oil and gas leases on Indian land. Supervised on segregated tribal and restricted allotted Indian lands 33 leases, 21 permits, and 1 temporary mining permit for coal; 1 asphalt lease and 2 right-of-way leases; supervised on Quapaw Indian lands 40 zinc-lead leases.

Oregon.—Completed 131 miles of river-utilization surveys on the Applegate River, Chewaucan River, Deep Creek, Grave Creek, Hood River and tributaries, Nehalem River, and South Umpqua River; and surveyed in detail 5 square miles in the Lower Applegate and Paisley reservoir sites and the Alternate, Cranberry, State, Grave Creek, Elsie, Days Creeks, Shovely and Tiller dam sites. Made geologic and geophysical studies of foundation materials and conditions at 14 dam sites. Supervised 43 power projects, 134 prospecting permits for oil and gas, 1 lease and 4 prospecting permits for coal, 2 sodium permits, 3 potash permits, and 1 oil-shale lease.

South Dakota.—Initiated an areal and structural investigation in Butte and Harding Counties for purposes of mineral classification. Supervised 50 prospecting permits for oil and gas and 6 oil and gas leases on Indian land; 5 leases, 3 permits, and 1 license for coal on public land.

Utah.—Examined land in the Diamond Fork area, Utah County, for purposes of mineral classification. Investigated occurrence of carbon dioxide gas in the Farnham area, Carbon County. Continued stratigraphic and structural investigations in Washington County. In cooperation with the geologic branch initiated a structural and stratigraphic investigation of the Henry Mountains area, Emery, Garfield, and Wayne Counties, and of the Strawberry Valley quadrangle, Utah and Wasatch Counties. Completed 109 miles of river-utilization surveys on the Bear River, Sevier River, and Willard Creek and surveyed in detail 27 square miles in the Otter Creek and Piute reservoir and dam sites. Made geologic studies of foundation materials and conditions at one dam site; continued operations in connection with plugging oil wells and reconditioning water wells under Public Works allotment. Supervised 17 power projects; 25 leases and 884 prospecting permits for oil and gas on public land and 1 oil and gas lease on Indian land; 48 leases, 57 permits, and 2 licenses for coal; 11 sodium permits, 31 potash permits, and 1 phosphate lease.

Washington.—Completed 98 miles of river-utilization surveys on the Cispus, Cowlitz, Sauk, and Toutle Rivers and surveyed in detail 11 square miles in the Mossy Rock and Sauk reservoir sites and the Green River dam site. Made geologic and geophysical studies of foundation materials and conditions at 21 dam sites. Supervised 21 power projects, 12 prospecting permits for oil and gas, 1 lease and 14 permits for coal, 1 sodium permit; 3 silver-gold leases and 4 tungsten leases on Indian lands.

Wisconsin.—Supervised 1 power project.

Wyoming.—Examined land in the West Dewey area, Weston County, and the Smith Creek area, Carbon County, for purposes of mineral classification. In cooperation with the geologic branch continued phosphate investigations in northern Lincoln County; and structural and stratigraphic investigations in the Cody, Pitchfork, and Shoshone districts, Park County, and the east side of the

Big Horn Basin, Big Horn County. Through the geologic branch examined land in the Cottonwood Creek area, Park County, for purposes of mineral classification. Completed 72 miles of river-utilization surveys on the Bear River and Savery Creek and surveyed in detail 9 square miles in the Yellow Creek reservoir site and the Needles and Lower and Upper Savery Creek dam sites. Made geologic studies of foundation materials and conditions at 2 dam sites. Supervised 10 power projects, 477 leases and 1,707 prospecting permits for oil and gas on public land, 24 oil and gas leases on Indian lands, 56 leases, 60 permits, and 22 licenses for coal, 2 prospecting permits for sodium, and 1 permit for potash. Performed technical supervision at Emergency Conservation Camp 858, established for conserving coal deposits.

WORK ON PUBLICATIONS

Texts.—The book publications of the year numbered 57 and contained 5,760 pages. Besides these publications 30 brief papers in mimeographed form were issued as memoranda for the press. During the year 38,785 pages of manuscript were edited and prepared for printing, 1,397 galley proofs were read, and 6,385 page proofs were revised. Indexes were prepared for 39 publications, covering 6,310 pages. Copy and proof or stencils for 580 pages of multigraph or mimeograph matter were read. During the year 22 foreign letters, in German, French, Spanish, Italian, and Portuguese were translated.

Illustrations.—The section of illustrations prepared 2,213 drawings and photographs, transmitted 1,154 illustrations to accompany 44 reports, received and examined 569 proofs, and examined 82 edition prints.

Geologic map editing and drafting.—The geologic map of Texas, scale 1: 500,000 was completed and published. This map is in four parts, each 50 by 40 inches, and is printed in 23 colors, with 108 map units represented by patterns. This map was prepared and drafted, the proof read, and the color printing directed in this section. A total of 213 illustrations, comprising geologic maps, sections, and diagrams, were drawn in the section, and illustrations for 27 papers were edited. Proofs of 18 geologic maps and sections were read.

Distribution.—A total of 353 publications, comprising 57 new books and pamphlets, 96 new or revised topographic and other maps, 199 reprinted topographic and other maps, and 1 geologic map, were received during the year. Several special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 140,802 books and pamphlets and 673,590 topographic and other maps, a grand total of 814,392. The division distributed 101,827 books and pamphlets, 3,413 geologic folios, and 746,820 maps, a grand total of 852,060, of which 3,051 folios and 645,123 maps were sold. The net proceeds (gross collections less copying fees and amounts refunded) from the sales of publications were $37,963.17, including $37,136.32 for topo-

graphic and geologic maps and $826.85 for geologic folios. In addition to this $10,308.74 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were $48,271.91.

Engraving and printing.—During the year 70 newly engraved topographic maps including 4 revised maps, were printed, and 26 special maps, making a total of 96 new maps printed and delivered. Of the newly engraved maps 45 were completed under the Public Works allotment. Corrections were engraved on the plates of 413 maps. Reprint editions of 184 engraved topographic maps and 15 photolithographed State and other maps were printed and delivered. In addition, 81 new topographic maps had been engraved and were in press June 30, including 56 under Public Works allotment, and the engraving of 161 other new topographic maps was in hand, including 93 under Public Works allotment. One new geologic map was printed, the edition amounting to 4,550 copies. Of new and reprinted maps, 296 different editions, amounting to 673,590 copies, were delivered.

A large amount of work was done for 68 other units of the Government and State governments, and the charges for it amounted to about $220,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed.

Transfer impressions numbering 386 were made during the year and the amount turned over to miscellaneous receipts was $179.90.

Of topographic maps, geologic maps, and contract and miscellaneous work of all kinds, a grand total of 3,441,687 copies were printed and delivered.

The photographic laboratory made 16,111 negatives (including 5,408 wet plates for photolithographs, 585 wet plates for photographic prints, 35 paper negatives, 3,010 dry plates, 471 lantern slides, 406 half-tone negatives, and 6,196 field negatives), 23,518 prints (including 2,093 maps and diagrams, 21,010 photographs for illustrations and records, and 415 bromide enlargements), 4,674 zinc plates, 400 intaglio etchings, and 11 celluloid prints and mounted 5,165 prints.

LIBRARY

The library served nearly 10,000 readers during the year, about half of them not members of the Geological Survey. The total number of books, pamphlets, and serial parts circulated amounted to more than 46,000 items. Books borrowed from other libraries for the use of the Geological Survey numbered 1,249, and 1,310 books were loaned to other libraries. Loans to members of the Survey and to other individuals privileged to borrow books increased from 7,299 to 8,537. Nearly 19,000 new books, pamphlets, and serial parts and more than 1,500 maps and charts were received during the year, and more than 10,000 new cards were filed in the catalog.

The most satisfactory feature of the year was the authorization for binding of 1,784 volumes at a cost of approximately $7,000, but the library's urgent needs for binding remain at 17,000 volumes, as of the accessions during the last 2 years many paper-covered volumes are in immediate need of binding.

The bibliography of North American geology for 1935–36 was delivered to the editor in April and is in press as Bulletin 892. The volume contains 4,716 entries, as compared to 3,836 entries in the volume for 1933–34.

During the year some 1,600 Geological Survey reports were transferred from the library to the division of distribution.

APPROPRIATIONS AND EXPENDITURES

The appropriation made directly for the work of the Geological Survey for the fiscal year 1937 included 10 items, amounting to $2,807,817, of which $76,804.88 remained unobligated on June 30, 1937. In addition, $5,000 was allotted from appropriations for the Interior Department for miscellaneous supplies.

Classifications of Obligations Incurred by the United States Geological Survey During the Fiscal Year Ended June 30, 1937

	Salaries	Topographic surveys	Geologic surveys	Alaskan mineral resources	Gaging streams
Salaries of permanent employees	$140,385.69	$591,058.35	$421,393.25	$41,405.87	$848,714.56
Wages of temporary employees		561,957.06	25,796.99	3,800.91	212,918.69
Supplies and materials		13,258.64	6,515.84	629.91	36,107.14
Dead storage of passenger-carrying vehicles		21.31			19.59
Other storage and pasturage of animals		966.15	322.78		175.94
Communication services		1,275.29	339.20	5.56	5,143.60
Travel expenses		114,400.23	29,460.78	10,660.38	112,945.93
Hire, maintenance, repair, and operation of passenger-carrying vehicles		1,182.98	2,045.67		10,521.96
Transportation of things		5,025.27	2,042.60	357.80	8,903.35
Hire, maintenance, repair, and operation of freight-carrying vehicles		53,337.07	6,840.50		33,080.11
Printing and binding		136,352.61	4,451.81	85.99	4,897.80
Furnishing of heat, light, power, water, and electricity					174.90
Rents		39.41	221.13	600.00	3,037.16
Repairs and alterations		7,073.36	3,962.12	156.96	35,488.48
Special and miscellaneous current expenses		78.95	72.70		30.00
Purchase of passenger-carrying vehicles		1,065.93	2,407.80		11,784.77
Purchase of freight-carrying vehicles		1,135.02	4,842.03		13,905.55
Purchase of scientific instruments and parts		70,109.38	5,006.75		40,604.72
Other equipment		14,600.34	3,985.34	1,993.48	34,523.22
Structures and parts					21,221.93
Miscellaneous refunds, adjustments and transfers		104,796.54	463.99	25.00	156,544.29
Total	140,385.69	1,677,733.89	520,171.28	59,721.86	1,590,743.69

Classifications of Obligations Incurred by the United States Geological Survey During the Fiscal Year Ended June 30, 1937—Continued

	Classification of lands	Printing and binding	Preparation of illustrations	Geologic and topographic maps	Mineral leasing	Total
Salaries of permanent employees	$83,284.20		$21,105.10	$240,780.92	$332,646.52	$2,720,774.46
Wages of temporary employees	2,379.95			68.53	55,533.38	862,455.51
Supplies and materials	1,070.42		256.24	59,808.30	3,491.24	121,137.73
Dead storage of passenger-carrying vehicles					55.00	95.90
Other storage and pasturage of animals	132.80				22.00	1,619.67
Communication services	122.03			15.31	2,708.72	9,609.71
Travel expenses	6,402.61			105.22	22,839.65	296,814.80
Hire, maintenance, repair, and operation of passenger-carrying vehicles	1,158.94				12,147.29	27,056.84
Transportation of things	187.25			480.79	2,825.25	19,822.31
Hire, maintenance, repair, and operation of freight-carrying vehicles	871.49				1,750.56	95,879.73
Printing and binding	657.32	$117,000.00	127.99		743.51	264,317.03
Furnishing of heat, light, power, water, and electricity					3,972.35	4,147.25
Rents					1,173.65	5,071.35
Repairs and alterations	193.43			10,152.89	20,049.89	77,077.13
Special and miscellaneous current expenses					89.31	270.96
Purchase of passenger-carrying vehicles	610.03				11,730.56	27,599.09
Purchase of freight-carrying vehicles						19,882.60
Purchase of scientific instruments and parts	695.15			16.88	516.89	116,949.77
Other equipment	1,688.91			13,774.52	20,039.42	90,605.23
Structures and parts						21,221.93
Miscellaneous refunds, adjustments and transfers	150.94			918.13	555.00	263,453.89
Total	99,605.47	117,000.00	21,489.33	326,121.49	492,890.19	5,045,862.89

In addition to the above amounts, there was expended directly by cooperating agencies $64,151.82 for topographic surveys and $403,570.02 for stream gaging.

APPENDIX

Topographic and planimetric mapping by the Geological Survey in the United States, Puerto Rico, and Hawaii, to June 30, 1937

State	Total area mapped during fiscal year 1937 (square miles)										Types of standard surveys with contours, fiscal year 1937 (square miles)			Total area mapped to June 30, 1937 (square miles)	Percentage of total area of State mapped to June 30, 1937	Control, fiscal year 1937		
	Planimetric [1] on scale of 1 to—		For engraved publication with contour intervals from 5 to 100 feet on scale of 1 to—													Spirit levels (miles)	Transit traverse (miles)	Triangulation stations occupied
	24,000	31,680	12,000	15,840	24,000	25,000	30,000	31,680	62,500	125,000	Revision [2]	Resurvey [3]	New survey [4]					
Alabama					[5] 86							86		21,983	42.3	70	135	
Arizona									442			65	377	60,919	53.4	505	4	44
Arkansas									428			299	129	23,760	44.6	178	222	4
California					68				1,062	214	239	159	946	134,507	85.0	240		13
Colorado		49	[5] 101		[5] 18			160	64			207	136	57,120	55.0	99		22
Connecticut														4,965	100.0			
Delaware														2,370	100.0			
District of Columbia														70	100.0			
Florida									229				229	6,373	10.9			
Georgia					33				226			259		25,202	42.5	215	5	31
Idaho					[5] 12				538	44		12	582	35,643	42.5	213		29
Illinois									448			64	384	40,365	71.2	551	48	
Indiana														4,287	11.8	114	150	
Iowa														13,710	24.4	17	75	
Kansas														64,446	78.4			
Kentucky														27,358	67.4		50	
Louisiana		928												11,330	23.4	[6] 552	[6] 1,875	
Maine									14			14		21,876	66.2			
Maryland														12,327	100.0		143	
Massachusetts								704				704		8,266	100.0	615		
Michigan		2,054						61					61	14,894	25.7	315		
Minnesota														8,890	10.5	12	60	
Mississippi									253				253	7,511	16.0	96	115	
Missouri								88	2,377			755	1,710	52,579	75.7	[6] 9,934	[6] 9,247	
Montana										805			805	45,942	31.3	242		11
Nebraska				4								4		27,931	36.0	118	676	
Nevada									267				267	54,991	49.7	307		26
New Hampshire									201			201		9,302	100.0	89		
New Jersey														8,224	100.0			
New Mexico								49	48	89		97	89	45,069	36.8	102		12
New York								21	293		16	298		49,204	100.0	84		
North Carolina	295				[7] 127				44			171		19,040	36.3	256	28	18

North Dakota									152				152	14,534	20.5		60	
Ohio														41,040	100.0		62	
Oklahoma									245				245	42,172	60.2	98	112	
Oregon									49		49			39,125	40.5			
Pennsylvania									516			130	386	40,162	89.0	29		
Rhode Island														1,248	100.0			
South Carolina									311				311	15,278	49.3	[6] 3,834	[6] 3,244	
South Dakota														19,887	25.6	31	16	
Tennessee	1,454				[7] 182				5			187		23,633	56.2	36		
Texas									372				372	90,295	34.0	290	297	
Utah				15		41			160		41		175	20,955	24.7	55		
Vermont									13				13	8,752	91.5			
Virginia									402			402		37,897	88.9	127	499	
Washington									375	1,261			1,636	41,532	60.1	248	148	37
West Virginia									20		20			24,170	100.0			
Wisconsin									54				54	19,808	35.3	6	27	
Wyoming									124	587			711	34,081	34.8	113		
Total	1,749	3,031	101	19	526	41		1,083	9,732	3,000	365	4,114	10,023	1,435,023	47.4	19,791	17,298	247
Hawaii														6,435	100.0			
Puerto Rico							[8] 146				29		117	271	7.9	159	5	

[1] Prepared from aerial photographs with field examination and showing culture, drainage, and woodland, but no contours. Reproduction by 3-color photolithography (advance sheet).
[2] Revision mostly of culture only.
[3] Resurveys in large part cover areas previously surveyed on a smaller scale.
[4] New surveys cover areas not heretofore mapped.
[5] Reproduction by 2-color photolithography (advance sheet).
[6] Includes surveys administered and supervised by the Geological Survey and executed by emergency relief personnel but not previously reported.
[7] Reproduction by 3-color photolithography (advance sheet).
[8] Contour interval 5 meters.

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Summary of Outstanding Mineral Withdrawals and Classifications

June 30, 1937, in acres

State	Coal		Oil		Oil shale		Phosphate		Potash
	Withdrawn	Classified as coal land	Withdrawn	Classified as oil land	Withdrawn	Classified as oil-shale land	Withdrawn	Classified as phosphate land	Withdrawn
Alaska		56,993							
Arizona	139,415								
Arkansas		61,160							
California	17,603	8,720	1,178,392						90,324
Colorado	4,142,233	3,082,272	215,370		1,172,778	952,239			
Florida							66,796	120	
Idaho	11,520	4,603					276,239	270,036	
Louisiana			466,990	4,233					
Montana	6,259,193	[1] 9,373,884	1,336,697	67,651			280,089	3,833	
Nevada	83,673								39,422
New Mexico	4,119,616	984,829							9,282,160
North Dakota	5,954,364	11,178,286	84,894						
Oregon	4,361	18,887							
South Dakota		250,093							
Utah	3,404,043	1,267,697	[2] 1,344,473		2,737,274	2,703,755	277,344	2,937	
Washington	691,801	141,444							
Wyoming	2,143,991	[3] 6,847,235	541,777		2,079,897	425,214	989,133	25,293	
Total	26,971,813	33,276,103	5,168,593	71,884	5,989,949	4,081,208	1,889,601	302,219	9,411,906

[1] Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).
[2] Includes 13,578 acres withdrawn as helium reserve.
[3] Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

General Summary of Cases Involving Land Classification

Class of cases	Record for fiscal year 1936–37						Record since receipt of first case	
	Pending prior to July 1, 1936	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1937	Gain or loss during fiscal year	Received	Acted on
Mineral leasing laws:								
Permit applications	9	302	311	294	17	−8	62,353	62,336
Lease applications	209	1,837	2,046	1,635	411	−202	4,318	3,907
Committee cases	13	289	302	290	12	+1	13,157	13,145
Concurrence	21	1,537	1,558	1,494	64	−43		
Interference (surface rights)	10	90	100	90	10			
Unit operation plans	595	547	1,142	981	161	+434	1,343	1,182
Cases involved in unit plans	2,528	783	3,311	2,345	966	+1,562	4,042	3,076
Development (drilling operations, etc.)	5	56	61	59	2	+3	17,579	17,577
Mineral classification:								
Oil and gas (including "349")	130	1,402	1,532	1,268	264	−134	29,943	29,679
Water and power:								
Federal Power Commission:								
Preliminary permits	5	48	53	41	12	−7	446	434
Determinations under sec. 24	19	36	55	52	3	+16	628	625
Classification	1	6	7	4	3	−2	557	554
Rights-of-way	15	138	153	123	30	−15	7,326	7,296
Irrigation project reports	2		2	2		+2	944	944
General information:								
General Land Office (coops., etc.)	9	376	385	358	27	−18		
Indian Office							9,549	9,549
Total	3,571	7,447	[1] 11,018	9,036	1,982	+1,589		

[1] Includes all cases pending at beginning of fiscal year.

Mineral Production from Public Lands and Revenues accrued therefrom, Fiscal Year 1937

State	Petroleum (barrels)	Natural gas (M cubic feet)	Gasoline (gallons)	Coal (short tons)	Potassium (short tons)	Sodium (short tons)	Phosphate (short tons)	Accrued revenues
Alaska				134,115				$7,181.55
Alabama				70,326				7,032.64
California	18,773,946	39,758,420	68,320,426	73		68,439		3,468,274.98
Colorado	1,156,234	2,679,558	88,858	597,299		1,499		162,905.43
Idaho				1,136			23,359	2,557.95
Louisiana	204,630	1,457,774	17,706					64,950.70
Montana	473,719	2,391,952		359,698			2,745	105,657.39
Nevada								160.00
New Mexico	5,632,723	16,397,193	1,059,270	46,012	449,584	5,932		652,676.03
North Dakota				477,472				29,656.85
Oklahoma	121,769		262,395					20,516.90
Oregon				27				206.75
South Dakota				2,832				508.84
Utah	611	107,794	11,856	1,329,040				133,999.44
Washington				27,788				2,778.86
Wyoming	10,488,279	15,652,570	27,961,659	1,175,385				1,601,671.80
Total	36,877,412	78,445,261	97,722,170	4,221,203	449,584	75,870	26,104	6,260,277.27
Total 1936	34,371,038	75,016,349	95,291,995	4,062,189	378,601	57,610	50,732	5,172,768.84

Figures for oil, gas, and gasoline from Louisiana, New Mexico, and Oklahoma are for 11 months ended May 31, 1937.

PETROLEUM CONSERVATION DIVISION

George W. Holland, *Director*

THE act approved by the President on February 22, 1935 (49 Stat. 30), regulating interstate and foreign commerce in petroleum and its products by prohibiting the shipment in such commerce of petroleum and its products produced in violation of State law, generally known as the Connally Act, was to have expired June 16, 1937, but by the act of Congress approved by the President, June 14, 1937 (Public No. 145, 75th Cong., 1st sess.), the act was extended to June 30, 1939.

By Executive Order No. 6979, dated February 28, 1935, the Secretary of the Interior was designated by the President to execute certain powers and functions vested in the President by the law, and subsequently Executive Orders Nos. 6980–B, 6980–C of March 1, 1935, Executive Order No. 7024–B of April 25, 1935, and Executive Order No. 7129–A of August 6, 1935, were issued for the enforcement of the law.

The Secretary of the Interior by Orders Nos. 1054 and 1057, dated March 14 and March 31, 1936, established the Petroleum Conservation Division to advise and assist him in the enforcement of the act and in the administration of Federal Tender Board No. 1 and Federal Petroleum Agency No. 1, both located at Kilgore, Tex. The Division is also authorized to discuss the work of any agency dealing with oil and gas, recommend action on any case brought to its attention, coordinate information, and, through appropriate channels, act as the contact agency with the Interstate Oil Compact Commission (see H. J. Res. 407, approved Aug. 27, 1935, Public Res. No. 64, 74th Cong., and S. J. Res. 183, approved Aug. 10, 1937, Public Res. No. 57, 75th Cong.), present required data to the Congress, attend oil and gas conferences in which the Department is interested, cooperate with the oil-producing States in the study of physical waste and the enactment of uniform oil and gas conservation laws, and contact other departments of the Government whose work deals in any measure with oil and gas.

Federal Tender Board No. 1 was established by Executive Order No. 6980–C on March 1, 1935, to operate in a designated area known as the East Texas Field, which includes the counties of Gregg, Upshur, Smith, Rusk, and a part of Cherokee. The Board is required to issue certificates of clearance, or tenders, permitting the shipment in interstate commerce of petroleum and its products whenever it determines that the petroleum or petroleum products does not constitute contraband oil. Contraband oil is defined as petroleum which, or any constituent part of which, was produced, transported, or withdrawn from storage in excess of the amounts permitted to be produced, transported, or withdrawn from storage under the laws of a State or any regulation or order prescribed thereunder by any board, commission, officer, or other duly authorized agency of such State, or any of the products of such petroleum.

Federal Petroleum Agency No. 1 was established by Executive Order No. 7024–B, dated April 25, 1935, to exercise all duties and functions pertaining or incidental to investigations necessary to the enforcement of the Connally Act and to investigate and report on all applications for tenders.

The administration of the act is essentially a field activity. Of the 72 persons employed at the close of the fiscal year, 58 were in the field and 14 in Washington.

It has been necessary to establish but one tender board, that in east Texas. Should the need arise, additional boards can be established by the President. The law is effective, however, in other fields, although the tender system is not employed.

The Rodessa Field in Louisiana, Texas, and Arkansas, was under constant observation, and examinations were made in other areas, such as Corpus Christi, Conroe, and Talco. Reports covering operations in Oklahoma, New Mexico, and Kansas were received and checked periodically.

THE EAST TEXAS FIELD

The need for a tender board in the East Texas Field is evident when the magnitude of the area is understood. This field is about 50 miles long and 3.5 to 10 miles wide. It contains more than 130,000 acres of productive territory in which 23,000 oil wells were producing in June 1937. Two-thirds of the flowing oil wells in the State of Texas are in this area. The field produces about 15 percent of the national crude oil output or nearly as much as the aggregate production from all of the wells in Louisiana, Kansas, and New Mexico, the three States which rank fourth, fifth, and sixth in national output. At the time the field was discovered in 1930, it contained at least one-fourth of the oil reserves of the entire United States. During the fiscal year, the reported production of crude oil in east Texas was 160,717,784 barrels,

of which 148,167,000 barrels, or 92 percent was shipped from the field on Federal tenders. Although only 8 percent of the crude oil is refined in the field, the petroleum products, including casinghead gasoline and butane, moving on Federal tenders totaled 23,230,000 barrels during the year. For summary of refineries operating in the East Texas field, see tables A and A–1 and for summary of casinghead operations see table B.

The Federal Government and the State of Texas have worked together in east Texas in the prevention of waste with the result that the ultimate productive capacity of the field has been greatly extended. It has been estimated that the recoverable oil from the field has been increased about 30 percent or 600,000,000 barrels, which would be equal to the discovery of 60 average size oil fields.

With the Federal Government prohibiting the shipment of contraband oil in interstate commerce and the State government disapproving its movement intrastate, the market for contraband oil is practically destroyed and the production of such oil in east Texas has been reduced to a fraction of 1 percent.

During the fiscal year, the Federal Tender Board and the Federal Petroleum Agency received and considered a total of 6,420 applications for tenders, of which 4,120 were for 227,104,844 barrels of crude petroleum, and 2,300 for 23,187,091 barrels refined products. All of the applications were approved by the Board except 65 for crude petroleum and 28 for refined products.

Tenders were issued for 223,742,735 barrels of crude petroleum. Applications not approved totaled 2,670,463 barrels and applications pending totaled 974,964 barrels. For refined products, tenders were issued for 23,230,065 barrels. Applications for refined products not approved totaled 33,650 barrels and applications pending totaled 176,474 barrels.

Of the total production allowable of 163,245,068 barrels for the East Texas Field during the fiscal year, 99.15 percent was represented by wells reported to the Tender Board.

Almost all of the crude oil shipped from the East Texas Field on Federal tenders moved through 12 trunk pipe lines and various gathering systems. For details of this operation see tables C and C–1.

The principal activities of Federal Petroleum Agency No. 1 have been in the east Texas area.

Throughout the fiscal year continuous efforts were made by the Agency to detect violations and to prepare and present cases to the Department of Justice. As of June 30, 1936, 84 investigations were

pending and during the fiscal year, 124 new investigative cases were set up by the Agency and assigned to members of the staff. At the close of the year, 66 cases were pending. A total of 31 cases were referred to the Department of Justice.

The marine unit at Houston, Tex., was discontinued during the fiscal year. During the fiscal year examiners were assigned to the Rodessa, Corpus Christi, and Houston areas, and investigations were made and reports prepared under the Connally Act in certain fields of southern Louisiana and west Texas. In the East Texas Field a check was made of a large number of leases to determine whether such leases could make their full allowable in accordance with the rules and regulations of the Railroad Commission of Texas.

The following table shows the expenditures made of available funds:

Personal Services

Agency	*Appropriation*
Petroleum Conservation Division	$50, 900
Federal Tender Board No. 1 and Federal Petroleum Agency No. 1	151, 875
Total	202, 775

Miscellaneous

Class	*Appropriation*
Materials and supplies	$13, 866
Communications	2, 123
Travel	6, 695
Transportation of things	351
Printing and binding	1, 192
Rent of buildings	11, 017
Equipment	1, 675
Total	36, 919
Total obligated	239, 694
Unobligated	60, 306
Total funds available	300, 000

	Washington	*Field*	*Total*
Personnel as of June 30, 1936:			
Petroleum Conservation Division (including Federal Tender Board No. 1 and Federal Petroleum Agency No. 1)	19	78	97
Personnel as of June 30, 1937:			
Petroleum Conservation Division (including Federal Tender Board No. 1 and Federal Petroleum Agency No. 1)	14	58	72

SUMMARY OF OPERATIONS

Refineries Operating in the East Texas Field and Reporting to the Federal Tender Board No. 1, Fiscal Year Ending June 30, 1937

CRUDE PETROLEUM

		Barrels
Stocks 7 a. m., beginning of period		303,676
Receipts:		
East Texas crude via pipe line		11,460,648
East Texas crude via trucks		10,940
East Texas crude from casinghead plants		383
Rodessa crude via pipe line		688,639
Talco crude via pipe line		16,020
Talco crude via tank car		147,221
Southwest Texas crude via tank car		162,159
Total crude to be accounted for		12,789,686
Disposition:	*Percent*	
East Texas crude charged to stills	92.01	11,395,634
Rodessa crude charged to stills	5.34	660,989
Talco crude charged to stills	1.37	169,516
Southwest Texas crude charged to stills	1.28	158,202
Total crude distilled	100.00	12,384,341
East Texas crude burned at refineries		183
East Texas crude transferred to fuel oil		132
East Texas crude delivered to pipe lines		37,274
Adjustments in crude stocks		1,138
Crude sold or otherwise disposed of		2,207
Stocks 7 a. m., close of period		280,874
		12,706,149
Net difference in stocks during period		83,537
Total crude accounted for		12,789,686

TABLE A–1

Refineries Operating in the East Texas Field and Reporting to the Federal Tender Board No. 1, Fiscal Year Ending June 30, 1937

REFINED PRODUCTS—STOCKS, DELIVERIES, AND YIELDS[1]

Product	Stocks 7 a. m., end of period	Deliveries	Stocks 7 a. m., beginning of period	Casinghead gasoline blended and other products received	Add [2]	Manufactured	Percent yield
Fuel oil	50,107	2,529,552	48,004	132	24,931	2,556,454	20.643
Gasoline and naphtha	116,414	7,632,683	119,768	232,227	8,752	7,405,854	59.800
Kerosene	20,986	615,285	22,233	958	3,031	616,111	4.975
Gas oil distillate	6,095	675,745	24,985		4,665	661,520	5.341
Unfinished oils	39,833	641,487	119,375	13,271	14,399	563,073	4.547
Loss in refining						581,329	4.694
Total	233,435	12,094,752	334,365	246,588	55,778	12,384,341	100.000

[1] All figures in barrels.
[2] Stocks of refineries discontinuing operations or reports during fiscal year.

Summary of Casinghead Plant Operations in the East Texas Field, Fiscal Year Ending June 30, 1937

		Monthly average
Number of plants operating in the field		19
Number of plants reporting to the Federal Tender Board No. 1		17
Number of wells feeding 16 plants		18,921
Allowable oil for above wells (barrels)		11,853,166

		Fiscol year totals (million cubic feet)
Gas received from leases		47,202,161
Still gases received from refineries		425,652
Total gas processed		47,627,813

	Barrels	*Barrels*
Stocks beginning of period:		
Casinghead gasoline	29,975	
Straight run gasoline	1,324	
Naphtha	1,654	
Total stocks beginning of period		32,953
Casinghead gasoline, butane, and propane manufactured from lease gas	[1] 4,387,209	
Gasoline manufactured from still gases	56,692	
Total manufactured		4,443,901
Casinghead gasoline received at plants		6,696
Naphtha and straight run gasoline received for further processing		154,255
Total supply		4,637,805
Shipments of casinghead gasoline intrastate	2,770,311	
Shipments of casinghead gasoline interstate	1,765,026	
Total shipments		[2] 4,535,337
Evaporation and handling loss		42,151
Casinghead and butanes vented and flared		34,734
Stocks 7 a. m. end of period:		
Casinghead gasoline	23,386	
Straight run gasoline	1,192	
Naphtha	1,005	
Total stocks end of period		25,583
Total disposition		4,637,805

Average monthly allowable oil per well (barrels)	626.46
Average monthly gas production per well (million cubic feet)	207.88
Average gas-oil ratio of wells (cubic feet per barrel)	331.85
Average gallons casinghead gasoline, butane, and propane per million cubic feet well gas	3.90
Average gallons gasoline per million cubic feet still gas	5.59

[1] Includes 316,868 barrels butanes and 11,839 barrels propanes.
[2] Includes butanes and propanes.

Summary of Operations, 12 Trunk Pipe Lines and Various Gathering Systems Operating in the East Texas Field and Reporting to the Federal Tender Board No. 1, Fiscal Year Ending June 30, 1937

ACCOUNTABLE CRUDE PETROLEUM AND PRODUCTS

	Barrels	*Barrels*
Stocks 7 a. m. beginning of period:		
East Texas crude	3,688,479	
Rodessa crude	177,114	
Van crude		
Topped crude		
Gasoline		
Casinghead gasoline	1,760	
Total opening stocks		3,867,353
Receipts:		
East Texas crude run from leases of reporting producers	160,861,929	
East Texas crude run from leases of delinquent producers	111,879	
Total east Texas crude run from leases	160,973,808	
East Texas crude from gasoline and reclamation plants	94,753	
East Texas crude from nonreporting pipe lines in field	37,522	
East Texas weathered crude from broker	9,870	
East Texas crude from refineries	45,818	
Rodessa crude from Rodessa field	4,292,736	
Talco crude from Talco field	19,008	
Van crude from Van field	223,502	
Total crude receipts		165,697,017
Topped crude received from refineries	470,973	
Kerosene received from refineries	12,412	
Recycle stock received from refineries	2,594	
Gasoline received from refineries	69,713	
Casinghead gasoline from gasoline plants	3,168,824	
Total petroleum products received into lines		3,724,516
Net overage reported:		
East Texas crude	48,008	
Van crude	3,028	
Gasoline	17	
Total net overage reported		51,053
Total receipts and opening stocks		173,339,939
Less net corrections in various monthly opening stocks		19,105
Net crude and products to be accounted for		173,320,834
Interline receipts		70,911,345
Total of all oils handled		244,232,179

TABLE C–1

CRUDE PETROLEUM AND PRODUCTS ACCOUNTED FOR

	Barrels	*Barrels*
Deliveries:		
East Texas crude direct from field	148,167,139	
Rodessa crude direct from field	3,074,828	
Van crude direct from field	226,272	
Talco crude direct from field	2,988	
Topped crude direct from field	407,407	
Kerosene direct from field	13,736	
Gasoline direct from field	58,705	
Casinghead gasoline direct from field	3,149,140	
Total deliveries direct from field		155,100,215
East Texas crude to east Texas refineries reporting to Federal Tender Board No. 1	11,458,157	
Rodessa crude to east Texas refineries reporting to Federal Tender Board No. 1	688,639	
Talco crude to east Texas refineries reporting to Federal Tender Board No. 1	16,020	
Total crude to east Texas refineries reporting to Federal Tender Board No. 1	12,162,816	
East Texas crude to east Texas refineries not reporting to Federal Tender Board No. 1	916,973	
Topped crude to East Texas refineries not reporting to Federal Tender Board No. 1	116,163	
Total crude delivered to refineries		13,195,952
East Texas crude delivered to reclamation plants		627
East Texas crude delivered to pipe lines not reporting to Federal Tender Board No. 1		20,173
East Texas crude delivered to broker not reporting to Federal Tender Board No. 1		956
East Texas crude consumed in Field		31,513
Recycle stock delivered to east Texas refineries		2,594
Net shortage reported:		
East Texas crude	9,545	
Rodessa crude	10,943	
Van crude	258	
Topped crude	1	
Casinghead gasoline	18,396	
Total net shortage		39,143
Stocks 7 a. m. close of period:		
East Texas crude	4,384,662	
Rodessa crude	523,764	
Van crude		
Topped crude	839	
Gasoline	11,025	
Casinghead gasoline	9,371	
Total closing stocks		4,929,661
Total crude and products accounted for		173,320,834
Interline deliveries		70,911,345
Total of all oils handled		244,232,179

OFFICE OF INDIAN AFFAIRS

John Collier, *Commissioner*

THE Federal Government, working through the Office of Indian Affairs, has had the traditional role of guardian of Indian property and protector of Indians. As conservator, the Indian Office has been at times faithless, and through most of later times ineffective. In recent years, protections for Indian property have been tightened, but it has not been until the past 3 years that the tide has been turned and that Indian property has begun to increase in amount and value.

Of the 130,000,000 acres held in trust for Indians by the Government in 1887, when the General Allotment Act was passed, some 49,000,000 of the poorest acres remained in 1933. At the close of the fiscal year 1937, this amount had been increased to approximately 52,650,000 acres, with additional purchases pending.

Land has not only been acquired for Indians, been safeguarded from slipping away: Indian land, through allocations of emergency funds, is being rebuilt. Only a beginning has been made, but already the healing of damaged Indian ranges, the protection of Indian timber and the blessing of new water supplies have helped to revitalize Indian land.

More important, even, than economic benefits from augmented resources have been the reorganization of Indian enterprise and the kindling of confidence among Indian groups in their undertakings of tribal enterprise.

This report, which tells something of the work of the past year, deals first with this progress in Indian reorganization, then with efforts to conserve and administer Indians' physical resources and to provide Indians with a source of livelihood, then with education of Indian children and the Indian health program. It concludes with a discussion of the steps being taken to improve the mechanics of the Indian Service, and with a brief mention of problems yet unsolved.

TRIBAL GOVERNMENT PROBLEMS

The problems which immediately confront newly organized tribes are several, but perhaps the most immediate and most pressing is that of getting funds on which to operate. Tribal funds, which are derived from a cash conversion of tribal capital assets or from income on tribal property, are deposited in the Treasury and cannot be appropriated to tribal use except by Congress or, in some instances, with the approval of the Secretary of the Interior. Therefore, even though tribes may have funds to their credit, under still-existing law they are in the position of incompetent wards with inheritances lying securely in the hands of a guardian. These tribes must find their own sources of revenue. If they are fortunate enough still to own unallotted tribal land, they may cause the rental on the land to be paid into their tribal treasury instead of into the Federal Treasury, as previous law required. Several tribes have already taken steps to bring about this change of procedure, and others will follow. This advantage, as has been pointed out, is accessible only to tribes owning undivided communal land.

As tribes become incorporated and borrow money from the act's revolving credit fund to establish and develop business or agricultural enterprises, other revenue will come in. Such revenue will also be under tribal rather than governmental control. Another means of securing revenue, the possibilities of which have scarcely been explored as yet, would be a system of fees for services which the tribal government renders its members and for privileges which it extends to nonmembers. This task of obtaining revenue to cover the costs of tribal government operations is critical, and in its solution will lie the future of successful group activity for many tribes.

The land tangle.—A problem scarcely less important is that of land utilization and management. It is most graphically illustrated in the case of heirship lands which have become so entangled in a welter of fractionate ownership that Indians and agency officials alike get to the point of throwing up their hands in despair. Meantime, the land lies idle or is leased, usually to non-Indians. Through the machinery for exchange of lands, which the Reorganization Act authorizes, an indication is given of how the problem might be solved. It could be solved far more quickly if money were available to purchase lands in such dolorous standing. It can be appreciated, however, how much money would be required when it is considered that approximately 7,000,000 acres are involved. At one reservation, Flathead in Montana, the Indians have taken the initiative in this matter by having a bill introduced in Congress which would permit them to use their own tribal funds for the purchase of lands within the reservation borders. This would allow them to purchase not only heirship lands but lands which have gone into white ownership.

Applied anthropology aids in administration.—The Indian Service continues to make use of applied anthropology in formulating its policies and in dealing with Indian groups. The small anthropological staff has continued to devote its efforts primarily to the gathering of social and economic facts regarding tribes or groups which are organizing either under the Indian Reorganization Act, the Oklahoma Indian Welfare Act, or the Alaska Act. The main concern has been to see that the constitutions are really based on the contemporary social and economic life of the people concerned. Unfortunately, the staff has been too small to gather basic facts for all tribes which are organizing.

During the current year the applied anthropology staff was reorganized from dollar-a-year positions to regular civil service status.

TRIBAL ORGANIZATION

At the end of the fiscal year, 65 tribes, representing an Indian population of 86,238, had adopted constitutions and by laws, to which formal approval had been given by the Secretary of the Interior. Of these tribes, 32 had ratified charters of incorporation, the population of this latter group being 34,492. Constitutions and charters for additional groups were in process of being drafted and considered, and will be voted upon in the course of the fiscal year 1938.

Oklahoma groups begin to organize.—The figures above are exclusive of the Oklahoma tribes, where organization work did not begin until a few months before the close of the fiscal year. There are approximately 38 tribal groups eligible for organization in Oklahoma. Some will probably not undertake formal reorganization. At present, two constitutions have been voted upon, in elections in which not a dissenting vote was cast. One charter has been ratified, in an election likewise unanimous.

What reorganization work in Oklahoma thus far has disclosed is the fact that interest in tribal survival has endured in spite of the almost complete destruction of tribal reservations and tribal governments. Particularly in eastern Oklahoma among the Five Civilized Tribes, the idea has been prevalent that tribal feeling had largely disappeared. Actually, among the Creeks and to lesser extent among the Cherokees, native patterns of community organization and group action have persisted.

Organization of Alaskan villages.—The problem of organizing the Alaska natives is complicated by several factors. First, by the great distances between villages, to which the lack of transportation and the enduring winter add immeasurably. Transportation is limited to boats for coast travel and to dog teams for interior travel—both of which are slow; and to airplane travel, which, while rapid, is expensive. Actually, the cost of transportation by boat or dog team, considering the amount of time, is about as expensive as air travel.

Organization work also is complicated in that the Alaska natives, with some exceptions, do not fall into well-defined tribal groups occupying definite geographical areas and having a tradition of tribal organization and a background of governmental recognition. Tribes in the United States, while they have been scattered and tribal governments have been broken down, at least have behind them a history of a common life upon Indian reservations. There is no such history in Alaska, and even the status of land ownership is an ambiguous one which in some cases may have to be clarified before organization work can proceed.

At the close of the year, nine constitutions had been submitted to Washington by village groups in Alaska, and these were being reviewed.

The Hopi organize.—Few anthropologists or students of Hopi life were ready to believe that the Hopi Indians in Arizona would ever agree to come together. There are nine independent villages at Hopi, speaking two unrelated languages (Hopi and Tewa), besides various dialects. There was practically no tradition of concerted tribal action. Added to this were important social differences, unlike interests, even rivalries, and extreme divergencies in the acceptance of white culture. These were the elements which had to be welded together into a working agreement of. representative government. Also, the Hopi were inclined to suspect any suggestion of self-improvement emanating from Washington.

What seemed to be the impossible was accomplished. Approximately 50 percent of the eligible voters came to the polls in October 1936, and of the ballots cast 80 percent were in favor of the constitution. The preamble of the rather remarkable Hopi document speaks of it as "a way of working together for peace and agreement between the villages, and of preserving the good things of Hopi life, and to provide a way of organizing to deal with modern problems, with the United States Government and with the outside world generally."

MAKING CREDIT AVAILABLE

Credit has been an urgent Indian need. Until passage of the Reorganization Act, credit was obtainable only in meager amount from reimbursable funds, which reverted to the Treasury when repaid; and in some cases from tribal funds. The Reorganization Act authorized a revolving fund of $10,000,000, of which $2,500,000 was appropriated in 1936 and $980,000 in 1937. Of the appropriated amounts, $50,000 was authorized for administrative expenses in 1936 and $65,000 in 1937.

LOANS TO INDIAN CORPORATIONS

Due to the fact that loans from the Reorganization Act fund may be made only to Indian chartered corporations, loans have had to be deferred until tribes organized and obtained charters of incorporation from the Secretary. Meantime, studies of credit needs were made, regulations formulated and the credit system explained. As tribes organized and formed plans, loans were made.

The following commitments were made during the 1937 fiscal year (of the total amount of $2,719,931, the sum of $410,908 had been advanced by June 30, 1937):

Reservation or Agency	Corporation	Amount
Blackfeet, Mont	The Blackfeet Tribe of the Blackfeet Reservation	$100,000
Crow Creek, S. Dak	The Lower Brule Sioux Tribe	40,000
Carson, Nev	The Pyramid Lake Paiute Tribe	15,000
	The Fort McDermitt Paiute and Shoshone Tribe	20,000
Flathead, Mont	The Confederated Salish and Kootenai Tribes	65,000
Great Lakes, Wis	The Red Cliff Band of Lake Superior Chippewa Indians	16,000
Mescalero, N. Mex	The Apache Tribe of the Mescalero Reservation	163,000
Rocky Boy's, Mont	The Chippewa Cree Indians of the Rocky Boy's Reservation	55,000
Rosebud, S. Dak	The Rosebud Sioux Tribe	35,000
Salem School, Oreg	The Confederated Tribes of the Grand Ronde Community	3,000
Tulalip, Wash	The Tulalip Tribes of the Tulalip Reservation	15,000
	The Muckleshoot Tribe of the Muckleshoot Reservation	10,000
Tongue River, Mont	The Northern Cheyenne Tribe of the Tongue River Agency	[1] 2,090,931
Winnebago, Nebr	The Winnebago Tribe of Nebraska	35,000
	The Ponca Tribe of Native Americans of Nebraska	7,000
	The Santee Sioux Tribe of Nebraska	20,000
	The Omaha Tribe of Nebraska	30,000
Total commitments		$2,719,931

[1] $2,060,931 is for a series of loans covering a period of 18 years.

The loans are largely for industrial purposes. Each borrower from the corporation is required to work out a definite plan showing how he expects to use the funds, and the source from which repayment will be made. The time of the loans is determined by the type of enterprise in which the funds are invested. The maximum time for which a corporation may receive a loan is 20 years. The interest rate which corporations may charge has been set at 3 percent. The Government requires a 1 percent charge.

LOANS TO INDIANS OF OKLAHOMA

The Oklahoma Indian Welfare Act authorized the appropriation of $2,000,000 for loans to Oklahoma Indians, associations, and corporate groups. In addition, it made available for loans to Oklahoma Indians a just share of funds appropriated pursuant to the Indian Reorganization Act. No appropriation was made under the Oklahoma Indian Welfare Act; consequently it has been necessary to conduct credit activities in Oklahoma from the funds and with the staff provided under the Indian Reorganization Act.

During the year a number of individual loans have been made, totaling $19,521 under the Oklahoma credit system. Charters for

1 district and for 22 county credit associations in Oklahoma were approved. These organizations will borrow money from the Government, and will loan to Indians in the respective districts. One cooperative livestock association charter was approved on the Cheyenne and Arapaho jurisdiction.

REIMBURSABLE FUNDS USED FOR INDIAN ENTERPRISES, EDUCATIONAL LOANS, RELIEF

The act providing appropriations for the fiscal year 1937 carried $165,000 for encouraging industry and self-support among Indians. All but $404.51 of this sum was allotted to 33 jurisdictions. This was supplemented with allotments totaling $363,387.62 from tribal loan funds.

Fifteen thousand dollars of the general appropriation was set aside for educational loans; $14,187.31 was allotted to 17 jurisdictions for loans to 82 students. Sixteen students from nine tribes received loans totaling $3,246 from their respective tribal loan funds.

Several sources of relief have been available during the year; consequently, it has not been necessary to use a large amount of reimbursable funds for subsistence. Only $3,773 was used for support loans as against $12,355 last year, all made from the general appropriation.

TRIBE REHOUSES ITS MEMBERS

The Mescalero Apaches have been living during the past 15 or 20 years around the central agency, in shacks and wickiups in appalling disrepair. The Indians leaned heavily for guidance and economic help upon the agency personnel. There is ample land (tribally owned and assigned to individuals) at Mescalero, but apathy has prevailed and assignments have never been put to their full use.

The tribe organized under the Indian Reorganization Act and ratified its charter on August 1, 1936. Subsequently, on its own initiative, the tribe has worked out, with Indian Service staff members, a plan to change its entire economic life—to rehouse its members on or near their land assignments, and to equip them to work their land. The tribe has borrowed $163,000 from the revolving fund. Of this amount $144,000 is being used to build 108 homes in 5 communities (there are about 750 Indians on the reservation). Work on the houses is being done under the supervision of the tribal business committee and the agency. If individuals do not make good use of the houses and lands assigned to them, the business committee has the power to remove them and reassign the houses and lands. Repayment to the loan fund will be made from proceeds from tribal timber sales.

Of the loan of $163,000, approximately $18,000 has been reloaned to individuals for purchase of farm equipment and teams. Fifty-four loans, averaging $310 each, were made this spring. More than $1,000

has been repaid already. Every family which obtained a loan planted a garden this year; they are now making arrangements to can the surplus produce.

LAND INCREASES IN AREA; PROTECTIONS ARE TIGHTENED

Indian landholdings have increased during the year. Sources of increase have been several: Through restoration (by authority of sec. 3 of the Indian Reorganization Act) of lands to reservation status which had been formerly opened to homestead entry; through the land purchase fund of the Indian Reorganization Act; through land purchase funds provided by the Resettlement Administration; and by various special acts.

LANDS RESTORED TO INDIANS THROUGH THE INDIAN REORGANIZATION ACT

Under section 3 of the Indian Reorganization Act, 349,207.73 acres, formerly opened to sale or entry, have been restored to tribal ownership and reservation status. The total restorations made to date are as follows:

Reservation:	*Acreage*
Utes (Ute Mountain Band), Colo	30,000
Grand Portage, Minn	9,277.59
Flathead, Mont	192,425.63
Kiowa, Comanche, and Apache, Okla	[1] 600
Pine Ridge, S. Dak	9,504.51
Standing Rock, N. and S. Dak	107,400
Total	349,207.73

[1] Approximate.

Under the provisions of section 2 of the amendment of May 1, 1936 (49 Stat. 1250), to the Indian Reorganization Act, relating to the Territory of Alaska, 300,000 acres were withdrawn for the benefit of natives of Eklutna. Additional withdrawals involving approximately 6,000,000 acres are in various stages of progress.

LAND ACQUIRED THROUGH REORGANIZATION ACT FUNDS

By authority of the Reorganization Act, Congress appropriated $1,000,000 for the acquisition of land during the fiscal year 1936. For the fiscal year $1,000,000 was again appropriated, and in addition the Secretary of the Interior was authorized to enter into contracts for the acquisition of additional land, not to exceed a total of $1,000,000. With these funds and authority to contract, 236,783 acres were optioned and 105,965 were purchased.

Furthering the land acquisition program under the Reorganization Act, $950,000 has been appropriated to meet the contracts entered into by the Secretary of the Interior under the 1937 contractual

authority referred to above; in addition $500,000 has been appropriated with which to make new acquisitions during the fiscal year 1938.

The lands being acquired for Indians under the provisions of the Reorganization Act are classified as irrigable, agricultural, grazing or forest in character. They are being utilized to establish or complete tribal agricultural, grazing and forestry units and for use by individuals as small farms, subsistence gardening tracts and home sites; also as fishing sites and wild rice camps. Some timber and grazing lands are being acquired; however, where it is known that lands are to be acquired for farming or subsistence gardening purposes for individuals, only desirable agricultural lands are selected, since one of the outstanding objectives of the purchase program is to buy lands upon which Indians can make a living.

In those cases where purchases are being made for tribal and community purposes the lands will remain in large compact areas, to be administered by the Indians themselves for the benefit of the tribe. Where purchases are being made for individual family use the lands will be available for their use through assignments issued by the tribal council.

When purchases are completed, other units of the Service, particularly the extension, credit, and organization groups, step into line to advise and help on problems of home building and acquisition of stock and equipment.

RESETTLEMENT PURCHASES ADD TO INDIAN LANDS

The Resettlement Administration, which took over the submarginal land program of the Federal Emergency Relief Administration, has accepted options constituting legal commitments covering 1,218,395 acres of land within or adjacent to existing Indian reservations or communities, at a total option price of $3,585,165. Of this area the purchase of 993,673 acres, at a cost of $2,655,145, has actually been completed.

SPECIAL PURCHASES ADD VARIOUS SMALLER TRACTS

The purchase of lands under the Arizona Navajo Boundary Extension Act of June 14, 1934 (48 Stat. L., 960), was brought nearer to completion by the purchase of 13,757.62 acres, together with improvements, at a cost of $41,478.82. This brings the total purchases under this act to 323,903.99 acres.

Under acts of Congress 12.19 acres have been added to the Barona Ranch, Calif. (Capitan Grande Indians); 240 acres have been added to the Kanosh Reservation, Utah; 320 acres have been added to the Koosharem Reservation, Utah; 1,280 acres have been added to the Shivwitz Reservation, Utah; and authority has been granted for the purchase of 640 acres for the Santa Rosa band of Mission Indians, California.

Legislation has also been enacted authorizing the exchange of Indian lands in Owens Valley, Calif., for lands and water rights now owned by the city of Los Angeles. This legislation enables the city of Los Angeles to acquire lands needed for watershed purposes and provides lands for the Indians better than those they now own.

The progress reported last year in the purchase of land within the various Pueblos in New Mexico with funds awarded pursuant to the Pueblo Lands Board Act as amended continued during the fiscal year 1937. Purchases of 64 tracts totaling 3,201.43 acres were completed, involving an expenditure of $77,368.97. Negotiations are now under way for the purchase of many more tracts.

Lands have been acquired through purchase and donation for school, hospital, and other administrative purposes, involving six tracts covering 295.44 acres. The total cost of the lands was $1,962.

NEW MEXICO NAVAJO BOUNDARY BILL STILL PENDING; LAND LEASED FOR NAVAJOS

During the year an aggregate of 497,722.75 acres of white-owned land was leased for the Navajo Indians at an annual rental of $16,275.01. The lands were leased pending acquisition by purchase or exchange in Arizona under the provisions of the act of June 14 (48 Stat. L., 960), and the enactment of similar legislation applicable to New Mexico.

TRUST PERIODS EXTENDED

Trust periods were extended automatically, by authority of the Indian Reorganization Act, for all tribes which accepted the act. As a protection to those tribes which did not accept the act, by order of the President dated September 30, 1936, the period of trust on allotments made to Indians and on lands patented to tribes or bands of Indians which otherwise would have expired during the calendar year 1937 was extended for a further period of 25 years.

CANCELLATION OF FORCED PATENTS AND RECOVERY OF TAXES

During the past fiscal year 2,454.72 acres of land were restored to their original trust status through cancellation of 15 patents in fee issued to various Indian allottees during the trust period without their application or consent. Cancellation of the patents was effected under the authority of the act of February 26, 1927 (44 Stats., 1247), as amended and supplemented by the act of February 21, 1931 (46 Stats., 1205). The total number of such cancellations of which the Indian Office has record is 469.

Judgments in suits instituted by the Department of Justice at the request of the Indian Office were rendered by various Federal courts for the recovery of taxes illegally collected or to cancel tax assessments involving approximately 75 allotments for which patents in fee were

issued without application and heretofore canceled by the Department under the authority of the acts above cited. Recommendations were made to the Department of Justice for the institution of similar suits involving approximately 30 additional allotments and the cases are now pending.

A FEW SALES AND PATENTS IN FEE MADE TO AVOID HARDSHIP IN INDIVIDUAL CASES

A few tracts have been sold to meet emergency situations on reservations not affected by the provisions of the Indian Reorganization Act and these mostly have been tracts located in areas not predominately Indian-owned. A number of Indians have conveyed their lands, or portions of them, to the United States in trust for other Indians and many inherited allotments have been partitioned so as to give each heir a separate tract of land for his individual use and occupancy. Adjustments of this nature are constantly being made.

Permits and leases for business purposes have increased since sales of trust allotments have been precluded; these bring additional income to the Indians. Tribal councils and business committees have the authority to determine, subject to departmental approval, the tribal lands to be used for mission and church purposes.

Restricted lands of individual members of the Five Civilized Tribes, totaling 2,711 acres, were sold. Of this, 980 acres were to be used for State and Federal projects and the majority of the remaining sales were restricted to emergency situations or where the lands were taxable and were about to be lost through tax sales.

Only eight patents in fee for trust allotments were issued to Indians upon application. In all of these instances it was shown that such action was necessary in order to relieve conditions of financial distress, and that the sale of such lands would not interfere with the program of consolidating lands in Indian ownership. The restrictions were removed from four tracts of purchased land under similar circumstances, and for the most part involved town property.

To protect the lands of Five Civilized Tribes Indians in Oklahoma approximately 48 suits have been instituted upon the recommendation of this office to remove clouds from the title and recover possession of allotted or purchased lands. Such of these cases as have been brought to a conclusion have been almost invariably decided in favor of the Indians.

The act of June 20, 1936 (49 Stats., 1542), which declared that all lands theretofore purchased out of trust or restricted funds of an Indian and conveyed by a deed restricting alienation or encumbrance of the land without the consent of the Secretary, should be exempt from taxation until otherwise directed by Congress was amended by the act of May 19, 1937 (Public, No. 96, 75th Cong. 1st sess.), so as to limit its effect to homesteads to be selected by the Indian owner of the land.

INDIAN MINERALS ADMINISTERED ON CONSERVATIVE BASIS

On September 4, 1936, the Department transferred full supervision of field operations, including royalty accounting, of oil and gas leases under the jurisdiction of the Five Civilized Tribes Agency to the district engineer, Geological Survey, Tulsa, Okla. This work has been done by the Survey engineers for some time prior to September 4 at other agencies in Oklahoma outside of the Osage Reservation. New oil and gas operating regulations were approved, following the transfer, on October 30, 1936.

There has been considerable increase in interest in oil and gas lease sales in Oklahoma, particularly in the area of the Choctaw and Chickasaw Tribes and on the Kiowa Reservation. There was a slight increase in the production of oil on the Osage Reservation during the year. Developments continued on the Blackfeet Reservation in Montana. There was practically no activity in oil and gas leases on the Crow Reservation, although there are a few producing wells on that reservation. Two placer gold mining leases have been approved in the Big Horn Canyon of the Crow Reservation. Developments so far have indicated fair prospects of the recovery of some royalty from these leases, but sufficient work has not been accomplished to show definite value of the leases.

There has been considerable increase in activity on leases of restricted Quapaw Indian lands for lead and zinc mining purposes due to the increased price for concentrates during the year.

INDIAN FOREST AND RANGE RESOURCES

A large share of the remaining Indian estate is in the form of range, timber, and wildlife. These assets are administered through the superintendents by the Division of Forestry and Grazing, which, during recent years, has shaped its policies to insure enjoyment and return from these resources for all time.

To put into effect these principles of conservation, the General Grazing Regulations of December 28, 1935, the General Forest Regulations of April 23, 1936, and the Navajo and Hopi Grazing Regulations of June 2, 1937, were approved and promulgated by the Department, and major forward steps have been taken in giving them practical expression.

CONSERVATION POLICY STRENGTHENED

The year past has been one of action in the promotion of the principles of conservation on Indian lands. Range studies have been conducted to establish carrying capacities which will maintain the productivity of the land in perpetuity. Timber surveys have been carried out which when completed will make possible the compilation of careful working plans for the major forested reservations and insure the practice of sustained yield forest management. A policy of eco-

nomic selective logging, governed by sound silviculture, is resulting in a balancing of age classes and a reduction of timber losses from pine beetles. Pine beetle infestation on the Yakima and Warm Springs Reservations has been diminished through the application of artificial control, prosecuted in cooperation with the Civilian Conservation Corps—Indian division. Finally, a handbook of fire control has been formulated and approved which will help to reduce losses from fires.

All of these accomplishments have been effected without a material reduction in the revenues flowing from Indian lands, without any increase in the appropriations of the organization principally responsible for the practice of conservation thereon, and with the cooperation of the Indians. Opposition to essential stock reduction programs and to conservative selective cutting of Indian timber has made itself manifest, but conservative opinion has in general prevailed among Indian groups.

DEMAND FOR INDIAN TIMBER REVIVES

Owing to an upward trend in the production of lumber during the year 1936 a demand for Indian timber has again developed and many applications to purchase timber have been received and considered. Only a limited number of small sales was consummated, however, and these were authorized principally as salvage operations to reduce losses being sustained through the activities of the western pine bark beetle. Several comparatively large sales were under consideration for advertisement by the Indian Office and the Department at the close of the fiscal year; it is expected that some of these units will be placed on the market in order to meet the needs of the Indians and salvage timber which is being destroyed by the beetles.

TIMBER CUT BRINGS $1,413,004.97 TO INDIANS

Approved existing contracts continued in full operation during the year, producing a total volume cut of 414,591,243 feet, board measure, and a gross return of $1,413,004.97 to the Indians. Returns on the reservations of major importance from a forestry standpoint for the fiscal period were, in order of volume, as follows:

Reservation	Volume cut, board feet	Value of timber cut
Klamath Agency, Oreg	181,635,540	$663,158.94
Quinaielt (Taholah Agency) Wash	75,030,600	195,197.35
Menominee Agency, Wis	29,843,660	105,800.07
Spokane (Colville Agency), Wash	27,491,620	75,231.65
Fort Apache Agency, Ariz	24,079,360	71,564.53
Colville Agency, Wash	22,264,770	64,299.21
Consolidated Chippewa, Minn	17,564,546	125,607.77
Kalispel (Northern Idaho Agency) Idaho	9,825,590	37,370.26
Mescalero Agency, Ariz	8,600,480	25,236.53
Makah (Taholah Agency) Wash	7,138,190	9,930.18
Flathead Agency, Mont	3,913,680	11,997.92
Red Lake Agency, Minn	3,112,840	16,282.49
Hoopa Valley Agency, Calif	2,823,967	7,282.19
Jicarilla Agency, N. Mex	690,310	2,416.09
Crow Agency, Mont	288,400	891.03
Tulalip Agency, Wash	287,690	738.76
	414,591,243	1,413,004.97

INDIAN SAWMILLS MAKE SHOWING

The Menominee Indian Mills of Wisconsin and the Red Lake Indian Sawmill of Minnesota again closed their books on a successful operating year. They were successful not merely from the standpoint of profit-taking—although the results in that connection were not insignificant—but also from the standpoint of Indian industrialization, Indian wages earned, and Indian progress realized. They were successful, moreover, in that the natural resources under development have been so exploited that their use today has in no way made less likely continued enjoyment tomorrow.

SOIL CONSERVATION PRACTICES ON INDIAN LANDS

In the Navajo and Pueblo regions, under Indian Service leadership, the Government's work has become a compound of the work of the Departments of Agriculture and of the Interior. The union of services was commenced in both areas while the Soil Conservation Service was under the Department of the Interior. It was continued after the transfer of the Soil Conservation Service to the Department of Agriculture. The administrative control in each of these areas rests with the Indian Service superintendent. Land-use planning is the primary function of the Soil Conservation Service in the set-up, but in addition, demonstrations and operations are carried forward by it. In the Navajo area, the Bureau of Animal Industry plays a vital role, while in the Pueblo area, through Indian Service initiative, there has been built up a committee on problems of the Rio Grande watershed, with a representative of the Indian Service as chairman, which draws together in diverse relationships the contributions of the grazing district, the General Land Office, the Indian Service, the Resettlement Administration, the Soil Conservation Service, and the Forest Service. The committee's assignment is to find out how the dense rural and village population of Indians and Spanish-Americans can be enabled permanently to subsist itself through utilization of the land and water of a gravely depleted watershed—that of the Rio Grande in central and northern New Mexico.

Practically, the work in the Pueblo country amounts to a total enterprise of regional planning, and it points toward a more integrated regional administration in times immediately to come.

A most interesting circumstance in the Navajo and the Pueblo areas, of course, is the consciousness of and sustained cooperation by the Indians themselves in the tasks of planning and execution. Probably no white groups have made, voluntarily and swiftly, economic readjustments so drastic as have been made in the last 2 years by the Pueblos of Acoma and Laguna and by the Navajo Tribe.

PHYSICAL WORKS IMPROVE RANGE

On the Navajo Reservation and in the Pueblo jurisdiction, the Soil Conservation Service has made detailed plans for range management, erosion control, and the consequent economic adjustments. In both areas, the Soil Conservation Service has constructed extensive works for the control of run-off, spreading of flood waters, the extension of flood irrigation, and for various types of range improvement. On the Navajo Reservation, the Soil Conservation Service has established a demonstration and experimental area covering almost 100,000 acres.

Cooperative range improvement and erosion control work was undertaken by the Soil Conservation Service on the Shoshone Reservation in Wyoming and on the Warm Springs Reservation in Oregon.

SURVEYS FURNISH BASIC ECONOMIC DATA

In December 1935 the Soil Conservation Service organized, in cooperation with the Indian Service, a unit of technicians for making physical and human surveys of various reservations for the purpose of producing plans and programs in the execution of which the Indian Service would bring about a better and more complete use of reservation resources. The basis of these programs was the introduction and application of land-use practices which would check erosion and bring about not only the full development but also the conservative management of Indian resources.

At the end of the fiscal year 1937, surveys had been completed and land-use plans made for Havasupai, Papago, Pima, and Walapai Reservations in Arizona, the Mescalero Reservation of New Mexico, the Shoshone Reservation in Wyoming, and the Uintah and Ouray Reservations in Utah; range management plans for seven of the Pueblos had been completed by this cooperative unit and surveys had been started on eight additional reservations.

EXTENSION WORK EMPHASIZES LIVESTOCK

Severe drought again prevailed on eastern Montana, Dakota, Nebraska, and Oklahoma reservations. In these areas, a good many cattle and other livestock which ordinarily would have been retained for breeding stock, were sold for lack of forage. The cumulative effect of drought in these States has been disastrous.

The emphasis during the past year on conservation, economic rehabilitation, and the organization of Indians for the extension of credit has thrown extra burdens on the Extension Division.

INDIAN LIVESTOCK INDUSTRY SET BACK BY DROUGHT; GAINS ARE EVIDENT SINCE 1933

Extension workers have put special emphasis on helping Indians to build up their livestock industry.

The 12 States of Arizona, Colorado, Idaho, Montana, New Mexico, North Dakota, South Dakota, Oregon, Utah, Washington, and Wyoming, contain some 46,568,000 acres of Indian land, or about 90 percent of all Indian-owned land. Approximately 80 percent of this area is range land.

The tables below [1] show that the number of Indians owning dairy cattle and the number of such cattle decreased slightly in 1936; and that the number of Indians owning beef cattle decreased slightly although the number of cattle increased by 3,628 head over 1936. The figures, comparing 1935 and 1936, should be considered in conjunction with the fact that 70,664 head were sold or slaughtered, as compared with 54,827 in 1935.

Dairy Cattle

	1933	1934	1935	1936
Number of Indians owning	6,336	9,133	8,556	8,476
Total number owned	16,406	25,711	20,966	20,624
Average value per head		$23.07	$37.85	$38.30
Total value		$593,127	$793,526	$789,892
Number live animals sold	252	2,171	1,001	1,415
Amount received	$3,603	$36,008	$22,229	$29,529
Pounds dressed meat sold		3,500	10,151	5,400
Amount received		$245	$1,235	$530

Beef Cattle

Number of Indians owning	8,627	13,787	13,812	13,159
Total number owned	167,313	229,343	233,974	237,602
Average value per head		$18.95	$31.10	$29.53
Total value		$4,346,307	$7,276,265	$7,015,443
Number live animals sold	12,284	36,046	44,766	46,718
Amount received	$210,609	$578,070	$1,305,875	$1,158,524
Pounds dressed meat sold	793,063	547,179	880,947	610,688
Amount received	$52,486	$44,820	$86,114	$62,788

Total income received from cattle: 1933, $266,698; 1934, $659,143; 1935, $1,415,453; 1936, $1,251,371.

The beef cattle table shows a greater number of cattle sold in 1936 than in 1935, and the income from those sold in 1936 less than that received in 1935. This was due largely to the number of Indian cattle forced onto the market in poor flesh, bringing only prices paid for common and canner cattle.

Cattle for foundation herds.—The greatest impetus in the livestock industry was gained during the winter of 1934–35 and fall of 1935, when a total of 42,100 head of cattle was obtained from various sources for issue to Indians as foundation herds in order to give them a start in the livestock business. These cattle were issued

[1] All figures in this section are for calendar years.

under contracts providing for the return of a yearling heifer of like quality within a certain number of years. The repayments will, in turn, be issued to other Indians under similar contracts. A revolving pool of cattle has thus been established, and to date, over 7,000 additional cattle have been supplied to Indians from this pool. In time, it should be possible for all Indians who want to undertake cattle raising to obtain an economic unit from this pool.

Indians are using their own range.—The Indians have been leasing the bulk of their grazing lands to whites because they have had no sources of credit or other means of getting a start in using their own land. As the livestock industry is built up, and the Indians have use for their own lands, lands are being withdrawn from further leasing and are being held exclusively for Indian use. The following table will show the increase in Indian use of grazing lands in a 2-year period, 1934–36, on a number of reservations:

Acreage Grazed by Indians

	1934	1936
Blackfeet, Montana	44,926	324,531
Crow, Montana	62,343	142,334
Fort Belknap, Montana	177,788	285,250
Fort Berthold, North Dakota	173,102	285,325
Fort Hall, Idaho	80,000	171,900
Fort Peck, Montana	80,550	102,510
Klamath, Oregon	502,411	544,306
San Carlos, Arizona	1,088,330	1,422,519
Shoshone, Wyoming	244,138	536,531
Standing Rock, North Dakota	75,231	110,568
Yakima, Washington	190,050	310,269

Cooperative livestock associations show marked increase.—The most important development in the Indian livestock field, perhaps, has been the marked increase in Indian initiative and management. Indians, through cooperative livestock associations, are managing controlled grazing, round-ups, sales, and other business affecting their livestock enterprises. Cooperative livestock associations have increased from a comparatively small number in 1933 to 53 in 1935 and to 119 in 1936. These 119 associations, at the end of 1936, had a total membership of 4,476 and owned 123,061 head of cattle.

Sheep and goats.—The reduction program was continued on the overstocked and overgrazed Navajo Reservation. The dipping records of the Bureau of Animal Industry show the following comparative figures in the number of sheep units: [1] 1933, 1,013,606; 1934, 942,059; 1935, 801,406; 1936, 724,336.

In spite of the decrease in the number of sheep in the Southwest, increases were recorded in the totals for all other reservations.

[1] The term "sheep unit" here includes grown sheep, lambs, rams, goats, and kids. Lambs and kids are figured on the basis of 2 for 1 grown animal. The term does not here include cattle and horses. When these are added, the Navajo range is found still to be carrying an overload of several hundred thousand sheep units.

The Southwestern Range and Sheep-Breeding Laboratory, Wingate, N. Mex.—The object of the laboratory-research program is to develop a strain of sheep with a type of wool suitable for Navajo handicraft and having a ready commercial market, but which also will produce more mutton than existing Navajo sheep while retaining their hardiness and ecologically adaptable characteristics.

The research program is now under way. There are 1,342 sheep at the laboratory, of which 629 are ewes. These are divided into five groups varying in size from 116 to 155 head. The groups are again divided into some 16 pens, according to fleece qualities and body conformation, each pen being bred to rams which have been selected for making improvements in wool and mutton in keeping with the purposes of the laboratory.

A Navajo Indian weaver has been employed to weave blankets from the various grades of wool as a test of their suitability for the production of Navajo rugs.

Other livestock.—A total of 78 purebred stallions and 1,484 mares were purchased. A total of 5,895 horses, mules, and burros were sold, most of which were wild or of little value. At the close of 1936, 29,550 Indians owned 115,006 horses, mules, and burros.

In 1936 poultry owned by Indians totaled 355,461. This figure is an increase over that of 1935, in spite of severe drought on more than 20 reservations. The number of birds consumed and the number marketed also increased; the number of Indians owning poultry, however, decreased.

Approximately 53 percent of the swine owned by Indians are on Oklahoma reservations where drought conditions continued. The number of Indians owning swine decreased from 5,153 in 1935 to 4,799 in 1936 and the number owned decreased from 23,573 in 1935 to 19,981 in 1936.

INDIAN FARMERS FIGHT DROUGHT AND INSECTS

Continued crop failures have forced many Indians to turn to Government-financed relief projects for a livelihood. The acreage farmed by Indians has decreased since 1933, and further decreased by 11.8 percent in 1936. In spite of the fact that many Indians have had to abandon farming for wage work, it has been heartening to notice the voluntary drop on many reservations in E. C. W. employment every spring, due to the Indians' wishes to try once more to get something out of their farms.

A total of 514,529 acres was cultivated by Indians during 1936. The irrigated acreage cultivated by Indians increased from 149,043 acres in 1935 to 192,997 acres in 1936, or 29.4 percent. The acreage planted to cereal crops was 244,135 acres, a slight increase over 1935, but the severe drought that prevailed in large areas decreased yields

by 32 percent. Cotton yields decreased 25 percent and sugar beets 28 percent from 1935. Because of emphasis placed on the necessity of growing forage crops for livestock feed the acreage planted increased 53 percent over 1935; however, drought greatly reduced yields.

Insects and drought completely wiped out gardens in many sections of Oklahoma and the Great Plains.

LOCAL EXTENSION ORGANIZATIONS SPREAD KNOWLEDGE OF MODERN PRACTICES

Increased membership in 4–H clubs, farm chapters, and women's clubs has meant a spread of ideas of self-help and agricultural progress. Self-help centers are being established, where Indian women are taught to can and preserve food, to make clothes, and to learn sound practices in nutrition and home management. Last year's totals in food preservation are impressive: 393,843 quarts of fruit; 55,183 of meat; 264,964 of vegetables and 51,062 quarts of fish. In addition 124,636 pounds of fruit were dried; 122,992 pounds of meat; 617,763 pounds of vegetables; and 135,980 of fish. Indian women made 142,710 pieces of clothing under auspices of home-extension groups.

Indian leadership is developed at these centers, and through them it is possible to reach a large number of homes with a small number of trained workers.

INCREASES IN INDIAN OPPORTUNITY THROW ADDITIONAL BURDEN ON EXTENSION STAFF

The attainment of the goal of self-support by the Indians is, to a very large degree, dependent upon a successful extension program. The fewness of the extension staff, however, makes it impossible for the Indians to receive the amount of help they seek and need. The developments which are taking place on most of the Indian reservations—soil conservation work, Emergency Conservation Work, new irrigation developments, rehabilitation enterprises, the organization of Indians under the Indian Reorganization Act, credit and other benefits derived from that act, land purchases, and the setting up of a cattle pool of some 35,000 head of cattle for the restocking of Indian ranges—have created a situation on many reservations which makes it essential that additional extension personnel be provided if the Indians are to receive the full benefits of the expenditures which have already been made and are to be made.

IRRIGATION WORK EMPHASIZES SMALL SUBSISTENCE PROJECTS

The Indian Service's Irrigation Division seeks to fit irrigation and water development into the general reservation programs of resources utilization and of increased self-help by Indians. Activities of the Division include development of water supplies for stock and

domestic use and the design, construction, and operation of irrigation systems.

The development of water supply for stock and domestic use during the past year has been confined to the Navajo, Hopi, Pueblo, and Papago areas in Arizona and New Mexico, together with some small developments in California and the Great Plains area.

SEVENTY-FIVE COMMUNITY GARDENS DEVELOPED

A program of subsistence garden development around which the Indians could build up their cattle and stock industry was inaugurated in 1935 with funds provided by the Public Works Administration. This work is being continued with congressional appropriations augmented by E. C. W. labor.

These small subsistence developments are confined exclusively to Indian-owned land. (The larger irrigation projects include both Indian and privately owned land.) At the end of 1936 a total of 75 gardens had been developed, totaling 813 acres. During the growing season of 1936, 31 of these gardens produced approximately 350,000 pounds of vegetables with a market value of $8,000.

CONSTRUCTION COSTS TO AVERAGE LESS THAN $100 PER ACRE

Recent studies indicate that there are approximately 1,200,000 acres of irrigable land within the present Indian irrigation projects, of which about 500,000 acres have been provided with irrigation facilities and have an adequate water supply. The total construction cost to date is approximately $50,000,000 and the estimated cost of completing all work now planned for the ultimate irrigable area of 1,200,000 acres is $50,000,000. The work now planned includes not only supplemental storage and the extension of irrigation facilities, but also the expenditure of approximately $5,000,000 for assisting the Indians in the subjugation of their lands. The completion of this program will result in an average construction cost of less than $100 per acre, including the subjugation work.

INDIANS' AND LESSEES' USE OF INDIAN OWNED IRRIGATED LAND

Out of the 500,000 acres now supplied with irrigation facilities and for which there is an adequate water supply, some 470,000 acres were irrigated last year, of which 150,000 acres were irrigated by 7,600 Indian families; 120,000 acres of Indian lands were farmed under lease; and 200,000 acres were in white ownership. Actual use of the land by Indians is increasing. The following tabulation shows the actual use of irrigated land in Indian irrigation projects during the calendar years 1934, 1935, and 1936:

Year	Acres Indian operated	Acres Indian leased	Acres privately owned	Total
1934	139,868	102,094	193,523	435,485
1935	140,788	108,435	198,088	447,311
1936	147,264	117,178	197,995	462,437

PROJECTS APPROXIMATELY SIXTY PERCENT SELF-SUPPORTING

Funds available for irrigation and water development activities during the fiscal year 1937 totaled $3,324,164 of which $1,156,664 was from appropriations for regular operation and maintenance, $780,900 from appropriations for construction and $1,386,600 from allotments made by the Public Works Administration. All appropriations for irrigation development are reimbursable by the lands benefited. Under the Leavitt Act of July 1, 1932 (47 Stat. 564), however, no construction assessments are made against Indian lands as long as the lands remain in Indian ownership. Annual irrigation operation and maintenance charges are collected from all Indians who are considered financially able to make payment. Most of the smaller projects are operated by the Indians themselves with some assistance in the way of supervision and the furnishing of materials and supplies, and on the larger projects the Indians are permitted to work out the annual charges which amount to from 50 cents to $2 per acre. All privately owned lands within these projects pay their proportionate share of both operation and maintenance charges and construction charges and Indian lands leased pay their proportionate share of the operation and maintenance assessments.

LARGE PROJECTS CARRIED FORWARD IN SIX STATES

The principal construction activities during the year, carried on with allotments made by the Public Works Administration, consisted of the construction of a storage reservoir in the Owyhee River, Duck Valley project (Nevada), the construction of an equalizing reservoir on the Fort Hall project (Idaho); the completion of the distribution system to Indian lands on the San Carlos project (Arizona); the beginning of construction of a pumping plant to serve 13,000 acres on the Fort Peck project (Montana); the construction of a storage reservoir on the Flathead project (Montana); continuation of drainage work on the Wapato project (Washington); and miscellaneous construction work in the Navajo and Pueblo areas (Arizona and New Mexico).

INDIAN EMERGENCY CONSERVATION WORK GIVES WAGE WORK AND BUILDS UP INDIAN RESOURCES

Of fundamental importance in the revitalization of Indian life has been the Indian Emergency Conservation Work. It has given wage work where relief was desperately needed. But its importance has not only been its relief aspects. Rather, it has made possible the systematic conservation and building up of reservation resources. The work has gone on long enough for Indians themselves to see results and to sense the economic potentialities of their holdings. The rise in morale achieved through the consistent policy of encouraging participation of tribal councils in planning the work, and of advancing capable Indians into responsible positions, has been as important a result as the actual physical improvements.

I. E. C. W. ended its fourth and final year on June 30, 1937. Henceforth this activity will be known as the Civilian Conservation Corps, Indian Division.

The sum of $8,914,000 allotted for the work in 1937 was a slight decrease from that received during the fiscal year 1936.

ENROLLMENT AND EMPLOYMENT

More than 50,000 Indians have participated in Indian emergency work since the beginning of the work in June 1933. The total daily number of men on the pay roll during the past 4 years has been approximately 8,500, and more than 11,500,000 calendar days have been worked. At some of the agencies it was necessary to stagger employment.

Indians have been given preference in supervisory and facilitating positions, when qualified. There are not many Indians technically trained. However, a large number of group foremen, mechanics, machine operators, camp assistants, and assistant foremen are Indians. The employment record for skilled, facilitating, and supervising positions shows 540 Indians as against 436 whites, for the 4-year period.

Wages for Indian enrollees have been, as in camps for whites, $30 per month, plus board, lodging, and clothing, or a commutation of $15 per month when the worker lives at home and provides his own meals.

The family camp continues to be popular. Reservation staffs have helped these groups in their social, sanitation, and health problems.

HEALTH GOOD; ACCIDENTS FEW

E. C. W. staffs have worked hard on safety and health programs. There were very few deaths during the past year; there was some illness and a few accidents. Red Cross aid continues to be given; first-aid schools have been encouraged and life-saving courses have been held.

PRODUCTION ACCOMPLISHMENTS SHOW VARIED CONSERVATION PROGRAM

According to an announcement made a few months ago by the office of the director, Mr. Robert Fechner, the conservation program of the United States has been advanced at least 20 years by the work of the Conservation Corps. This is also true of the Indian program. The record of work done is impressive. Conservation has been emphasized: Water development, prevention of soil erosion, and similar projects have improved reservation lands. Major activities undertaken during the past 4 years follow:

Telephone lines	miles	5,636.7
Firebreaks	do	2,282.8
Truck trails	do	6,420.6
Horse trails	do	2,019
Fences, 2,576,431 rods or	do	7,863.5
Springs, small reservoirs, and well development	units	6,909
Impounding and large diversion dams		922
Insect and tree pest control	acres	911,394
Erosion control, check dams:		
Permanent	units	16,402
Temporary	do	50,474
Bridges:		
Vehicle	do	659
Stock		226
Corrals	units	141
Elimination useless range stock		269,836

Reservation values have been substantially increased; the work has been urgently needed and well done.

APPROXIMATELY 70 PERCENT OF FUNDS SPENT FOR WAGES

Pay-roll items (actual wages and emoluments) total 69.7 percent of the funds spent during the 4-year period. Emoluments include shelter and subsistence, commutation thereof, feed and hire of teams. Purchases of heavy equipment total 7.7 percent. Supplies and materials accounted for 15 percent. Heavy equipment definitely increased the amount of work accomplished, and had little, if any, unfavorable effect on the employment of Indians.

LEISURE-TIME PROGRAMS GIVE INDIAN ENROLLEES VALUABLE TRAINING

After working hours, programs of recreation and education for Indian enrollees have been maintained. Training on the job has been emphasized. Most of the educational enterprises has been vocational rather than academic. The regular employees of the Indian Service have generously volunteered their services to assist in the program.

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SAVINGS ACCUMULATED BY INDIANS

More than $1,800,000 has been deposited in individual Indian money accounts during the past 4 years. Household equipment, livestock, farm equipment, and clothing have been purchased from these savings; homes have been repaired and new ones constructed. A substantial balance remains for later use.

"INDIANS AT WORK"

The pamphlet "Indians At Work" has become increasingly popular. It is liked by the Indians, and is read with regularity by them.

RELIEF AND REHABILITATION PROGRAM MAKES A BEGINNING IN IMPROVING LIVING CONDITIONS

The Indian relief situation had been crucial even before the depression. Early in the present administration a partial survey of the housing and economic condition of Indians emphasized the fact that a large number were in desperate straits—landless, miserably housed, and without means of support. While direct relief was being provided, and, after 1933, work relief, there were no funds for attacking this fundamental problem of housing and economic rehabilitation until the passage of the Emergency Relief Act of 1935 and the subsequent allocation to the Indian Office by the President, in January 1936, of $2,000,000 of emergency funds.

Later reduced by retransfers to the Treasury to a total of $1,767,027, these funds were used as follows: For direct relief, $336,323; for rehabilitation, $1,360,500; for administration, $70,204. In March 1937, additional funds were made available to the Indian Office as follows: $498,000 for field projects, and $39,000 for administration.

By the terms of the Presidential allocation, the rehabilitation funds were to be used for the following purposes:

To finance the rehabilitation of Indians in stricken rural agricultural areas by means of loans or grants, or both, to enable them to construct or repair houses, barns, outbuildings, and root cellars; to develop wells and springs for domestic water; to clear and improve land for gardens and small farms and to purchase land for such purposes when necessary; to make furniture and other handicraft products; and to establish, maintain, and operate other small self-help projects.

VARIED CONSTRUCTION AND COMMUNITY PROJECTS UNDERTAKEN

As of June 30, 1937, the rehabilitation program had accomplished the following:

Building Construction Projects

Houses, new	874	Poultry houses	160
Houses, repairs	1,711	Combination cow shed and poultry houses	37
Barns	148		

Building Construction Projects—Continued

Woodsheds	10	Smithies and woodworking shops	7
Combination garage and woodsheds	58	Combination self-help project buildings, new	82
Toilets	999	Combination self-help project buildings, repairs	25
Hog houses	61	Combination carpenter shop and canning kitchen	1
Cattle sheds	5	Combination corral and shearing shed	1
Root cellars	79	Corrals	10
Combination root cellar and smoke house	2	Shearing sheds	2
Flour and grist mills	8	Blacksmith shops	12
Granaries	5	Provision and supply depot (sheep industry)	1
Canneries	3		
Sorghum mills	3		
Machine sheds	5		

Water and Land Development Projects

Gardens	15,066	Miscellaneous land improvements	13
Irrigation	11		
Water development	587		

Self-Help and Miscellaneous Projects

Canning and sewing	26	Fencing	66
Canning and sewing equipment	67	Hide tanning	1
Hay press	1	Weaving	1
Portable caldrons	3	Equipment and tools for arts and crafts	1
Sawmills and logging	6	Agricultural machinery	3
Dipping vats	73	Shearing machines	2
Furniture and handicrafts	7		

Projects were conducted at 68 agencies, situated in 23 States. On April 30, 1937, the Indian rehabilitation program had furnished 1,421,384 man-hours of employment at an estimated man-year cost of $963. As of June 17, 1,352 needy Indians requiring employment were being given work.

NEED FOR REHABILITATION WORK CONTINUES

The rehabilitation program has been of the utmost importance in caring for cases of desperate need, in restoring initiative and morale, and improving opportunities for community and family self-support. Concerned as it is with permanent improvements in the way of housing, farm buildings, self-help buildings, self-help enterprises, and the development of land and water resources, the rehabilitation program is particularly designed to help Indians toward a level of economic self-sufficiency and decent living. By improving the Indians' economic status, rehabilitation work should ultimately be reflected in lessened gratuity appropriations for relief and support.

ROAD WORK IMPROVES RESERVATION CONDITIONS; AFFORDS RELIEF

In its road program the Indian Service has sought to develop adequate reservation road systems, and, as was contemplated by Congress, to provide employment for Indians and to train Indians gradually for technical positions in road building.

COSTS OF RESERVATION ROADS HAVE BEEN LOW

Reservation road programs are headed by qualified, experienced road engineers. All Indian Service projects are examined and approved as to location, type, and design by the Bureau of Public Roads, whose requirements have sharply increased Indian Service road engineering costs.

Accomplishments during the fiscal year ending June 30, 1937, with the $3,500,000 provided by Congress for Indian road work follow:

Roads:	
Improved	879. 07
Surfaced	597. 34
Total (miles)	1, 476. 41
Bridges:	
Constructed	193
Repaired	207
Total	400
Culverts:	
Constructed	2, 272
Repaired	263
Total	2, 535
Maximum number of people employed on road work during the year	11, 655
Total man-hours of work furnished during the year	4, 039, 505
Average earnings per hour	$0. 457

A result which cannot be measured statistically is the increased proficiency of Indian employees in surveying, drafting, and other technical work. Indians in increasing numbers are qualifying for responsible road jobs. Approximately 70 percent of road expenditures go for wages.

NEED FOR ROAD WORK CONTINUES

The need for road-improvement work on Indian reservations is of continuing urgency. Congress recognized in two acts (acts of June 19, 1934, and June 16, 1936) that $4,000,000 are annually required for road work on nearly 200 Indian reservations in 24 States, for this purpose; but the full amount authorized has not been appropriated in every year. Little or no help from the States or counties or townships can be expected for roads built for Indian use; consequently

this task will remain a permanent obligation of the Federal Government.

Following past practice, part of the road appropriation was used to purchase machinery, so that now the Indian Service has a modest amount of modern and efficient road-construction machinery. Garages and storage sheds have also been constructed at most jurisdictions for the repair and preservation of valuable equipment and machinery. This Service is organized to carry on road construction and improvements at low costs; and in cooperation with the Bureau of Public Roads, it has made surveys and plans for a 5-year future road-construction program.

ROADS ARE FOR RESERVATION USE—NOT DESIGNED FOR TOURISTS

The Indian Service has refused to construct or authorize the construction on reservations of tourist roads which would mean the exploitation of Indian life and culture. Moreover, the Service does not approve of road construction into wilderness areas which will better serve the Indians and the public if left unmolested. But the Service does seek to build reasonably good roads for reservation use. The day-school program, especially, hinges upon roads adequate for daily bus service; and the health program, in attempting to reach out into Indian communities, depends on passable roads. We are resisting the pressure to build roads of more costly and elaborate type than present or prospective use can justify.

CONSTRUCTION

With the exception of appropriations continued available for the construction of public-school buildings, and for the Sioux sanatorium in South Dakota, all building and utility construction work during the fiscal year 1937 was carried on as a part of the Public Works program. Ten public-school buildings were completed in the Northwest district and three more are nearing completion.

A number of large and important projects were completed during the year. Among these are the hospitals at Sisseton and Yankton, S. Dak., Cass Lake, Minn. and Crow Agency, Mont. Contracts were let during the year for the combined general hospital and tuberculosis sanatorium at Talihina, Okla., and for the hospital and laboratory building at Fort Defiance, Ariz. Completion dates for these two projects are March 18, 1938, and November 8, 1937, respectively. The Sioux Sanatorium at Rapid City, S. Dak., also being constructed by contract, will be ready for occupancy on January 1, 1938.

Except for buildings being erected under contract, the Public Works construction program was completed as of June 30, 1937. The construction program for the fiscal year 1938 will be financed from an

appropriation of $2,047,500 contained in the regular Interior Department appropriation act. This change from emergency to regular funds necessitates the replacing of all Public Works employees with persons selected from the civil service registers. The personnel in the three field construction offices (located at Albuquerque, N. Mex.; Billings, Mont.; and Muskogee, Okla.) will be reduced to the minimum number necessary to take care of the program for 1938. It is hoped that the shift from emergency to regular employees can be completed by September 30, 1937, and that the new program can be well under way before the cold winter weather sets in.

INDIAN ARTS AND CRAFTS DEVELOPED AS PART OF INDIAN LIFE AND ECONOMY

One of the characteristics of the American Indian is his outstanding ability as a craftsman. Unfortunately, however, most Indian arts and crafts products have been marketed in a haphazard fashion, and returns to the Indian producers have been low. The wide variations in quality and the uncertainties of production have made large-scale marketing difficult.

With the objective of building up this potential resource and increasing revenues from it while maintaining its integrity, this administration sought the passage of an arts and crafts bill which would provide funds and personnel for working out better production and marketing methods. Such an act was passed August 27, 1935 (49 Stat. 891), and the Indian Arts and Crafts Board was appointed during the following year. Broad powers are given the Board in the execution of its functions, but it may not itself act as a dealer.

"QUALITY" MARKET SOUGHT FOR INDIAN CRAFTS

After 6 months of extensive study in the field covering both production and marketing conditions, the Board found itself prepared last January (1937) to define its general policies and to initiate its first concrete projects.

In its work with the producer, it is the Board's policy to make raw materials available; to stimulate quality production and to help in the organization of craftsmen groups; to supply craftsmen of tribes having traditional handicrafts with all available information on techniques formerly used by their tribes and to acquaint them with the exigencies of the current market; to those groups having no traditional handicrafts, an opportunity to learn industries is to be given. In its work with the local dealers, it is the Board's policy to encourage emphasis on quality work and to help in establishing business relations with a quality market. Stimulation and actual cooperation in the organization of exhibits of Indian arts and crafts, stimulation of

publications on Indian arts and crafts and establishment of an educational service for sales forces of stores carrying Indian crafts goods are included among the Board's plans for promotion work in the ultimate market.

LOCAL PROJECTS ARE INITIATED

The following specific projects have been initiated by the Board.

Silver project (*Navajo, Pueblo, and Hopi Reservations, N. Mex. and Ariz.*).—Standards of genuineness and quality for the silver work of the Navajo, Pueblo, and Hopi Indians have been established and published. A Government stamp, to be applied only to pieces that meet these standards, has been devised.

The loan of expert Navajo teachers of silversmithing from the Division of Education of the Indian Service has been arranged. These men are serving as advisers to reservation silversmiths who wish to produce the highest type of jewelry. Private groups are supplying the workmen with raw materials and adequate wages. Even after visits to all local dealers, no work of a quality equaling the products of the teachers and their students (with the exception of old pieces) has been found to be on sale. The Board believes that this project will not only produce a better source of income for the best silversmiths, but will also create a demand for better jewelry and thus stimulate the production and trade for more profitable merchandise all over this region.

Navajo textile project.—A certificate of genuineness for Navajo textiles has been devised, to be attached to such fabrics as are made only of wool and woven in the traditional Navajo manner.

Textile home-industry project (*eastern Oklahoma*).—To extend the Board's activities into regions where the traditional crafts work has but little sales appeal or has been completely lost, staff members of the Board made a special survey of this region. As a result, plans have been made to introduce home industries that will give the workman a chance to profit from his manual skill and, at the same time, give him an opportunity to develop a characteristic style of his own.

The first home industry to be developed in the Oklahoma region is the making of hand-spun yarn. Inquiries on the market have shown that most of the homespun yarn used in the United States today is imported from foreign countries and is available only at a very high price. The Board has asked the Education Division of the Indian Service for the loan of an expert spinning teacher as instructor, and hopes later on to help in the organization of an Indian cooperative or credit association to carry on the work on a commercial basis. The Board also will cooperate in the development of sales outlets for this commodity. It is expected that this project will be widened in the future to include rug making and weaving.

Arts and crafts group project (Western Oklahoma).—In recognition of the strength of the old traditional arts and crafts societies in this region, the Board has initiated projects based on group work. A staff member of the Board has encouraged the formation of fairly large groups of Indians interested in improving the quality of the traditional arts of their tribes. In Shawnee and in Anadarko, production has already started in cooperation with the local Indian Service agencies and organized groups of local businessmen who have recognized the value of a development of finer Indian products as of definite value to the whole region. Beadwork and leatherwork are the principal products to be made under these projects.

Experimental laboratory, Tesuque, N. Mex.—A small laboratory was in operation last spring at Tesuque to experiment with the production methods of weavers, tanners, and silversmiths from various reservations. It was the purpose of this laboratory to help the craftsmen to find out what specific types of raw material are best fitted for their purposes and what production methods bring the best results.

Legal protection of Indian products against unfair and fraudulent advertising methods.—With the aid of the United States district attorney of the territory involved, the use of misleading labels on one type of imitation Indian jewelry has been stopped; another case of the same kind is in the hands of the attorney now. Two cases of false newspaper advertising have been referred to the Federal Bureau of Investigation for appropriate action.

Indian exhibit at Paris World's Fair.—An Indian exhibit at the World's Fair in Paris this summer was arranged through the cooperation of the Board with the American Federation of Arts, which was in charge of the exhibition of American handicrafts.

Plans begun for Indian exhibit at World's Fair in San Francisco in 1939.—Representatives of the Indian Arts and Crafts Board have conferred with the world's fair authorities and interested private groups in San Francisco on an Indian exhibit at the Golden Gate International Exposition in 1939. A staff member of the Board helped to outline a plan for an exhibit that for the first time will show the whole scope of the Indian's artisic ability in a dignified, dramatic manner. This display will be more comprehensive than any ever held.

EDUCATION OF INDIAN CHILDREN

BUILT AROUND FLEXIBLE PROGRAMS, SUITED TO VARYING CONDITIONS

The policy of the present administration has been to give consideration to the human factors which govern relationships between racial groups.

IMPLEMENTING AN EDUCATIONAL POLICY

The new pattern of education for the Indians attempts to adjust the school program to the needs of the Indian community, recognizing and preserving significant factors in Indian life and aiding in adjustment to white culture at points where such adjustment appears inevitable. However, it is not enough to declare that a new policy is in order. It must somehow or other be incorporated into the living of a staff which for many years may have been practicing quite the reverse. Therefore, in order to give positive effect to the new policies, it has been necessary to develop agencies for in-service training.

In-service training through summer schools.—During the summer of 1936 the Education Division of the Indian Office operated two in-service training institutes: One at Pine Ridge, S. Dak.; the other at Wingate, N. Mex. Courses in anthropology, philosophy of Indian education, rural sociology, Indian arts and crafts, and in the vocational, agricultural, and home-making needs of the several areas studied were offered. Demonstration schools were operated in which the very difficult subject of teaching English to non-English speaking native children was made a prime concern. Opportunity was given for teachers in the Service to learn something of the Sioux or the Navajo language. Each institute operated for 6 weeks, and 404 teachers in all were reached. Through arrangements with a number of first-rank American colleges, teachers were enabled to secure college credit toward an undergraduate or graduate degree. In response to requests from the field, this summer training program was extended for the summer of 1937, and four schools were operated. The program was repeated at Pine Ridge and Wingate, and two new centers at Sequoyah and Chilocco in Oklahoma were added. Demonstration schools were organized at each of the four centers, and a total of 972 educational personnel was served. In addition 27 teachers were registered from public schools outside of the Indian Service which enroll Indian children.

Apprentice training aids young Indian teachers.—In carrying out the policy of enlarging the number of Indians employed in the Service, a program of apprentice training for Indian college graduates trained in education was inaugurated in the fall of 1936. A dozen young Indians showing better than average potentialities for teaching were placed with a selected group of superior Service teachers to increase their probabilities for success when actually given full-time responsibilities as teachers. This plan has proved most successful and is being extended for the school year 1937–38 with a small appropriation approved by Congress covering apprentice salaries.

DAY-SCHOOL AND PUBLIC-SCHOOL ATTENDANCE INCREASES

Hitherto Unschooled Children Enrolled

The growing emphasis upon day-school attendance of Indian pupils has resulted in an increase of Indian day-school enrollment in Federal schools from 4,532 pupils in 1928 to almost 12,000 during the school year 1936–37. More than half of this increase represents children not previously enrolled in any school. During the same period of time Indian pupils in public schools have increased from 34,163 to 50,328.

The most spectacular development of the new day-school policy has been on the Navajo Reservation. Here there has been an increase of 37 new day schools during the last 2 years, with a resultant increase from 822 pupils in attendance at day schools to an enrollment of 2,147. Because of the tremendous number of Navajo children estimated not in any school at all, there has been no decrease in boarding-school enrollment during this period of time. There are still more than 7,000 Navajos of school age who are not enrolled in any kind of school.

INDIAN SERVICE HIGH SCHOOLS INCLUDE TRAINING FOR SELF-SUPPORT

There has been a continuing increase of Indian pupils enrolled in federally operated high schools. Many of these, because of the sparsity of population on some of the larger reservations, are and must continue to be boarding schools. On some of the smaller reservations or in areas where the population is more compact, these high schools are operated on a day basis.

The new Indian Service high schools are developing a program the major objective of which is to produce economically self-sustaining citizens. Recognizing that for many Indians their remaining lands constitute a major asset, these high schools are bending every effort to produce groups of young people who are not only interested in farming or stock raising, but who, through the course of their high-school careers, have engaged in farming under the supervision of the school on a practical self-supporting scale. This type of program has undergone gratifying development at the Chilocco School in Oklahoma on whose 8,000-acre campus the children are operating individual farms of 40 to 80 acres, caring for a substantial beef herd, raising chickens on a commercial scale, and otherwise experiencing the problems involved in making a living on a farm typical of that area.

The Fort Sill, Riverside, and Cheyenne and Arapaho Schools, also in Oklahoma, are being extended from elementary and junior high school into senior high schools and are offering a similar program of agriculutral training. The Oglala Community High School at Pine Ridge in South Dakota is placing a great deal of emphasis on livestock training. It is operating a beef herd of over 600 head, engaging in the poultry business on a commercial scale, and operating a

hatchery for the furnishing of young stock to the local Indians. A similar program is being developed at the Rosebud Boarding School and plans of a similar nature are being developed for the Crow Creek, Cheyenne River, and Standing Rock Reservations. The principles underlying this type of development are being applied in varying degrees throughout the Indian schools.

REALISTIC TEXTBOOKS SOUGHT FOR INDIAN CHILDREN

One of the most serious problems of the Indian Service lies in dealing with races of people, large numbers of whom still speak their native languages and for whom English is a little-used foreign tongue. In many of these groups, as for instance the Navajo, the Pima and the Papago, written records are entirely foreign to the racial experience, and reading, therefore, lacks the functional reality which it occupies in the thinking of the average white child. Furthermore, on the more isolated reservations, Indian young people have no opportunity for contact with ferryboats and steamers, firemen, policemen, postmen, railroad trains and streetcars, and many other objects and people whose activities form the familiar basis of elementary school reading. The problem of teaching these young people to read, to make intelligent use of numbers, and in other ways to accept the basis of American education would be greatly simplified if textbook material existed which was phrased in terms of the Indian child's experiences. During the last year the Education Division has, therefore, accepted as one of its responsibilities the encouragement of the preparation of materials to be used in Indian schools. Some of this material will probably be published by the Government because of its exclusive application to limited areas in the Indian Service. In other cases, the Indian Service will encourage its commercial publication because it would appear to be valuable for use in white schools as well as Indian schools.

SPECIAL SCHOOLS

Recognizing the importance of health for a population which has suffered seriously from the inroads of disease introduced by the whites, the Education and Health Divisions are cooperating in the operation of several special schools. At Fort Apache in Arizona, at Chemawa, in Oregon, and at three of the boarding schools on the Navajo Reservation special trachoma programs are being operated, and the schools are devoted almost exclusively to children suffering from this disease. In several of the day-school areas on the Navajo Reservation, cooperation with the Health Division is making available the service of special physicians and nurses to operate trachoma clinics for children and parents.

At Fort Totten in North Dakota an old boarding school closed several years ago has been reopened as a tuberculosis preventorium, and a special regimen is in force calculated to strengthen these children against the greatest scourge of Indian life.

At the Eklutna Vocational School and at Wrangell Institute in Alaska where a Territorial tuberculosis survey indicates that almost 25 percent of the population is suffering from active tuberculosis, school children revealed to be suffering from the disease are being given segregated treatment in dormitory units of the two school plants, in the absence of adequate provision for hospitalization or for home treatment.

EDUCATIONAL LOANS

While much of the educational emphasis in Indian schools is on practical learning, leading toward economic self-sufficiency, the Government has been earnestly seeking competent Indian young people for advanced vocational and collegiate training. Under the Indian Reorganization Act several hundred thousand dollars have been appropriated for loans to Indians for higher education and at the present time 372 students are receiving Government aid, 146 of whom engaged in advanced vocational work. To meet the needs within the Indian Service for competent operators of tractors, graders and other road machinery and Diesel power plants, a special school for adults was opened at Phoenix Indian School last year. Its students were limited to men of promise, and all of its graduates were placed. Because of increased opportunities for practical experience on the Navajo Reservation, the school is this year being moved to Wingate. Haskell Institute also offers a program of advanced training for commercial students.

EDUCATION OF ALASKA NATIVES AND INDIANS

During the last year several significant changes have taken place in the organization of the native schools in Alaska, which are also under the jurisdiction of the Indian Service's Education Division.

Civil service standards strengthen personnel.—Until recently the civil service regulations have not applied to these schools. For the last year or two new appointments have been drawn from civil service registers and during the current year an attempt has been made to qualify through noncompetitive examination as many of the incumbent Alaska teachers as possible and to replace with civil service appointees members of the Alaska staff who fall far short of minimum civil service requirements. These steps should materially strengthen the Alaska personnel. New salary classifications recognizing the extremely isolated nature of many of the Alaska posts should make these positions somewhat more attractive than they have been in the past.

Quality of native crafts improves.—The interest aroused in the preservation and development of native arts and crafts has resulted in the initiation of several projects of adult craft activity which should ultimately be of great value to many of the natives of Alaska. The School at Nome has cooperated in adapting and restyling several of the native skin garments, with the result that 50 native women have been kept busy producing parkas and mukluks which have been absorbed by commercial traders as rapidly as produced. The success of this endeavor at Nome will be followed up in other northern areas and it is hoped that a material contribution to the cash economy of the Eskimos may result.

Efforts are being made to improve the quality of wood carving among the southeastern natives and ivory carving among the Eskimos of the north coast, both of which have deteriorated in the face of Japanese competition.

Demand for secondary education grows.—The same increased interest in secondary education that has been remarked on in connection with the Indians of the continental area is also becoming manifest in Alaska. Only two Federal centers of secondary education are now operated—Wrangell Institute and Eklutna Vocational School. The maximum enrollment at both of these institutions was reached during the current year and enrollments for the new year indicate a substantial increase which will tax present facilities. This increased interest is apparent among the Eskimos as well as the Alaska Indians, which indicates that consideration must be given shortly toward the establishment of a secondary school for Eskimos, keyed to their economic needs and located in the northern part of Alaska where climatic conditions and vocational opportunities will resemble those in their natural homes.

The Eklutna School, to which Eskimo secondary students are now sent, is located on Cook Inlet only a short distance from Matanuska Colony, in an area where climatic conditions are milder and considerably different than those encountered in their homes. There has been some evidence that this factor has not contributed to the most healthy conditions for many students from the northern areas.

The preliminary reports of the territorial tuberculosis survey indicate the presence of active tuberculosis upon the part of about 25 percent of the village populations. A slightly lower percentage was discovered in the boarding schools. Due to the totally inadequate provision for sanitarium care within the territory, the Education Division has been cooperating with the Health Division in providing rest care in segregated portions of the school dormitories for students in need of medical attention.

Two thousand native children without school facilities.—There are still approximately 2,000 natives not in any school. Some of these

are in areas remote from white contact into which no attempt has yet been made to penetrate. In several of these locations the Eskimos are requesting schools, and at Chandalar, just north of Fort Yukon, the natives themselves have furnished a primitive structure and paid a small salary to a teacher in order to inaugurate the educational work. The Service has furnished some equipment and supplies and hopes in the near future to be able to add this to its active schools. In other areas served only by territorial schools, full-bloods are excluded, and in some of these areas where the white population has disappeared, the Indian Service is taking over the operation of the school and admitting full-bloods as well as mixed-bloods.

School buildings need replacement.—Many of the original Alaska school buildings were built hastily and without a view to permanence. Some have long outlived their usefulness and others have been outgrown. The Government is, therefore, faced with a problem of replacing many of these structures with better insulated and more permanent buildings which provide more adequately for community needs.

Alaska reindeer become Indian Service responsibility.—With the close of the current year the supervision of the Alaska reindeer service has been transferred from the territorial government to the Office of Indian Affairs. In view of the fact that the direct supervision of herds and the business of the native cooperative stores has been handled by Federal teachers, the full responsibility for the reindeer service has been placed under the Education Division of the Indian Office.

The Alaska native—Alaska's greatest resource.—The exploitation of the mineral and animal resources of Alaska has not been without effect on the native people. The nicely balanced, though primitive, economy which enabled the Eskimo and the Alaska Indian to wrest a living from a country of climatic extremes, has been upset—upset not only physically, but, what is more tragic, psychologically. People, who before the coming of the white man were self-dependent, adjusting their activities to the seasonal rhythm of life, have been taught to depend on a cash economy. Instead of hunting and fishing for their own needs and growing gardens in areas where such effort is rewarded abundantly, the native has been encouraged to disregard these activities and work instead for wages, or trap for the white man and buy his food and clothing from the store. More and more a people which once was self-sufficient has become dependent upon external forces which are totally disregardful of their human needs. Alaska is coming to be thought of as an area capable of permanent and desirable economic development. This new permanency of Alaska will necessitate a redefinition of the native's position in Alaska life.

Although the fact has not always been recognized, the native Alaskan is one of the most important resources of the Territory.

The whites of Alaska cannot continue to profit at the expense of the natives. Constitutionally suited to life in the Arctic, the Eskimo and the Alaska Indian must form the foundation to any long-range planning for the development as contrasted to the exploitation of the Territory.

The Education Division of the Indian Office is being guided by these facts in undertaking to develop an educational program which will capitalize the native virtues and at the same time adapt the natives for necessary contacts with their white associates.

FOR BETTER HEALTH AMONG INDIANS

THROUGH ENLARGED PUBLIC HEALTH WORK, IMPROVEMENT OF HOSPITAL FACILITIES, RESEARCH

That Indian health has improved in recent years is borne out by the figures below showing the decline in the death rate between 1933 and 1936. The Indian death rate in 1936 was 13.7 per thousand, or 2.2 more per thousand than among whites (including Negroes). Only as recently as the 1920's the Indian death rate was double that of the general population. The Indian death rate is still too high. Tuberculosis and the infant death rate are the principal factors.

	1933	1936	Per 1,000 decrease as compared with 1933
Indian birth rate per 1,000 population	23.8	22.3	−1.5
Indian death rate per 1,000 population	15.5	13.7	−1.8

The Indian Service maintained a health staff of 1,625 workers[1] during the fiscal year 1937, and 4,139 hospital beds, in its effort to improve health among Indians. The increase in the health appropriation from $4,011,620 to $4,502,630 made possible much-needed improvements in equipment and personnel.

PUBLIC HEALTH PROGRAM SEEKS COOPERATION OF STATES; EXTENDS PREVENTIVE WORK

State cooperation increases scope of work.—The Health Division is expending its cooperative relationships with State and local health authorities. One notable example is the five-county full-time health district in Oklahoma. This was made possible through the cooperation of the State Board of Health, the Public Health Service, the Children's

[1] Health personnel at the close of the fiscal year included 10 administrative and supervisory physicians, a supervising dentist, 7 supervisory nurses, 150 whole-time and 87 part-time physicians, a special expert in tuberculosis, 3 special physicians for tuberculosis, 12 special physicians for trachoma, 19 consultants, 14 whole-time and 11 part-time dentists, 115 field nurses, 418 hospital nurses, 12 nurses at large working with special physicians, 6 assistant medical technicians, and 759 other employees, a total of 1,625. This represents an increase of about 150 over 1936, due in large part to the opening of new hospitals, with some additional employees to provide better service at existing plants.

Bureau, and the Indian Office. The Indian Office is supplying the services of three nurses. The population in this five-county area is 25 percent Indian.

The cooperative health work in North Carolina on the Cherokee Reservation has continued and the area has increased from a three-county to a five-county unit.

Contractual relationships have been established with the State of Minnesota for the further development of public health service for the benefit of Indians in the Arrowhead district of that State (the northeast tip of the State).

There has been a continuous increase in the number of senior physicians appointed deputy State health officers by State health departments, made possible by Executive order of May 1935. There has been a notable increase in this procedure in the Northwestern States.

Indian Service pioneers in tuberculosis vaccination.—The work of vaccination against tuberculosis under Dr. Joseph D. Aronson, special expert, was notable. During the fiscal year there were vaccinated against tuberculosis a total of 97 children at the Pima Agency, 232 at the Shoshone Agency, and 177 at the Turtle Mountain Agency. An equal number of controls are under observation. Plans were made during the year to extend this work on the Rosebud Agency and in the southeastern section of Alaska. The public health nursing program and the follow-up of these vaccinated children and the keeping of records has been strengthened.

The prevention of disease through immunizations and inoculations is evidenced by:

Vaccinations against smallpox	36, 625
Inoculations against diphtheria	8, 847
Immunizations against typhoid fever	10, 489

A few Indians were immunized against spotted fever.

"Trachoma schools" prove effective.—The continued operation of the Roosevelt Trachoma School on the Fort Apache Reservation, Ariz., brought significant results. The concentrated program of treatment of children in this school is demonstrating that it is possible actually to eliminate trachoma from the school child by this means. It has been predicted that after one more year of intensive treatments trachoma will be practically arrested among the school children on the Fort Apache Reservation.

HOSPITAL CONSTRUCTION MAKES IMPROVED SERVICE POSSIBLE

The hospitals which were reported under construction at the end of 1936 were completed during 1937 and are now available for use, making a total of 93 hospitals and sanatoria, exclusive of infirmaries

of less than 10 beds, with a total capacity of 4,139 beds, 131 cribs, and 280 bassinets. Included in this group are 15 sanatoria with a capacity of 1,300 beds, some of which are also available for general medical and surgical cases. The increase in number of beds available over 1936 was nearly 400.

The following hospital and sanatoria projects are under construction and will add approximately the number of beds indicated when completed:

	Beds
Fort Defiance Hospital and laboratory, Arizona	140
Wishiah Sanatorium, California, unit for Indians	30
Choctaw-Chickasaw Sanatorium, Talihina, Okla. (replacement and enlargement)	150
Tahlequah Hospital, Oklahoma	75
Sioux Sanatorium, Rapid City, S. Dak	150

Hospital treatments increase.—In hospitals there were treated 52,222 patients for general conditions other than tuberculosis and in the various sanatoria 2,334 patients were treated for tuberculosis. Outpatient treatments numbering 428,207, and 1,311,291 hospital treatments were given. The number of maternity cases treated in hospitals was 3,857, in contrast with 3,301 last year. The yearly increase of obstetrical service in Indian hospitals is significant of the attitude of Indians toward modern medicine. There were 13,445 Indians treated for trachoma.

Pneumothorax operations for tuberculosis.—In the tuberculosis field, emphasis has been placed on the treatment of selected cases by collapse therapy or pneumothorax. One doctor has been operating on the Blackfeet Reservation and another in the vicinity of San Xavier and on the Sells Agency. Two additional physicians on educational leave went to the Phipps Institute in Philadelphia for this type of training. One was sent to the Pine Ridge Reservation and the other detailed to Dr. Aronson in connection with the tuberculosis vaccination campaign.

Dental service aided by use of trailers.—Dental treatment was given to 30,886 Indians and 64,630 treatments were given. This service consisted mostly of work among the school children in an effort to preserve teeth in that age-group; however, dental treatments were furnished adults in emergencies and to relieve pain. The three dental trailers in operation have been of immense help in the covering of large territories.

NURSING WORK EXPANDS; TURNOVER, DUE TO HEAVY DEMANDS ON NURSES, HANDICAPS WORK

The nursing work of the Indian Service has increased in amount and in scope during the year 1937.

Specialized training for nurses improves service.—In the field of public health nursing the research work in tuberculosis control has

opened several positions demanding nurses trained to collect epidemiological data and carry on educational activities of an intensive nature. The nurses detailed to this work were willing to take special instructions at their own expense (nurses do not have educational leave) at Phipps Institute.

In the field of trachoma control, nurses have been given special instruction at the Fort Apache Trachoma School. A public health nurse has been established at the Navajo Agency to do an intensive follow-up of day-school and community trachoma patients. Several nurses have taken leave without pay to get instruction at Dr. Gradle's trachoma clinic in southern Illinois.

Hospital nursing standards evaluated.—A study was made by the National Organization of Nursing Education in cooperation with the nursing section looking toward an evaluation of the nursing service being rendered at one or two hospitals in the Oklahoma district. Certain of these techniques of study are now being used in our supervisory work throughout the service.

The building of new hospitals has been the occasion for certain standards of organization to be laid down. One chief nurse has been responsible for opening hospitals, so that a similarity of organization is being brought about.

High turn-over continues—Superwomen needed.—The nursing service still suffers from inadequate numbers. The overhead costs in personnel are extremely difficult to absorb in units of 50 beds and below. The nurse in charge is responsible for nursing, for food preparation and purchase, for typing the records, for giving anesthetics, for supervising the cleaning, for issuing drugs, and delivering babies in the absence of the physician. These superwomen are difficult to find, and, when found and employed, their tempers get worn down. Changes of scene, matrimony, and physical breakdowns are the most frequent reasons for labor turn-over.

More than 50 percent of the nurses have been in the service less than 2 years. This undesirable rate of turn-over will continue until better hours of work and better quality of performance are made possible. Nurses of the best caliber do not find either professional or personal satisfaction in trying to nurse 20 to 40 patients for a 12-hour stretch.

There are 52 Indian girls taking training in schools of nursing with the help of educational loan funds. There will be places for all of them in the Indian Service on the successful completion of their training.

Civil service has been unable to furnish adequate lists of eligibles for either public health or hospital vacancies. The plan has been to try to fill the vacancies in isolated places either by transfer or by probationary appointment, rather than offering appointment in the centers where temporary nurses are usually available.

Nurse-aid training continues.—The training of Indian nurse aids has continued this year. Members of the first class have made successful adjustments in their work. Twenty-three were admitted, 20 graduated, and 17 were placed in the various hospitals of the service. There is a problem in continuing to absorb the supply of trained nurse aids without displacing older personnel who have not had training.

Supervisory nurse for each district needed.—The year 1938 promises further opportunity for improvement in the quality of work being done if each medical district is furnished with a supervisory nurse. This should give better data on the causes of turn-over and prevent many of the misunderstandings and breakdowns.

RESEARCH AIDS IN FIGHT AGAINST TRACHOMA AND OTHER DISEASES PREVALENT IN INDIAN COUNTRY

Dr. Phillips Thygeson, of Columbia University, continued his research work in the pathology and prevention of trachoma at the Roosevelt School, Fort Apache, Ariz. The first year of this study seemed to indicate that trachoma was due to a filterable virus. This, the second year, was devoted to the growing of live epithelial tissue in the laboratory according to the Rockefeller technique. The project succeeded. Next year the work will continue in an endeavor to grow the trachoma virus on the growing epithelial tissue in an effort to develop an antitoxin.

Columbia University also continued its research work, made possible through the support of the Indian Office, in the study of dental caries and nutrition among the tribes on the Lower Kuskokwim River in Alaska. The dietaries of native groups were carefully studied by weight and variety per individual and samples sent to the laboratory at Columbia University, New York, for analysis, as well as the examination of body excretions from groups showing dental caries and those with no dental caries.

Yale University, through Dr. John R. Paul, has made a study of cardiac rheumatism among various tribes in the western section of the United States. It was found that among 688 children in the northern tribes, the rate of rheumatic heart disease was 45 per thousand. Among 1,106 in the middle-western section the rate was 19 per thousand. while among 1,019 children in the southwestern section the rate was only 5 per thousand.

In connection with the Public Health Service, studies were continued among the Pueblos in New Mexico to determine the incidence of amebic dysentery. It was shown that among 1,024 Indians examined in seven localities in New Mexico the rate of amebic dysentery ranged from 40.2 percent to 14.1 percent. The general rate was about 20 percent. This is high. In connection with these studies,

the cause and the source of this infection and its ultimate prevention are being and will be investigated.

Negotiations were consummated with Harvard University for a study of venereal disease among the Cherokee Indians in North Carolina. This study, without expense to the Indian Office, proposes to obtain a clearer concept of the ratio of venereal disease in racial groups.

ALASKA MEDICAL SERVICE

Toward the end of the fiscal year, Dr. J. G. Townsend, Director of Health, in company with Mr. D. E. Thomas, Chief of the Alaska Section of the Indian Office, Dr. J. F. van Ackeren, Dircetor of the Alaska Medical Service, and Mr. Claude M. Hirst, Director of Education in Alaska, made an intensive trip through the Territory, visiting all of the hospitals with the exception of that at Unalaska. The trip was of great value in making an evaluation of the Alaska health problem and afforded an opportunity for conferences between the health and educational representatives toward the furtherance of better service.

For the nearly 30,000 Indians, Eskimos and Aleuts of Alaska, scattered over an area one-fifth the size of the United States, the following medical workers are provided: 1 director, 1 dental supervisor, 1 supervisor of nurses, 7 full-time physicians, 6 part-time physicians, 27 field nurses, 18 hospital nurses, and in addition, a considerable number of minor employees, most of whom are natives. Dental service is furnished by local dentists under contract on a fee basis.

Tuberculosis death rate is more than ten times the white.—The great and overpowering problem among Alaskan natives is tuberculosis, the death rate from which ranges from 600 to 800 per hundred thousand, according to locality. (This is in comparison with only 50 per hundred thousand among the white population.) Little can be done to correct this tragic situation until more hospitals can be built.

New hospitals to be built.—In July 1936 the Office of Indian Affairs took over the operation of the hospital at Point Barrow, which had been previously operated by the Presbyterian Mission Board. In February 1937 fire broke out in the hospital and it was burned to the ground, together with a considerable portion of the supplies. Since then the medical work has been carried on under a severe handicap. However, an appropriation of $100,000 was included by Congress in the Second Deficiency Act for the construction of a hospital at Point Barrow, and plans are now under way.

Representatives of the Construction Division of the Office of Indian Affairs visited Alaska during the spring to make a study of locations for the new schools and hospitals for which an appropriation

was made, and one member of the group went to Point Barrow. It is hoped that this hospital will be completed within the next 2 years.

The Interior Department Appropriation Act for 1938 carries funds for the construction of a modern hospital at Bethel, on the Kuskokwim River. This hospital has been urgently needed for many years. A full-time physician for this area is being added to the staff, and the position of part-time physician is being discontinued.

Cooperation with Territorial officials sought.—The medical director of Alaska is working in very close liasion with the Territorial health authorities, and a closer alliance between the Indian Office and the Alaska Health Department is developing.

Serving an area hitherto without help.—The first health service to natives living to the eastward of Point Barrow was inaugurated this year. A public health nurse of considerable Alaskan experience packed two sleds with a 30-day food supply and made the trek to Demarcation Point. The story of her experience brings fresh realization of the desperate need for medical service, the eagerness of the Eskimo for reliable help and the tremendous difficulty of rendering even the most simple type of medical service in that vast area of cold.

INDIAN CLAIMS MAKE CREEPING PROGRESS

Across two administrations, Congress has been informed that Indian tribal claims will not be settled for another hundred years by present methods, and that in the majority of cases, after jurisdictional acts have been passed, no settlement whatever is secured—no justice done. In 15 years, with suits pending which have set forth claims in excess of a billion dollars, the actual moneys collected by Indian tribes have been in the neighborhood of $6,000,000, while as stated, the majority of the suits brought have been wholly abortive, due to defects in the jurisdictional acts authorizing them.

The costs to the Government are extravagant, and the political and moral reactions upon the Indians are demoralizing.

The Indian Claims Commission Bill proposes a conservative forward step. It passed the Senate in 1937, but was lost in the House during the past session of Congress.

There follows a summary of the work of the Indian Office during 1937 in the laborious task of settling Indian claims.

Reports were made during the year to the Department of Justice and the United States Court of Claims on 16 tribal claims suits. Approximately 80 tribal claims suits are now pending in the United States Court of Claims and the Supreme Court of the United States. Six cases were dismissed with decisions adverse to the Indians. The Seminole Nation of Oklahoma recovered a judgment of $10,099.25 in the Court of Claims.

Reports have been prepared and sent to the committees of Congress on over 30 bills relating to Indian tribal claims against the United States; 1 report on a depredation claim; 3 reports on attorney fee claims; and 6 reports on enrollment and individual Indian claims.

SHOSHONE AND KLAMATH SUITS SET IMPORTANT PRECEDENTS

In the suits of the Shoshone Indians of the Wind River Reservation in Wyoming and the Klamath Tribe of Oregon, decisions of more than ordinary importance to Indians were handed down by the Court of Claims, dealing with the fundamental question of the nature and extent of the tribal title to treaty reservations. Counsel for the United States, relying upon the decision of the Supreme Court in the case of the *United States* v. *Cook* (19 Wall. 591), had contended that the Indian tribal title is analogous to that of a life tenant, embracing only the right of the members of a tribe to live on the reservation, and to use such materials as might be necessary for building and farming purposes; and that the Indians are not entitled to compensation for the value of the land, as such, or for the timber and mineral content of the land. In rejecting this contention, the Court of Claims held that the title of the Indian tribe includes, as beneficial incidents, the net value of the land, including the net value of any timber and minerals within the boundaries of the reservation. The court further held that the power of the Government to hold and manage the property and affairs of the Indians in good faith for their betterment and welfare does not extend so far as to enable the Government to give their lands to others and to appropriate them to its own purposes. The Shoshone Indians were awarded a net judgment of $4,408,444.23, and the Klamath Tribe of Oregon was awarded a judgment of $5,313,347.42. In view of the important question and the large amounts involved, these cases probably will be carried to the Supreme Court of the United States.

PERSONNEL ADMINISTRATION

Personnel administration in the Indian Service is, as is undoubtedly true of all other agencies, one of the most important functions. Due to the extreme diversity of problems and activities handled by this Service, its requirements for adequately trained persons are representative of nearly every activity that is being carried on under the Federal Government.

In every phase of the work, persons with the ability to handle human-relation problems in addition to their specialties are needed. For example, an Indian Service forester must not only be skilled in timber work, he must be able to work with, direct, and train Indians of differing individual temperaments and cultural backgrounds. Likewise, doctors, nurses, extension agents, and other workers in spe-

cialized fields must be skilled not only in their particular professions, but must be experts in dealing with problems of human relations.

One of the most acute problems of personnel administration facing the Indian Service is that of recruiting adequately trained administrators. In another section of this report reference is made to a plan looking toward the selection and training of persons for eventual employment in administrative positions.

Ultimately the successful recruitment and training of persons for administrative positions will require modification of present civil-service methods of selection. At the present time, civil-service examinations make no provision for the elimination of candidates who are not suited to Indian Service work because of prejudices, or inability to work in isolated communities and under conditions as they exist on many of the reservations. Likewise, present civil-service examinations do not differentiate between successful and merely acceptable performance. In situations where the success or failure of an employee hinges so much on his or her ability to handle tactfully and judiciously all kinds of practical situations, depending almost exclusively on a gift in the field of human relations, it is essential that these important factors be given considerable weight. Some progress has been made along this line. The Civil Service Commission has to some extent recognized the specialized problems that exist in the Indian Service and has announced certain examinations for the sole purpose of filling positions in the Indian Service, such as those for teachers and nurses. More thought and effort is needed, however, before these examinations will result in securing persons with the desired training and experience.

There is an all but universal demand by the various field units for additional personnel. Very little increase has been provided during the last several years in the regular personnel available for carrying on of the work of the Indian Service. The large emergency programs that have been carried on, many of which have been completed, have created additional problems for the regular agency staffs, and have demanded that a careful analysis be made of methods of procedure so as to insure the maximum of work with a minimum of effort. Even where such studies have been completed, and where all possible duplication of effort has been eliminated, the regular personnel hardly are able to handle adequately the volume of business required of them.

In carrying out the announced policy of the administration to place Indians, wherever available and qualified, in regular positions in the Indian Service, notable increases in Indian employment have been effected. Some of the offices at the present time have 100 percent Indian staffs. The number of Indians employed in the Washington office has increased during the past 3 years from 10 percent of the total staff to about 35 percent. Indians have been placed in many

of the important posts, including those of regional coordinator, superintendent, education field agent, and chief clerk.

EMPLOYMENT OF INDIANS

An employment service is maintained for the placement of Indians in positions both within and without the Service. During the fiscal year, employment was obtained for some 6,570 Indians, 2,654 of whom were placed within the Indian Service, and 3,916 with private employers. Two-thirds of those placed outside of the Indian Service went into permanent positions. The type of situations in which Indians have been placed has varied from highly technical assignments to household work. Many Indians have been placed in industrial positions, and satisfactory employment opportunities have presented themselves to Indians who have graduated from Indian Service trade schools. The follow-up work with Indians who have been placed outside the Service indicates that for the most part they have been able to adapt themselves satisfactorily to urban industrial life.

As far as possible, Indians are encouraged to remain on their homelands and to use their training in working out their individual economic problems and the economic rehabilitation of their tribes. But whenever an Indian indicates a desire to secure employment off the reservation, all possible aid is extended to him in securing work for which he or she is fitted by training and experience.

STEPS TOWARD IMPROVEMENT OF INDIAN OFFICE ADMINISTRATION

The Indian Service is one of the largest bureaus in the Federal Government, with peculiarly complex duties, and jurisdiction over many different kinds of property in many States. Indian self-government eventually should simplify the problem of Indian administration. For the present, however, the processes of education and the extension of powers to tribal groups are throwing additional tasks upon Indian Service workers. To simplify and to improve the coordination of this complicated and scattered organization is no easy task; however, gradual improvements are being made.

DECENTRALIZATION OF AUTHORITY

Responsibility has been shifting to field units of the Service and to Indian groups, in the attempt to lessen the number of decisions that must be made in Washington. In Oklahoma and Kansas, a regional coordinator acts as a unifying force over the supervisory personnel in the entire area. He also, although without administrative authority over the superintendents, acts as a clearing agent for jurisdictional matters, and serves to bind together the various jurisdictional activities in these relatively homogeneous areas. A similar plan is

being tried out in the Lake States. An area coordinator, stationed at Minneapolis, has advisory status with regard to all Indian Service activities in the States of Minnesota, Wisconsin, and Michigan.

A different plan is being tried out in the Southwest. There, in the large Navajo and Pueblo areas, no coordinator has been set up, but the superintendents in the two jurisdictions have been so provided with technical personnel that their jurisdictions are virtually self-contained.

A recent step forward in the direction of efficient organization has been the creation of uniform supervisory districts. Each technical division of the Indian Service is interested in its own particular field of activity; some of the divisions are more particularly interested in a definition of territory broken down along economic lines; others, more concerned with a definition along State lines. And with each technical division provided with a different number of employees on its field staff, no two divisional field districts coincided. There were numerous headquarters, and coordination was extremely difficult. After considerable study, a system of 10 districts was worked out: District one's headquarters, with supervision over agencies east of the Mississippi, is the Washington Office; the area west of the Mississippi including also Wisconsin and Michigan, has been divided into eight districts; and Alaska has been designated as the tenth district. Under this system, a supervisor of health activities, for example, will be brought into the same headquarters with the supervisor of education or forestry or extension. All supervisors in the same headquarters will be interested in approximately the same Indian jurisdictions, and a coordination of effort and an exchange of experience will be promoted.

IMPROVEMENT IN MAIL AND FILES SYSTEM

The complexity of Indian Office administration is reflected nowhere so clearly as in the office's mail and file system. There are stored records dating back to pre-Revolutionary days. The files had not been reclassified since 1907. Many of the old records were still in letter-book or folder form.

Approximately a year and a half ago a revision of the mail and files system was undertaken, and the mail and files system is already showing the results of the overhauling. The registration of incoming mail had dwindled down to about 20 percent. Today, 80 percent of the incoming mail is being briefed or carded.

ACCUMULATION OF RELIABLE STATISTICS AS BASIS FOR SOUND PLANNING

Progress in Indian Service administration is not possible without systematic planning and program-making.

A prerequisite to sound planning is the accumulation of basic facts—facts about Indians and their resources must be ascertained.

Cooperative studies go beyond enumeration of acreage and population, classification of soil types, and irrigable areas. They go into the psychological background of the people themselves, so that any plans now made will be based upon not only physical facts but upon a sound anthropological basis.

An office planning group has been established, which has begun to collect and correlate all available information about certain reservations. The planning group in particular has undertaken a study of the agencies in the Lakes States area. The outcome of all these efforts, it is believed, will be plans and programs which will serve as a stable background for consistent developments in Indian administration.

The central personnel unit has been reorganized to the end that certain groups of the personnel shall be responsible for the handling of all the personnel matters for certain groups of reservations. Further development along these lines is contemplated and will, if possible, be accomplished during the coming year.

IN-SERVICE TRAINING PROGRAMS

In-service training, which seeks to improve the usefulness and opportunities of those already in the Service, is being given in various forms. The summer school institutes for teachers have already been described (see p. 227), as have also, briefly, the courses being offered to Indian enrollees in E. C. W. camps during their leisure time.

In the Navajo-Pueblo area, the foundations have been laid for an experiment in recruitment and in-service training for administrative positions. The "internes", selected by personal interview from the graduating or graduate groups in universities, will be placed in varied situations of increasing responsibility. A director of training will oversee their educational experiences and maintain records of their achievement; but administratively they will be held fully responsible to the agency giving them their experience. Indian Service and Soil Conservation Service will supply the most important of the experiences and testing assignments. To advise in the conduct of this experiment and others which may follow, the Secretaries of Agriculture and Interior have appointed an interdepartmental committee of Washington office representatives, and the Civil Service Commission has designated a representative to sit upon this committee.

In the interest of smoother administration, groups of Chief Clerks have been called into Washington to take part in a series of explanations and discussion of regulations, business procedure, and common reservation problems.

CODIFICATION OF DATA NEEDED

In the field of organization and administration are two problems which are pressing for attention. Approximately 3 years ago a codification of Indian Service regulations was undertaken. Due to a shortage of personnel, the work of codification has had to be set aside for the time being, and the Office has not yet been able to take up the task and carry it to completion. This should be done; the sooner the better.

PROBATE WORK IS EXPEDITED

Procedure for the determination of heirs of Indians and for probate of Indian wills has been simplified and made uniform by the probate division.

The master docket, instituted in 1934, is proving invaluable. A complete record of each case is kept, immediately available, and up-to-date.

The work of the probate division in conducting courses of instruction on the proper execution of wills among all Federal employees doing this type of work is now beginning to bear fruit; also the present practice of examining all wills during the lifetime of the testator and correcting errors in description and ambiguous or prohibited devises is eliminating contests and applications for rehearing. The present practice of notifying all interested parties of decisions made by the Secretary of the Interior, and the provision of opportunity for hearings in the event of dissatisfaction, is apparently most satisfactory to Indians. Misunderstandings both as to the law and the facts are immediately explained, with the result that nearly all cases are closed satisfactorily after the first hearing. The docket shows that during the current year the applications for rehearing had dwindled to 2.8 percent, and that after explanations and review, the rehearings were less than 1 percent.

Records show that during the fiscal year 1937 the probate division disposed of cases as indicated:

General probate of wills and determination of heirs	1,712
Five Civilized Tribes cases	297
Osage cases, wills, fees, etc	70
Total	2,079

A study is now being made of the law and the practice relating to inherited interests in estates that, through division among numerous heirs, have become practically valueless and yet entail enormous expense in management. Some progress has been made, and it is hoped that plans may be worked out whereby such lands can be made useful to their Indian owners.

INDIAN SERVICE APPROPRIATIONS

Treasury Appropriations

Object	1932	1933	1934	1935	1936	1937	1938
General purposes	$2,587,285.73	$1,840,054.35	$1,593,500.00	$1,806,894	$2,780,880	$3,343,401.05	$3,150,441.85
Industrial assistance	1,605,000.00	1,301,000.00	1,233,881.67	1,060,510	3,740,490	2,238,470.00	1,932,500.00
Irrigation and water development	497,601.00	457,824.00	599,614.00	450,665	1,321,652	1,149,664.00	1,293,998.00
Education	10,185,400.00	9,771,000.00	9,103,230.00	7,990,565	8,795,120	9,395,375.00	10,048,525.00
Conservation of health	3,658,000.00	3,508,800.00	3,281,800.00	3,264,595	3,849,620	4,422,360.00	4,965,690.00
Support of Indians	2,216,300.00	2,156,300.00	2,141,900.00	2,141,815	2,279,350	2,425,000.00	2,770,100.00
Miscellaneous (roads, annuities, etc.)	40,020.00	31,020.00	31,020.00	42,020	771,020	736,020.00	761,020.00
Subtotals	20,789,606.73	19,065,998.35	17,984,945.67	16,757,064	23,538,132	23,760,290.05	24,922,274.85
Construction (general)	5,570,440.00	1,654,100.00	711,600.00	400,000	981,000	780,900.00	4,291,775.00
Roads and bridges	670,000.00	1,420,000.00	270,000.00	2,000,000	4,000,000	3,500,000.00	3,000,000.00
Total	27,030,046.73	22,140,098.35	18,966,545.67	19,157,064	28,519,132	28,041,190.05	32,214,049.85

SPECIFIC APPROPRIATIONS FROM TRIBAL FUNDS MADE TO SUPPLEMENT FOREGOING TREASURY APPROPRIATIONS

General purposes	$332,913.98	$126,300.00	$390,501.00	$100,000	$9,153	$20,000.00	$159,815.00
Industrial assistance	180,532.21	45,000.00	188,000.00	35,000	151,000	381,000.00	91,600.00
Irrigation and water development	49,500.00	59,000.00	46,950.00	6,720	6,500	7,000.00	5,000.00
Education	910,000.00	803,000.00	708,600.00	599,550	389,580	332,820.00	314,995.00
Conservation of health	125,000.00	125,000.00	131,550.00	121,490	162,000	80,000.00	----------
Support of Indians	1,767,100.00	1,032,380.00	789,100.00	564,155	781,700	768,400.00	788,180.00
Miscellaneous (roads, annuities, etc.)	50,000.00	25,000.00	25,000.00	----------	----------	105,000.00	105,000.00
Total	3,415,046.19	2,215,680.00	2,279,701.00	1,426,915	1,499,933	1,694,220.00	1,464,590.00
Grand total	30,445,092.92	24,355,778.35	21,246,246.67	20,583,979	30,019,065	29,735,410.05	33,678,639.85

PROBLEMS NOT MET OR INCOMPLETELY MET

The Indian Service has failed to deal, so far, with several urgent problems. Some of these unmet problems are set forth below.

THE ALLOTTED LAND SITUATION

This situation necessarily gets worse each year, with the passage of more and more allotted land into the heirship status and into the more complicated phases of heirship. There are cases of expenditure by the Federal Government on heirship lands totaling seventy times the value of the lands in question, and still, under existing law, destined to go on running. There are cases of allotments which have more than a hundred heirs entitled to various shares, and whose total annual rental of, say, $40, is divided into the heirs' respective varying shares of cents and fractions of cents, and credited to the heirs on the agency books.

The original draft of the Wheeler-Howard bill would have supplied the corrective for this disastrous Indian land situation. As Congress did not grant that power to the Department, the Indian Service can only proceed by a creeping operation of remedies which scarcely will keep pace with the advance of the disease.

THE ARCHAIC APPROPRIATION SYSTEM FOR INDIANS

The Indian Service appropriation is perhaps the most voluminous and heterogeneous known in the Government. The dead hand of the past rests upon hundreds of frozen appropriations. The Service falls short of practicable economies and it uses moneys in places of lesser need, while places of intenser need go without, as a result of the frozen appropriation system.

WHAT TO DO ABOUT LIQUOR AMONG INDIANS

Technically, the Indian Service adheres to an all-embracing plan of universal prohibition among Indians. Practically, with the funds allowed by Congress, prohibition is being enforced only in limited areas. Shall the Service abandon prohibition entirely? Shall it work toward a break-down of Indian country into areas where enforcement is still imperative, and other areas where costs and frictions probably must continue to exceed the results? Can local tribal option be established unconditionally, under a statute authorizing the introduction solely of light wines and beers under a system of government monopoly and with a permit system?

In Alaska there prevails the opposite condition from that of the United States. There, no local prohibition exists, and there the conditions are even worse than they are known to be in any of the areas within the United States where enforcement of prohibition is imperfect.

ADEQUATE APPROPRIATIONS FOR INDIAN ECONOMIC DEVELOPMENT

The evaporation of Indian economic resources went forward at unchecked or accelerated speed for more than a lifetime; then, beginning in 1934, a reversal of the process has been secured—on paper. Whether, quantitatively speaking, the downward economic trend can be really reversed depends partly upon getting a solution of the allotted lands problem mentioned above; partly upon the help of the Budget and of congressional appropriations committees in permitting the shift of frozen appropriations out of unproductive into economically productive uses; but partly also upon getting a more generous allowance for land purchases and for agricultural credit than has yet been secured.

Connected with the immediately above-mentioned problems is another which should cause the Indian Service more concern than it does. This reference has to do with the practice established long ago of rendering Indians either no service or universally free services; not only free schools but universally free medicine; not only free medicine but free real-estate administration; and so on.

The problem of putting some part of Indian Service work upon at least a partially self-supporting basis is one that must be faced.

APPENDIX

INDIAN POPULATION

Indian population as reported by Indian agencies has been increasing about 1.2 percent per annum during the last 7 years. Although the data upon which this figure is based comprise only about two-thirds of all Indians in the United States according to the United States Bureau of the Census, and contain certain discrepancies which are explained below, it is believed that they are sufficiently accurate and representative to serve as a basis for measuring the currently normal growth of Indian population.

The statistics which follow on Indian population are contained in tables 1 and 2. The data in table 1 (a and b) which give a total of 332,397 Indians in the United States were obtained from the 1930 decennial enumeration of the United States Bureau of the Census. The data in table 2 (a and b) which are taken from the records kept at the Indian agencies and reservations of enrolled Indians on January 1, 1937, show a total of 241,499 Indians. To this last figure should be added 95,867 persons of Indian blood who have certain rights under the Indian Reorganization Act of June 18, 1934, or by various other acts or treaties have come under the supervision of the Office of Indian Affairs; thus making a total of 337,366.

Several reasons may be assigned for the lack of agreement between the two sets of figures for total number of Indians in the United States. The first concerns the definition of an Indian. One of the major

difficulties in seeking data on Indians in the United States is the lack of a statutory definition as to what constitutes an Indian. When the fifteenth decennial census was taken in 1930 by the Bureau of the Census, enumerators were instructed to record as Indians those of mixed blood "except where the percentage of Indian blood is very small", or where he was "regarded as a white person in the community where he lives." The degree of blood was reported as either full or mixed. An Indian, as defined by the Office of Indian Affairs on the other hand, is any person of Indian blood, regardless of degree, who through wardship, treaty or inheritance has acquired certain rights.

A second reason for the discrepancy lies in the fact that the data in table 2–b, which were obtained by the Office of Indian Affairs from the superintendents of Indian agencies, include only those persons of Indian blood whose names appear on their rolls. Among this number about 84.5 percent live on the jurisdiction where enrolled and 2½ percent on other Indian jurisdictions. The 13 percent residing elsewhere in the United States, and the 2½ percent now living at reservations other than where enrolled, are recorded in this table as in the States in which their respective jurisdictions are located, because it has been found impracticable to allocate them to the States in which they may be residing, especially as the addresses of many of them are unknown.

Further inaccuracies in these census rolls of Indian agencies are due to the inability of some superintendents to obtain immediate, or indeed any, notification of births and deaths occurring in their respective jurisdictions. Absentee Indians also frequently fail to report births and deaths to their jurisdiction headquarters. In order to bring up to date and otherwise correct these census rolls, superintendents have attempted at various times to make house-to-house canvasses, but as lack of funds prohibits such enumerations except at very infrequent intervals, the census rolls at the Indian agencies are altered from year to year primarily upon the basis of reported births and deaths.

Table 2–a contains a summary for the last 8 years of Indian population enrolled at Indian agencies by place of residence. The last column of this table may be particularly interesting for it reveals the percent of total enrolled Indians living elsewhere than on reservations. In 1930, it will be noted, 14.6 percent so resided, while in 1934 it had dropped to 12.4 percent. By January 1, 1937, a slight increase to 12.9 percent is revealed. This may perhaps be attributed to better times, just as the reverse movement from 1930 to 1934 may be due to the depression. Although the data do not cover a sufficiently long period to serve as a basis for definite conclusions there is reason to believe that there is a tendency for Indians to return to their reservations during hard times, and to leave, seeking other opportunities, when economic conditions improve.

According to the United States Bureau of the Census, Oklahoma in 1930 contained 92,725, or 27.9 percent of all Indians in the United States, and more than any other State. Arizona followed Oklahoma with 43,726 or 13.2 percent of the total, and New Mexico was third with 28,941 or 8.7 percent. In 1930 these three States contained practically half of the entire Indian population of the United States.

On January 1, 1937, over 60 percent of the total Indian population enrolled at Indian agencies was full-blood. In Arizona, Florida, Iowa, Mississippi, and New Mexico practically the entire enrolled Indian population is full-blood, while in Colorado, Nevada, and Utah over 80 percent is full-blood. The full-blood population ranged between 40 and 50 percent of the total number in 7 of the 22 States which contain Indian agencies. Of these 22 States, Minnesota has the smallest percentage of enrolled full-blood Indians. Arizona has more full-blood enrolled Indians than any other State, followed by New Mexico. These two States together contain 54 percent of all the enrolled full-blood Indians in the entire United States. Only 7 percent of the total enrolled population at all Indian agencies is less than one-fourth degree Indian blood.

The most important tribes numerically enrolled at Indian agencies are the Navajo, numbering 44,304, Sioux, including the Assiniboin, 35,857, and the Chippewa, 26,457; while in 1930 the same tribes numbered 40,863, 33,168 and 23,647, respectively. The increase from April 1, 1930, to January 1, 1937, for the Navajo tribe was 3,441 or 8.4 percent, for the Chippewa tribe 2,810 or 11.9 percent, and the Sioux, including the Assiniboin, 2,689 or 8.1 percent.

The Indians under the supervision of the Office of Indian Affairs whose names do not appear on the census rolls at Indian agencies and who are estimated to total 95,867, are listed below as follows:

California (special roll made pursuant to the Court of Claims act of May 18, 1928, less those enrolled at Indian agencies reported in table 2)		14,835
Michigan, under the Reorganization Act of June 18, 1934		2,262
New York, 1932 estimate		4,523
Oklahoma (Five Civilized Tribes, Bureau of the Census, 1930)		72,626
Cherokee	40,904	
Chickasaw	4,685	
Choctaw	16,641	
Creek	8,607	
Seminole	1,789	
Texas, under the Reorganization Act of June 18, 1934		300
Washington (Taholah Agency), unattached Indians largely of Cowlitz tribe, 1936 estimate		500
Wisconsin:		
Rice Lake Bands of Chippewa, special census, July 1930		221
Stockbridge tribe, under Reorganization Act of June 18, 1934		600

The supervision of the education and medical relief of the natives of Alaska was transferred to the Office of Indian Affairs on March 16, 1931. Of Alaska's total population of 59,278, according to the last

census enumeration of the United States Bureau of the Census taken as of October 1, 1929, 29,983 or 50.6 percent were recorded as Indians. Of the latter, 19,028 were Eskimauan, leaving 10,955 of other linguistic stocks.

TABLE 1-A.—Indian Population by Age, 1930

Age	Total	Male	Female	Age	Total	Male	Female
All Ages	**332,397**	**170,350**	**162,047**	25 to 29 years	23,491	12,127	11,364
				30 to 34 years	19,309	10,032	9,277
Under 5 years	46,680	23,447	23,233	35 to 44 years	33,031	17,285	15,746
Under 1 year	9,296	4,681	4,615	45 to 54 years	25,039	13,403	11,636
5 to 9 years	46,736	23,434	23,302	55 to 64 years	16,787	9,178	7,609
10 to 14 years	39,456	20,028	19,428	65 to 74 years	10,030	5,257	4,773
15 to 19 years	36,219	18,154	18,065	75 and over	6,327	3,079	3,248
20 to 24 years	28,843	14,697	14,146	Unknown	449	229	220

Source: Bureau of the Census, Department of Commerce.

TABLE 1-B.—Indian Population by State and Sex, 1930

State	Population			State	Population		
	Total	Male	Female		Total	Male	Female
Total	332,397	170,350	162,047	Montana	14,798	7,664	7,134
				Nebraska	3,256	1,674	1,582
Alabama	465	228	237	Nevada	4,871	2,456	2,415
Arizona	43,726	22,471	21,255	New Hampshire	64	33	31
Arkansas	408	210	198	New Jersey	213	123	90
California	19,212	10,018	9,194	New Mexico	28,941	14,864	14,077
Colorado	1,395	748	647	New York	6,973	3,584	3,389
Connecticut	162	90	72	North Carolina	16,579	8,353	8,226
Delaware	5	3	2	North Dakota	8,387	4,293	4,094
District of Columbia	40	17	23	Ohio	435	252	183
Florida	587	299	288	Oklahoma	92,725	46,744	45,981
Georgia	43	26	17	Oregon	4,776	2,442	2,334
Idaho	3,638	1,833	1,805	Pennsylvania	523	305	218
Illinois	469	250	219	Rhode Island	318	154	164
Indiana	285	158	127	South Carolina	959	474	485
Iowa	660	349	311	South Dakota	21,833	11,172	10,661
Kansas	2,454	1,333	1,121	Tennessee	161	85	76
Kentucky	22	16	6	Texas	1,001	516	485
Louisiana	1,536	800	736	Utah	2,869	1,516	1,353
Maine	1,012	518	494	Vermont	36	20	16
Maryland	50	34	16	Virginia	779	436	343
Massachusetts	874	458	416	Washington	11,253	5,778	5,475
Michigan	7,080	3,835	3,245	West Virginia	18	15	3
Minnesota	11,077	5,691	5,386	Wisconsin	11,548	5,951	5,597
Mississippi	1,458	743	715	Wyoming	1,845	982	863
Missouri	578	336	242				

Source: Bureau of the Census, Department of Commerce.

TABLE 2-A.—Indian Population Enrolled at Federal Agencies by Place of Residence 1930 to 1937, inclusive

Year [1]	Total population	Residing on reservations			Residing elsewhere	Percent	
		Total	At jurisdiction where enrolled	At another jurisdiction		Residing on reservations	Residing elsewhere
1930	221,808	189,361	185,377	3,984	32,447	85.4	14.6
1931	225,544	193,213	189,162	4,051	32,331	85.7	14.3
1932	228,381	199,140	194,391	4,749	29,241	87.2	12.8
1933	231,754	202,865	197,852	5,013	28,889	87.5	12.5
1934	234,792	205,759	200,744	5,015	29,033	87.6	12.4
1935	235,270	205,920	200,767	5,153	29,350	87.5	12.5
1936	238,283	208,794	203,554	5,240	29,489	87.6	12.4
1937	241,499	210,338	204,943	5,395	31,161	87.1	12.9

[1] From 1930 to 1934, inclusive, as of Apr. 1; from 1935 to 1937, inclusive, as of Jan. 1.

TABLE 2–b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total enumerated Indian population [1]	**241,499**	**122,802**	**118,697**	**204,943**	**104,978**	**99,965**	**5,395**	**2,628**	**2,767**	**31,161**	**15,196**	**15,965**
Arizona	**45,653**	**23,503**	**22,150**	**43,813**	**22,578**	**21,235**	**330**	**158**	**172**	**1,510**	**767**	**743**
Colorado River Agency, see California	**1,213**	**661**	**552**	**759**	**417**	**342**	**38**	**22**	**16**	**416**	**222**	**194**
Cocopah Reservation (Cocopah)	41	24	17	33	21	12	3	1	2	5	2	3
Colorado River Reservation	775	412	363	638	341	297	16	11	5	121	60	61
Chemehuevi	309	148	161	217	104	113				92	44	48
Mojave	459	260	199	420	236	184	14	10	4	25	14	11
Other tribes	7	4	3	1	1		2	1	1	4	2	2
Fort Mojave Reservation (Mojave)	397	225	172	88	55	33	19	10	9	290	160	130
Fort Apache Agency and Reservation (Apache)	**2,781**	**1,470**	**1,311**	**2,742**	**1,452**	**1,290**	**12**	**6**	**6**	**27**	**12**	**15**
Hopi Agency and Reservation (Hopi)	**3,248**	**1,689**	**1,559**	**3,166**	**1,650**	**1,516**	**10**	**4**	**6**	**72**	**35**	**37**
Navajo Agency, see New Mexico and Utah (Navajo) [2]	**21,988**	**11,305**	**10,683**	**21,945**	**11,283**	**10,662**	**27**	**15**	**12**	**16**	**7**	**9**
Paiute Agency, in Utah, and Kaibab Reservation (Paiute)	**85**	**51**	**34**	**80**	**48**	**32**	**2**	**2**		**3**	**1**	**2**
Phoenix School Jurisdiction and Camp Verde Reservation (Apache)	**417**	**231**	**186**	**162**	**89**	**73**	**51**	**32**	**19**	**204**	**110**	**94**
Pima Agency	**6,109**	**3,114**	**2,995**	**5,854**	**3,002**	**2,852**	**146**	**51**	**95**	**109**	**61**	**48**
Fort McDowell Reservation (Mojave-Apache)	194	106	88	169	93	76	8	4	4	17	9	8
Gila River Reservation	4,651	2,364	2,287	4,496	2,291	2,205	72	28	44	83	45	38
Maricopa	339	156	183	335	155	180	3		3	1	1	
Pima	4,164	2,130	2,034	4,021	2,063	1,958	64	25	39	79	42	37
Other tribes	148	78	70	140	73	67	5	3	2	3	2	1
Maricopa Reservation (Papago)	176	94	82	176	94	82						
Salt River Reservation	1,088	550	538	1,013	524	489	66	19	47	9	7	2
Pima	980	494	486	919	473	446	52	14	38	9	7	2
Other tribes	108	56	52	94	51	43	14	5	9			
San Carlos Agency, and Reservation (Apache)	**2,966**	**1,507**	**1,459**	**2,869**	**1,450**	**1,419**	**30**	**19**	**11**	**67**	**38**	**29**
Sells Agency	**6,184**	**3,127**	**3,057**	**5,709**	**2,907**	**2,802**	**5**	**2**	**3**	**470**	**218**	**252**
Gila Bend Reservation (Papago)	112	65	47	96	56	40				16	9	7
Papago Reservation	5,556	2,800	2,756	5,116	2,595	2,521				440	205	235
Papago	5,501	2,767	2,734	5,081	2,577	2,504				420	190	230
Pima	26	11	15	20	8	12				6	3	3
Other tribes	29	22	7	15	10	5				14	12	2
San Xavier Reservation (Papago)	516	262	254	497	256	241	5	2	3	14	4	10
Truxton Canon Agency	**662**	**348**	**314**	**527**	**280**	**247**	**9**	**5**	**4**	**126**	**63**	**63**
Havasupai Reservation (Havasupai)	208	121	87	206	119	87	1	1		1	1	
Hualapai Reservation (Walapai)	454	227	227	321	161	160	8	4	4	125	62	63

California [3]	8,707	4,432	4,275	6,919	3,605	3,314	76	33	43	1,712	794	918
Carson Agency, in Nevada [4]	1,393	687	706	1,289	646	643				104	41	63
Fort Independence Reservation	73	40	33	73	40	33						
Paiute	69	38	31	69	38	31						
Shoshone	4	2	2	4	2	2						
Inyo County	886	423	463	784	382	402				102	41	61
Paiute	739	348	391	654	315	339				85	33	52
Shoshone	142	73	69	127	65	62				15	8	7
Other tribes	5	2	3	3	2	1				2		2
Mono County	434	224	210	432	224	208				2		2
Maidu	3	3		3	3							
Paiute	362	182	180	361	182	179				1		1
Shoshone	15	6	9	15	6	9						
Washoe	54	33	21	53	33	20				1		1
Colorado River Agency, in Arizona and Fort Yuma Reservation (Yuma)	848	440	408	745	385	360	5	4	1	98	51	47
Hoopa Valley Agency	1,946	959	987	1,497	752	745	9	5	4	440	202	238
Hoopa Valley Reservation	1,549	754	795	1,278	632	646	9	5	4	262	117	145
Hoopa	575	302	273	506	269	237	9	5	4	60	28	32
Klamath	974	452	522	772	363	409				202	89	113
Rancheria	397	205	192	219	120	99				178	85	93
Bear River (Bear River)	23	13	10	19	11	8				4	2	2
Blue Lake (Blue Lake)	66	34	32	41	17	24				25	17	8
Crescent City (Smith River)	46	19	27							46	19	27
Eel River (Miami)	150	78	72	83	47	36				67	31	36
Smith River (Smith River)	112	61	51	76	45	31				36	16	20
Mission Agency	2,956	1,560	1,396	2,048	1,141	907	10	4	6	898	415	483
Augustine Reservation (Mission)	14	9	5	11	6	5				3	3	
Cabazon Reservation (Mission)	27	17	10	22	12	10	1	1		4	4	
Cahuilla Reservation (Mission)	106	52	54	63	31	32	1		1	42	21	21
Campo Reservation (Mission)	133	67	66	118	56	62	1	1		14	10	4
Capitan Grande Reservation (Mission)	168	86	82	155	83	72				13	3	10
Cuyapaipe Reservation (Mission)	3	1	2	1		1				2	1	1
Inaja Reservation (Mission)	33	17	16	31	15	16				2	2	
Laguna Reservation (Mission)	5	2	3	5	2	3						
La Jolla Reservation (Mission)	232	127	105	133	83	50	1		1	98	44	54
La Posta Reservation (Mission)	3	1	2	2	1	1				1		1
Los Coyotes Reservation (Mission)	86	51	35	71	44	27				15	7	8
Manzanita Reservation (Mission)	66	28	38	57	26	31				9	2	7
Mesa Grande Reservation (Mission)	227	127	100	153	90	63	1		1	73	37	36
Mission Creek Reservation (Mission)	21	10	11	14	7	7				7	3	4
Morongo Reservation (Mission)	299	159	140	179	110	69				120	49	71
Pala Reservation (Mission)	210	113	97	139	81	58	1	1		70	31	39
Palm Springs Reservation (Mission)	49	25	24	48	25	23				1		1
Pauma Reservation (Mission)	67	35	32	44	24	20				23	11	12
Pechanga Reservation (Mission)	221	112	109	103	58	45				118	54	64
Rincon Reservation (Mission)	185	102	83	97	58	39	2	1	1	86	43	43
San Manuel Reservation (Mission)	43	22	21	28	15	13				15	7	8
San Pascual Reservation (Mission)	9	4	5	9	4	5						
Santa Rosa Reservation (Mission)	50	30	20	26	15	11				24	15	9

See footnotes at end of table.

TABLE 2–b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
California—Continued.												
Mission Agency—Continued.												
Santa Ynez Reservation (Mission)	86	39	47	19	11	8				67	28	39
Santa Ysabel Reservation (Mission)	249	130	119	198	110	88				51	20	31
Soboba Reservation (Mission)	127	62	65	107	52	55				20	10	10
Sycuan Reservation (Mission)	38	17	21	37	17	20				1		1
Torres-Martenez Reservation (Mission)	199	115	84	178	105	73	2		2	19	10	9
Sacramento Agency [3]	**1,564**	**786**	**778**	**1,340**	**681**	**659**	**52**	**20**	**32**	**172**	**85**	**87**
Fort Bidwell Reservation	129	76	53	94	54	40	11	6	5	24	16	8
Paiute	127	76	51	94	54	40	11	6	5	22	16	6
Other tribes	2		2							2		2
Modoc County other than Fort Bidwell Reservation	416	204	212	280	141	139				136	63	73
Pit River	308	152	156	266	134	132				42	18	24
Other tribes	108	52	56	14	7	7				94	45	49
Round Valley Reservation [5]	829	409	420	802	398	404	18	7	11	9	4	5
Tule River Reservation [5]	190	97	93	164	88	76	23	7	16	3	2	1
Colorado	**843**	**430**	**413**	**813**	**416**	**397**	**21**	**7**	**14**	**9**	**7**	**2**
Consolidated Ute Agency, see Utah	**843**	**430**	**413**	**813**	**416**	**397**	**21**	**7**	**14**	**9**	**7**	**2**
Southern Ute Reservation (Ute)	392	206	186	367	195	172	19	7	12	6	4	2
Ute Mountain Reservation (Ute)	451	224	227	446	221	225	2		2	3	3	
Florida: Seminole Agency and Reservation (Seminole)	**586**	**290**	**296**	**586**	**290**	**296**						
Idaho	**4,207**	**2,087**	**2,120**	**3,565**	**1,771**	**1,794**	**196**	**104**	**92**	**446**	**212**	**234**
Coeur d'Alene Agency, see Washington	**2,152**	**1,015**	**1,137**	**1,753**	**824**	**929**	**130**	**66**	**64**	**269**	**125**	**144**
Coeur d'Alene Reservation (Coeur d'Alene)	608	286	322	427	201	226	21	9	12	160	76	84
Kootenai Reservation (Kootenai)	118	59	59	104	53	51				14	6	8
Nez Perce Reservation (Nez Perce)	1,426	670	756	1,222	570	652	109	57	52	95	43	52
Fort Hall Agency and Reservation, see Utah	**1,853**	**962**	**891**	**1,628**	**846**	**782**	**48**	**29**	**19**	**177**	**87**	**90**
Bannock	342	171	171	267	134	133	14	7	7	61	30	31
Shoshone	1,504	789	715	1,355	711	644	33	21	12	116	57	59
Other tribes	7	2	5	6	1	5	1	1				
Western Shoshone Agency and Reservation, in Nevada	**202**	**110**	**92**	**184**	**101**	**83**	**18**	**9**	**9**			
Paiute	127	73	54	110	65	45	17	8	9			
Shoshone	75	37	38	74	36	38	1	1				
Iowa: Sac and Fox Sanatorium Jurisdiction and Reservation (Sac and Fox of the Mississippi)	**441**	**213**	**228**	**394**	**193**	**201**	**29**	**9**	**20**	**18**	**11**	**7**
Kansas [6]	**1,471**	**748**	**723**	**969**	**502**	**467**	**62**	**30**	**32**	**440**	**216**	**224**
Potawatomi Agency [6]	**1,471**	**748**	**723**	**969**	**502**	**467**	**62**	**30**	**32**	**440**	**216**	**224**
Kickapoo Reservation (Kickapoo)	332	167	165	248	124	124	15	8	7	69	35	34
Potawatomi Reservation (Potawatomi)	1,013	524	489	666	353	313				347	171	176
Sac and Fox Reservation (Sac and Fox of the Missouri)	126	57	69	55	25	30	47	22	25	24	10	14

Michigan: Great Lakes Agency, scattered bands (Potawatomi) [3] [7]	**142**	**70**	**72**	**135**	**67**	**68**	**1**	**1**		**6**	**2**	**4**
Minnesota	**15,721**	**7,890**	**7,831**	**11,391**	**5,854**	**5,537**	**427**	**206**	**221**	**3,903**	**1,830**	**2,073**
Consolidated Chippewa Agency	**13,096**	**6,547**	**6,549**	**9,292**	**4,763**	**4,529**	**392**	**194**	**198**	**3,412**	**1,590**	**1,822**
Boise Forte or Nett Lake Reservation (Chippewa)	663	315	348	442	207	235	2	1	1	219	107	112
Cass Lake and Winnibigoshish Reservations (Chippewa)	536	277	259	489	259	230	14	8	6	33	10	23
Fond du Lac Reservation (Chippewa)	1,306	683	623	739	395	344	13	5	8	554	283	271
Grand Portage Reservation (Chippewa)	370	158	212	273	126	147				97	32	65
Leech Lake Reservation (Chippewa)	931	478	453	823	426	397	51	23	28	57	29	28
White Earth Reservation (Chippewa)	8,342	4,142	4,200	5,702	2,919	2,783	310	154	154	2,330	1,067	1,263
White Oak Point Reservation (Chippewa)	580	307	273	501	269	232	2	1	1	77	37	40
Purchased Lands or Mille Lac Reservation (Chippewa)	368	187	181	323	162	161				45	25	20
Pipestone School Jurisdiction and Purchased Lands (Sioux)	**561**	**283**	**278**	**165**	**89**	**76**	**1**		**1**	**395**	**194**	**201**
Red Lake Agency and Reservation (Chippewa)	**2,064**	**1,060**	**1,004**	**1,934**	**1,002**	**932**	**34**	**12**	**22**	**96**	**46**	**50**
Mississippi: Choctaw Agency and Purchased Lands (Choctaw)	**1,908**	**962**	**946**	**1,898**	**959**	**939**	**10**	**3**	**7**			
Montana	**16,085**	**8,199**	**7,886**	**13,843**	**7,139**	**6,704**	**459**	**238**	**221**	**1,783**	**822**	**961**
Blackfeet Agency and Reservation	**4,261**	**2,186**	**2,075**	**3,660**	**1,896**	**1,764**	**43**	**21**	**22**	**558**	**269**	**289**
Blackfeet	4,242	2,183	2,059	3,653	1,895	1,758	43	21	22	546	267	279
Other tribes	19	3	16	7	1	6				12	2	10
Crow Agency and Reservation (Crow)	**2,173**	**1,106**	**1,067**	**1,930**	**1,004**	**926**	**34**	**10**	**24**	**209**	**92**	**117**
Flathead Agency and Reservation (Flathead)	**3,085**	**1,567**	**1,518**	**2,412**	**1,256**	**1,156**	**107**	**61**	**46**	**566**	**250**	**316**
Fort Belknap Agency and Reservation	**1,487**	**761**	**726**	**1,347**	**689**	**658**	**29**	**20**	**9**	**111**	**52**	**59**
Assiniboin	678	347	331	628	320	308	13	8	5	40	22	18
Gros Ventre	809	414	395	719	369	350	16	12	4	71	30	41
Fort Peck Agency and Reservation	**2,796**	**1,396**	**1,400**	**2,395**	**1,212**	**1,183**	**149**	**70**	**79**	**252**	**114**	**138**
Assiniboin	1,554	781	773	1,325	676	649	79	39	40	150	66	84
Sioux	1,242	615	627	1,070	536	534	70	31	39	102	48	54
Rocky Boy's Agency and Reservation	**718**	**377**	**341**	**605**	**315**	**290**	**46**	**28**	**18**	**67**	**34**	**33**
Chippewa	481	248	233	390	200	190	37	20	17	54	28	26
Cree	190	95	95	177	86	91	8	7	1	5	2	3
Other tribes	47	34	13	38	29	9	1	1		8	4	4
Tongue River Agency and Reservation	**1,365**	**806**	**759**	**1,494**	**767**	**727**	**51**	**28**	**23**	**20**	**11**	**9**
Cheyenne	1,561	802	759	1,490	763	727	51	28	23	20	11	9
Other tribes	4	4		4	4							
Nebraska [6]	**5,100**	**2,664**	**2,436**	**3,530**	**1,824**	**1,706**	**394**	**204**	**190**	**1,176**	**636**	**540**
Potawatomi Agency, in Kansas, and Iowa Reservation	**515**	**277**	**238**	**287**	**152**	**135**	**26**	**15**	**11**	**202**	**110**	**92**
Winnebago Agency	**4,585**	**2,387**	**2,198**	**3,243**	**1,672**	**1,571**	**368**	**189**	**179**	**974**	**526**	**448**
Omaha Reservation (Omaha)	1,684	888	796	1,415	734	681	35	20	15	234	134	100
Ponca Reservation (Ponca)	397	191	206	197	97	100	13	4	9	187	90	97
Santee Reservation (Sioux)	1,292	676	616	736	378	358	218	108	110	338	190	148
Winnebago Reservation (Winnebago)	1,212	632	580	895	463	432	102	57	45	215	112	103
Nevada	**5,381**	**2,672**	**2,709**	**5,050**	**2,513**	**2,537**	**268**	**131**	**137**	**63**	**28**	**35**
Carson School Jurisdiction, see California [4]	**4,652**	**2,298**	**2,354**	**4,415**	**2,191**	**2,224**	**193**	**87**	**106**	**44**	**20**	**24**
Fallon Reservation	245	129	116	240	127	113	1	1		4	1	3
Paiute	161	90	71	159	89	70	1	1		1		1
Shoshone	84	39	45	81	38	43				3	1	2

See footnotes at end of table.

TABLE 2–b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Nevada—Continued.												
Carson School Jurisdiction, see California—Continued.												
Fort McDermitt Reservation (Paiute)	252	124	128	229	113	116	18	8	10	5	3	2
Pyramid Lake Reservation	549	281	268	541	276	265	5	3	2	3	2	1
Paiute	535	274	261	527	269	258	5	3	2	3	2	1
Other tribes	14	7	7	14	7	7						
Summit Lake Reservation (Paiute)	53	25	28	42	21	21	3	2	1	8	2	6
Walker River Reservation	505	261	244	492	254	238	12	7	5	1		1
Paiute	424	214	210	411	207	204	12	7	5	1		1
Shoshone	81	47	34	81	47	34						
Nonreservation Paiute Area, Nevada	1,008	473	535	972	459	513	33	12	21	3	2	1
Paiute	870	406	464	846	398	448	22	7	15	2	1	1
Shoshone	51	23	28	43	20	23	8	3	5			
Washoe	82	40	42	79	38	41	2	1	1	1	1	
Other tribes	5	4	1	4	3	1	1	1				
Nonreservation Shoshone Area, Northeastern Nevada	847	401	446	769	363	406	76	37	39	2	1	1
Paiute	17	10	7	17	10	7						
Shoshone	830	391	439	752	353	399	76	37	39	2	1	1
Nonreservation Shoshone Area, Southern Nevada	601	291	310	587	283	304	9	6	3	5	2	3
Cherokee	2	2		2	2							
Paiute	146	66	80	137	60	77	9	6	3			
Pueblo	9	5	4	9	5	4						
Shoshone	444	218	226	439	216	223				5	2	3
Nonreservation Washoe Area	592	313	279	543	295	248	36	11	25	13	7	6
Paiute	66	39	27	66	39	27						
Washoe	493	256	237	444	238	206	36	11	25	13	7	6
Other tribes	33	18	15	33	18	15						
Paiute Agency, in Utah	194	94	100	182	89	93				12	5	7
Moapa River Reservation (Paiute)	157	78	79	148	74	74				9	4	5
Las Vegas Tract (Paiute)	37	16	21	34	15	19				3	1	2
Western Shoshone Agency and Reservation, see Idaho	535	280	255	453	233	220	75	44	31	7	3	4
Shoshone	447	229	218	386	196	190	59	32	27	2	1	1
Other tribes	88	51	37	67	37	30	16	12	4	5	2	3
New Mexico [8]	35,515	18,284	17,231	35,031	18,021	17,010	64	27	37	420	236	184
Jicarilla Agency and Reservation (Apache)	714	363	351	701	355	346	9	5	4	4	3	1
Mescalero Agency and Reservation (Apache)	752	365	387	739	354	385	4	3	1	9	8	1
Navajo Agency, in Arizona (Navajo)	22,010	11,155	10,855	22,005	11,152	10,853	3	2	1	2	1	1
United Pueblos Agency [9]	12,039	6,401	5,638	11,586	6,160	5,426	48	17	31	405	224	181
Acoma Pueblo (Pueblo)	1,137	577	560	1,115	563	552				22	14	8
Cochiti Pueblo (Pueblo)	307	163	144	295	156	139				12	7	5

Isleta Pueblo (Pueblo)	1,137	614	523	1,116	601	515				21	13	8
Jemez Pueblo (Pueblo)	648	336	312	648	336	312						
Laguna Pueblo (Pueblo) [9]	2,332	1,216	1,116	2,043	1,072	971	27	6	21	262	138	124
Nambe Pueblo (Pueblo)	141	67	74	131	62	69				10	5	5
Picuris Pueblo (Pueblo)	97	46	51	91	43	48				6	3	3
Pojoaque Pueblo (Pueblo)	20	10	10	20	10	10						
Sandia Pueblo (Pueblo)	125	63	62	125	63	62						
San Felipe Pueblo (Pueblo)	623	340	283	623	340	283						
San Ildefonso Pueblo (Pueblo)	131	67	64	130	66	64				1	1	
San Juan Pueblo (Pueblo)	550	277	273	523	258	265	8	5	3	19	14	5
Santa Ana Pueblo (Pueblo)	251	149	102	251	149	102						
Santa Clara Pueblo (Pueblo)	433	221	212	393	202	191	11	4	7	29	15	14
Santo Domingo Pueblo (Pueblo) [9]	923	537	386	916	532	384				7	5	2
Sia Pueblo (Pueblo)	208	114	94	206	112	94				2	2	
Taos Pueblo (Pueblo)	763	380	383	755	379	376				8	1	7
Teseque Pueblo (Pueblo)	133	70	63	133	70	63						
Zuni Pueblo (Pueblo)	2,080	1,154	926	2,072	1,146	926	2	2		6	6	
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee)	**3,327**	**1,749**	**1,578**	**2,282**	**1,207**	**1,075**	**7**	**6**	**1**	**1,038**	**536**	**502**
North Dakota	**11,002**	**5,577**	**5,425**	**7,323**	**3,740**	**3,583**	**184**	**90**	**94**	**3,495**	**1,747**	**1,748**
Fort Berthold Agency and Reservation	**1,692**	**827**	**865**	**1,619**	**788**	**831**	**12**	**9**	**3**	**61**	**30**	**31**
Arikara	616	296	320	579	281	298	3	1	2	34	14	20
Gros Ventre	731	357	374	707	343	364	4	3	1	20	11	9
Mandan	345	174	171	333	164	169	5	5		7	5	2
Fort Totten Agency and Devils Lake Reservation (Sioux)	**1,022**	**512**	**510**	**933**	**471**	**462**	**47**	**22**	**25**	**42**	**19**	**23**
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	**46**	**28**	**18**	**46**	**28**	**18**						
Standing Rock Agency and Reservation, see South Dakota (Sioux)												
Turtle Mountain Agency and Reservation Chippewa)	**1,729**	**866**	**863**	**1,578**	**793**	**785**	**52**	**25**	**27**	**99**	**48**	**51**
Oklahoma [3]	**6,513**	**3,344**	**3,169**	**3,147**	**1,660**	**1,487**	**73**	**34**	**39**	**3,293**	**1,650**	**1,643**
Cheyenne and Arapaho Agency and Reservation (Cheyenne and Arapaho)	**23,865**	**11,974**	**11,891**	**17,562**	**8,848**	**8,714**	**708**	**365**	**343**	**5,595**	**2,761**	**8,834**
Kiowa Agency	**2,836**	**1,479**	**1,357**	**2,522**	**1,307**	**1,215**	**133**	**72**	**61**	**181**	**100**	**81**
Kiowa Reservation	**6,308**	**3,067**	**3,241**	**6,253**	**3,040**	**3,213**	**14**	**7**	**7**	**41**	**20**	**21**
Apache	4,816	2,341	2,475	4,768	2,318	2,450	11	5	6	37	18	19
Comanche	340	178	162	338	177	161	1	1		1		1
Kiowa	2,213	1,079	1,134	2,194	1,071	1,123	2		2	17	8	9
Wichita Reservation	2,263	1,084	1,179	2,236	1,070	1,166	8	4	4	19	10	9
Caddo	1,492	726	766	1,485	722	763	3	2	1	4	2	2
Delaware	967	479	488	962	476	486	1	1		4	2	2
Wichita	140	63	77	140	63	77						
Osage Agency and Reservation (Osage)	385	184	201	383	183	200	2	1	1			
Pawnee Agency	**3,649**	**1,857**	**1,792**	**2,007**	**1,046**	**961**	**8**	**6**	**2**	**1,634**	**805**	**829**
Kaw Reservation (Kaw)	**3,106**	**1,578**	**1,528**	**2,471**	**1,270**	**1,201**	**195**	**99**	**96**	**440**	**209**	**231**
Oakland Reservation (Tonkawa)	515	268	247	296	156	140	44	21	23	175	91	84
Otoe Reservation (Otoe)	51	27	24	39	21	18	4	3	1	8	3	5
Pawnee Reservation (Pawnee)	756	391	365	582	301	281	70	36	34	104	54	50
Ponca Reservation (Ponca)	959	483	476	779	408	371	44	19	25	136	56	80
	825	409	416	775	384	391	33	20	13	17	5	12

See footnotes at end of table.

TABLE 2–b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Quapaw Agency	**3,430**	**1,681**	**1,749**	**1,725**	**865**	**860**	**308**	**156**	**152**	**1,397**	**660**	**737**
Eastern Shawnee Reservation (Shawnee)	280	131	149	167	84	83	26	14	12	87	33	54
Miami Reservation (Miami) [10]	287	143	144	126	66	60	2	2		159	75	84
Ottawa Reservation (Ottawa)	422	222	200	228	120	108	11	7	4	183	95	88
Peoria Reservation (Peoria) [10]	370	173	197	175	82	93	37	20	17	158	71	87
Quapaw Reservation (Quapaw)	556	266	290	326	154	172	17	10	7	213	102	111
Seneca Reservation (Seneca)	732	363	369	405	200	205	144	71	73	183	92	91
Wyandotte Reservation (Wyandotte)	783	383	400	298	159	139	71	32	39	414	192	222
Shawnee Agency	**4,536**	**2,312**	**2,224**	**2,584**	**1,320**	**1,264**	**50**	**25**	**25**	**1,902**	**967**	**935**
Iowa Reservation (Iowa)	112	53	59	111	53	58				1		1
Kickapoo Reservation (Kickapoo)	260	137	123	249	131	118				11	6	5
Potawatomi Reservation (Potawatomi)	2,667	1,353	1,314	894	448	446	17	7	10	1,756	898	858
Sac and Fox Reservation (Sac and Fox)	861	432	429	740	378	362	15	7	8	106	47	59
Shawnee Reservation (Shawnee)	636	337	299	590	310	280	18	11	7	28	16	12
Oregon	**4,720**	**2,310**	**2,410**	**3,625**	**1,826**	**1,799**	**308**	**155**	**153**	**787**	**329**	**458**
Klamath Agency and Reservation	**1,412**	**687**	**725**	**1,094**	**553**	**541**	**51**	**28**	**23**	**267**	**106**	**161**
Klamath	823	402	421	655	337	318	7	4	3	161	61	100
Modoc	329	155	174	243	114	129	27	14	13	59	27	32
Paiute	143	71	72	114	57	57	17	10	7	12	4	8
Pit River	110	55	55	82	45	37				28	10	18
Shasta	7	4	3							7	4	3
Salem School Jurisdiction	**1,165**	**606**	**559**	**908**	**482**	**426**	**35**	**22**	**13**	**222**	**102**	**120**
Grande Ronde Reservation	362	192	170	251	139	112	19	12	7	92	41	51
Clackamas	81	38	43	49	27	22	9	5	4	23	6	17
Rogue River	58	34	24	46	28	18				12	6	6
Umpqua	63	28	35	45	19	26				18	9	9
Other tribes	160	92	68	111	65	46	10	7	3	39	20	19
Siletz Reservation	471	240	231	361	183	178	8	3	5	102	54	48
Chastacosta	30	13	17	25	12	13				5	1	4
Galice Creek	42	23	19	38	20	18				4	3	1
Joshua	45	24	21	15	9	6	1	1		29	14	15
Klamath	60	35	25	47	26	21				13	9	4
Meguenodon	55	27	28	40	17	23				15	10	5
Rogue River	46	26	20	39	21	18	1	1		6	4	2
Tututni	41	16	25	38	15	23				3	1	2
Other tribes	152	76	76	119	63	56	6	1	5	27	12	15

Fourth Section Allottees (Public Domain)	332	174	158	296	160	136	8	7	1	28	7	21
Cherokee	18	12	6	18	12	6						
Klamath	55	26	29	46	22	24	3	3		6	1	5
Kus	55	25	30	52	23	29	1	1		2	1	1
Rogue River	74	40	34	70	39	31				4	1	3
Tututni	18	7	11	7	4	3				11	3	8
Umpqua	43	25	18	37	21	16	3	3		3	1	2
Other tribes	69	39	30	66	39	27	1		1	2		2
Umatilla Agency and Reservation [1]	**1,345**	**638**	**707**	**915**	**450**	**465**	**170**	**86**	**84**	**260**	**102**	**158**
Cayuse	370	167	203	308	144	164	40	18	22	22	5	17
Paiute	73	30	43	61	27	34	12	3	9			
Umatilla	124	47	77	101	39	62	15	6	9	8	2	6
Walla Walla	631	311	320	331	176	155	71	41	30	229	94	135
Other tribes	147	83	64	114	64	50	32	18	14	1	1	
Warm Springs Agency and Reservation [1]	**798**	**379**	**419**	**708**	**341**	**367**	**52**	**19**	**33**	**38**	**19**	**19**
Paiute	71	34	37	60	30	30	7	3	4	4	1	3
Tenino (Warm Springs)	460	207	253	424	192	232	22	9	13	14	6	8
Wasco	227	118	109	203	108	95	11	3	8	13	7	6
Other tribes	40	20	20	21	11	10	12	4	8	7	5	2
South Dakota	**27,733**	**14,204**	**13,529**	**23,728**	**12,272**	**11,456**	**1,142**	**542**	**600**	**2,863**	**1,390**	**1,473**
Cheyenne River Agency and Reservation (Sioux)	**3,477**	**1,805**	**1,672**	**2,895**	**1,518**	**1,377**	**284**	**152**	**132**	**298**	**135**	**163**
Crow Creek Agency	**1,572**	**786**	**786**	**1,274**	**651**	**623**	**151**	**54**	**97**	**147**	**81**	**66**
Crow Creek Reservation (Sioux)	963	467	496	831	411	420	68	19	49	64	37	27
Lower Brule Reservation (Sioux)	609	319	290	443	240	203	83	35	48	83	44	39
Flandreau School Jurisdiction and Purchased Lands (Sioux)	**350**	**190**	**160**	**176**	**101**	**75**	**40**	**22**	**18**	**134**	**67**	**67**
Pine Ridge Agency and Reservation (Sioux)	**8,703**	**4,434**	**4,269**	**7,812**	**4,019**	**3,793**	**180**	**84**	**96**	**711**	**331**	**380**
Rosebud Agency	**8,698**	**4,465**	**4,233**	**7,801**	**4,036**	**3,765**	**253**	**115**	**138**	**644**	**314**	**330**
Rosebud Reservation (Sioux)	6,650	3,437	3,213	6,312	3,258	3,054	81	39	42	257	140	117
Yankton Reservation (Sioux)	2,048	1,028	1,020	1,489	778	711	172	76	96	387	174	213
Sisseton Agency and Lake Traverse or Sisseton Reservation, see North Dakota (Sioux)	**2,761**	**1,422**	**1,339**	**1,930**	**1,022**	**908**	**136**	**63**	**73**	**695**	**337**	**358**
Standing Rock Agency and Reservation, in North Dakota (Sioux)	**2,172**	**1,102**	**1,070**	**1,840**	**925**	**915**	**98**	**52**	**46**	**234**	**125**	**109**
Utah	**2,151**	**1,111**	**1,040**	**2,041**	**1,056**	**985**	**39**	**24**	**15**	**71**	**31**	**40**
Consolidated Ute Agency, in Colorado, and Public Domain Allotments (Ute)	**43**	**25**	**18**	**43**	**25**	**18**						
Fort Hall Agency, in Idaho, and Washakie Sub-Agency (Shoshone)	**132**	**61**	**71**	**118**	**55**	**63**	**10**	**6**	**4**	**4**		**4**
Navajo Agency, in Arizona	**310**	**162**	**148**	**310**	**162**	**148**						
Navajo	306	159	147	306	159	147						
Paiute	4	3	1	4	3	1						
Paiute Agency, see Arizona and Nevada	**389**	**201**	**188**	**365**	**188**	**177**	**3**	**1**	**2**	**21**	**12**	**9**
Goshute Reservation (Goshute)	154	79	75	146	72	74	1	1		7	6	1
Kanosh Reservation	26	12	14	23	10	13				3	2	1
Paiute	5	2	3	5	2	3						K
Ute	21	10	11	18	8	10				3	2	1
Koosharem Reservation (Ute)	27	13	14	26	13	13				1		1
Paiute Reservation (Paiute)	19	12	7	13	9	4				6	3	3
Shivwits Reservation (Paiute)	91	46	45	86	45	41	1		1	4	1	3

See footnotes at end of table.

TABLE 2-b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Utah—Continued.												
Paiute Agency, see Arizona and Nevada—Continued.												
Skull Valley Reservation (Goshute)	37	19	18	36	19	17	1		1			
Gandy (Homestead) (Paiute)	6	4	2	6	4	2						
Cedar City (church property) (Paiute)	29	16	13	29	16	13						
Uintah and Ouray Agency and Reservation (Ute)	**1,277**	**662**	**615**	**1,205**	**626**	**579**	**26**	**17**	**9**	**46**	**19**	**27**
Washington [3]	**13,098**	**6,487**	**6,611**	**9,402**	**4,700**	**4,702**	**199**	**78**	**121**	**3,497**	**1,709**	**1,788**
Coeur d'Alene Agency, in Idaho, and Kalispel Reservation (Kalispel)	**97**	**50**	**47**	**85**	**46**	**39**	**12**	**4**	**8**			
Colville Agency	**4,068**	**2,036**	**2,032**	**3,410**	**1,746**	**1,664**	**103**	**39**	**64**	**555**	**251**	**304**
Colville Reservation (Colville)	3,221	1,631	1,590	2,798	1,436	1,362	73	28	45	350	167	183
Spokane Reservation (Spokane)	847	405	442	612	510	302	30	11	19	205	84	121
Taholah Agency [3]	**2,502**	**1,273**	**1,229**	**1,472**	**773**	**699**	**23**	**13**	**10**	**1,007**	**487**	**520**
Chehalis Reservation (Chehalis)	26	20	6	17	15	2				9	5	4
Makah Reservation (Makah)	407	224	183	341	192	149	3		3	63	32	31
Nisqually Reservation (Nisqually)	62	38	24	53	34	19				9	4	5
Ozette Reservation (Ozette)	1	1		1	1							
Quinaielt Reservation	1,766	874	892	865	430	435	14	11	3	887	433	454
Chehalis	105	51	54	61	23	38				44	28	16
Quileute	284	143	141	263	132	131	1	1		20	10	10
Quinaielt	1,228	616	612	529	267	262	12	9	3	687	340	347
Upper Chinook	124	51	73	4	4		1	1		119	46	73
Other tribes	25	13	12	8	4	4				17	9	8
Skokomish Reservation	208	101	107	175	91	84	5	1	4	28	9	19
Clallam	2	1	1				2	1	1			
Skokomish	206	100	106	175	91	84	3		3	28	9	19
Squaxin Island Reservation (Squaxin)	32	15	17	20	10	10	1	1		11	4	7
Tulalip Agency	**3,498**	**1,742**	**1,756**	**2,034**	**1,004**	**1,030**	**15**	**5**	**10**	**1,449**	**733**	**716**
Lummi Reservation (Lummi)	661	337	324	544	277	267				117	60	57
Muckleshoot Reservation (Muckleshoot)	194	89	105	182	82	100	1		1	11	7	4
Port Madison Reservation (Suquamish)	168	84	84	152	79	73	3		3	13	5	8
Puyallup Reservation (Puyallup)	322	155	167	30	13	17				292	142	150
Swinomish Reservation (Swinomish)	285	135	150	275	130	145				10	5	5
Tulalip Reservatipn and Tulalip unattached Indians (Snohomish)	667	315	352	467	220	247	5	1	4	195	94	101
Public Domain (Clallam)	762	396	366	3	1	2				759	395	364
Public Domain (Nooksak)	239	125	114	221	115	106	2	2		16	8	8
Public Domain (Skagit)	200	106	94	160	87	73	4	2	2	36	17	19
Yakima Agency and Reservation (Yakima)	**2,933**	**1,386**	**1,547**	**2,401**	**1,131**	**1,270**	**46**	**17**	**29**	**486**	**238**	**248**
Wisconsin [3]	**11,532**	**5,788**	**5,744**	**8,939**	**4,532**	**4,407**	**428**	**196**	**232**	**2,165**	**1,060**	**1,105**
Great Lakes Agency [7]	**4,614**	**2,313**	**2,301**	**3,248**	**1,621**	**1,627**	**118**	**69**	**49**	**1,248**	**623**	**625**

Bad River Reservation (Chippewa)	1,191	615	576	663	346	317	25	15	10	503	254	249
Lac Courte Oreille Reservation (Chippewa)	1,623	790	833	1,328	651	677	38	19	19	257	120	137
Lac du Flambeau Reservation (Chippewa)	871	413	458	672	319	353	5	2	3	194	92	102
Red Cliff Reservation (Chippewa)	618	327	291	287	147	140	47	31	16	284	149	135
Scattered bands (Potawatomi)[7]	311	168	143	298	158	140	3	2	1	10	8	2
Keshena Agency and Menominee Reservation (Menominee)	**2,221**	**1,129**	**1,092**	**2,120**	**1,088**	**1,032**	**19**	**5**	**14**	**82**	**36**	**46**
Tomah School Jurisdiction	**4,697**	**2,346**	**2,351**	**3,571**	**1,823**	**1,748**	**291**	**122**	**169**	**835**	**401**	**434**
Oneida Reservation (Oneida)	3,241	1,629	1,612	2,333	1,210	1,123	160	66	94	748	353	395
Public Domain Allotments (Winnebago)	1,456	717	739	1,238	613	625	131	56	75	87	48	39
Wyoming	**2,311**	**1,158**	**1,153**	**2,104**	**1,065**	**1,039**	**43**	**21**	**22**	**164**	**72**	**92**
Shoshone Agency and Wind River or Shoshone Reservation	**2,311**	**1,158**	**1,153**	**2,104**	**1,065**	**1,039**	**43**	**21**	**22**	**164**	**72**	**92**
Arapaho	1,164	594	570	1,124	574	550	14	8	6	26	12	14
Shoshone	1,147	564	583	980	491	489	29	13	16	138	60	78

[1] See estimated statement of other Indians not enumerated, numbering 95,867. The Miami and Peoria Reservations, Quapaw Agency, with a total Indian population of 657 formerly reported in estimated statement in the text preceding tables, now included in table 2.

[2] Includes Jan. 1, 1936, population for the Navajo tribe which was formerly under the Hopi Jurisdiction.

[3] See estimated statement on page — for population not enumerated.

[4] A house-to-house canvass was made by the Carson Agency, Nevada, and many Indians reported as residing in California last year are now reported in Nevada.

[5] Not available by tribe.

[6] Iowa Reservation reported in Nebraska, formerly reported in Kansas, hence, the marked change in population from last year.

[7] Potowatomi Indians numbering 142 formerly reported in Wisconsin, Great Lakes Agency, scattered bands, now reported in Michigan, Great Lakes Agency, scattered bands.

[8] A house-to-house canvass was made by the United Pueblos Agency, New Mexico, and the census rolls corrected. Many duplications and unreported deaths were found, causing a decrease in the population from that reported last year.

[9] Jan. 1, 1936, population.

[10] Formerly included in the estimated statement in text preceding tables.

[11] The jurisdiction of 202 Indians was transferred from the Warm Springs Agency to the Umatilla Agency.

OFFICE OF EDUCATION

J. W. Studebaker, *Commissioner*

TO "promote the cause of education", as charged in the organic act the Office of Education during the year ending June 30, 1937, carried on its usual services, and in addition continued to pioneer in some of the newer fields including conservation education, radio, and public forums. These have been further explored with a view to their increasing importance in educational programs of the Nation's schools.

The year has been a significant milestone in the history of land-grant colleges. It was their diamond anniversary. Seventy-five years ago the Morrill Act was passed by Congress and signed by Abraham Lincoln. This act established our national system of land-grant colleges, which today includes many of the country's leading educational institutions. The act granted public land to each State to be sold or used for the establishment of colleges of agriculture and mechanic arts. Some of the States, instead of establishing new institutions, designated existing ones to provide instruction in these fields. Today—after 75 years—there are 69 land-grant institutions with properties and plants valued at nearly half a billion dollars; staffs of faculty members totaling over 28,000; and students, including those in residence and in summer sessions, and those taking extension and correspondence courses, reaching almost a half million.

The rapid rise in secondary school enrollments throughout the country for the past few years has for the first time in the Nation's history brought the number of high-school graduates to a total beyond the million mark in 1937.

EDUCATION'S OUTLOOK

IN PUBLIC SCHOOLS

Outstandingly, the horizons of activity of the schools are continually being expanded to include the out-of-school group. At the elementary-school level this tendency is showing itself in increasing

emphasis on nursery schools and kindergartens and the related subject of parent education. At the high-school level increasing attention is being given to the needs of young people who have dropped out of school, whether at the end of the compulsory school age, before completion of the high-school course, or after being graduated from high school. The facilities for their future education most often involve some plan for part-time education, such as night school, part-time day school, cooperative classes, correspondence instruction, and programs combining work and study. In the past, these part-time programs have emphasized chiefly the vocational motive. There seems, however, no reason why part-time programs cannot be more fully developed to serve other important objectives, such as good citizenship, improved home membership, and worthy use of leisure time.

Conservation Education

A service in conservation education was organized during the year in the Office of Education in response to growing demands from schools throughout the country for consultative service and for teaching materials in this field. The plans for immediate service include: (1) A brief survey of work underway in conservation in schools and school systems; (2) preparation of bibliographical material for use in secondary schools; (3) an exploratory conference on conservation education; (4) preparation of suggestive curricular material and teaching guides. Of these the first-named project has been completed and the report printed. Several bibliographies are being prepared. A conference was held in June, which brought together some of the Nation's leaders in this movement. A bulletin of suggestive curricular material is in press. It is hoped that on this foundation an increasingly constructive service in conservation education can be developed.

In schools throughout the country conservation education is gaining ground, as indicated by the following facts: (1) It is included with increasing frequency in the instructional programs of elementary and secondary schools, especially in courses of study in science and the social studies. The subject matter is organized in activity units around important science concepts and themes, and as topics and problems in units of the social studies groups, particularly geography and history. Conservation problems furnish topics suitable for activity units at all school levels in both material and human resources. (2) In universities, instruction in subjects related to the use of natural resources and other background studies is increasingly being pointed toward conservation. Teacher-training institutions are realizing the need for teachers prepared to teach the subject and are offering special courses, both during the regular year and as short

sessions in summer terms. (3) State departments of education in a number of States issue bulletins devoted directly to general instruction in conservation, or prepared to promote special phases of conservation education, such as studies in forestry, wildlife studies, and observance of Arbor Day, bird day, or conservation week.

Curricular and Other Interests

Interest in the curriculum continues to be a strong motive in both elementary and secondary education. This interest was for a time somewhat submerged by the necessity for retrenchment in school expenditures. That it was not submerged is indicated by the speed and the vigor with which it has returned, under the stimulus of State and local school agencies.

In the field of adult education the past year has shown trends to regard educational provisions for adults as part of a regular continuing program for the preparation of the individual for full participation in the society in which he lives. There are evidences of a developing philosophy of adult education that will be effective in defining and establishing its place in American education and in making it an integral part of a publicly supported program.

There is a growing realization that education for effective adjustment to society must give more attention to the individual pupil than has been done under our "mass" system of education. There is thus an increasing tendency in the public schools to provide services for the individual pupil that will aid: In adjustment to school conditions, in orderly progress through school, in the discovery of attitudes and interests that give promise of desirable development, in the early discovery of antisocial attitudes and forms of behavior, in the selection of educational courses, in making a vocational choice, and in placement and adjustment in employment.

The contribution that the industrial arts can make toward the realization of generally accepted educational objectives occupied an important place in the discussion of curriculum problems.

The high death and injury rate from automobile accidents has stimulated the development of systematic instruction in safety in all its aspects. Numerous courses of study on the subject are being used throughout the country.

Efforts are being made by those engaged in the medical work of schools to see that such work is improved and that public funds spent for this work be more effectively administered. There has been a growing interest in the introduction and improvement of instruction in hygiene in the high-school grades.

Increased interest in character education has resulted in measures to correct and prevent behavior difficulties. Such measures include

classes for adults in family relationships, character education curricula, and personal guidance.

Significant among educational developments for handicapped children is the growing conviction that they are a responsibility of the secondary school as well as of the elementary school. Special provision for mentally or physically handicapped pupils of high-school age has in the past been made only in connection with the special classes organized in elementary schools or through segregated schools. A study made during the past year, however, reveals that the high schools are caring for an increasing number of these adolescents through an adjustment of curriculum and equipment to meet their needs. Such a development is but a reflection of the educational principle that the high school exists for all adolescents who can attend day school, regardless of their academic or physical limitations, and that it should plan its program accordingly.

During the year, 44 State legislatures met in regular session and enacted important legislation touching upon many phases of education. The most significant of these acts pertained to school financing. A number of States are assuring a much greater share of the cost of a foundation education program than heretofore; others have strengthened plans which previously had been made for State participation in school support but which lacked effectiveness in the production of adequate revenue. Provisions made during recent legislative sessions for special State taxes to be levied in whole or in part for the benefit of the public schools will undoubtedly raise education standards in financially weak areas of several States and consequently the average standards for such States.

More than the usual amount of legislation concerning teacher welfare has been enacted during the past year. This falls into two general types; (1) provisions for the retirement of aged teachers and (2) teacher tenure designed to give permanency and stability to the teaching profession.

Rural Education

In considering the present outlook in rural education the following trends are significant: (1) The abandonment of one-teacher schools and their replacement by larger centralized schools; (2) the disproportionate increase of the number of rural children attending high schools; (3) the growing disparities in the economic welfare of urban and rural teachers; and (4) marked improvements in the training status of the latter.

During the past 4 years the number of 1-room schools has been reduced by 10,169, or about 7 schools per day. During the same period the number of rural schools offering high-school work has been increased by 883, or 5.3 percent, but the number of children attending

high school in rural communities has been increased by 764,513 pupils, or 53.2 percent. The salary situation is less encouraging. In the past 4 years rural teachers' salaries were cut approximately 20 percent while those of city teachers were cut only about 10 percent. Over a 15-year period statistics show wider and wider disparities between the salaries of these two classes of teachers. Despite this fact great progress has been made in the improvement of scholastic qualifications. Even in the 1-room schools nearly half of the teachers now report 2 years or more of college work, a proportion which nearly doubled during the past 5 years. State certification standards are rising and teacher tenure is improving. If, with these improvements, teachers' salaries and the financial support of rural schools generally can be improved, conditions will be promising for the development of a richer program of education for rural children.

IN COLLEGES AND UNIVERSITIES

Conditions in higher education have shown steady improvement during the past year. The latest reports show a slight reduction in the number of higher educational institutions in this country, notwithstanding an addition to the list of seven new liberal arts colleges and four teachers colleges. The total number of higher institutions of learning as of June 30, 1937, is given at 1,688 as against 1,704 for the year preceding.

College enrollments have increased in nearly 600 accredited institutions for which reports are available. This increase appears to be general throughout the country. In the institutions reporting, full-time enrollments increased in 1936–37 over the year preceding 6.5 percent; and total enrollments have increased 7.5 percent.

According to partial reports, the number of staff members employed in colleges and universities is now nearly back to normal and salaries in a large proportion of institutions, have been restored to former levels.

Many universities and colleges continue to study curriculum problems that are partly the result of the depression. There is a tendency to weed out the less necessary courses of study, to integrate departmental activities, and to stress the importance of the more general studies.

Professional education seems to have held its own during the past year. Enrollment gains were indicated in medicine and law, and only slight losses were shown for theology, dentistry, pharmacy, and teacher education. Demands for well-educated elementary teachers increased materially.

A new approach to the accrediting of colleges recently exemplified by the methods of the North Central Association of Colleges and Secondary Schools is shown also in the procedures of the Engineers' Council for Professional Development. The council began during

the past year a survey of curricula in engineering schools. The survey considers particular curricula rather than the school as a whole, keeping in mind the State laws governing the licensing of engineers for professional practice.

The National Youth Administration has continued the college student-aid program initiated by the Federal Emergency Relief Administration. This has not only helped many students, but has also served to stabilize the incomes of colleges that were largely dependent upon tuition fees.

FEDERAL EDUCATIONAL ACTIVITIES

The scope of Federal activities with respect to education manifested itself along many different lines of action during the year. In addition to the accrued normal functions of the Office of Education, it has continued the five national education projects which were inaugurated by a grant of emergency funds the previous year, namely, the study of local school-administrative units; surveys of vocational education and guidance of Negroes; educational radio project; cooperative university research project; and public-affairs forum project.

Federal education activities were carried on also by a number of new or supplementary Government agencies. The W. P. A. has continued to allot funds to support educational programs for adults through day and evening schools and Americanization classes, and also for young children through nursery schools. These programs, initiated in 1933 and directed or sponsored by public school authorities, have continued to serve age levels for which public schools have not hitherto assumed full responsibility.

The National Youth Administration provides assistance for boys and girls 16–25 years of age in continuing their education in high schools and colleges. The Federal Emergency Administration of Public Works continued to make grants and loans to public school districts for school buildings.

During the year the President created an Advisory Committee on Education, the original purpose of which was to consider the problem of vocational education. Later this committee was enlarged and assigned the function of studying the whole relationship of the Federal Government to the problem of education in general and to make a report and recommendations on the subject.

Recent congressional action concerning education in the several States consisted principally in the inclusion in the Interior Department appropriation bill of approximately $14,500,000 for the further development of vocational education as provided under the Smith-Hughes Act and acts supplementary thereto, including the George-Deen Act of June 8, 1936.

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RESEARCH AND INVESTIGATION

IN ELEMENTARY AND HIGH-SCHOOL FIELDS

The Office of Education has continued the study of local school-administrative units in 10 States, begun in the previous fiscal year. The purpose of the project is to explore the possibilities for the organization of more satisfactory schools, attendance areas, and local school-administrative units. The work of the 10 State projects has been guided and coordinated by the Office of Education project staff. By this activity a considerable body of information on attendance areas and administrative units, not previously available, has been gathered. This, in itself, is one of the significant contributions of the study.

Each State project staff has prepared either a summary or an extended report for every county studied. These reports summarize the basic data collected for school units within the county and present proposals for changes in the organization of those units. In addition, each State project has prepared and is printing a State report describing, on a State-wide basis, the status of existing attendance areas and administrative units, evaluating the existing situation and proposing a State-wide program for the organization of more satisfactory school units. Significant and practical results are already apparent from this study. In most instances, recommendations growing out of the work of the projects have been made an integral part of the program of the State department of education. In some States, such recommendations have been enacted into law and in all States, the proposed changes in the organization of attendance areas and administrative units have stimulated a healthy discussion of local school units and their problems.

On the basis of data submitted by the State projects, the Office of Education is preparing publications describing the work of the project, analyzing the status of existing school units in the 10 States, and evaluating the procedures followed in conducting the project.

The Office of Education has continued its program of studying current acts of Congress and the various State legislatures affecting education. Two circulars were issued on current school legislation during the year. These circulars summarized the most important legislation enacted by Congress and the State legislatures in 1936 relating to education. Also, during the year there has been prepared a biennial review of educational legislation in 1935 and 1936.

A study is in progress to discover to what extent colleges, universities, and teacher-training institutions are offering opportunities for the orientation of teachers in parent education; what subjects are being offered for this purpose; where prospective teachers might expect to find such courses.

Another study in parent education is concerned with parent education programs in city school systems. Information has been assembled through questionnaires and field consultations with directors of parent education and superintendents of schools in a selected number of large cities.

A study has been made of features constituting the various State plans for financing the public schools. It aims to set forth the basic principles of government upon which the States outline their legislative programs for financing the schools, the essential features of such programs, and certain relative data.

In the field of secondary education the following studies were completed: Needed Research in Secondary Education, which is based upon the findings of the national survey of secondary education; Trends in Secondary Education, dealing with recent developments; the textual material to accompany the statistics in public high schools; subject registrations in private high schools and academies, and subject registrations in public high schools. A study was made of the special subject and general supervisory personnel for elementary and secondary grades in 2,000 cities having a population of 2,500 or more; of the preparation offered by colleges and universities for general and special subject supervisors. Recently constructed report cards of pupil progress in elementary grades were analyzed and trends in the development of such cards were noted.

An analysis of 1,664 courses of study was made to show present trends in organization, methods of construction, objectives, pupil activities, and teacher helps and guides.

During the period when the economic depression was having the most serious effects upon the schools, the Office of Education presented relevant data in a number of different publications. In order to have a permanent record of some of these important findings, a bulletin which reviews and brings these findings together has now been prepared. The lack of similar information concerning the effect of previous depressions made it evident that such a record is desirable.

IN COLLEGES AND UNIVERSITIES

Among the studies conducted during the year in the field of higher education are the following: Student Mortality in Colleges—approximately 15,000 freshmen who entered the several schools and colleges of higher education institutions were followed through their college years since 1931–32. Analyses were made of the extent to which these students remained in college, the causes of withdrawal, and related facts.

Another cooperative effort included returns from 642 colleges and universities. Insurance and annuity plans suitable for colleges and

universities were discussed, the extent of their use indicated, and important features presented. Other studies in process during the year included an analysis of the methods of control exercised by the executive branch over State institutions of higher education; Unit Costs of Higher Education; and Continuity of College Attendance. Data were secured from replies to a questionnaire sent to all colleges of arts and sciences (including those that are divisions of universities) listed in the Educational Directory for 1936.

A study of financial aid to college students through employment opportunities and means offered for reducing student expenses was also conducted by means of a questionnaire sent to all institutions of higher learning, by correspondence, and through visits to a few institutions known to afford unusual opportunities for self-help.

An analysis of faculty salaries paid by colleges and universities in 1936 to faculty members was made, including land-grant colleges, State universities, privately controlled institutions, and denominational colleges.

The Office of Education has continued its investigations in the problems of graduate study and research.

IN SPECIAL EDUCATION

The Survey of Vocational Education and Guidance of Negroes continued through the year. Its purpose was to supply a body of facts upon which an effective program of curriculum reorganization in the field of vocational education and guidance may be developed. Data were collected from approximately 200 communities in 34 States.

Some of the values of the survey are: (1) Information on facilities and opportunities for vocational education will serve in determining the present status of this important phase of the education of Negroes. (2) Studies of 2,000 evening-school students and of 20,000 graduates and nongraduates of high schools will give some indication of the relation between schooling and subsequent experience. (3) Trends in enrollment in certain vocational courses and the extent to which States utilize Federal funds in providing vocational education for Negroes are shown in a special study on this subject. (4) Personnel information on 27,000 Negro high-school students should have important implications for vocational education and guidance programs.

Research activities in rural education have included: (1) Report of a survey of education in the southern mountains, appraising the economic and social conditions of the more mountainous counties of six Southern States and comparing the educational conditions in these counties with those of the nonmountain counties of the same States; with those of the States as wholes; and with those of the United States. (2) A report of the present status and trends in rural-school personnel,

including data from more than 200,000 teachers and principals employed in the rural schools and showing their salary, training, experience, and maturity status. (3) A brief survey of the present status and trends of the movement to provide professional supervision for rural schools. (4) Preparation (with the cooperation of several leaders in the field working outside the Office of Education) of material for a chapter of the biennial survey on "Review of conditions and developments in education in rural and other sparsely settled areas."

IN COMPARATIVE EDUCATION

As a major investigation for the year, a staff member visited Yugoslavia to study the school system in all its aspects, gather official and other publications relating to education in that country, and collect such data as would be valuable for a bulletin on the subject. The project included a brief visit to Albania and a cursory survey of education there.

Preparation of the bulletin on institutions of higher education in Germany was continued throughout the year.

A decennial survey of education in countries other than the United States, to be a part of the biennial survey, was made for Europe, Asia, Africa, and Australia. The western continents are still to be reported on. A brief special study was made of education in the island of Rhodes.

IN STATISTICS

With education in the United States administered as a State and local function, the Office of Education carries on, as one of its major responsibilities, the collection and presentation of information on a national basis for this locally administered educational system.

Material was collected by mail and field service for the school year ending in June 1936 and tabulations made as shown in the following table, in which the capital letter "C" stands for data collected and "T" tabulated and "C–T" collected and tabulated within the year.

Subject of study, 1936–37	Type of study		
	Biennial	Periodic	Special
State school systems:			
Personnel and finances	C		
Preliminary statistics	C–T		
County school systems: Personnel and finances			T
City school systems:			
Personnel and finances	C–T		
Per capita costs		C–T	
School janitor service			T
Higher education:			
Personnel and finances	C		
Land-grant colleges		C–T	
Receipts and expenditures (preliminary)		C–T	
Student health			T
Instruction in hygiene			T
College salaries (1936)		C–T	
Continuity of college attendance			C–T
Economic status of college alumni			C–T
Student mortality in universities			C–T
Unit costs in higher education			C

Subject of study, 1936–37	Type of study		
	Biennial	Periodic	Special
Secondary schools:			
Personnel	T		
Subject registrations		T	
Elementary schools: General and special supervision of instruction			T
Teaching staff: Rural salaries, tenure, and experience		T	
Libraries:			
Public elementary and secondary school		T	
Public library trends			T
College library trends			T
Residential schools for exceptional children: Personnel and finances	C–T		
Visual aids in education			T
Public school building needs			C–T

IN OTHER FIELDS

The investigation concerning instruction in hygiene in colleges and universities was completed and published during the year under the title, "Instruction in Hygiene in Institutions of Higher Education."

A review of data concerning health instruction in both high schools and colleges, from the point of view of the student, was collected from 100 colleges and will be published under the title, "Student Needs and Interests in Hygiene."

The medical and nursing services of colleges and universities for the preservation of the health of these students and the care of the sick were investigated and will appear shortly as Health Services in Institutions of Higher Education. A study which has long been in progress concerning the influence of school life on the growth and longevity and general physical condition of children was completed and published as The Physique of the School Child.

A study was completed in cooperation with a few outstanding persons in the field of industrial arts education of the place and function of industrial arts in the public-school programs. In cooperation with 13 institutions of higher education, a study was made of the relation between high school and college. Information on the status of guidance in cities having a population of 100,000 or more was collected and compiled. Information on guidance programs in the various States was collected from State departments of education and compiled. A study was made of recent developments in adult education and a report was prepared that deals with the purposes, philosophy, and trends in this phase of education.

In the field of measurements and testing, studies along the following lines were conducted: Factors in the adjustment of college students; cumulative record cards and statistical forms for studying pupil progress.

The new division of library service in the Office of Education has been in process of development during the year. Six library specialists have been brought in to work on the following definite problems: Professional library education; school library administration; library

standards; housing and equipment of school libraries; library statistics; library service to C. C. C. camps.

PROMOTING AND COORDINATING RESEARCH

Requests to the Office of Education for assistance in making studies of education in other countries totaled 204 during the year. This shows an increase of 26 percent over the number of similar requests the previous year. For nearly every one of the 204 studies, one or more bibliographies, long or short depending on the nature of the subject, were furnished. In addition, a special bibliography on education in Japan was compiled; a list of references on the history of education in Russia was arranged; and an article was written for the Journal of Educational Research. The regular annual list of references on comparative education was furnished the Journal of Elementary Education.

UNIFORM RECORDS AND REPORTS

The Office has continued its cooperative efforts in the interest of more uniform records and reports in the field of State school systems and libraries. A new set of definitions of terms used in State school statistics was formulated. From the results of various conferences the reporting form to be used in 1937–38 has been completed and sent to the States, with instructions to guide them in setting up the materials they will collect for 1937–38. A committee from organizations interested in public library statistics cooperated with this Office through the American Library Association in preparing a form to be used by State library agencies, the American Library Association, and this Office in collecting statistics.

COOPERATIVE RESEARCH

The university research project closed officially on June 30, 1937, after operating about 1½ years. Sixty universities located in 32 States, the District of Columbia, and Hawaii joined the Office of Education in this activity. More than 165 separate study reports for 40 studies were made by the universities, and the major findings were assembled and coordinated by the Office. Findings are being made available in 11 bulletins and 4 pamphlets. Many of the universities are also publishing material growing out of this research.

More than 60,000 individuals and hundreds of institutions of higher education assisted in providing data for the several studies. A number of the institutions continued work on the former project studies on their own funds after the project closed. It is believed that the success of this undertaking will encourage future research programs involving cooperative activities of the Office of Education and of the higher education institutions.

THE LIBRARY

The library of the Office of Education, together with libraries of three other bureaus of the Department of the Interior, is now established in the new Interior Building. Here a more extensive library service will be developed than has been possible heretofore.

A revised list of publications of the Office has been prepared and this list, which covers the publications issued from 1910 to 1936, will help librarians and students of education in obtaining material and completing files.

The work of the library has increased as new projects have been undertaken in the Office. Many calls for books outside the scope of this collection necessitated an increased number of interlibrary loans from other libraries. On the other hand, many books and theses have been loaned from this library to other libraries in various parts of this country and Canada.

During the year a series of articles by members of the library staff appeared in School Life, describing various activities and collections of the library. Following the publication of these articles several gifts of college catalogs and valuable old textbooks were received from institutions and individuals throughout the country.

The State and city boards of education were circularized for courses of study and many were received, bringing the already extensive collection fairly up to date.

During the year an unusual amount of binding has been done, taking care of files of reports, both foreign and domestic, which had never been completed and bound and which were in danger of being lost or remaining incomplete.

It is the hope of the library personnel that the enlarged quarters and better equipment may be reflected in greatly improved service for the future.

SIGNIFICANT DEMONSTRATIONS

IN PUBLIC FORUMS

The public forum project during the year established and sponsored in cooperation with local boards of education, 19 public forum demonstration centers in rural and urban communities in all sections of the country. The purpose of these projects was to demonstrate a community-wide program of public discussion of public affairs for youth and adults under local educational management and in different types of communities. The 19 centers selected represented a total gross population of approximately 4,000,000 people.

The development of the program may be divided into three phases: (1) Preparation and planning for 10 projects, July 1, 1936, to September 1, 1936; (2) operation of community-wide forums in 10 centers, September 1, 1936, to February 1, 1937; (3) operation of 18 centers

for all or most of the period between February 1, 1937, and June 30, 1937.

Between September 1, 1936, and February 1, 1937, 10 projects conducted 3,895 meetings attended by 350,810 people. Between February 1, 1937, and June 30, 1937, 18 projects scheduled 6,119 meetings attended by 634,473 people. It should be noted that some of the projects during the latter period terminated their schedules in March, still others in April, a few in May, and practically all by June 15. The project organized a total of 10,014 forum discussions with an attendance of 985,283 people. In addition to these meetings the various projects organized 1,187 radio forums, sold or distributed over 60,000 pamphlets on public affairs to augment the discussions by follow-up reading, and prepared thousands of charts, graphs, and other visual aids for use in connection with the discussions.

About 237 different leaders of discussion served the projects varying lengths of time, conducting on the average six or seven forum meetings per week. These leaders were chosen by the local educational managements.

About 100,000 days of work were performed by professional and skilled workers certified to the projects by the Works Progress Administration in such capacities as artists, writers, promotion assistants, discussion leaders for small groups, research assistants, assistant librarians, accountants, bookkeepers, typists, stenographers, and clerks.

The administrative staff in the Office of Education included an assistant administrator, field counselor, research assistants, clerks, and stenographers. This Office carried on all the correspondence necessary to establish the demonstration centers and served these centers as a clearing house during the period of operation. In addition, this staff prepared for publication and distribution seven publications and a monthly digest of project developments. These publications reached approximately 150,000 people and served the adult civic education movement in many ways. A careful plan of research was developed by the administrative staff and each project carried forward a plan of reporting its activities and program development. In addition to the direct responsibilities for a service to the projects sponsored by the Office of Education, the administrative staff completed a survey of 431 forums under various auspices, and provided a counseling service which assisted the leaders and directors of more than 150 forums under different auspices.

The administrative staff also prepared numerous articles and reports for newspapers, magazines, and various publications, thus spreading a knowledge of the program as a whole.

One of the activities of the administrative staff was the organization of plans to encourage increased reading of public affairs informa-

tion. Pursuant to this objective, the administrative staff published two indexes of Public Affairs Pamphlets, the first containing about 300 titles, the second together with mimeographed supplements, listing over 900 titles. These carefully cross-indexed and annotated bibliographies of pamphlet material were distributed widely and used not only by forums but by librarians, college and high-school teachers, and leaders of civic and educational organizations throughout the country. In connection with this index and in cooperation with the American Library Association and the public affairs committee, the administrative staff of the public forum project organized 30 pamphlet display centers. These displays, usually attractively laid out in libraries, brought hundreds of current pamphlets on current affairs to the attention of the civic and educational leaders.

Also in cooperation with the American Library Association the administrative staff organized a bulletin which will be ready for printing in the near future dealing with practical methods of library service to forums and discussion groups.

The thousands of letters received by the Office of Education from educators and civic-minded people in all parts of the country indicate a Nation-wide interest in the work of this division and the widespread influence of the demonstration program.

IN EDUCATIONAL BROADCASTING

The broadcasting and radio activities of the Office of Education embrace three phases: (1) Demonstration programs over coast-to-coast networks; (2) services to local broadcasters and educators; (3) activities to train and help educators use radio effectively.

Activities were carried on under an allotment from emergency funds made October 1, 1936, to the educational radio project. This allotment made possible further continuation of the project originally initiated December 1935. The principal objectives of the project were: (1) To provide employment for W. P. A. and C. C. C. radio and script-writing talent; and (2) to discover ways in which radio can be used for the promotion of education, both for organized instruction as well as for general enlightenment. The National Broadcasting Co. and the Columbia Broadcasting System have made generous contributions in time, personnel, studio facilities, and counsel.

Programs

The Office of Education conducted seven series of coast-to-coast programs during the year. These were: Have You Heard? natural science, N. B. C.; Answer Me This! questions and answers on historical and sociological facts, N. B. C.; Education in the News, reporting developments in fields of education; Safety Musketeers, safety education, C. B. S.; The World Is Yours, dramatizations of

the activities and exhibits of the Smithsonian Institution, C. B. S.; Treasures Next Door, dramatizations of excerpts from the "best sellers" of all times, C. B. S.; Let Freedom Ring, dramas of mankind's struggle for civil liberties, C. B. S.

That a vast audience exists for such programs is evidenced by the fact that more than 400,000 listeners—young and old, from every State in the Union—responded by letters to the Office of Education.

The first national school assembly—commencement exercises for graduating classes—was held May 14, with Secretary of the Interior Harold L. Ickes, and other speakers participating. Other "special events" broadcasts held during the year included programs in honor of Inauguration Day and American Education Week.

Script Exchange

For many years school officials and local broadcasters have been searching for scripts which are both significant and entertaining. To supply this need, the radio project, in cooperation with the National Association of Broadcasters, established the Educational Radio Script Exchange. The script exchange has filled requests for 54,000 scripts, which have been produced in 42 States, over 114 radio stations.

In addition to serving as a depository and point of distribution for scripts, the exchange prepared and distributed aids to school groups wishing to go on the air. These aids include a Manual of Suggestions for producing radio programs and a glossary of terms used in the radio industry. Thirteen scripts, showing the functions of municipal government, were prepared in cooperation with the Public Administration Clearing House and the Rockefeller Foundation. This series was broadcast over Station WTNJ, Trenton, N. J. These scripts are now being edited for distribution to local radio stations through the script exchange.

In order that the experience gained from the experimental radio programs may be widely drawn upon, the Commissioner of Education authorized a limited number of educators to observe and participate in the production of the Office of Education's radio programs. Teachers and school officials from a score or more States participated in this radio workshop operated in cooperation with the New York University. Practice and observations were conducted in New York City. The National Broadcasting Co. and the Columbia Broadcasting System assisted extensively in this venture. Three sessions of the workshop trained more than 80 persons who are now practicing and promoting educational broadcasting in their own communities.

The problem of improving the quality of educational broadcasting—on national as well as local air lanes—is one requiring sustained experimentation and study. Toward the solution of this problem the project has made distinct contributions.

The project has experimented in the application of techniques of radio-program organization and presentation which can now be passed on to local educators. It has applied on a Nation-wide scale the use of print to supplement radio; and the project's supplementary printed materials have been acclaimed by listeners as being invaluable to better comprehension of educational radio programs. It has discovered an extensive radio audience for educational radio programs; and the discovery will undoubtedly lead broadcasters to set aside more time than heretofore for programs of an educational nature.

On the other hand, the receptiveness of the audience to educational broadcasts is leading public agencies to attempt to learn the art of disseminating information about their activities. More than a score of Federal agencies have turned to the radio project for help in script writing and production. To these agencies the project has given its full cooperation.

EDUCATIONAL POLICY FORMING

In response to demands of State departments of education for information on education throughout the world, the Office has acted as a clearing house for circulars and press releases of the International Bureau of Education. It has also given information relative to certification of foreign students and applicants for professional licenses.

Staff members have served on policy forming committees of organizations outside the Office, including the following: American Council on Education; National Education Association; National Committee on Research in Secondary Education; Cooperative Study of Secondary School Standards; National Research Council; National Conference of Supervised Correspondence Study; National Council of Parent Education; American Library Association; National Congress of Parents and Teachers; International Council for Exceptional Children; National Negro Student Health Association; National Tuberculosis Association; American Association of School Physicians; and others.

Among important world conferences at which the Office was represented were the Fifth International Conference on Public Instruction, the International Conference on Health in Universities, and the Seventh World Conference of New Education Fellowship.

FEDERAL RADIO EDUCATION COMMITTEE

Radio is more and more coming to take its place in the American educational system, but the most successful use of it by educators continues to be a challenging experiment.

Agreement as to what are the common problems of broadcasters and educators has been reached in considerable measure in meetings,

during the year, of the subcommittees of the Federal radio education committee. Comprehensive studies of these common problems are to be undertaken within the next few months. Briefly, the studies may be characterized as follows:

1. A survey of cooperative efforts—in local and State areas.
2. Development of an experiment and idea exchange—To support the Office of Education in conducting a clearinghouse where findings may be made available to broadcasters and listeners.
3. Teacher training—To prepare proposed courses for teacher training in the use of radio.
4. Publicizing programs—A study of methods and media of publicity.
5. Listening groups—to examine the educational value of listening groups and the organization and motivation behind them.
6. The problems and methods of broadcasting to and by schools.
7. Methods of training production managers in educationally owned stations.
8. Collection of experiences of network series—in pamphlet form.
9. Survey of public opinion—To determine what the listening public considers of educational value in radio progams.
10. Essential value of radio to all types of listeners—To determine what educational broadcasting is—what makes a radio broadcast "effective" before educational broadcasting can become consistently "effective."

It is estimated that the cost of carrying on such a study program will amount to approximately $250,000 over a period of 2 years. At a meeting attended by the chairman of the Broadcast Division of Federal Communications Commission, the Commissioner of Education, the presidents of the Rockefeller and the Carnegie Foundations and representatives of the broadcast industry, it was agreed that if the necessary amount were divided into approximately three equal parts, each foundation would contribute one-third of the fund and the radio industry, the remaining third. Certain of the studies will be carried on in the Office of Education under the direction of the Commissioner. Other studies will be undertaken by institutions and organizations with research facilities where the nature of the study seems to lend itself to attack by an agency having a particular interest in it and an available staff which can at once begin work.

With the inauguration of certain fundamental inquiries and the operation of controlled experimentation, the work of the Federal radio education committee—the official agency authorized to coordinate efforts of educators and broadcasters—should progress to the end that broadcasting may achieve the greatest social usefulness.

SERVICE IN THE FIELD

Extensive investigation was made by the Office during the year relative to the work being done in conservation education in various parts of the country. Universities, State departments of education, and local school systems were visited in order to confer with indi-

viduals active in the development of conservation education in the schools.

Consultation and advisory services on school-building problems were given in various States where such service was requested.

At the request of the State superintendent of schools in Virginia, and of the county superintendent of Arlington County, a study was made during the year of certain problems connected with the education of handicapped children in the local schools of the county, and recommendations were submitted for adjustment of the same. At the request of the superintendent of schools of Philadelphia, the Office made a study of the plans for the organization of work in the two new vocational schools of that city, and a staff member served in an advisory and consultative capacity at a meeting of administrative officers called to review the proposed program for the schools.

Individual staff members have rendered consultative services in person or by extended correspondence to a large number of school officers, organizations, or agencies.

Participation in meetings—National, State, and local—of staff members included practically every field of educational interest during the year. Likewise, cooperation with professional and public service groups was most extensive.

INFORMATION SERVICE

Increased demand for, publications of the Office of Education resulted in an increase of approximately 62 percent in free distribution this fiscal year over the past fiscal year. The total reached 544,347.

School Life, official organ of the Office, issued monthly from September through June, increased its paid circulation during the year by 64.2 percent. Its total paid circulation reached 12,858. March of Education, the news letter of the Commissioner of Education, went to school executives to transmit quickly, from time to time, important information reaching the Office of Education.

A total of 77 manuscripts were prepared for publication within the year, excluding the 10 numbers of School Life. More than 300 charts, graphs, maps, and other illustrative material were constructed.

In the editorial division alone, 44,749 letters of inquiry about publications were received. Other divisions likewise had heavy correspondence, which together made a grand total of 692,448 pieces of incoming mail.

Reports available relative to public addresses and articles by members of the Office staff indicate a total of 177 addresses and 72 articles published in various periodicals outside the Office.

The Office continued its cooperation with newspapers and journals by preparing 192 press notices dealing with Office activities, trends in education, and general news about America's schools.

EDUCATIONAL EXHIBITS

Included among the extensive educational exhibits prepared by the Office during the year were those for the American Vocational Association, National Education Association, National Catholic Education Association, Northwest Territory Celebration, National Congress of Parents and Teachers, American Association for Adult Education, American Library Association, and others.

Committees from the staff of the Office of Education have assisted in plans for both the museum and the art gallery in the new Interior Building.

PUBLICATIONS PREPARED DURING THE FISCAL YEAR, 1936–37

Bulletins

1935

No. 2. Chapter I, Statistical summary of education, 1933–34.
No. 2. Chapter III, Statistics of city school systems, 1933–34.
No. 2. Chapter IV, Statistics of higher education, 1933–34.
No. 2. Chapter V, Statistics of public high schools, 1933–34.

1936

No. 11. A guide to curriculum adjustment for mentally retarded children.
No. 12. Public education in Alaska.
No. 13. The deaf and hard-of-hearing in the occupational world.
No. 14. Poland's institutions of higher education.
No. 15. Authority of State executives over higher education.
No. 16. A step forward for adult civic education.
No. 17. William Torrey Harris.
No. 18–VI. Youth: Community surveys.
No. 19. Functional planning of elementary-school buildings.

1937

No. 1. Part I, State and county school officers.
No. 1. Part II, City school officers.
No. 1. Part III, Colleges and universities.
No. 1. Part IV, Educational associations and directories.
No. 2. Volume I, chapter II, Trends in secondary education.
No. 2. Volume I, chapter V, Review of educational conditions and developments in rural and other sparsely settled areas.
No. 3. Public affairs pamphlets.
No. 4. Conservation in the education program.
No. 5. Insurance and annuity plans for college staffs.
No. 6. Bibliography of research studies in education, 1935–36.
No. 7 Student health services in institutions of higher education.
No. 8. Education of Negroes—A 5-year bibliography, 1931–35.
No. 10. Economic status of college alumni.
No. 11. College student mortality.
No. 12. Some factors in the adjustment of college students.
No. 13. Economic status of rural teachers.
No. 14. Successful practices in the teaching of English to bilingual children in Hawaii.

No. 15. Learning English incidentally: A study of bilingual children.
No. 16. Student interests and needs in regard to hygiene.
No. 17. Opportunities for the preparation of teachers of exceptional children.
No. 18. Opportunities for the preparation of elementary school supervisors.
No. 19. C. C. C. camp education: Advisers, enrollees, and program.
No. 20. Education for the public service: Study of the civil service in New York City.
No. 21. Vocational education and guidance of Negroes.
No. 22. List of publications of the Office of Education and the Federal Board for Vocational Education, 1910–36.
No. 23. Professional library education.

Pamphlets

No. 70. Per capita costs in city schools, 1935–36.
No. 71. An annotated bibliography on the education and psychology of exceptional children.
No. 72. Status of rural school supervision.
No. 73. Subject registrations in private high schools and academies.
No. 74. Crucial issues in education.
No. 75. Safety and health of the school child.
No. 76. Successful methods of teaching English to bilingual children in Seattle public schools.
No. 77. Opportunities for the preparation of teachers of native and minority groups.
No. 78. Unit costs of higher education.
No. 79. State school taxes and school funds and their apportionment.
No. 80. Sources of visual aids and equipment for instructional use in schools.

Leaflets

No. 34. State library agencies as sources of pictorial material for social studies.
No. 35. Essentials in home and school cooperation.
No. 38 (revised). Instruction in the effects of alcohol and tobacco.

Bibliographies

No. 2 (revised). Guidance.
No. 3 (revised). Supervision of instruction in rural schools.
No. 4 (revised). The education of women.
No. 21 (revised). Secondary education: Instruction.
No. 37. Elementary education: Organization and management.
No. 43. Elementary education: Teaching methods.
No. 46. Education for family life.
No. 49. Higher education: Control, organization, and administration.
No. 50. Higher education: Curriculum and instruction.
No. 51. Student personnel work.
No. 52. Educational problems of the southern highlands.
No. 53. Changing philosophies in higher education.
No. 60. Government publications for parents and leaders in parent education.
No. 61. Government publications on health, physical education, and recreation.
No. 62. Government publications showing the work of the Government.

INTERNATIONAL RELATIONS

Efforts toward improved international intellectual relations have had six distinct phases during the year: Assisting the Department of State in the selection of official delegates to represent the United

States at international conferences and congresses; nominating persons to receive scholarships offered by other countries; meeting educators from other countries and planning itineraries in the United States for them; assisting members of the Office and other Americans in arranging for travel abroad; working toward the accrediting of American schools abroad; and helping keep foreign mailing lists up to date.

While the Office annually replies to many requests for data about special opportunities to study abroad, until 1936–37 it did not attempt to select recipients of scholarships or fellowships or in any way to administer them. At the request of the Department of State and in cooperation with the Institute of International Education, it canvassed universities in the United States and nominated two persons to receive scholarships awarded by the Chilean Government for attendance at the summer school of the University of Chile in January and February 1937.

It also took up with the University of Heidelberg, Germany, the matter of aiding the university in its selection of young Americans to benefit by the scholarships it offers. The present status of the arrangement is that the Office of Education will pass upon the credentials of all applicants.

During the year the Office has had considerable correspondence with the National Association of Regional Standardizing Agencies, and its four principal constituent members, on arranging accreditment for all American schools abroad which may qualify. The present arrangement with the president of the National Association is that he will furnish the Office a statement of the areas of the world assigned to each of the four agencies, and during 1937–38 the Office will circularize these schools and aid them in understanding the methods and purposes of accreditment.

ADMINISTRATION AND SUPERVISORY ACTIVITIES

C. C. C. EDUCATIONAL PROGRAM

At the beginning of the fiscal year 1936–37, the C. C. C. educational program had been in operation for 2½ years. During that time certain practical objectives had been developed out of the expressed needs and interests of the enrollees; C. C. C. officials had become acquainted with these objectives and the methods of achieving them; the administrative organization of the program had been completed; the educational personnel had been carefully selected and trained, and had gained experience in camp work; and finally, the program had been extended to include 75 percent of the enrollees who participated in it on a purely voluntary basis.

The C. C. C. educational program, therefore, entered into its third fiscal year with clear-cut objectives, a trained personnel, and a record of successful experiences. It was considered no longer an

experiment, but an essential part of the entire C. C. C. program. This year witnessed the extension of the educational program to include almost 90 percent of the enrollees, but much more than that, there was improvement in the educational activities and the content of the instruction offered. The previous years might be characterized as a period of experimentation and extension of the program—this year might be called a year of consolidation of the ground already gained. At the close of the fiscal year, Congress extended the Civilian Conservation Corps for a period of 3 years and emphasized the importance of the educational program by establishing the corps, "for the purpose of providing employment, as well as vocational training, for youthful citizens of the United States who are unemployed and in need of employment * * *" The act also provided, "That at least 10 hours each week may be devoted to general educational and vocational training" and finally authorized, "That in the discretion of the director continuous service by the enrollee during his period of enrollment shall not be required in any case where the enrollee attends an educational institution of his choice during his leave of absence."

The administration and organization of the program remained unchanged during the year. In accordance with the original Executive order establishing the program, the War Department was responsible for its execution with the advisory assistance of the Office of Education. The other agencies of the Department of the Interior, Department of Agriculture, and Department of Labor were to cooperate with the War Department in this work. The Office of Education appointed a national director of C. C. C. education to act as adviser to the War Department; corps area advisers to act as advisers to the corps area commanders; district advisers to act as advisers to the district commanders; and camp advisers to act as advisers to the camp commanders.

Of the 4,500 men who have been appointed as camp educational advisers, 1,863 were still on duty in June 1937. Ninety-nine percent of these men are college graduates, 74 percent having the bachelor's degree, 22 percent having the master's degree, and 1 percent the doctorate. Two percent have a teaching certificate only and 1 percent have neither a degree nor a teaching certificate.

The educational reports for the past fiscal year show a remarkable picture of the growth of the educational facilities in the camps which can be attributed solely to the ingenuity and hard work of the officials and enrollees. In the past, approximately $100 per company per year has been allotted for the purchase of educational supplies and equipment and in addition about 300 books and 30 magazines and newspapers have been supplied to each camp.

The reports show that of the 1,900 camps, 60 percent now have schoolhouses and 77 percent have constructed and equipped vocational training shops. These schoolhouses and shops range from 10 by 10 cubicles to large buildings with several thousand square feet of floor space. Equipment in some camps consists only of a few hand-made knives used for wood carving; in others there are elaborate power tools and other facilities. Thirty-nine percent of the camps have schoolhouses with more than a thousand square feet of floor space and 9 percent have shops of this size. In the average school building there are four small classrooms. Seventy percent of the camps have a separate room for the library and 83 percent have a separate room for reading. The total value of the shop tools and equipment is estimated at $260,000. The library in the average camp has been expanded from 200 to approximately 800 books. It is reported that 76 percent of the camps have adequate lighting facilities for classrooms and shops. The following table gives these data in detail:

Physical Facilities for Education as of June 30, 1937

Total number of C. C. C. companies	1,900
Number camps having schoolhouses	1,146
Percentage camps having schoolhouses	60
Number camps having 1,000 square feet of classroom space	746
Percentage camps having 1,000 square feet of classroom space	39
Total number of classrooms	5,255
Number of classrooms per schoolhouse	4.6
Number camps having shops	1,460
Percentage camps having shops	77
Number camps having 1,000 square feet of shop space	181
Percentage camps having 1,000 square feet shop space	9
Total value of shop tools and equipment	$262,768
Number camps having special room for library	1,326
Percentage camps having special room for library	70
Number camps having reading rooms	1,571
Percentage camps having rooms	83
Number camps having projectors for educational purposes	972
Percentage camps having projectors for educational purposes	51
Total number projectors owned by the camps	690
Number of textbooks	393,155
Number of reference books	221,181
Number of library books not including text and reference books	941,141
Total number of books	1,555,477

During the summer months approximately 27,000 persons acted as instructors, and during the winter months approximately 30,000. Of this number, only 3,800 (the educational advisers and their assistants) devote their entire time to the educational program. The others have been drafted from the Army officers, technical personnel, and enrollees in the camps, from Federal relief organizations, and the regular school systems.

Throughout the development of the camp program of instruction, guidance and individual diagnosis have served as the foundation of all educational effort. The needs and interests of the men are so varied that any program of instruction for them must be elastic and adaptable. Educational activities evolved to meet enrollee needs include the following: (1) The elimination of illiteracy; (2) removal of deficiencies in common school subjects; (3) training on the job; (4) general vocational training; (5) avocational training; (6) cultural and general education; (7) health and safety education; (8) character and citizenship training; and (9) assisting enrollees to find employment.

A cumulative record card is kept on the progress of each enrollee. In addition to the enrollee's academic and vocational rating on the card, there is recorded the result of each interview held with him. The use of this card helps greatly in the individual guidance and placement of the enrollee.

The educational activities may be roughly classified in six groups: Academic courses, vocational courses, informal activities, professional training, miscellaneous activities, and certain general activities. During the average month of the past year, about 53,000 courses and activities were carried on in the camps. In an average company there were approximately 26 courses, of which 7 were academic; 8 were vocational; 4 were connected with the job training activities; 3 were informal activities (arts and crafts, dramatics, music, etc.); 2 are classified as miscellaneous (first aid, health, and safety courses); and 2 are classified as professional.

The reports show that from 85 percent to 90 percent of the men participate in the educational program. Most of these men attend two and sometimes three or more different courses and activities. Six out of every 10 men attend the miscellaneous courses; 5 out of 10 attend the job-training courses; 4 out of 10 attend the other vocational courses; 3 out of 10 attend the academic courses; 2 out of 10 attend the informal activities; and 1 out of 10 attend the professional courses.

Academic courses in the C. C. C. include those subjects common to the elementary, high-school, and college curriculum which are not vocational. The reports reveal that 3.2 percent of the enrollees are illiterates; 39.3 percent have not completed the elementary grades; 46.3 percent have not completed high school; 11 percent are high-school graduates; and 0.2 percent are college graduates.

The extent of participation in the academic courses varies markedly on the different levels of education. Thus 9 out of every 10 illiterates are taking literacy courses; 4 out of 10 on the elementary level are taking elementary courses; 3 out of 10 on the high-school level are taking high-school courses; and 7 out of every hundred on the college level are taking college courses.

The work projects in the field offer opportunities for training in a wide variety of occupations, and the jobs required for the operation and maintenance of the camp add a number of other opportunities for training. Instruction on these jobs is given by those who supervise the work. The report for June 1937 shows that 51 percent of the enrollees are now participating in job training.

In addition to the 8,098 job-training courses given during June 1937 there were 14,864 other vocational courses given in the camps. These vocational courses which were attended by 115,331 men, were entirely distinct from the regular job-training program. They were offered during leisure time and comprised subjects in which the enrollees expressed an interest. Among the most popular of these subjects were commercial courses, mechanical trades, journalism, carpentry, art, cooking, forestry, photography, accounting, and business management.

Camp educational officials have attempted at all times to train enrollees to make the most constructive use of their leisure time. Organized informal activities include arts and crafts, dramatics, music, discussion groups, camp newspapers, hiking clubs, and hobby groups. Recent reports indicate that approximately 22 percent of the men engage in these activities.

Safety, health, first aid, and life saving are, of course, important subjects of instruction in camp life. The report shows an attendance of approximately 174,000 men for these courses during the month of June 1937.

Camp libraries have been expanded to the extent that more than 1,500,000 books are now available to the enrollees. During the past year the circulation of books has averaged 300,000 per month and about 50 percent of the enrollees are regularly engaged in reading. Approximately 6,500 films dealing with a wide variety of subjects are shown to the men every month and more than 1,600 camps now publish a camp newspaper.

Agencies of the Federal, State, and local governments, as well as educational institutions, fraternal and civic organizations, have aided the C. C. C. educational program. The Works Progress Administration supplies some 2,000 teachers; the National Youth Administration, several hundred more. The State and local school systems of the country furnish more than a thousand teachers to the camps, and about a thousand members of local communities near the camps also assist as instructors and leaders of educational activities.

Correspondence course materials are being supplied enrollees by scores of colleges and universities, State departments of education, and private institutions. More than 20,000 enrollees are taking such courses. Hundreds of camps near schools and colleges are invited to use the facilities of the institutions by school officials. This readi-

ness to cooperate has resulted in the attendance of more than 7,500 enrollees each month in nearby schools. Incomplete reports indicate that more than 6,000 men during the past year were awarded elementary, high-school, or college diplomas, while enrolled in the corps. One of the most tangible and heartening measurements of the effect of C. C. C. training is the fact that an average of 8,000 enrollees were discharged each month during the past year to accept employment.

LAND-GRANT COLLEGES AND UNIVERSITIES

The Secretary of the Interior is charged with the supervision of the expenditures of the Morrill funds and supplements for the support and endowment of the land-grant institutions. This work is delegated to the Office of Education.

Each State, including Alaska, Hawaii, and Puerto Rico, provides a land-grant college or university; Massachusetts provides 2, and each of the 17 Southern States provide a separate Negro land-grant college. The Federal endowment (act of 1862) raised from the sale of lands and land scrip amounted in 1936 to $24,368,868, not including 662,281 acres of unsold land valued at $5,005,468. The income from these funds totaled $1,120,214 and was used mostly for faculty salaries.

The supplementary Morrill funds amounted to $3,530,000, which were divided, $70,000 to each State and Territory (except Alaska which received $50,000). On and after 1938–39, the appropriation will be $5,030,000 annually to the States.

The total amount of Federal funds received by the land-grant institutions in 1935–36 was about $36,000,000. The value of the plants and properties of the land-grant colleges was nearly half a billion dollars ($461,821,367).

Receipts from all sources reported by these 69 institutions amounted to $165,924,249 of which 12.6 percent was from student fees; 3.5 percent endowment income; 20.0 percent Federal Government; 37.5 percent State government; 1.2 percent county or city government; 2.5 percent private gifts; 5.2 percent from sales and services; 13.0 percent from auxiliary enterprises; and 4.5 percent miscellaneous.

Expenditures amounted to $158,326,063. These were paid out as follows: General administration 5.2 percent, resident instruction 35.4 percent, organized research 9.4 percent, extension 15.7 percent, libraries 2.0 percent, and operation and maintenance 7.5 percent, totaling 75 percent for educational and general purposes; auxiliary enterprises 12.2 percent, noneducational expense 2.1 percent, and capital outlays 9.6 percent.

A staff of 28,873 faculty members was employed to offer instruction to 209,455 students in residence work. About 20,000 students were taking correspondence courses, about 72,000 enrolled in extension

classes, and 53,000 in summer sessions. First degrees during the year were awarded to 28,946 students; 4,126 students received master's degrees, and doctor's degrees were conferred upon 852.

HOWARD UNIVERSITY REPORT

Howard University was inspected during the year by the Office of Education, as required by law. The annual report was compiled for presentation to Congress. For this annual report the president of the university assembled data according to a plan approved by the Office. These data constitute both the report to the Secretary of the Interior by the president of the university and the report to the Congress by the Office of Education.

Inasmuch as the annual report of the president of the university to the Secretary of the Interior is included in the Annual Report of the Secretary, no details concerning the university are given here.

VOCATIONAL EDUCATION

The cooperative program of vocational education carried on under the Smith-Hughes Act of 1917 and supplementary legislation, has two objectives. They are: (1) To prepare young persons for advantageous entrance into useful employment by equipping them with specific and tangible working assets, and (2) to give workers already employed the education they need to improve or maintain their employability or occupational status, or to regain their employability. Carried on not as a separate educational entity, but as a part of the public secondary school program, as provided under the enabling act, the vocational education program offers training to workers and prospective workers in agriculture, trade and industry, homemaking, and the distributive occupations.

The administration of the Federal Vocational Education Act, formerly the responsibility of the Federal Board for Vocational Education, is now vested in the Vocational Education Division of the Office of Education. In addition, the responsibility for administering the National Vocational Rehabilitation Act of 1920, which provides for the vocational restoration of persons disabled in industry and otherwise, training them where necessary and placing them in wage-earning employment, is also vested in the Vocational Division.

This report covers the twentieth year of Federal cooperation with the States in a country-wide program of vocational education, the seventeenth year of such cooperation in vocational rehabilitation, and the fourth year of the administration of these two programs by the Vocational Division of the Office of Education. In these two decades the enrollment in vocational schools has increased tenfold, and the number of disabled men and women who are being annually returned to self-supporting employment now equals approximately 10,000.

The vocational education and vocational rehabilitation acts now administered by the Office of Education are as follows:

The Vocational Education Act (Smith-Hughes), to provide for cooperation with the States in the promotion of vocational education. (Approved Feb. 23, 1917.)

The Vocational Rehabilitation Act, to provide for the promotion of vocational rehabilitation of persons disabled in industry or otherwise, and their return to employment. (Approved June 2, 1920, as amended June 5, 1924, June 9, 1930, and June 30, 1932.) Additional appropriations for 1936 and 1937 and annually thereafter for cooperating with the States and Hawaii in extending and strengthening their programs of vocational rehabilitation of the physically disabled, are authorized under the Social Security Act, approved August 14, 1935.

An act extending the benefits of the Vocational Education and Vocational Rehabilitation Acts to the Territory of Hawaii. (Approved Mar. 10, 1924.)

An act to provide for vocational rehabilitation of disabled residents of the District of Columbia. (Approved Feb. 23, 1929.)

An act extending the benefits of the Vocational Education and Vocational Rehabilitation Acts to the Island of Puerto Rico. (Approved Mar. 3, 1931.)

An act (George-Deen) to provide for the further development of vocational education in the several States and Territories, authorizing for the year 1937–38 and annually thereafter, additional appropriations for vocational education (approved June 8, 1936). This act continues authorization of additional appropriations upon expiration of the George-Ellzey Act of May 21, 1934, which authorized additional appropriations for the years 1935–37; and authorizes appropriations for vocational education in agriculture, trades and industries, home economics, the distributive occupations, and teacher training.

An act (Randolph-Sheppard) authorizing the operation of vending stands in Federal buildings by blind persons (approved June 30, 1936).

FEDERAL BOARD FOR VOCATIONAL EDUCATION

The Federal Board for Vocational Education created under the Smith-Hughes Act, to administer the provisions of the act, is composed of four members ex officio, as follows: The Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, and the Commissioner of Education; and three persons appointed by the President—one to represent agriculture, one to represent manufacturing and commerce, and one to represent labor.

The functions of the board were transferred to the Office of Education in 1933. As now constituted, the board acts in an advisory capacity, serving without compensation. Dr. Paul H. Nystrom, of New York, representing commerce and industry, is the chairman of the Board.

Two meetings of the Board were held during the past year, one in February and one in June. Among the problems which were considered and on which action was taken at these meetings are the following:

1. Policies of the Office of Education covering participation of State and local boards for vocational education in plant training programs for workers in trade and industrial occupations.

2. Use of State and local advisory committees composed of representatives of labor and industry, and of school administrators, in establishing and operating trade and industrial classes.

3. Need for study of teacher-training curricula insofar as they relate to vocational teachers.

TECHNICAL ADVISORY COMMITTEE

At the Fifty-fifth Annual Convention of the American Federation of Labor, held in Atlantic City, N. J., in October 1935, the committee on resolutions recommended that the convention "request the Federal Commissioner of Education to appoint a committee for the purpose of advising him in connection with all questions surrounding plant training." The resolutions committee recommended further that "this advisory committee consist of nine members, three to be outstanding representatives from the ranks of organized labor; three to be outstanding representatives of employers; and three to be recognized authorities in connection with State and local direction of vocational training."

Complying with the Federation's recommendation, the Commissioner of Education appointed a committee known as the Technical Advisory Committee on Trade and Industrial Education.

Through the efforts of this committee, a set of standards and safeguards to be followed by public vocational schools in determining whether they are justified in using Federal funds in establishing in private industrial plants vocational training programs in which instruction is given during the working day, was formulated and adopted. These standards and safeguards have been placed in effect by the Commissioner of Education as official policies governing assistance by State boards for vocational education in the establishment and operation of plant-training programs. A definite statement of this policy was incorporated in the revised edition of Bulletin 1, Statement of Policies for the Administration of Vocational Education, issued in February 1937.

The committee recommended that the Commissioner of Education urge upon State boards for vocational education the necessity for appointing State advisory committees, composed of equal representation of employers and labor, to advise them on matters pertaining to industrial training problems. A similar recommendation was made by the Technical Advisory Committee with respect to the establishment of local advisory committees on industrial education.

The committee has also devoted considerable time to the interpretation of certain phrases in Bulletin 1 and the extent to which the standards for plant-training programs should be applied.

POLICIES OF VOCATIONAL EDUCATION

The first statement of policies was incorporated in Bulletin 1 of the Federal Board for Vocational Education, issued in 1917. Changing conditions and the development of new problems through experience in the field necessitated a revision of this bulletin by the Federal Board in 1922 and again in 1926. During the past year the Office of Education made a fourth revision of the bulletin which reflects the policy changes that have been made since 1926, as a result of thorough consideration of the various problems in the field of vocational education.

The changes are based upon the experience gained in cooperating with the States in the development of the vocational education program over a period of 20 years and the criticisms and suggestions secured from representative groups and individuals engaged in and affected by the program of vocational education.

Among the individuals and groups from whom advice and counsel were solicited in revising the policies of the Office of Education are the following: State superintendents of public instruction, representatives of city school systems, State boards for vocational education, the American Home Economics Association, the American Vocational Association, representatives of labor and of employers, the Federal Advisory Board for Vocational Education, and the Technical Advisory Committee on General Policies, appointed by the Commissioner of Education, and members of the staff of the Office of Education.

Special attention was given in revising Bulletin 1 to the problems with which the States were confronted in formulating their general plans for the promotion of vocational education during the 5-year period beginning July 1, 1937, as required under the terms of the Smith-Hughes Act. It was necessary, also, to include in the revised statement of policies, new policies made necessary under the provisions of the George-Deen Act, which superseded the George-Ellzey Act, and which became effective July 1, 1937.

The Office of Education recognizes that as social and economic conditions change from time to time, it will probably be necessary to formulate new policies as needs arise. Any new policies or modifications of present policies thus made necessary will be issued as addenda to Bulletin 1.

Growth of Vocational Education and Vocational Rehabilitation Programs During the Year

A consistent growth has taken place in the vocational-education program carried on under Federal grants, since its establishment under the Smith-Hughes Act, in 1917, as evidenced by the increase in enrollment in vocational schools from year to year. Similarly, the growth of the vocational rehabilitation program may be measured by the

increase in the number of disabled persons rehabilitated since the inception of this program under the Federal Vocational Rehabilitation Act of 1920.

Enrollments in vocational schools operated under State plans, in agriculture, trade and industry, and home economics, increased from 164,123 in 1918 to 1,381,701 in 1936 and probably exceeded 1½ million for the fiscal year ending June 30, 1937.

Of the total number enrolled in 1936, 391,000 in round numbers were farmers, trade and industrial workers, and homemakers taking instruction in subjects related to their daily employment; 334,000 were youth employed in these three fields and attending part-time classes; and 656,000 were boys and girls attending full-time classes.

More than 10,300 persons disabled through accident, illness, or congenital causes were prepared for and placed in employment as self-supporting individuals in 1936, under the vocational rehabilitation program carried on in 45 States. This is an increase of more than 900 over 1935, and of 4,700 over 1933. In this particular it should be noted that the marked increase in the number rehabilitated during the past 3 years is attributable to supplementary Federal funds made available through the Federal Emergency Relief Administration and the Works Progress Administration, and more recently through the supplementary annual appropriation of $841,000 provided under the National Security Act.

State reports for 1936 show that in addition to the 10,338 persons rehabilitated, 44,625 disabled persons in process of rehabilitation were being carried on the rolls at the close of the year.

Acceptance of Vocational Rehabilitation Acts by Kansas and Vermont

During the year, the legislatures of Kansas and Vermont accepted the terms of the National Vocational Rehabilitation Act of 1920, under which Federal grants for vocational rehabilitation are provided. Arrangements have been made to start the rehabilitation program in Vermont on July 1, 1938. The Kansas legislature, although it accepted the Federal act, did not provide funds for its operation. The inauguration of the program in that State, therefore, will be delayed until funds are appropriated for the purpose.

Cooperative Services to the States

Cooperative services to the States in the fields of vocational education and vocational rehabilitation, which is one of the chief functions of the Vocational Division of the Office of Education, cover a wide field.

Special attention has been given during the past year by the Vocational Division to assisting State vocational education administrators in formulating plans for the operation of programs of vocational educa-

tion for the 5 years, beginning July 1, 1937, so that they may conform to the provisions of the George-Deen Act and the revised interpretations of policy set up by the Office.

The Vocational Division has rendered similar services to the States, also, in the field of vocational rehabilitation. A brief statement of some of the services rendered by the Vocational Division in the several fields of vocational education and in the field of vocational rehabilitation is presented in the following paragraphs:

In the field of vocational agriculture.—In State conferences devoted to plans and programs for the ensuing 5-year period, special attention has been given to reemphasizing the primary aim of vocational agriculture—to train present and prospective farmers for proficiency in the production and marketing of farm products—as well as the contributory objectives—intelligent cooperation with others; establishment and maintenance of a satisfactory farm home; participation in worthy rural, civic, and social relationships; and the selection, purchase, use, and repair of power equipment on the farm. Continued emphasis has been placed upon farm practice activities which tend to increase the efficiency of the farm business and add to the happiness of the individual farmer.

Teacher-training institutions preparing young men to teach vocational agriculture have adjusted their programs with a view to training more teachers in anticipation of the expansion of the national program of vocational agriculture under the provisions of the George-Deen Act, effective July 1, 1937. Marked progress has been made in the improvement of the preemployment teacher-training programs maintained in 71 colleges and universities for the purpose of training white and Negro agricultural teachers.

The national organization known as the Future Farmers of America, composed of white boys studying vocational agriculture in the high schools of the country, and the New Farmers of America, a similar organization for Negro students, have continued to grow in numbers enrolled. Both organizations are sponsored by the Office of Education.

The 142,000 members of the Future Farmers of America are, through their 4,600 chapter organizations, learning to save systematically, and are getting experience in parliamentary procedure, public speaking, home beautification and repair, community activities, conservation of national resources, pest eradication, and cooperative activities such as purchasing and marketing of farm supplies and products.

Part of the time of one staff member of the agricultural education service is devoted to service as executive secretary of the Future Farmers of America, which, under the direction of State supervisors of agricultural education, is managed and operated by its officers and members.

In the New Farmers of America, principal emphasis during the year has been placed upon improving training in leadership. A manual similar to one followed by the Future Farmers of America is being prepared for the New Farmers of America and will be distributed to the membership at an early date.

In the field of trade and industry.—In addition to rendering assistance to State boards for vocational education in setting up State plans for the next 5 years, aiding them in promoting various types of trade and industrial education, inspecting and evaluating existing programs, auditing vocational education accounts, and exercising the regular supervisory functions, the trade and industrial education service has carried on numerous other activities, including State and local surveys of vocational education needs and investigations bearing upon the organization and operation of effective programs, carried on by field agents. Assistance was given in training leaders for an educational program in connection with the industries of the bay region of California, in a training program for Texas peace officers, in training for drillmasters of fire departments in Connecticut, in training for textile workers in Pennsylvania, in mapping vocational curriculum and building needs for the industrial area of West Virginia, in training conferences for coordinators of industrial education programs in 7 States, in summer teacher-training conferences in 11 States; in programs of training for public service in 5 States, sponsored by State municipal leagues; cooperation with State departments of education, local boards of education, and architects in mapping plans for building and equipment for new vocational schools in 7 States; with the International Brickmasons and Plasterers Union in studying existing programs of training for brickmasons and plasterers in 3 States, with State public health officials of Texas in training local health department inspectors and school custodians, in a survey of the industrial teacher-training programs in Colorado, in a survey of vocational education needs in Iowa, in a survey of training needs in the cities of Chattanooga and Knoxville, and in a program designed to prepare teachers of nurses' training courses sponsored by State boards of nurses' examiners in Minnesota and Pennsylvania.

In the field of home economics.—The usual number of regional and interstate conferences have been held and a large number of individual conferences with directors of vocational education, supervisors, and teacher trainers of home-economics education have been carried out. Particular attention has been directed to the issuing of materials on organization and administration.

Staff members planned and participated in a short, intensive training course for itinerant teacher trainers for Negro schools; participated in State conferences for home-economics teachers in 5 States; offered special short courses in summer schools of 6 teacher-training institutions; conducted 8 interstate conferences (2 for representatives from Negro

teacher-training institutions and State supervisors); participated in plans for special family-life institutes at 6 teacher-training institutions; conducted studies of teacher-education programs in 22 institutions in 8 States; called and participated in a national conference on home management for college instructors in home economics to consider kinds of family life and community experiences students should have as a part of their home-management work; conducted a conference called by the State department of education in 1 State for presidents, heads of home-economics departments, and teacher trainers in all colleges of the State to consider the State-wide program in home economics; assisted in home-economics curriculum-building programs for public schools in a number of States and advised in revision of college and university programs for the preparation of home-economics teachers; provided special programs of interest to city supervisors of home economics in connection with 2 regional conferences; and worked with 2 agricultural groups in 2 regions in planning programs to improve farm-family living.

In the field of commercial education.—Preparations have been made by many of the States in the past year for starting courses for employees in the distributive occupations—those involved in getting the products of factories and farms to the consumer—as authorized under the George-Deen Act approved June 8, 1936, and effective July 1, 1937. Much of the time of the commercial-education service during the past year, therefore, has been devoted to assisting the States in securing information concerning the educational needs of the groups of workers in the distributive occupations, and in planning effective instructional programs for these groups as well as for those who must be trained as teachers of distributive occupational subjects.

Particular attention was given to aiding State boards for vocational education in outlining the kinds of classes for teaching distributive occupational subjects so that they might be in a position to include this information in their State plans for the 5-year period beginning July 1, 1937.

The Office has conferred with several commercial trade associations, notably the National Association of Retail Grocers, the National Association of Retail Meat Dealers, and organizations representing retail department stores, in regard to organizing educational committees to work with the Office of Education and with State vocational education administrators in developing a program of vocational education for workers represented by these associations.

Considerable time has been devoted to assisting secondary schools in adjusting commercial courses and curriculums to present-day commercial-employment opportunities and requirements for high-school commercial graduates.

Assistance was also given the Maryland State Board for Vocational Education in revising the State course of study in commercial subjects used in Maryland high schools. Similar help also was given the revision committee of the Pittsburgh public schools, and the Philadelphia schools received aid in revising a course in salesmanship.

In the field of vocational rehabilitation.—Eight principal services were rendered during the year by the Office of Education to State boards for vocational rehabilitation and local rehabilitation officials, assisting in the following ways:

1. Training new personnel.
2. Organizing rehabilitation case record systems.
3. Expanding State rehabilitation services.
4. Organizing and conducting studies of special phases of rehabilitation service.
5. Developing cooperative relations with welfare and similar organizations in carrying on rehabilitation activities.
6. General promotion of State programs of rehabilitation.
7. Expanding cooperation in rehabilitation work by employees of other State services.
8. Conducting conferences of State staff members.

During the past year detailed surveys of vocational rehabilitation programs were made in the States of Ohio, West Virginia, Indiana, and Oklahoma.

Cooperation With Other Agencies

The necessity for cooperating with governmental and other public and private agencies whose activities and objectives dovetail to some degree with the programs of vocational education and vocational rehabilitation, carried on under Federal grants, has been recognized by those responsible for the promotion of these programs ever since their inception.

The economic and social conditions of the past few years, during which a number of emergency organizations with functions allied to vocational education have been established, have served to emphasize to an even greater degree the importance of such cooperation.

In the field of agricultural education the Vocational Division has cooperated with various farmer organizations such as the Grange and the Farm Bureau; it has continued to cooperate with such Government agencies as the Farm Credit Administration, the Soil Conservation Division, and the Agricultural Adjustment Administration, in preparing subject matter designed to keep farm boys and farmers informed as to the service they may obtain from these organizations.

The Vocational Division has sought the help of these various outside agencies, also, in solving some of its own problems, especially in the field of research, and in preparing bulletins and other materials for use in different fields of trade and industrial training. In this rela-

tionship, the trade and industrial service has cooperated during the year with the following organizations:

American Municipal Association; Gypsum Industries Association; International Association of Chiefs of Police; International Association of Fire Chiefs; International Society of Master Painters and Decorators; League of New Hampshire Arts and Crafts; Metal Lath Association; National Occupational Conference; National Federation of Business and Professional Women's Clubs; National Committee on Prisons and Prison Labor; National Council for Household Employment; National Association of State Boards of Examiners in Cosmetology; National Association of University Women; National Association of Hotels and Restaurants of the United States and Canada; National League of Nursing Education; Portland Cement Association; Southern Women's Educational Alliance; Southern Mountain Workers Guild; and Structural Clay Products Institute.

The cooperation of the Division with Government and with other agencies in the field of home-economics education may be summarized as follows: Joint study with Home Economics Extension Service, United States Department of Agriculture, on methods of meeting local needs for home-economics education and assistance in nutrition programs in drought areas; cooperation with Rural Resettlement Administration, Tennessee Valley Authority, Rural Electrificatio Administration, and Works Progress Administration; assistance to Interdepartmental Committee of Federal Government in coordinating health and welfare activities; and participation in conferences with Children's Bureau, United States Department of Labor, American Home Economics Association, National Council of Parents and Teachers, American Youth Commission, National Council of Parent Education, American Vocational Association, National Education Association, Association of Southern Agricultural Workers, National Consumer-Relations Council, and National Committee on Household Employment.

Working relations with Federal and State agencies with which cooperation is required by law, and with other National, State, and local agencies which are in position to aid in the program of vocational rehabilitation, have been materially strengthened during the year. In several States and the District of Columbia a coordinated program for the placement of the handicapped was put into effect.

Under the provisions of the Randolph-Sheppard Act, authorizing the operation of vending stands in public buildings by blind persons, cooperative relations have been established with State commissions for the blind and other agencies in position to assist in this blind-employment movement. During the year 24 States were authorized to set up programs under which blind persons are employed as attendants in vending stands in Federal and other buildings, and approxi-

mately 100 such stands are in operation. Through such efforts increased use is being made by State rehabilitation departments of the services available from workmen's compensation bureaus, State employment bureaus, hospitals, and numerous welfare agencies in carrying on vocational rehabilitation activities.

Contribution to Education in C. C. C. Camps

Reports to the Office of Education indicate that States and local communities are making their vocational education programs available to enrollees in Civilian Conservation Corps camps to a considerable degree. Twenty-three States have organized classes, especially for these enrollees. In 27 States enrollees are attending classes in nearby vocational schools. Eighteen States report that they have conducted group conferences for educational advisers, leaders, and camp commanders, for the purpose of training them in conference-leading, teacher-training, and foremanship activities. Special services have been given in 10 States in planning and organizing instructional material for use in camp educational programs. Staff members of the Vocational Division have assisted the educational division of the Civilian Conservation Corps in a similar way.

Research Activities

Following the policy inaugurated when the program of Federal cooperation with the States in the promotion of vocational education was started in 1917, definite and specific "studies and investigations" in this field, provided for under the Smith-Hughes Act, have been carried on during the past year. The following list indicates a few of such studies: The occupational status and progress of former vocational-agriculture students; subject matter material in the fields of farm management, farm production, and the marketing of farm products; teacher training; amount and distribution of time devoted to vocational agriculture in high schools; analyses of State plans for vocational education in agriculture; training for, and occupations of, out-of-school farm youth; potential departments of vocational agriculture in high schools; supervised farm-practice programs; training for the fields of painting and decorating, plastering, metal lathing and bricklaying, sheet metal work in the aviation industry, railway and shipyard machine-shop practice, fire and police protection, and other public-service occupations; home economics at the college and high-school levels; teaching of home-management; housing as a part of home-economics programs; education for household employment; homemaking needs of out-of-school youth and adults; service occupations for which home-economics education prepares girls.

Research activities in the commercial-education field were confined largely to gathering and distributing information to State boards for

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vocational education, and to organizations representing those engaged in the distributive occupations, on the need for training and on possible training programs in this field.

In addition to the surveys of State programs of rehabilitation made in Ohio, West Virginia, Indiana, and Oklahoma, the Rehabilitation Service has prepared and published a series of 10 job analyses for use in supervising disabled persons under training for specific occupations.

Data from reports covering more than 10,000 persons rehabilitated in various States were tabulated and distributed to those who could make use of such material in rehabilitation work.

New Developments

Perhaps the most significant new development in vocational education during the year was the preparation under way in the States to take advantage of the provisions of the George-Deen Act, effective July 1, 1937, under which training is to be given in part-time and evening classes for those engaged in the distributive occupations—wholesaling, retailing, and other merchandising operations. Approximately one of every six workers gainfully employed in the United States is engaged in a distributive occupation.

Greater emphasis upon plans for programs of training for public-service occupations, and in the eastern section of the United States upon what may be termed general training in specific fields as compared with specific training covering a single trade as typified by the unit trade school, are among the new developments in the field of trade and industrial education.

Considerable attention has been given to plans for training in public-service occupations. During the year many of the States have made plans for training in a wide range of such occupations, including police- and fire-protection work, public-sanitation work, weights and measures inspection, water-works operation, municipal lighting, milk and meat inspection, and other nonclerical occupations involved in the operation of modern municipalities.

The program of the Public Employment Division of the United States Department of Labor, the public-health program administered by the Public Health Service, the program for crippled children administered by the Children's Bureau of the Department of Labor, and the unemployment compensation provision of the Social Security Act have made necessary a closer correlation in the States of the rehabilitation service with the four fields listed. During the year satisfactory progress has been made by the Office of Education in its efforts to correlate the programs of rehabilitation carried on in the States with the programs of these allied agencies.

Of special significance is an arrangement made under the sponsorship of the Office of Education, whereby the executive committee of

the newly created States Rehabilitation Council, composed of State rehabilitation officials and workers, will function as a technical advisory committee to the Office, in the field of vocational rehabilitation. This executive committee of the council will, upon invitation of the Commissioner of Education, meet from time to time with representatives of the Office of Education to discuss developments in the vocational-rehabilitation program and to suggest means of improving this program, through the adoption of new Federal policies.

Apprentice Training

The program of apprentice training carried on under the terms of the Smith-Hughes Act has been materially strengthened and the possibility of duplication of this program eliminated through an agreement with the Federal Committee on Apprentice Training, under which the responsibilities of the committee and the Office of Education have been definitely allocated.

Under this cooperative relationship the committee assists the States in the promotion of appropriate legislation on apprenticeship and the Office of Education assumes responsibility for sponsoring educational programs of training for apprentices, in cooperation with State boards for vocational education. This training program calls for the selection and training of special teachers for apprentice groups and the selection and training of coordinators, in order that the work experience and school training of apprentices may be brought into proper relationship. It also calls for the preparation of analyses of specific trades and of training plans, and of outlines for the teaching of technical subjects, and the adaption of subject matter to meet the special needs of apprentices in a wide variety of trades and crafts.

During the year staff members of the Vocational Division of the Office of Education conducted an 18-day conference on apprentice training in cooperation with a steel corporation, the Illinois and Indiana State boards for vocational education, and the boards of education of Chicago and Gary.

Publications

Each year reports of annual regional conferences arranged and conducted by regional agents in the three fields of vocational education—agriculture, trade and industry, home economics—and in vocational rehabilitation, are mimeographed and distributed to those interested in using them as reference material. Such reports were issued in 1936–37 as usual. In addition the following printed and mimeographed publications, a number of which grew out of studies and investigations, were issued and distributed:

General

Digest of Annual Reports of State Boards for Vocational Education to the Office of Education, Division of Vocational Education, for the year ended June 30, 1936.

Agricultural Education

Bulletin 154, Analyses of Special Jobs in Quality Milk Production, revised 1937.
Bulletin 191, Interpretive Science and Related Information in Vocational Agriculture.
Misc. 1851. Vocational Agriculture Service Map.
Misc. 1880. Supplementary Farm Practices.
C. L. No. 2015. Importance of Follow-up.
F. F. A. Service Letter No. 138. Summary of the Ninth National Convention of Future Farmers of America.

Trade and Industrial Education

Bulletin 185. Aviation in the Public Schools.
Misc. 1853. National Conference on Trade and Industrial Education.

Home Economics Education

Bulletin 187. Home Economics Education Courses.
Misc. 1822. The Forward Look for the Committee on Cooperation.
Misc. 1859. Selected List of Books, Pamphlets, and Periodicals on Vocations Toward Which Home Economics Training Makes a Contribution.
Misc. 1860. Publications Concerning Minority Groups.
Misc. 1861. Source Material on Negro Life and Education.
Misc. 1867. Suggested References on Consumer Education.
Misc. 1873. Planning the Family Expenditures.
Misc. 1884. Suggestive Materials for the Teaching of Housing in Home Economics Programs.
Misc. 1907. The Status of In-Service Training of Home Economics Teachers in the United States in 1934.
Misc. 1910. Illustrations of Tests for Evaluating Instruction in Some Phases of Consumer Buying.
Misc. 1928. Organization and Administration, Home Economics Education (preliminary draft, May 1937, of Bulletin No. 28, revised).

Commercial Education

Bulletin 186. Cooperative Training in Retail Selling in the Public Secondary Schools.

Vocational Rehabilitation

Leaflet No. 5. Restoring the Handicapped to Useful Employment.
A Statistical Study of Disabled Persons Rehabilitated 1935–36.
A Study of the Rehabilitation of One-Armed Persons.
A Study of Rehabilitated Persons Disabled Through Employment Accidents.
An Analysis of Types of Training Given Rehabilitated Persons.
A Statistical Study of the Rehabilitation of Persons Disabled by Tuberculosis and Heart Disease.
A Study of Persons Rehabilitated Through Training in Commercial Occupations.
Analyses of Seven Jobs in Which the Handicapped Can Be Trained.

Appropriations: 1937 and 1938

Appropriations for administering the vocational-education program carried on under Federal funds for the fiscal year ended June 30, 1937, totaled $265,000—$192,000 under the Smith-Hughes Act and $73,000 under the George-Ellzey Act. The George-Ellzey Act expired June 30, 1937, and was superseded by the George-Deen Act, which authorized increased appropriations for allotment to the States and for administrative expenses. For the fiscal year ending June 30, 1938, Congress appropriated $425,000 for the administration of the Smith-Hughes and George-Deen Acts. The appropriation for administering the Federal vocational-rehabilitation acts was increased from $78,420 for the fiscal year ended June 30, 1937, to $95,000 for the year ending June 30, 1938, the increase providing principally for additional personnel required in the administration of the Randolph-Sheppard Act making provision for the establishment of vending stands for blind persons.

The Smith-Hughes Act appropriates $7,167,000 annually for allotment to the States for cooperative vocational education in agriculture, trades and industries, and teacher training. The total amount authorized in the George-Deen Act of $14,483,000 was appropriated for 1938, an increase of more than $10,000,000 over the amount authorized in the George-Ellzey Act, which expired on June 30, 1937. Appropriations for vocational education in Hawaii and Puerto Rico are continued in the same amounts for 1938 as for 1937.

The appropriation to the States for 1937 under the Vocational Rehabilitation Act of June 2, 1920, as amended, was in the amount of $1,891,000, and for 1938, $1,800,000. Continued appropriations in the total amount authorized are provided for vocational rehabilitation in Hawaii and Puerto Rico. The appropriation for rehabilitation in the District of Columbia is increased from $15,000 for 1937 to $25,000 for 1938, in accordance with an amending act.

The acts authorizing appropriations for allotment to the States for vocational education and rehabilitation provide that unexpended balances remaining in the States at the close of a fiscal year shall be deducted from the allotments to those States for the ensuing year. Appropriations made in consideration of the unexpended balances provide that the allotments to the States shall be made on the basis of the total amounts authorized in the acts.

Appropriations for allotment to the States and Territories are shown in table I, total allotments to the States and Territories for vocational education in table II, and allotments for vocational rehabilitation in table III.

TABLE 1.—Appropriations for Allotment to the States and Territories for Vocational Education and Vocational Rehabilitation: 1937, 1938

Act	Appropriation	
	Fiscal year ending June 1937	Fiscal year ending June 1938
VOCATIONAL EDUCATION		
Smith-Hughes Act:		
Total	[1] $7,167,000.00	[1] $7,167,000.0
Vocational agriculture	3,027,000.00	3,027,000.00
Vocational trade, industry, and home economics	3,050,000.00	3,050,000.00
Vocational teacher training	1,090,000.00	1,090,000.00
George-Ellzey Act (expired June 30, 1937):		
Total	[2] 3,000,000.00	
Vocational agriculture	1,000,000.00	
Vocational trade and industry	992,207.84	
Vocational home ecnomics	1,007,792.16	
George-Deen Act (effective July 1, 1937):		
Total		14,483,000.00
Vocational agriculture		4,067,200.00
Vocational trade and industry		4,058,975.00
Vocational home economics		4,048,825.00
Distributive occupations		1,254,000.00
Vocational teacher training		1,054,000.00
An act making appropriations for the Territory of Hawaii:		
Total	30,000.00	30,000.00
Vocational agriculture	10,000.00	10,000.00
Vocational trade, industry, and home economics	10,000.00	10,000.00
Vocational teacher training	10,000.00	10,000.00
An act making appropriations for the Island of Puerto Rico:		
Total	105,000.00	105,000.00
Vocational agriculture	30,000.00	30,000.00
Vocational trade and industry	30,000.00	30,000.00
Vocational home economics	30,000.00	30,000.00
Vocational teacher training	15,000.00	15,000.00
Total, vocational education	10,302,000.00	21,785,000.00
VOCATIONAL REHABILITATION		
Vocational Rehabilitation Act	1,891,000.00	1,800,000.00
Hawaii	5,000.00	5,000.00
Puerto Rico	15,000.00	15,000.00
District of Columbia	15,000.00	25,000.00
Total, vocational rehabilitation	1,926,000.00	1,845,000.00
Total, vocational education and vocational rehabilitation	12,228,000.00	23,630,000.00

[1] Permanent and continuing appropriation. Estimated expenditure $7,000,000.
[2] Allotments to States made on basis of $3,084,603 as authorized in the act.

TABLE 2.—Allotments of Federal money to the States and Territories for vocational education, year ending June 30, 1938

State or Territory	Smith-Hughes Act				George-Deen Act					
	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational home-economics education	Vocational education for distributive occupations	Vocational teacher training
Total	[1] $7,157,977.62	$3,018,853.83	$3,049,265.27	$1,089,858.52	$14,483,000.00	$4,067,200.00	$4,058,975.00	$4,048,825.00	$1,254,000.00	$1,054,000.00
Alabama	160,268.82	106,018.23	32,611.15	21,639.44	401,144.05	165,947.24	55,072.91	135,856.98	24,429.46	19,837.46
Arizona	35,926.19	15,926.19	10,000.00	10,000.00	80,408.60	20,000.00	20,000.00	20,408.60	10,000.00	10,000.00
Arkansas	113,969.95	82,028.87	16,776.23	15,164.85	305,740.84	138,607.14	30,995.77	105,115.82	17,120.09	13,902.02
California	313,266.41	84,540.06	182,301.17	46,425.18	493,375.58	76,828.34	213,243.37	108,333.79	52,410.87	42,559.21
Colorado	61,536.56	28,757.35	22,779.21	10,000.00	123,622.04	35,018.40	31,752.56	36,851.08	10,000.00	10,000.00
Connecticut	89,214.52	26,484.45	49,589.77	13,140.30	144,923.17	20,000.00	64,104.14	33,938.47	14,834.50	12,046.06
Delaware	30,000.00	10,000.00	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Florida	84,785.54	39,488.86	33,290.52	12,006.16	159,855.59	34,542.21	50,149.93	50,602.96	13,554.13	11,006.36
Georgia	175,228.68	112,207.67	39,236.98	23,784.03	430,909.73	175,634.20	62,833.09	143,788.43	26,850.55	21,803.46
Idaho	37,587.72	17,587.72	10,000.00	10,000.00	85,860.29	23,322.53	20,000.00	22,537.76	10,000.00	10,000.00
Illinois	420,534.11	111,199.48	246,935.68	62,398.95	673,513.00	123,722.64	279,646.92	142,496.48	70,444.17	57,202.79
Indiana	185,584.34	80,412.77	78,689.02	26,482.55	360,165.48	100,662.97	102,283.38	103,044.87	29,897.00	24,277.26
Iowa	146,260.73	83,146.09	42,908.77	20,205.87	331,923.17	121,080.05	62,961.33	106,547.48	22,811.05	18,523.26
Kansas	111,527.42	64,167.24	31,978.49	15,381.69	250,754.04	87,561.92	49,499.38	82,227.05	17,364.88	14,100.81
Kentucky	157,592.30	101,201.53	35,010.22	21,380.55	379,737.33	145,672.06	60,643.33	129,684.62	24,137.19	19,600.13
Louisiana	124,390.87	70,683.15	36,522.14	17,185.58	282,172.30	102,842.00	53,597.61	90,576.86	19,401.35	15,754.48
Maine	50,615.30	26,528.15	14,087.15	10,000.00	101,582.84	21,171.85	26,416.52	33,994.47	10,000.00	10,000.00
Maryland	92,659.43	36,602.80	42,714.98	13,341.65	162,385.90	29,400.76	58,788.05	46,904.63	15,061.81	12,230.65
Massachusetts	225,939.31	23,310.27	167,878.22	34,750.82	294,968.15	20,000.00	174,008.92	29,870.92	39,231.31	31,857.00
Michigan	270,137.03	85,855.27	144,684.11	39,597.65	459,102.70	96,872.60	171,207.64	110,019.17	44,703.06	36,300.23
Minnesota	148,887.03	72,816.70	55,103.85	20,966.48	317,424.54	110,858.20	70,365.18	93,310.90	23,669.73	19,220.53
Mississippi	124,424.02	93,141.81	14,847.09	16,435.12	349,001.51	168,741.26	27,283.12	119,356.49	18,554.13	15,066.51
Missouri	209,813.81	98,675.62	81,459.38	29,678.81	431,203.86	137,990.54	106,052.83	126,447.79	33,505.35	27,207.35
Montana	39,875.61	19,875.61	10,000.00	10,000.00	90,801.51	25,331.93	20,000.00	25,469.58	10,000.00	10,000.00
Nebraska	82,280.54	49,713.06	21,299.32	11,268.16	192,684.27	72,518.94	33,409.76	63,704.76	12,720.99	10,329.82
Nevada	30,000.00	10,000.00	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
New Hampshire	32,679.49	10,714.23	11,965.26	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
New Jersey	218,495.63	39,135.29	146,312.71	33,047.63	302,649.11	20,000.00	164,895.07	50,149.88	37,308.52	30,295.64
New Mexico	37,642.12	17,642.12	10,000.00	10,000.00	82,607.48	20,000.00	20,000.00	22,607.48	10,000.00	10,000.00
New York	679,136.35	115,167.53	461,031.10	102,937.72	947,775.59	89,138.46	500,480.36	147,581.33	116,209.68	94,365.76
North Carolina	192,981.96	131,572.98	35,484.35	25,924.63	485,954.01	198,094.85	66,222.13	168,604.08	29,267.15	23,765.80
North Dakota	51,635.26	31,635.26	10,000.00	10,000.00	129,730.19	49,191.21	20,000.00	40,538.98	10,000.00	10,000.00

[1] The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

TABLE 2.—Allotment of Federal money to the States and Territories for vocational education, year ending June 30, 1938—Continued

State or Territory	Smith-Hughes Act				George-Deen Act					
	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational home-economics education	Vocational education for distributive occupations	Vocational teacher training
Ohio	$371,096.69	$119,248.45	$197,495.50	$54,352.74	$627,015.40	$125,453.59	$237,563.83	$152,810.82	$61,360.55	$49,826.61
Oklahoma	143,352.81	87,756.55	36,002.87	19,593.39	337,188.90	126,795.87	57,856.10	112,455.55	22,119.60	17,961.78
Oregon	57,324.88	25,866.11	21,458.77	10,000.00	111,628.76	27,693.47	30,789.18	33,146.11	10,000.00	10,000.00
Pennsylvania	537,709.58	172,677.04	286,273.09	78,759.45	858,491.92	106,072.11	370,028.00	221,276.85	88,914.06	72,200.90
Rhode Island	47,842.03	10,000.00	27,842.03	10,000.00	88,296.97	20,000.00	28,296.97	20,000.00	10,000.00	10,000.00
South Carolina	106,714.19	76,236.31	16,259.29	14,218.59	274,928.97	113,473.43	34,676.21	97,692.95	16,051.82	13,034.56
South Dakota	51,323.28	31,323.28	10,000.00	10,000.00	128,452.67	48,313.48	20,000.00	40,139.19	10,000.00	10,000.00
Tennessee	156,555.22	95,875.76	39,282.82	21,396.64	376,206.74	150,491.95	59,084.68	122,859.89	24,155.35	19,614.87
Texas	343,814.26	191,491.24	104,691.96	47,631.06	780,504.42	291,248.04	146,433.22	245,386.28	53,772.22	43,664.66
Utah	35,132.76	13,466.11	11,666.65	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Vermont	33,424.97	13,424.97	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Virginia	145,433.63	91,209.99	34,419.18	19,804.46	337,148.87	117,718.58	62,036.16	116,880.97	22,357.89	18,155.27
Washington	89,381.85	37,840.26	38,757.07	12,784.52	165,452.09	37,731.20	53,077.76	48,490.36	14,432.86	11,719.91
West Virginia	104,667.06	68,990.85	21,535.80	14,140.41	226,923.60	55,607.33	53,981.55	88,408.27	15,963.56	12,962.89
Wisconsin	169,327.36	77,210.55	68,083.37	24,033.44	343,977.87	109,088.25	86,784.01	98,941.39	27,132.12	22,032.10
Wyoming	30,000.00	10,000.00	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Alaska					80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
District of Columbia					80,512.97	20,000.00	20,512.97	20,000.00	10,000.00	10,000.00
Hawaii					80,020.99	20,020.99	20,000.00	20,000.00	10,000.00	10,000.00
Puerto Rico					254,271.99	126,739.41	21,941.06	79,764.66	14,253.00	11,573.86

TABLE 3.—Allotments of Federal Money to the States and Territories for Vocational Rehabilitation, Fiscal Years Ending June 30, 1937 and 1938

State or Territory	1937	1938	State or Territory	1937	1938
Total	[1] $1,885,009.61	[1] $1,938,000.00	Nevada	10,000.00	10,000.00
			New Hampshire	10,000.00	10,000.00
Alabama	39,730.02	40,912.77	New Jersey	60,675.45	62,481.73
Arizona	10,000.00	10,000.00	New Mexico	10,000.00	10,000.00
Arkansas	27,842.67	28,671.54	New York	188,993.65	194,619.94
California	85,236.63	87,774.11	North Carolina	47,597.62	49,014.59
Colorado	15,551.07	16,014.02	North Dakota	10,222.02	10,526.32
Connecticut	24,125.59	24,843.80	Ohio	99,791.63	102,762.39
Delaware	10,000.00	10,000.00	Oklahoma	35,973.47	37,044.38
Florida	22,043.31	22,699.53	Oregon	14,319.87	14,746.17
Georgia	43,667.48	44,967.45	Pennsylvania	144,602.35	148,907.13
Idaho	10,000.00	10,000.00	Rhode Island	10,321.88	10,629.16
Illinois	114,564.47	117,975.03	South Carolina	26,105.33	26,882.47
Indiana	48,621.96	50,069.43	South Dakota	10,402.24	10,711.91
Iowa	37,097.98	38,202.37	Tennessee	39,284.23	40,453.71
Kansas	28,240.79	29,081.51	Texas	87,450.62	90,054.00
Kentucky	39,254.69	40,423.30	Utah	10,000.00	10,000.06
Louisiana	31,552.72	32,492.04	Vermont	10,000.00	10,000.00
Maine	11,972.28	12,328.69	Virginia	36,360.99	37,443.44
Maryland	24,495.27	25,224.49	Washington	23,472.38	24,171.15
Massachusetts	63,802.50	65,701.88	West Virginia	25,961.79	26,734.67
Michigan	72,701.29	74,865.59	Wisconsin	44,125.40	45,439.00
Minnesota	38,494.46	39,640.43	Wyoming	10,000.00	10,000.00
Mississippi	30,174.88	31,073.18	Hawaii	10,000.00	10,000.00
Missouri	54,490.29	56,112.45	District of Columbia	15,000.00	25,000.00
Montana	10,000.00	10,000.00	Puerto Rico	15,000.00	15,000.00
Nebraska	20,688.34	21,304.23			

[1] A special allotment of $5,000 to Hawaii and the allotment to the District of Columbia and the island of Puerto Rico are not included in the total.

GENERAL EDUCATION BOARD

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation, and the expenditure or other use or disposition of the same or the income thereof during the preceding year, has for its object the promotion of eduction within the United States.

The bylaws, as amended at the annual meeting of the members and trustees held December 17, 1936, provide that the fiscal year shall commence the 1st day of January in each year and end on the following 31st day of December. Accordingly there is presented herewith a report for the 6-month period July 1 to December 31, 1936.

On June 30, 1936, principal fund, belonging without restriction to the board, amounted to $34,734,598.42. Transactions during the period resulted in a net increase of $4,181,447.82, or a balance December 31, 1936, of $38,916,046.24. This fund is invested in stocks and bonds. In addition, the sum of $14,486,380.95 is reserved to pay appropriations to various educational institutions, and the further sum of $746,500 has been referred to the executive committee for appropriation, a total sum reserved of $15,232,880.95. This fund is invested as follows: Securities, $13,186,621.78, and cash on deposit, $1,299,759.17. Lapses and refunds on prior years' appropriations amounted to $273,000 and $1,500, respectively, and the further sum

of $2,750,000 previously authorized, was rescinded. Payments during the 6-month period amounted to $1,856,100.96.

There was appropriated from income during the 6-month period the sum of $1,045,834. Lapses on account of prior years' appropriations amounted to $298,353.54, however, leaving a net increase in income appropriations of $747,480.46.

The income from the above funds, together with income from undisbursed income, amounted during the period to $1,146,108.92; the balance of income from the previous year as of June 30, 1936, amounted to $8,688,467.05, which, together with sundry refunds amounting to $2,841.40, increased the total to $9,837,417.37. Disbursements from income during the 6-month period amounted to $1,604,928.49, leaving an undisbursed balance of income on December 31, 1936, of $8,232,488.88. Of this sum, $7,899,641.44 is in cash on deposit and $332,847.44 in sums advanced on account of appropriations which are to be accounted for. This balance of $8,232,488.88 consists of: Unpaid appropriations, $6,874,749.37; amount referred to the executive committee for appropriation, $603,690; and the sum of $754,049.51 which remains unappropriated.

The Anna T. Jeanes fund, the principal and interest of which are to be used for Negro rural schools, amounted, on December 31, 1936, to $15,919.21. The sum of $25,000 was appropriated during the period, of which the sum of $12,500 was paid. The unpaid balance of $12,500 is in cash on deposit.

The balance in the Anna T. Jeanes fund income account at June 30, 1936, amounted to $2,334.49. There was no income during the period and payments amounting to $1,110.99 reduced this balance to $1,223.50, which consists of unpaid appropriations of $875 and an unappropriated balance of $348.50. The total sum of $1,223.50 is in cash on deposit.

March 1, 1937.

DIVISION OF TERRITORIES AND ISLAND POSSESSIONS

Ernest H. Gruening, *Director*

THE Division of Territories and Island Possessions, in addition to the regular administrative functions of coordinating and supervising the activities under its jurisdiction, has assumed a large volume of budgetary and accounting work relating to the Territories and possessions, including the governments of Alaska, Hawaii, Puerto Rico, and the Virgin Islands; also The Alaska Railroad, Alaska Road Commission, Alaska Insane, The Virgin Islands Company; and the colonization projects on Howland, Baker, and Jarvis Islands.

The Division has made considerable progress in furthering the interests of these outlying areas and activities of the United States as they relate to the other Departments and agencies of the Federal Government, and many appearances were made during the fiscal year before the Bureau of the Budget, congressional committees, etc., in behalf of appropriations, legislation, and other administrative matters of importance. The Director of the Division made a number of trips to Puerto Rico and the Virgin Islands during the year, and the administrative officer visited the Hawaiian Islands to inspect the Homes Commission projects, territorial institutions, etc., and to organize and despatch the first expeditionary cruise under the Department of the Interior to Howland, Baker, and Jarvis Islands for the purpose of establishing and maintaining permanent colonization projects thereon. These islands are located in the Pacific Ocean on the Equator, approximately south of Hawaii, and groups of four Hawaiian-American citizens are maintained on each for the purpose of preserving United States sovereignty and obtaining certain meteorological material considered to be of value in connection with the proposed establishment of air routes to the Southern Hemisphere. The administrative officer also visited the Morningside Hospital, Portland, Oreg., where the Alaska insane patients are cared for under contract with the Federal Government.

Through these personal relationships and the use of the Federal Government's radio system and the commercial air facilities, the Division has maintained close communication with the distant and widely diversified activities under its supervision.

TERRITORY OF ALASKA

During 1937 the administrative functions of the Department in connection with the office of Governor of Alaska, The Alaska Railroad, the Alaska Road Commission, the Reindeer Service, and the care of the Alaska insane were performed through the Division of Territories and Island Possessions. This Division likewise was charged with aiding the several other branches of the Interior Department operating in Alaska when determining matters of policy with reference to the Territory. The Director of the Division was chairman of the Inter-Departmental Committee on Alaska, a committee established by the President for the better coordination of all Federal activities in Alaska.

The year witnessed the regular biennial and an extraordinary session of the Alaska Legislature. Outstanding among the enactments furthering the utilization of the resources of the Territory and providing for the welfare of its citizens were an appropriation for the biennium of $400,000 for roads and airfields, an act creating a Territorial Planning Council, one organizing an Aeronautics and Communications Commission, an enactment providing Social Security legislation, and another which established a new tax schedule for mines and mining.

The Alaska Railroad during the summer of 1936 provided three round-trip schedules per week between Seward and Fairbanks, with supplementary service out of Fairbanks to Nenana and Mount McKinley Park and out of Seward to Anchorage and Palmer. The Pacific coast maritime strike by disrupting steamer service to Alaska caused the operation of regular passenger trains to be discontinued from November 1, 1936, to February 18, 1937. The 1937 summer schedule was inaugurated June 8. When the Pacific coast maritime strike created a danger of a shortage of food and other necessary commodities in the Territory, The Alaska Railroad under Presidential authority operated an emergency steamship service from Seattle to Alaskan ports. River boat service was maintained on the Yukon during the season of navigation with bimonthly sailings between Nenana and Marshall. The deficit for the railroad for 1937 amounted to $172,065, after including a loss of $174,588 from the operation of ocean-going vessels during the maritime strike, and $7,449 expended for the investigation of mineral and other resources. Excluding these two items, the railroad and river lines would show a profit on normal operations of $9,971.

The Alaska Road Commission is charged with the construction and maintenance of roads, bridges, and trails in Alaska outside of national forests. Construction and maintenance of airfields, telephone lines, and shelter cabins is also undertaken for the Territory. The work accomplished during the fiscal year may be summarized as follows:

New construction: 63¾ miles of roads of which 16¾ miles were surfaced; 15 miles of sled road; 17¼ miles of trail, and a number of bridges.

Improvement: 75½ miles of road regraded and widened; 115 miles of road surfaced and 681 metal culverts installed.

Maintenance: 1,848¾ miles of road; 80¼ miles of tramway; 527½ miles of sled road; 2,412 miles of permanent trail; and 304 miles of temporary flagged trail.

The cost during the year was $1,055,432 of which $392,632 was for new work and $662,800 for maintenance and improvement.

Reindeer work has been administered under the supervision of the Reindeer Service with headquarters at Nome, Alaska. During the year 176,613 deer were handled and 67,094 newly marked. The number of reindeer recorded as being used by the Eskimos of Alaska for food, clothing and other purposes is 36,922, while the number of carcasses shipped from the Territory totaled 6,015. During the year 3,500 reindeer were driven from Barrow to Barter Island to protect the natives of that region against periodic food shortages.

Under provisions of law the insane of Alaska are cared for under contract with the Sanitarium Co., Portland, Oreg. The Interior Department is represented at the sanitarium by a medical supervisor with training and experience in psychiatry. At the beginning of the fiscal year, 309 patients were receiving treatment. During the year 49 patients were admitted and patients deceased, discharged or transferred number 62, leaving 296 persons receiving treatment at the end of the fiscal year. During the year improvements both in housing and treatment have been accomplished through additional buildings inauguration of insulin treatment, a recreational program, and occupational therapy.

TERRITORY OF HAWAII

The financial condition of the Territory is gratifyingly sound as is evidenced by the fact that at the beginning of the bienium, 1933–35, the general fund showed a deficiency of $1,527,944.49, while the same fund records a surplus of $1,315,133.51 at the close of the biennium on June 30, 1937. As to the biennium 1937–39, the Territory's budget is in balance.

Largely as a result of contributions from the Federal Government, extensive improvements were made to Territorial highways and airports, the sum of $2,376,872 having been expended by the Department of Public Works during the fiscal year 1937. The largest single item was from the National Recovery Highway fund which aided materially in the construction or realignment of 19 miles of completed, improved

highways. Following the recommendations of the District Advisor, Airport Section, Bureau of Air Commerce, the legislature at its 1937 session appropriated the sum of $200,000 for the improvement of airports to bring them up to Department of Commerce requirements and standards.

Hawaii's commerce, compiled on a calendar-year basis, showed a substantial increase in 1936; the total value of imports and exports amounting to $219,639,784. This is an increase of more than $35,000,000 over 1935. Imports from the mainland, United States and foreign countries during 1936 were valued at $92,462,979 and exports $127,176,805. Sugar, raw and refined, and canned pineapples and juice made up the bulk of the exports; the former being valued at $67,975,548 and the latter $51,452,493.

Among the accomplishments in the health administration of the Territory were the discovery of trichinosis and infectious jaundice, increased improvement in the control of venereal diseases (due to Social Security funds), work in connection with rehabilitation of crippled children (through Territorial and Social Security funds), and also establishment of additional clinics for mothers and infants in the Territory.

The estimated population shows an increase of 3,438 persons during the fiscal year, the total population on June 30, 1937, being estimated at 396,715, of whom 310,956 are American citizens.

HAWAIIAN HOMES COMMISSION

The Division maintained close relationship with the Hawaiian Homes Commission through Col. George Larrison, the Field Representative of the Department.

Major activities during the year included the reduction of homesteaders' debts to the commission and others; the increase in the percentage of homesteader labor in relation to the pineapple companies' labor in the Molokai homestead pineapple fields; the opening of additional homestead lots; the completion of a census of homesteaders with data regarding their blood mixtures, ancestry, occupations, etc.; an appraisal of the value of commission property; the adjudication in favor of the commission of the ownership of water diverted for the Molokai domestic water supply system; and the increase in acreages of food crops on Molokai.

PUERTO RICO

One of the important developments during the year was the purchase of the properties, rights, and franchises of the Ponce Electric Co. by the Government of Puerto Rico. Negotiations were completed on March 31, 1937, whereby funds amounting to $1,400,000 were furnished by the Federal Emergency Public Works Administration, in

exchange for an equal par value of revenue bonds of the insular government, which are equally and ratably secured by the net revenues derived from the operation of the project, and are additionally payable from any revenues available from the sale of electric power from all other parts of the system owned by Utilization of the Water Resources. The acquisition of these properties at a total cost of $1,082,431.41 will enable the insular government to carry forward on a well founded economic basis the development of its hydroelectric system. It will permit the insular government to distribute additional electric power in urban centers at a fair price to the consumers. The balance of funds over and above the purchase price will be used in purchasing additional equipment and improving the property which has been acquired.

Loans made by the former Puerto Rican Hurricane Relief Commission are now in process of composition and adjustment as authorized in Public Resolution No. 60, Seventy-fourth Congress, approved August 27, 1935. Regulations governing the procedure to be followed in making the compositions and adjustments were approved August 26, 1936, and, due to the present economic situation, were modified August 10, 1937. Two loans were paid off during the year. There are now 3,001 loans outstanding, which were originally contracted in the amount of $5,655,760, 22 loans having been fully repaid. Prior to making adjustments, the total sum due the United States, including unpaid interest, exceeded $6,000,000.

An issue of bonds for $1,000,000,000, dated July 1, 1936, the proceeds from which were used in the construction of insular and municipal roads, were sold on behalf of the government of Puerto Rico. They were short-term bonds, $500,000 being due July 1, 1937, and $500,000 due July 1, 1938. Bidders were allowed to name a coupon rate which would permit them to submit offers of not less than par. The offer of the Chase National Bank of 100.08, which submitted the most favorable bid, the bonds to bear interest rate of 1½ percent per annum, was accepted. Such a low rate of interest was most gratifying.

José Padin resigned as commissioner of education, effective December 31, 1936. The President nominated José M. Gallardo as his successor. Dr. Gallardo was confirmed by the Senate on May 3 and entered upon duty June 14, 1937. Funds were appropriated by the Legislature of Puerto Rico for the employment of 100 teachers of English from the continental United States during the year 1936 and for 100 additional teachers of English during 1937.

THE VIRGIN ISLANDS

Allocations of emergency relief funds by the Works Progress Administration provided for the improvement and extension of Bluebeard Castle Hotel, continuation of the homestead program, and

construction of roads connecting the most important agricultural districts with the three towns of the Islands.

Improvements to the Bluebeard Castle Hotel included construction of additional sleeping quarters, and a large water storage system. Essential grading and landscaping was begun with the aid of the C. C. C. organization.

There are now 380 holders of homesteads contracts in both the islands of St. Thomas and St. Croix. Extraordinary rainfall has resulted in unprecedented yields in the sugar crop in St. Croix, with the result that many homesteaders are reaping large returns from their plantings.

Many urgently needed improvements to the sewer and water systems were completed with Public Works funds. Government House, St. Croix, was reconstructed and fireproofed. The P. W. A. Housing Division has practically completed 3 urban housing projects consisting of 126 famly units with a total of 230 rooms located in each of the 3 towns of the islands.

A joiners' cooperative and a farmers' cooperative distribution outlet have been successfully established after long planning. These cooperatives, together with the handicraft cooperative previously established, will furnish an outlet for an increasing amount of goods and promise to become important factors in the economic improvement of the islands.

A total of 777 ships with a tonnage of 3,104,153 gross tons called at the port of St. Thomas during the year, continuing the increase in shipping begun in 1933. Favorable consideration was given by the United States Army Engineers to the project for the improvement of St. Thomas Harbor. In this connection, a committee, appointed by the Governor, made an extensive study and report on the establishment of a graving dock in St. Thomas.

A well-known American corporation has established its principal place of business in St. Thomas. Developments of considerable importance to the economic future of the islands may be anticipated as a result of the action of this corporation. Considerable interest has been evinced recently on the part of American private capital in the possibilities of developing business opportunities in the Virgin Islands.

THE VIRGIN ISLANDS CO.

During the fiscal year, the company cultivated 2,200 acres of sugarcane, and prepared land to plant an additional 900 acres. The Company purchased more than $50,000 worth of sugarcane from 700 homesteaders, which together with its own cane, produced 2,800 short tons of raw sugar, 2,500 tons being sold to refineries in the United States. During the year, the Company manufactured 93,000 gallons of pure cane juice rum which was placed in charred oak barrels to be

aged, increasing the total rum inventory to 496,000 gallons after deducting the 68,000 gallons sold during the year.

EQUATORIAL AND SOUTH SEA ISLANDS

Four cruises were made from Honolulu, Territory of Hawaii, to Jarvis, Baker, and Howland Islands during the year under the supervision of the field representative of the Department of the Interior, carrying water, food, and other supplies for the maintenance of the colonists stationed thereon. Buildings for housing personnel, aerological equipment, and miscellaneous supplies were constructed by the colonists on each island, and a landing field was prepared on Howland Island.

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PUERTO RICO

RECONSTRUCTION ADMINISTRATION

Ernest Gruening, *Administrator,* Resigned July 13, 1937

IN the 6 years preceding 1935, Puerto Rico like other parts of the United States was suffering from the effects of the general economic depression. But even before the crash of 1929, sugar, the island's chief industry, had not been profitable for a decade, due to world overproduction. This had reduced employment and wages in the sugar industry—generally wiped out previous profits in many instances and increased indebtedness in many more.

Moreover, two hurricanes of unusual destructiveness swept over the island within the unprecedentedly brief period of 4 years, in 1928 and 1932, causing property losses estimated at $175,000,000. These storms not only damaged every island industry but uprooted hundreds of thousands of families. The coffee agriculture of the island, on which half a million people depend, was almost destroyed, the fruit industry damaged to a degree so great that it has not recovered. Tobacco and sugar industries suffered greatly.

The sugar reduction program launched by the Jones-Costigan Act deprived some 25,000 wage earners of work.

National legislation to speed recovery on the continent, when extended to the island, in many instances added to the already existing hardships. Prices of food and other necessities which the island imports in large quantities from the mainland, were raised—quota production of sugar and tobacco was fixed below normal level. The extension of the N. R. A. and the attempt to fix wages in the needlework industry succeeded only in closing the shops of many entrepeneurs and causing further unemployment. Thus, the island's production generally was curtailed while living costs increased.

Aside, however, from these special, if temporary, adverse factors, it became apparent to those sincerely interested that Puerto Rico was suffering from certain fundamental social and economic ills, not entirely connected with world conditions but which if left unchecked would eventually bring social and economic chaos to the island.

Conditions in Puerto Rico were wretched when Spain retired in 1898. About 15 percent of the school population was in school. During the previous decade smallpox had taken an annual toll of 600 deaths. During the following 30 years under American administration economic and social conditions improved steadily. Modern sanitation, previously nonexistent, was introduced, an extensive road system was constructed, many public buildings, including primary and high schools, were erected. The university was founded. Yet tangible as were these accomplishments they were inadequate to meet the combined factors of depression, population growth, hurricanes, progressive land concentration, and soil erosion. Beginning with the island-wide hurricane of 1928 Puerto Rican economic conditions entered a crisis which became steadily aggravated. The hurricane of 1932 intensified the disaster. By the summer of 1934 unemployment reached a total of about 350,000.

One of the most fundamental problems has been the pressure of island population, increasing at the rate of 40,000 a year in an area already overcrowded and with no new frontiers for pioneering within the limits of its own shores. In the 39 years since the advent of American sovereignty the population has doubled. With the present population of approximately 1,800,000—529 persons to the square mile—with an arable area of approximately 1,225,000 acres or 0.7 acres per person, with which to sustain life, it was obvious that only a highly developed and well controlled program could come anywhere near meeting the problem in this strictly agricultural country. In spite of the insular government's extensive health program, general health conditions of the island, due to overcrowding, malnutrition, and a generally low standard of living, leave much to be desired and the death rates for tuberculosis, gastrointestinal diseases and malaria reach startling figures. Nearly 90 percent of the rural population in the island's interior and 40 percent of the urban inhabitants harbor the hookworm parasite.

Another basic problem has been a progressive concentration of the best lands of the island into fewer and fewer hands. The 1930 census showed that out of the 261,000 persons employed in agriculture 20 percent were farm operators. The number of farm operators declined from 5.2 percent of the total population in 1910 to 3.4 percent in 1930. In 1930 farms less than 20 acres in size, practically all of them owned by their operators, constituted 72 percent of the total number of farms; yet the acreage they comprised was only 12.4 percent of the total acreage in farms. Farms of less than 100 acres, 93.6 percent of the total, included merely 37 percent of the total land in farms in Puerto Rico. On the other hand, large farms of 500 acres and more, many of them of questioned validity under the Organic Act of Puerto Rico and only 367 in number (0.7 percent of total number of farms),

comprised 32 percent of all the area included in farms. The development of the sugar industry as a highly capitalized and technical business and the lack of a systematic agricultural policy to develop diversified farming, destructive storms causing loss of crops, bankruptcy and loss of the small agriculturists' holdings, ignorance about modern methods of cultivation which permitted increasing soil erosion, excessive population increase with mounting unemployment, and other factors, have increased the growing landlessness, crowding more people into city slum areas, thus aggravating overcrowding in the island's cities.

During the period 1933–35 Federal relief funds were first made available to Puerto Rico. It early became apparent, as stated above, that the economic plight of Puerto Rico was not really due to the same economic factors as on the mainland of the United States. Therefore Federal relief funds made available for the island could serve only a very temporary purpose, unless applied in such a manner as to effect certain fundamental revisions in the island's economy.

When the Puerto Rico Reconstruction Administration was established by Presidential order, dated May 28, 1935, under the authority of the Emergency Relief Appropriation Act of 1935, it was with the purpose of carrying out a comprehensive program which would not only relieve the immediate problems by creating widespread employment but would also tend toward a correction of adverse economic and social factors. For this purpose specific allotments were made for a wide variety of projects. A unique aspect of the program in Puerto Rico was that the tasks entrusted on the mainland to such varied agencies as the Works Progress Administration, the Public Works Administration, the Resettlement Administration, the Rural Electrification Administration, and the Tennessee Valley Authority were largely concentrated in the Puerto Rico Reconstruction Administration. Funds were allocated towards the end of August and in September 1935 the Puerto Rico Reconstruction Administration was organized in Puerto Rico. Adequate office space was not available. Temporary office buildings were, therefore, constructed and occupied by January 1936.

The duties assigned to the Puerto Rico Reconstruction Administration to make reconstruction possible and effective, called for rapid action, simultaneously on many fronts. The need of rapid expenditure to meet the existing major economic crisis conflicted with the desire for prudent, planned, economical disbursements, consonant with a long-range program. This dilemma existed until on February 11, 1936, Congress pass a bill establishing the moneys allocated to Puerto Rico as a special fund available to June 30, 1940, and the proceeds of operations into a revolving fund available indefinitely. This action by Congress enabled the Administration

while meeting the immediate emergency with work-relief projects, nevertheless to slow the tempo of its activities, to make a more analytical approach to many problems which experience indicated needed reconsideration, and to plan a sounder reconstruction program.

Activity had already begun along several lines, based generally upon a program which had formerly been developed by a policy committee composed of prominent Puerto Ricans, called to Washington in the early part of 1935 to formulate a program of reconstruction for the island. Land was purchased, a resettlement program to put worthy and small farmers back on the land started, workers' camps were organized as a part of the resettlement and forestry projects, giving opportunity for special educational work. Thousands of workers concentrated in comparatively large numbers called for a health program reaching all parts of the island, supplementing an already efficient but quantitatively insufficient insular program. Housing and public building began, with every effort being made to increase employment and to create projects of a lasting value.

By June 30, 1937, labor had been provided to the extent of 68,476,254 man-hours. The peak of employment, gradually rising, had been reached in November 1936, just prior to the beginning of the annual sugar harvest, when a total of 59,062 persons were employed, 97.5 percent from relief rolls. With outside employment increasing some of the Puerto Rico Reconstruction Administration construction projects ended. At the end of June 1937, there were 32,201 laborers (including workers under contracts) employed and 2,576 in the supervisory and administrative personnel.

On June 30, allocations to the P. R. R. A. from the emergency relief funds of 1935 and 1936 amounted to $40,418,395. Of this amount there had been disbursed $27,828,196.20. Other obligations or commitments amounted to $5,542,653.58, leaving an unencumbered balance of $7,047,545.22.

Principal disbursements were for wages and salaries, amounting to $13,565,512.56; purchase of materials, supplies, and equipment, $3,876,341.62; land purchased for rural electrification, forestation, cement plant, housing, and slum clearance, $4,201,258.65; homesteading, resettlement, and the sugar program involved the expenditure of $4,185,650.81, while payments on construction contracts were $3,129,665.56.

ORGANIZATION AND ADMINISTRATION

For administrative purposes the P. R. R. A. was organized with divisions of rural rehabilitation, rural electrification, forestry, university buildings, slum clearance, work relief, health, planning, census, legal, finance, business administration, and personnel. To many sections in these divisions was assigned the vast detail work of the

reconstruction program. The Administrator's office is in Washington, that of the Regional Administrator in San Juan.

The Reconstruction Administration has drawn on island engineers, architects, agronomists, physicians, nurses, social workers, laboratory technicians, lawyers, skilled clerical and office workers—practically every profession and specialized group—for its personnel.

Applications for administrative appointments have been filed by 45,040 persons, and employment for 4,934 to fill the executive, professional, and clerical positions has been provided for varying periods.

All P. R. R. A. purchases were and are made through the Procurement Division of the United States Treasury, while all disbursements are made by the United States Treasury Disbursement Office.

LAND UTILIZATION

Agriculture being Puerto Rico's main source of support, rural rehabilitation was made the cornerstone of the P. R. R. A. program. It seeks to reestablish on the land, as owners, hundreds of individuals, many of whom formerly were small farmers and others who were landless laborers. This marks the beginning of a new land policy.

The rural rehabilitation division of the P. R. R. A. is charged with the responsibility of carrying out the resettlement program. More than 70,000 acres of land have been purchased, or contracted for purchase, as a beginning of better land utilization. These lands are, or have been, under production in sugar, tobacco, coffee, and citrus fruit, the island's chief crops which provide the bulk of employment.

Laborers' camps have been established wherever large tracts of land have been acquired. With each camp program insofar as possible adapted to the particular needs of the community, its workers have been employed in agricultural and engineering work, incident to resettlement. Definite hours have been set aside for studies in practical agriculture, manual training, and elementary civics. Athletics have been stressed. Six land resettlement camps were operated, employing 4,237 men. This is in addition to 12 forestry camps, mentioned later.

For generations soil erosion has proceeded in Puerto Rico, unchecked. Already it has become a serious problem. The steep contours, the heavy precipitation, combined with faulty methods of cultivation, have permitted the washing out into the ocean of Puerto Rico's greatest natural asset, its soil—really its only true wealth. After any tropical shower the blue waters of the Caribbean are discolored brown for miles out to sea. Yet despite the obviousness of this problem it was never recognized in Puerto Rico until the P. R. R. A. was well under way. No consideration of soil erosion, no program to combat it, appeared in the original rehabilitation plan. Even contour plowing was not practiced in many parts of Puerto Rico. Instead the furrows run straight up and down the hills, veritable conduits for draining off

the topsoil. Terracing was unknown. In consequence, not only have many hills and upland valleys been largely denuded of their topsoil, but the infertile subsoil has washed down and covered over the topsoil of the valleys, seriously impairing the productivity.

A soil conservation camp, near Mayaguez, within a year, has successfully demonstrated that much eroding land can be saved for cultivation. Extensive work in terracing and soil-saving methods have demonstrated a practical program for Puerto Rico's eroded farm land. With proper treatment, hundreds of thousands of acres can be restored to profitable productivity. It is planned concomitantly to educate the farmers in these new methods and to extend this work during the coming year to other parts of the island, so that as rapidly as possible soil conservation and correct land utilization may replace the destructive methods hitherto in vogue in Puerto Rico.

First lands purchased for resettlers were some 4,000 acres, belonging to the American Suppliers, Inc., an absentee owner. The land was located in the mountainous interior, in the La Plata Valley, the finest tobacco section of Puerto Rico. Around 480 small farms have been created there, and allotted to laborers who qualified in the camps as candidates for a farm. On each a house is being or will be constructed. Up to June 30, 1937, 274 houses had been completed and 66 were under construction. Two hundred and seventy-one resettlers are already cultivating their farms, and as more houses are completed the rest will move in. These houses are built of concrete and are designed to be hurricane, earthquake, and termite proof.

Immediately after the resettlers occupied their farms a program of initial help was organized for them in the form of seed, fertilizers, insecticides. As a result, 1,070 acres have been prepared for planting up to June 30, 1937. Work on road building and other needed construction has been provided for the resettlers and the income from this labor totals $9,982.75 in wages. Others are given part-time work in different projects of the P. R. R. A. on a salary basis. The rest of the time is taken up in working on their own farms. A total of 543 acres has been planted. Crops grown by the resettlers will be marketed through newly formed insular cooperative marketing associations, already operating.

During the period of land development, home construction, and erection of other buildings, a crop of tobacco and winter vegetables was planted, partly to utilize the land and in the case of the vegetables, to demonstrate the feasibility of raising unfamiliar crops. The tobacco was marketed through the Puerto Rico Tobacco Marketing Association. The vegetable crop was sold in local markets, camps, and New York markets, bringing in $5,438.48. These receipts went into the revolving fund for further rehabilitation work.

To estimate the real importance of this vegetable raising program it is necessary to understand that this apparently simple and elementary form of agriculture has been virtually nonexistent in Puerto Rico. Despite complaints about the large quantities of foodstuffs that are imported at high prices, nothing practical had been done or had even been contemplated to remedy the situation. Previous to the program truck gardens had been almost nonexistent in Puerto Rico. Its landscape makes a sad contrast with the closely tilled fields of densely populated regions such as France, Germany, or Japan where every available square foot of ground is utilized and has been for generations. The failure so to utilize Puerto Rico's soil was the more paradoxical, first, in view of Puerto Rico's manifest land shortage and, second, its all year round productivity, which permits the growing of three crops of a food staple (such as corn) which in temperate zones can be produced only once annually.

Now vegetables never before seen have been introduced. They have been planted and raised by the men in the camps, then introduced into the camp fare, furnishing nutritive elements previously lacking. Three dozen different kinds of root and green vegetables, including turnips, cabbage, beans, okra, carrots, squash, beets, onions, potatoes, and radishes were grown in the camp truck gardens. The prevailing diet among the masses of Puerto Ricans, from whom the campers were drawn, has been consistently lacking in nutritive value. Polished rice, beans, and dried codfish, all imported, has been the standard fare. To these are now being added, through the program above outlined, a great variety of other foodstuffs. Many of the men, all of whom work in the gardens as a part of their training, are purposing to go into vegetable growing as soon as they become settled on their homesteads. Given an extension and amplification of this program, which will supplement the cane, coffee, tobacco, and other cash crops, the Puerto Rico of the future probably will become an intensely cultivated, terraced country supplying a very much larger proportion of food for home consumption, food more varied, more nutritive, and less costly.

In the tobacco, coffee, and citrus areas, where laborers were assigned as a part of the reconstruction program, more than 55,000 acres were planted to such food crops as plantains, bananas, cow peas, yams, corn beans, pigeon peas, sweetpotatoes, rice, cassava, and pumpkins. These plantings extended into more than two-thirds of the municipalities in the island. No attempt has been made to estimate the value of the food crops produced, but it is large, while the variety and extent is greater than the island has every known, though still far from adequate to meet island needs.

In the coffee section two large adjoining plantations, the Castaner and Llinas farms, of approximately 1,500 acres and about one-half

under coffee cultivation, have been purchased. They are being developed as a cooperative farming enterprise with provision for homes and 200 subsistence gardens for laborers, who will acquire theim by purchase. The house construction program in this area is being continued and up to June 30, 1937, 57 houses had been completed and 25 were under way.

During the first week of June 1937, 52 houses were assigned to the qualified laborers of the Janer camp. Remunerative work is being provided so that the settlers may be self-sustaining while initiating the cultivation of their land. The project also is being used as a demonstration farm for the introduction of new crops in the coffee area. It is planned to plant around 50 acres of *Cran cultura* cane. Acres of vanilla have been planted. Citron and various tropical fruits have been introduced.

Another tract of 1,526 acres near Luquillo recently has been purchased. A workers' camp was opened on June 1 and 200 houses will be built for distribution. Four hundred and thirty-one acres have been purchased on the island of Vieques, and a camp of 180 men will be operated there. Fifty houses will be built.

In providing assistance to tobacco, coffee, and citrus farmers a uniform policy has been followed of supplying part-time labor, fertilizer, and other aid. In return farmers entered into contracts with the P. R. R. A. to sell at one-half assessed value small tracts of land for resettlement and homesteading, the amount sold in no instance exceeding 10 percent of the individual tract. Final agreements entered into on April 30, 1937, provided for the P. R. R. A. to acquire 9,229 acres from 1,607 tobacco farmers, 22,940 acres from 1,698 coffee farmers, and 1,010 acres from 124 citrus farmers. Houses are to be built on these plots and laborers can raise a large part of their subsistence. Rural resettlement has become an island-wide undertaking.

The Reconstruction Administration maintains a central service farm of 40 acres at La Plata which is rapidly converting itself into a practical school for the resettlers. All of its land is under cultivation following new methods in agriculture, judicious fertilizing, disease and insect control, and seed selection. The farm has provided large amounts of seeds, corn, beans, rice, sweetpotatoes, yucas, dasheens, and yams to the resettlers. The farm also supplies plants, baby chicks, livestock, use of barns, implements, and farm machinery. The superintendent of the service farm serves as the local representative of all marketing cooperatives and agricultural credit agencies.

A modern poultry farm has been established at the central service farm for the purpose of incubating and growing pure-bred poultry for distribution among the resettlers and homesteaders in the whole island

Also 40 pedigreed Anglo-Nubian goats have been sent to La Plata for breeding purposes in order to improve the goat breeds of the resettlers. These goats are high milk producers.

Five other smaller or junior service farms are in operation in this region, which includes five municipalities. They are affiliated with the central service farm. Service farms will be established at other land projects, as developed.

Perhaps not the least important of the land utilization program has been the follow-up service for resettlers. Much training is necessary among the country people of Puerto Rico to overcome the inertia engendered by forced unemployment, undernourishment, illness, and the rural rehabilitation division of the P. R. R. A. has provided an inspection force to assist the newly formed farmer or resettled laborer to plant a garden, raise poultry, or improve his home.

The program is aimed directly at checking land concentration, crowding of slums, and importation of foodstuffs. When completed, over 12,000 new houses will be built and as many families will for the first time be producing a good part of their food supply while living under standards heretofore unknown to them.

Not the least of the important projects carried out by the rural rehabilitation division has been the introduction of new crops designed to fill the gap that exists in an agricultural country largely devoted to specialized farming. This is especially important in the coffee area where the devastating hurricanes practically have ruined a once prosperous industry, and where curtailed markets have discouraged redevelopment of the original acres. Special attention has been given to the growth of vanilla, an enterprise which originally was investigated by the Puerto Rico Emergency Relief Administration. Studies continued by the Puerto Rico Reconstruction Administration indicated that 21,000 acres of coffee lands in successful vanilla production would supply the entire American market vanilla beans, supplanting present foreign imports valued at almost $5,000,000 annually. The industry would provide labor for some 9,000 men and provide an entirely new secondary source of income for coffee farmers.

Vanilla propagation, requiring highly specialized technique, is being developed along with further experimentation in the field and laboratory. Methods of cultivation and curing which promise to evolve a profitable new industry are under careful scrutiny.

Other crops of promise are citron, sour lemon, and various insecticidal plants, the cultivation of which is being extended by the P. R. R. A.

CAMPS AND EDUCATION

In October and November 1935, steps were taken to establish the camps section of the P. R. R. A. Shortly thereafter it was organized together with the educational and supply units. It functions under the direction of the rural rehabilitation division.

The general aim of this section is not only to house workers on projects, but to contribute to human reconstruction by developing in the workers a greater ability to study and solve problems confronting them in their daily lives, through the inculcation of good social habits, agricultural and industrial skills, and through better nutrition coupled with the inculcation of certain elements of hygienic living.

In April 1936 the Reconstruction Administration took over two camps which were already in operation under the forestry division. These camps were enlarged and repaired. During June 1936 the construction of eight forestry camps was undertaken. Camps were constructed on land resettlement projects with the following result:

Eighteen camps have been operated at an average cost of $1,200 a month each.

A total of 4,237 men have received the benefits of the workers' reconstruction camps.

A total of 1,055,360 man-hours have been worked.

A total of 5,376 man-months have been employed.

Salaries and wages have averaged $963.54 per man-year of employment.

During the month of January 1937 camp Dona Juana was transferred to the C. C. C. from the Puerto Rico Reconstruction Administration.

At the end of March, camps Mariano Abril and Fernandez Juncos, and during the month of April, camps Elzaburu, Munoz Rivera, and Betances completed the periods for which they were intended and ceased to operate. Similar action was taken with 11 more camps at the end of June 1937.

The educational section of the Rural Rehabilitation Division began to operate January 2, 1936. Its staff is made up of a chief, a supervisor of health education and health recreation , a supervisor of agriculture, a head teacher in charge of special duties in the office, a secretary to the chief, and a stenographer. The present field personnel is as follows: 11 teachers of agriculture, 11 assistant camp teachers, and 11 recreational teachers.

The aforementioned objectives are being sought through health education, outdoor and indoor recreational activities, reading, discussions of social and economic problems directly affecting the laborers, gardening and poultry, and manual arts.

In September 1936 practical truck gardening was included in the educational program. This activity has given encouraging results. Tomatoes, beans, cabbages, carrots, onions, lettuce, cucumbers, egg-

plants, red peppers, potatoes, squash, and similar crops were harvested with splendid yields.

Over 75 percent of illiterate laborers in the camps have been taught to read and write sufficiently to continue their studies by themselves.

HEALTH ACTIVITIES

Success of the island reconstruction program to a large degree depends on the extent to which the people may have the facilities for both physical and economic health. Without the former the latter is wholly impossible. While the health activities of the P. R. R. A. confine themselves chiefly to those engaged in the organization, nevertheless a fair cross section of the entire island is reached. All workers are given medical examination, and treatment when needed.

In the camps future homesteaders are under constant observation. Every effort is made to have them physically fit before they assume their new obligations. Medical treatment is provided for the men's families as well as the men themselves. Hookworm elimination and prevention, inoculation against typhoid fever, vaccination for smallpox, prophylaxis and treatment of venereal disease, are part of the camp routine. Simple sanitation and personal hygiene have been taught in all camps.

Outside of the camps, dietary diseases and malaria have been given special study. More than 11 percent of the workers examined at Lafayette sugar central showed positive malaria reaction.

Rural medical centers have been in operation in sections where resettlement camps have not been established. These centers cover 51 municipalities. Each consists of three dispensaries staffed by a physician, nurse, social worker, and clerk. Through the dispensaries a careful rural health survey is under way. Both general and specialized clinics have been opened with a physician in attendance twice each week at each dispensary. Measures have been undertaken to check the spread of hookworm and malaria along with the treatment of those infected.

The health division has worked in close cooperation with the insular department of health, the department of education, and the School of Tropical Medicine.

Health Activities

Physical examinations	17, 402
Treatment for malaria	4, 070
Treatment for uncinariasis	13, 122
Typhoid fever innoculations	40, 720
Smallpox vaccinations	60, 245
Laboratory examinations	60, 245
Dental service	11, 930
Number of clinics held	6, 613
Patients attended	127, 569

SUGAR PROGRAM

Sugar is the backbone of Puerto Rico's economic life. Annually its agriculture, processing, and transportation represent a business turn-over of millions of dollars. Yet the industry has brought serious problems.

From a technical standpoint it is efficiently run. The criticism which it faces from a sector of Puerto Rican opinion relates to its social aspects. The four largest companies, while American, are absentees as far as Puerto Rico is concerned. Others are of Spanish ownership and therefore absentees from the national, American economy, as well as from the insular economy. The profits of these enterprises are taken away from the island and the political power of the companies frustrates adequate assessment and taxation. Moreover, the sugar industry—of necessity a large scale industry—has led to the progressive concentration of the best lands in fewer and fewer hands. The resulting large land holding is in contravention of the will of Congress, expressed 37 years ago and reaffirmed in the Organic Act limiting corporations engaged in agriculture to ownership of not more than 500 acres of land. (The validity of this legislation is for the first time being tested in the courts.) Below the larger agricultural-industrial sugar enterprises in the insular social structure are the colonos or cane farmers, independent cultivators whose holdings range from a fraction of an acre to over a thousand acres. These colonos deliver their cane to one of the company mills where it is ground and payment made on a basis of total quantity delivered plus sucrose content. The colonos have been emphatic in asserting a disadvantage in dealings with the larger corporate enterprises; that the virtual monopolies of these centrales resulted in unfavorable contracts to the growers; that credit conditions imposed upon them were oppressive. At the bottom of the sugar scale are the agricultural workers, poorly paid, inadequately housed, seasonably employed during the 5 months of the cane cutting season, and uprooted and unremunerated during the other seven. The great excess of population and labor supply makes betterment of their condition through unionization or collective bargaining difficult to attain.

The sugar program of the Puerto Rico Reconstruction Administration has been directed along the line of demonstrating through the yard-stock method that these problems might be corrected. For this purpose, the Central Lafayette with properties covering three municipalities in the southeastern part of the island, under French ownership for almost a century, was acquired in December 1936. It is noteworthy that this property was 100 percent absentee-owned both as regards the national and the insular economy. That was one impelling factor in its selection for purchase. The property

includes a modern raw sugar factory of 2,500 tons daily grinding capacity, 10,040 acres of land owned and approximately 8,000 additional acres under lease, leases also acquired. The property includes also railroads, rolling stock, work cattle, and other material and equipment essential for operation. To achieve the objectives of the sugar program, the following general set-up was adopted:

(a) Distribution of the land among laborer's cooperatives, and to resettled colonos.

(b) Operation of the mill on a cooperative basis, membership of which was to be the land cooperatives and colonos who had formerly ground their cane in this mill. This group numbered more than 300, the great majority of whom cultivated less than 10 acres each.

To carry out the above, a cooperative, the Asociasion Azucarera Cooperativa Lafayette, was organized by a group of the farmer-colonos on November 19, 1936, and a month later, simultaneously with the purchase of the sugar properties, this cooperative assumed title, and obligated itself to pay to the Puerto Rico Reconstruction Administration the full purchase price of the mill properties. One million three hundred and sixty-three thousand one hundred and ninety-nine dollars and forty cents was the amount paid for the mill property which will be amortized over a period of 20 years with payment of principal to begin in 1940 and with interest at 3 percent. The Puerto Rico Reconstruction Administration holds a first mortgage on all property as security for this loan. An additional advance of $261,841.12, secured by a lien on the industrial benefits of operations, was extended to the cooperative for initial operating expenses.

On December 11, 1936, eight land cooperatives were organized from among the agricultural workmen. A total of 3,006.91 cuerdas of land has been transferred to these eight land cooperatives, together with the cane growing at the time of the transaction, representing a total value of $1,543,741.51. These land cooperatives also purchased and hold in joint ownership the livestock, agricultural implements, and other movable property necessary for the field operations. The Puerto Rico Reconstruction Administration holds as security for these loans a first mortgage on all this property, and in addition the mill cooperative and the several land cooperatives have entered into a management agreement with the administrator of the Puerto Rico Reconstruction Administration whereby their interests will be handled by the manager of the mill cooperative, who is a P. R. R. A. employee, thus securing a central and efficient management. The balance of the land is being held by the administration for organizing additional land cooperatives so that every worker's family in the Lafayette area may be given the opportunity to participate in the enterprise and to become a small home owner. Meanwhile this land, destined for future cooperatives,

is being cultivated for the account of the administration by the centralized management.

As an integral part of membership in the land cooperatives, a resettlement program, designed to give better living conditions to the labor members, has been inaugurated by the P. R. R. A. and land has been set aside for the building of approximately 1,000 laborers' homes. The first 300 houses are under construction. Each family will be given sufficient land for gardening and for raising small livestock and poultry. Payment will be amortized over a period of years. A central service farm has been established to assist the resettled laborers, as well as the colonos who are members of the mill cooperative, with their agricultural problems. The first buildings have been erected. Three vocational schools, to be operated by the insular government, have been erected within the district and a new modern hospital is being built at the Central for the benefit of the laborers, the other employees, and their families. At the end of the first year's operations, June 30, 1937, the cooperative ground 257,110.27 tons of cane and manufactured 258,308 bags, 250 pounds each, of raw sugar. The average yield was 12.69 percent. Of this amount, 76,383.27 tons of cane were delivered from the land of the agricultural cooperatives, the balance from the lands held by the Reconstruction Administration and by independent colonos on their own property. Despite the fact that management of the properties was not acquired until January 1, 1937, and consequently no control was had over initial operating expenses, the project will show a profit of over $200,000 on the first year's business.

The acquisition of Lafayette, which was a totally absentee-owned property sending its profits abroad to a single family, is an important move seeking to rectify the most criticized social aspects of the sugar industry in Puerto Rico. Assuming management to be successful, it should result in—

1. Keeping the profits of the enterprise in Puerto Rico.
2. Elimination of exploitation.
3. Improved housing, sanitation, and social service, tending to establish higher standards of social responsibility among sugar enterprises generally.

In the rehabilitation program as first proposed in Puerto Rico, as presented to the Reconstruction Administration and widely publicized, the purchase of a number of mills simultaneously was recommended, as well as their transfer to the hands of colonos. The Reconstruction Administration after careful consideration modified both proposals. It limited itself, for the present, to the acquisition of one mill in behalf of cooperatives, in the belief that prudence dictates a careful exploration of the possibilities of operation of one such enterprise before any wholesale embarkation on a program obviously so administratively

difficult and fraught with important consequences. Second, it rejected the idea of loaning substantial sums of public money solely for the rehabilitation of a relatively limited group of farmers, some of them substantially well-to-do, to the exclusion of a great body of landless and indigent agricultural workers whose distressed condition under this plan would have remained virtually unmodified. The fundamental objectives—the correction of social weaknesses inherent in the rapid development of Puerto Rico's indispensable part-sugar economy—are, however, maintained unqualifiedly.

COCONUT BUD ROT ERADICATION PROJECT

According to a report by the insular experiment station after the 1932 hurricane, 185,005 palm trees were destroyed by the two successive hurricanes of 1928 and 1932. It also reported 603,193 standing palms. The palms, palm leaves, stumps, and other coconut trash were lying between the rows of standing palms hindering cultivation of the groves and serving as excellent harboring places for destructive insects, especially the well-known destructive Rhinocerous beetle, transmitter of the dreaded coconut bud rot disease. Production of nuts sank to the lowest level on record, and many groves were in a state of virtual abandonment.

With an allocation of $111,900 a strict sanitation campaign was prosecuted—an essential forerunner of any cultivation or replanting. Its objectives were to destroy by fire all tree trunks on the ground, rotten stumps, standing diseased palms, leaves and trash, to prevent the spread of disease from these foci of infestation to healthy growing palms, and to clear the ground for cultivation and further planting. It was calculated that 335,000 palm trees were required to replace those uprooted by storms and to plant barren areas in existing groves.

The program was launched in May 1936 as a relief project under the rural rehabilitation division of the P. R. R. A. A monthly average of 300 laborers were given work for 5 days a week, at a daily wage of 75 cents, for a period of 1 year and 1 month. On June 30, 1937, a total of 25,690.48 acres had been cleaned; 57,976 standing rotten palms and fallen trunks and 232,909 stumps had been removed, 586,808 larvae and 40,729 adult beetles had been destroyed. These activities were confined to the Bayamon, Canovanas, Mayaguez, and Arroyo districts and are 93.5 percent complete.

COOPERATIVES

Agricultural cooperatives are not new in Puerto Rico, but due to lack of trained leadership, under capitalization and competition from the speculative groups, the cooperative movement has, until recently, suffered many setbacks.

In the last 3 years both the insular and the Federal Government have taken important steps to aid the development of cooperatives. The insular legislature created a fund of $100,000 to further cooperatives in the island, and through this the "Cafeteros de Puerto Rico" was able to expand its functions until it now occupies a dominating place in the coffee industry.

The extension to Puerto Rico of the Bank for Cooperatives and of the Production Credit Association, aided in forming the Puerto Rico Tobacco Marketing Association.

The P. R. R. A. has assisted in improving and consolidating cooperatives already in existence, and attempts to fill in the gaps with new cooperatives where these were needed.

With the aid of the insular government in 1935, 163 cotton farmers, organized for cooperative marketing under the Puerto Rico Marketing Association for Minor Crops, produced 211 bales of cotton which sold in New York for $30,000. Last year 743 farmers produced and sold 544 bales of cotton for $88,000. The price in 1936 to the farmer was better, and the cost of ginning and marketing was reduced by half.

To furnish further aid, the P. R. R. A. has erected a cotton gin and warehouse at Isabela of adequate capacity, it is believed, to meet the expanding needs of a group of farmers who, by their efforts, are doing much for their own rehabilitation. A corn cooperative also has been organized, based on the experience with the cotton growers. A corn bin and mill have been erected along side the cotton gin at Isabela.

In another field again working with the insular government, a needlework cooperative has been established, designed to aid many thousands of skilled needleworkers, whose employment ceased with the ending of relief, in becoming self-supporting. Organized as Puerto Rico Handcraft, Inc., this organization has been selling its high grade handmade, silk garments in the island for some months, preparatory to seeking an outlet in the United States.

Needlework has developed into one of the island's leading industries offering employment to some 50,000 women, many of them on part time and working in their homes. Although wages have been low the industry has provided the sole means of support for thousands of families. As now organized, the industry almost invariably calls for a degree of hand and machine work in Puerto Rico on materials cut and stamped on the mainland. The work is done usually on a contract basis through agents and subagents whose commissions, together with competition from oriental countries for similar work, keep wages at a minimum. The needlecraft cooperative will do its own designing, cutting, finishing, and marketing.

On June 1, 1937, the planning division of the P. R. R. A., having functioned effectively in the two initial years of planning, was discontinued and was reorganized as the division of cooperatives in order

to concentrate its attention during the coming fiscal year on the organization of the following cooperative enterprises: Agricultural cooperative of Puerto Rico (a purchasing cooperative), Arecibo Fruit Growers' Cooperative Association (a canning cooperative), a cooperative association of all insular vegetable growers, and a cooperative project for the manufacture of yuca starch, vegetable oil and lard, and cattle feed. The first two mentioned have already been organized and construction has been started on the canning building for the Arecibo Fruit Growers' Cooperative Association.

CATTLE TICK ERADICATION

A tropical variety of fever tick, about which little information is available, has long infested not only island cattle but horses, mules, and goats. The annual economic loss resulting from tick infection has been large and this parasite, in cattle, has been one of the chief factors in holding back the proper development of an island dairy and meat industry. Local consumption of milk if averaged on a per capita basis, would amount to about a spoonful daily. In the diet of the masses beef is practically unknown.

In cooperation with the insular department of agriculture and commerce, the P. R. R. A. initiated a program designed to clean the island of the fever tick. The insular legislature cooperated by enacting a stringent quarantine law and work was commenced in April 1936.

Research work is being conducted by an entomologist. This work, so far as is known, is the first official research relative to the variety of tick found in Puerto Rico and it is likely to be some months before its life cycle and habits have been ascertained.

To carry out the program for fever tick eradication the island has been divided into three zones. In the western zone, 290 dipping vats have been completed, approximately 5 kilometers apart. Late in March a systematic dipping campaign was begun and the area was placed under quarantine. By the end of June 502,296 cattle, 12,492 goats, and 76,261 horses and mules had been twice presented at the tanks for dipping at 14-day intervals. Work is supervised and directed by the local representative of the Bureau of Animal Industry of the Department of Agriculture.

RURAL ELECTRIFICATION

The topography, meteorology, and agronomy of Puerto Rico combine to make the island an ideal terrain for the development of hydroelectricity. Puerto Rico's steep hills, rising to the 4,400-foot apex of the twin peaks of Los Picachos, at almost the exact center of the island, release a heavy precipitation. In the Luquillo Range at the

eastern end of the island it reaches 150 inches annually. The resulting cascades in the steep and narrow gorges furnish potential sites for dams and reservoirs, and the generation of power from the interaction of gravity and water. When it has completed its precipitous descent the stream is utilized for irrigating the cane fields which fill the coastal lowlands. With no mineral fuel resources, with every gallon of oil or pound of coal transported from the continent, at high prices, the conservation of the natural water supply, and its conversion into motive power, is in every sense an economically and socially desirable objective. Thereby a locally available, self-replenishing and perpetual source of energy, obtainable ultimately at moderate prices, replaces an exhaustible, expensive, imported fuel. And thus the two essential objectives, power production and irrigation, are attained, effectively distributing and diminishing costs.

Over 20 years ago the insular government entered the field of power development incidental to the establishment of a public irrigation system. In 1915 a division of the insular department of the interior was created, known as utilization of water resources, having under its active control the Puerto Rico Irrigation Service and, later, the Isabela Irrigation Service. Lack of funds prevented more extended development. The P. R. R. A. program for rural electrification has not only provided the insular government with long-needed assistance to carry on the extension of its system and the development of one of the island's most valuable natural resources, but has proved an excellent work-relief project. An area of approximately one-half of the island in which a third of the population resides is included in the territory served, and to be served, by the P. R. R. A. program. Not only is the additional power needed to meet existing demands but to provide for expanding industrial requirements not met by private enterprise.

The rural electrification program of the P. R. R. A. includes development of two new water power projects, long under study by the insular government, and the addition of new units to hydroelectric plants already in operation. Two hundred miles of transmission lines and 200 miles of distribution lines are included. As completed all of the units are being coordinated into a single service which in turn is interconnected with privately owned public-utility lines for island-wide exchange or power when needed. When the P. R. R. A. initiated its power program three large private corporations controlled the three major urban districts of San Juan, Ponce, and Mayaguez. Believing the inclusion of one or more of these concentrated markets desirable for the insular system, the P. R. R. A. requested the assistance of the Federal Power Commision and the Rural Electrification Administration, which through their respective executives sent experts who approved the purchase of the Ponce and Mayaguez utilities.

By means of a P. W. A. loan the Ponce plant was acquired in April 1937 and incorporated in the utilization of water resources. Simultaneously, substantial reduction in rates for the electric customers of Ponce took place. Immediately thereafter, following the prescribed program, negotiations were entered into for the similar acquisition of the Mayaguez Power & Light Co., a move highly desired by the citizenry of that community. This transaction which would result in a unified power system occupying the southwestern half of the island, had not been consummated on June 30.

The rural electrification division began to function in October 1935. Of the projects for which funds were allotted there have been completed and transferred to the government of Puerto Rico, Toro Negro Hydroelectric Plant No. 1, started October 10, 1935, completed March 20, 1937, at a cost of $692,600, Toro Negro Hydroelectric Plant No. 2 started October 10, 1935, completed March 20, 1937, at a cost of $493,100, and Carite Hydroelectric Plant No. 3 started October 7, 1935, completed January 8, 1937, at a cost of $227,000. The combined annual output of these plants is 26,000,000 kilowatt-hours.

The cost of transmission and distributing lines and telephone equipment constructed and installed under these projects, is included in the figures quoted. Ninety-four miles of 37-kilovolt transmission lines and 192 miles of distributing lines to which 2,880 customers have been connected have been constructed to date.

It is estimated that the Dos Bocas Dam started November 1, 1937, and the Garzas Dam started October 7, 1935, to be completed in 1939, will cost approximately $3,834,000 and $3,875,000, respectively. The combined annual output will be in the neighborhood of 64,000,000 kilowatt-hours.

The expenditures on the Dos Bocas project to date have been principally for surveys and engineering, construction materials and equipment, and the usual construction camp facilities. In addition to similar items of expense, 13.2 miles of all-weather access roads have been completed on the Garzas project, and 1,800 lineal feet of tunnel driven.

The engineering, supervision, and construction of these rural electrification projects have provided work for 291 appointive employees to whom $447,593.24 has been paid in salaries, and 4,221,463 man-hours in labor at a cost of $1,007,036 in wages.

REFORESTATION

The valuable virgin forest which covered most of Puerto Rico when Columbus discovered it, has long since disappeared except in small areas, principally in the Luquillo Range of the Caribbean National Forest and the Maricao Insular Forest.

Of the total insular extent of approximately 2,000,000 acres, it is estimated that 500,000 acres are best suited for growing timber. Approximately 300,000 acres of this potential forest area are so owned and located as to be practicable for purchase and administration by the government as public forest. So utilized, these forests, besides being of great commercial value, would be of great benefit in conserving stream flow—essential for the insular hydroelectric and irrigation systems—and in checking soil erosion. The remaining 200,000 acres are chiefly in small parcels and so scattered that the necessary reforestation can best be accomplished by private owners.

Such a reforestation program has been initiated by the forestry division of the Puerto Rico Reconstruction Administration, in cooperation with the United States Forest Service and the insular forest service. It should result in the public reforestation of a total area of slightly more than 200,000 acres by 1940, or about 40 percent of the island's total area suitable for forestation.

Climatic conditions are excellent for tree growth in Puerto Rico due to the year-round growing season and generally abundant rainfall. Many varieties of valuable cabinet woods thrive. Some of the Spanish cedar seedlings planted in 1935 attained a growth of 22 feet within a year, almost 2 feet per month.

The forestry division of the P. R. R. A., organized in September 1935, began actual field work the following month. Since then—up to June 30, 1937—approximately 20,000 acres of denuded forest lands have been purchased and planted. The cost of the land was $300,000, or $15 an acre, including cost of examinations, appraisals, and surveys.

Three forest nurseries with a capacity of 20,000,000 trees per year have been established and have produced the equivalent of 30,000,000 trees at an average cost of $6.33 per thousand. Fifteen thousand acres of land have been cleared and planted at an average cost of $33.33 per acre. Approximately 50 miles of road has been constructed at an average cost of $10,000 per mile. More than 100,000 pounds of seed have been gathered from the more desirable types of trees which the island supplies while 18,000 pounds of seed have been brought from South and Central American countries, including Haiti, Panama, Trinidad, Guadalupe, and the Dominican Republic. In general three types of trees have been planted, those useful for construction, tropical hardwoods suitable for cabinet use, and quick-growing trees for making charcoal. Charcoal is still the fuel in most common domestic use in Puerto Rico and many tons are imported annually.

The program has had a marked influence in stimulating general interest in reforestation in the island. The insular forest service has reported the distribution of more than 2,000,000 seedlings. These were distributed on request to individuals for planting wind-

rows or woodlots rather than for foresting definite areas. Nevertheless, these seedlings were sufficient to plant over 1,500 acres.

As a part of the forestry program a recreation park was developed in Luquillo forest, visited by more than 50,000 people within the year. The recreational area is provided with roads, trails, shelters, overnight cabins, and two swimming pools. Completion of the roads now under construction will bring the recreational area within easy access of the eastern half of the island.

Mona Island—lying in the Mona passage separating Puerto Rico and the Dominican Republic—some 25 square miles in extent, formerly rich in tropical timber, and virtually a deserted island, with two cave-dwelling families and three lighthouse keepers as its sole human inhabitants, is now being reforested. It has a large game supply and offers alluring possibilities as a unique tropical forest, game preserve, and recreational area.

UNIVERSITY BUILDINGS

The University of Puerto Rico, to which the island looks for trained personnel for development of its agricultural resources, protection of health, and broad community leadership, is largely supported by a special property tax, provided more than 10 years ago. Because of financial distress in much of the farming area the university's income had been greatly reduced during a period in which there has been an exceptional increase in enrollment and enlarged demands on the institution. An enrollment of 1,400 in 1929 has increased to more than 5,000. As a result the university has fallen behind in an orderly program of supplying the barest needs in plant and equipment.

Despite many handicaps, the university, founded in 1903, has grown steadily, has established an enviable reputation in the field of tropical medicine, and made useful contributions to insular agriculture and engineering.

The building program, made possible by a P. R. R. A. grant of $1,422,000, provided for new structures for the colleges of liberal arts and sciences, law, and pharmacy situated at Rio Piedras, and the College of Agriculture and Mechanic Arts at Mayaguez. A university building division was organized, work was started on the first building on December 5, 1935, and as of June 30, 1937, 2,267,176 man-hours of work had been provided. This building program is largely completed and the new structures will be occupied during the coming academic year.

The library, normal building, the home economics building, the biology building, and teachers' college, all located at Rio Piedras, have been completed and transferred to the board of trustees for the

use of the university. At Mayaguez, the plant industry building and the agricultural annexes also have been completed.

Reconstruction of the administration building at Rio Piedras has been partially completed. An additional appropriation of $65,000 is needed to complete the interior of this edifice.

Approximately $60,000 have been spent on campus improvements including fence, sidewalks, athletic field, and roads. The contract for installation of water supply and an electric plant for the college at Mayaguez remains unexecuted, strikes in the United States having delayed the delivery of materials.

Work has been started on enlargement and reconstruction of the School of Tropical Medicine, using $240,000 not included in the original allotment made to the university. The enlarged facilities which the building and its adjoining hospital will give the School of Tropical Medicine are of vast importance, not merely for improving the island health program, but for making Puerto Rico, strategically located in the tropics and on the inter-American air routes, the most important center for tropical medicine research in the Western Hemisphere.

CEMENT PLANT

Edwin C. Eckel, chief geologist of the T. V. A., in 1934 and again in 1936, studied the feasibility of the establishment of a cement plant in Puerto Rico, to be government-owned and operated and to supply all government requirements. He concluded that a plant of 1,000 barrels daily capacity was justified and approved the feasibility of the project as a government property. His estimate of production costs indicated a large saving to the government in view of the extensive housing project planned as a fundamental part of the reconstruction program. Cheaper cement will make possible a greater number of houses.

Construction of the cement plant has been commenced near Catano, across the bay from San Juan, with $1,225,000 appropriated for the project. Since the insular government normally is the largest consumer of cement, an arrangement has been made whereby the plant is to be operated by the insular government and an appropriation of $150,000 for this purpose was provided by the last session of the insular legislature. The plant will be ready for operation about January 1, 1938.

It is expected that under government operation the plant will be able to produce cement at a price approximately equal to that at which foreign cements are delivered in Puerto Rico. However, as only cement of American manufacture is used in government projects it is confidently believed that government operation of the cement plant will result in a saving on all public construction.

WORK RELIEF

With the ending of the administration of the Federal Emergency Relief Administration in Puerto Rico in June 1936, and the cessation of all direct relief, not only were thousands of Puerto Ricans deprived of needed financial and material assistance, but numerous projects were left incomplete, adding to unemployment in many municipalities. The work-relief division was conceived to finish a wide variety of non-Federal public projects already undertaken, to provide employment particularly in those sections not otherwise benefited by P. R. R. A. activities. In all 177 projects have been undertaken, many of them finished, with total appropriations of approximately $1,400,000, of which more than $1,000,000 has been paid in wages. More than 5,000,000 man-hours of work have been provided.

Work-relief projects include the completion of more than 82 kilometers of roads, 13.7 kilometers of streets, 10.7 kilometers of curbing and guttering, and 3 kilometers of side walks. Twenty-four public-school buildings have been reconstructed or repaired, ranging in size from one-room rural schools to urban high schools; a new vocational building for the School of the Blind was erected, and a two-story building at the leper colony, partially destroyed by fire, was reconstructed. Two municipal hospitals were built and restored and two city halls reconstructed. A cotton gin and warehouse, at Isabela, was completed for a cotton cooperative organized under the auspices of the P. R. R. A. A cooperative corn mill and warehouse was completed and machinery installed. Several laboratories were reconditioned. Extensive repairs were made to the patio of the Governor's palace, built by the Spanish more than 400 years ago—a building of great historical value and architectural interest.

A concrete landing pier was built at Sein Bay, Culebra, where naval vessels and marines assemble for winter maneuvers. On the island of Vieques, where unemployment has been high, the municipal power plant was modernized in cooperation with the municipality. At Mayaguez more than a mile of concrete storm sewer was constructed, and repairs, reconstruction, and additions made to various municipal water systems and filter plants, including the laying of several miles of piping. At Aguadilla an athletic field and recreation park were built to mark the site where Columbus landed in 1493, the only spot under the American flag where the discoverer set foot. Several other public playgrounds and recreational centers were constructed or improved, in several instances with the communities contributing to the cost.

Forty-five medical dispensaries were completed and provision made for the erection of 19 buildings to house health units to be operated by the insular government in connection with the reconstruction program.

Reconstruction totaling $355,000 on War Department property in San Juan was likewise undertaken. It includes the reconstruction of the ancient Santo Domingo barracks, one of the island's historic edifices dating from the early sixteenth century. It also includes the remodeling of the old "Manicomio", another colonial edifice, to render it available for the motorized transport of the Sixty-Fifth United States Infantry. The War Department in turn has transferred to the insular government an extremely valuable tract of land of some 7 acres on Ponce de Leon Avenue, the capital's principal thoroughfare. This tract, located between the School of Tropical Medicine and the United States Weather Bureau, is to be reserved for public medical purposes, the western half of the lot specifically for future expansion of work in tropical medicine.

HURRICANE STATIC RESEARCH

Research was originated under the Federal Emergency Relief Administration and continued by the Puerto Rico Reconstruction Administration to seek to improve methods of hurricane prediction based on the detection of static electricity in the atmosphere. This work is proceeding in a special laboratory erected on the grounds of the University of Puerto Rico, in conjunction with a similar laboratory at the University of Florida. Since last January two stations operated by the United States Naval Research Laboratory and two operated by the National Research Council of Canada have been collaborating.

HOUSING AND SLUM CLEARANCE

The great deficiencies in the housing of Puerto Rico's teeming population are apparent to even the most casual visitor.

The urban housing program of the P. R. R. A. not only aims to provide more satisfactory shelters for hundreds of thousands of slum dwellers, but also to distribute the population more rationally, and thus take the first steps toward breaking up the congested slum areas of San Juan and other island cities.

Surveys have been made in each slum area, listing all families, their income, rent now paid, expenses, etc., so as to determine the financial status of the groups to be affected and to adjust the program accordingly.

The main slum clearance projects are well advanced. One is San Juan, on reclaimed land transferred by the insular government, will provide 216 family units, and a similar project in Ponce, 142 family units. Now nearing completion and ready for occupancy on or before September 1, the San Juan project is a series of adjoining apartments of reinforced concrete, built to withstand hurricanes,

earthquake, and fire. The structures are three stories high, with interior patio, and four apartments to a floor. Each apartment has two bed rooms, bath, kitchen, and a large combined living and dining room. A recreational building provides playground space for children.

On a tract of 220 acres of land at Hato Rey, a suburb of San Juan, work has commenced for the erection of 416 houses—the beginning of a large model village. The site has 2,619 residential lots, with ample space reserved for parks, schools, and churches. Streets have already been laid out, sewerage and water system provided, and the first group of houses will be completed within a few months.

The Juan Morell Campos development at Ponce, is a modern urbanization on a 41-acre tract on which there will be 142 home units of four rooms each.

Cost of these houses will average $2,000 not including the added cost of development, construction of streets, and utilities. It is planned to rent them to families now living in the slum areas at rents of from $8 to $16 per month, with eventual ownership, under terms not finally determined.

Another project of far-reaching possibilities is the Trujillo Alto development. A farm of 485 acres has been purchased for resettlement purposes but it has been decided (because of its closeness to San Juan) to place on the 1-acre homesteads, heads of families now employed in the city. Concrete houses, costing not more than $900 are now being constructed and a rural village of over 350 houses will result. This will be the first of similar projects as a practical approach toward slum clearance.

THE ALASKA RAILROAD

O. F. Ohlson, *General Manager*

THE passenger-train schedule in effect during the summer of 1936 provided for three round trips each week between Seward and Fairbanks, with supplementary service out of Seward to Anchorage and Palmer, and out of Fairbanks to Nenana and McKinley Park, operating in conjunction with the arrival of passenger steamers at Seward on Tuesdays and Fridays of each week, and with the bimonthly arrival of river steamers at Nenana from Dawson on the upper Yukon River, and from Marshall on the lower Yukon River.

A reduction was made on September 26 to one round trip each week. From November 1, 1936, to February 17, 1937, passenger-train service was not rendered except to furnish connections with the arrival at Seward of the two voyages of the steamship *General W. C. Gorgas*. With the resumption of regular steamer service between Seattle and Seward, regular weekly passenger-train service was reinstated on February 18. During April and for 2 weeks in May, passenger service was operated biweekly to correspond with arrival of passenger steamers at Seward. The 1937 summer schedule, identical to that operated in 1936, was adopted on June 8.

Mixed train service between Anchorage and Matanuska branch line points was operated daily until August 23, 1936, when the Sunday train was discontinued. From the 1st of November to the end of the fiscal year, mixed train service to Matanuska branch line points was operated variously with one to three round trips being made, depending upon the volume of traffic to be moved.

Freight-train service between Seward and Fairbanks varied from weekly to biweekly, depending upon the volume of traffic, and the arrival of steamer connections. During the period November 1, 1936, to February 17, 1937, when regular passenger-train service was suspended, freight trains were operated as mixed trains, operating on a weekly schedule, connecting at Seward with Coast Guard cutters which handled United States mail between Seward and Juneau.

Special passenger trains and extra freight trains were operated when the volume of traffic offered for movement could not be handled by regular service.

During the period July 1, 1936, to close of river navigation on October 13, 1936, a round trip by river steamer was made every 2 weeks between Nenana and Marshall.

River boat service for the 1937 season of river navigation will consist of one round trip every 2 weeks between Nenana and Marshall.

During the fiscal year, a total of nine round trips was made by river boats between Nenana and Marshall, one round trip between Nenana and Ruby, four round trips between Nenana and Tanana, one round trip each between Nenana and Hot Springs and Nenana and Squaw Point; one one-way trip was also made from Tanana to Nenana.

A 200-ton capacity barge was constructed at Nenana and placed in service in May 1937.

Freight handled by river steamers during the fiscal year amounted to approximately 6,220 tons, this being an increase of 2,172 tons over the amount handled the preceding year and consisting mostly of mining machinery and fuel oil, and being indicative of a revival of gold mining along the Yukon River. Passengers handled amounted to 325, a decrease of 19 under the number handled in 1936.

During the year, 10 freight tariffs, five supplements to freight tariffs, 11 passenger tariffs and 1 supplement to passenger tariffs were issued, regulating rates on freight and passenger traffic.

A study of the freight rate structure was undertaken during the latter part of the year, the result of which was a general increase in rates, made applicable to practically all classes and commodities.

Coal rates were increased on May 20, 1937, in amounts varying from 25 to 30 cents per ton on local shipments; and the low export rates were increased 60 cents per ton. Petroleum and petroleum products were increased on the same date 15 cents per hundred pounds, being equivalent to 1 cent per gallon. The through rates applying from Seattle and Tacoma, Wash., to railroad points were revised on May 30, 1937, to provide for a 3-percent increase on the railroad proportion of the through rates and a Seward terminal charge of $2 per ton. Local class and commodity rates were increased 3 percent and tariff issued in June, to become effective during July 1937.

A competitive tariff was issued on April 12, 1937, naming carload rates on beer, groceries, and items of iron and steel from Seattle to Anchorage, at an increase over similar rates in effect last year during the period of navigation on Cook Inlet.

The Alaska Steamship Co., a party to the through tariff, increased their proportion of the through rate 5 cents per hundred pounds on October 15, 1936.

The number of rail-line revenue passengers carried in 1937 totaled 27,675 passengers, a decrease of 15,406 passengers as compared with last year, and due largely to a reduction in the local travel between Anchorage and Matanuska Valley points, also to reduced travel during the period of the maritime strike. Rail-line revenue passenger miles for the same period decreased 919,030 passenger-miles, the total for 1937 being 3,672,826 miles.

Passenger earnings, rail-line, decreased $34,702.19 in 1937, as compared to earnings in 1936, the passenger revenue for 1937 being $196,449.72. The average revenue per passenger increased from $5.36 in 1936 to $7.09 in 1937, caused by a greater number of long-haul passengers being handled.

Rail-line freight hauled totaled 157,717 tons, an increase of 6,707 tons over that handled in 1936. The tonnage of rail-line freight included 94,294 tons of coal, 2,089 more tons of coal than was hauled in 1936. The rail line ton-miles revenue freight was 25,676,316 ton-miles, an increase of 2,075,425 ton-miles over 1936.

Rail-line freight revenue totaled $1,449,010.51, an increase of $110,689.82 over the previous year.

The pay roll for 1937 amounted to $1,632,503.66, an increase of $60,049.41 over the preceding year. This increase is largely attributable to the application of the Annual Leave Act of March 4, 1936, which affects practically all employees of the railroad. The average number of employees in 1937 was 802, an increase of but 11 over the previous year.

The statistical report shows an operating deficit of $172,065.90, which includes a loss of $174,587.92 incurred in the operation of ocean-going vessels between Seattle and Alaska during the period of the maritime strike. Disregarding the figures for the ocean-line operations and considering only the figures covering the operation of the rail and river lines, there was an operating profit of $2,522.02, which figure included an amount of $7,448.99 expended during the year from a sum of $250,000 provided in appropriation act of 1932 for the investigation of mineral and other resources available which will affect railroad tonnage, which amount, if deducted, would show an operating profit of $9,971.01. Last year the profit was computed as $9,677.92.

A line change, costing $128,127.25, was made from mile 53.1 to mile 53.3, to eliminate two deteriorated snowsheds built in 1918 at a cost of $199,934. This work was started July 21, 1936, and was completed November 25, 1936.

To eliminate 1,188 feet of timber snowsheds in the vicinity of mile 76, work was commenced June 1, 1937, on a line change to cost approximately $74,931, work to be completed in October 1937.

To protect embankments from erosion, 13,461 cubic yards of rip-rap was placed at various points.

Between mile 49 and mile 58, 11,175 cubic yards of gravel was placed as ballast, and 10,300 cubic yards of gravel was placed in three bridges.

Work was started on remodeling the old warehouse at Healy to provide a messhouse and some sleeping quarters. A house was taken down at Eska and moved to Carlo to be rebuilt for section quarters. The section house at Sunshine was moved to higher ground. The construction of a new cold storage plant, adjacent to the commissary at Anchorage, was begun. The new warehouse at Holy Cross, started last year, was finished.

Concrete pipes were laid under bridges for six culverts between Curry and Gold Creek. The wooden truss spans of Bridge 146.4, over Knik River, were taken down; the material for a new steel bridge, consisting of 10 spans, 80 feet long, was purchased; and seven new piers of creosoted piles were driven. The south two spans of bridge 148.3, over the Matanuska River, were taken down preparatory to being replaced with a new steel bridge.

The addition to the Curry Hotel, started last year, was completed. It connects the hotel with the annex and comprises 12 rooms with private bathrooms, 4 private bathrooms to serve 4 rooms in the main hotel, and 6 multibedrooms without private bathrooms.

From mile 58 to mile 66, the 65-pound steel rails were replaced with 70-pound rails.

The telegraph and telephone pole line was reconstructed for 33.6 miles by replacing native poles with butt-treated cedar poles.

RAIL LINE OPERATING REVENUES

	1937	Increase over 1936	Decrease under 1936	Percent
Passenger	$196,449.72		$34,702.19	15.0127
Freight	1,449,010.51	$110,689.82		8.2707
Miscellaneous	217,308.55	1,064.61		.4923
Total	1,862,768.78	111,754.43	34,702.19	4.3149

RIVER LINE REVENUES

Passenger	$8,836.75		$1,039.55	10.5257
Freight	64,894.05	$14,054.40		27.6445
Miscellaneous	19,003.23		3,090.41	13.9877
Total	92,734.03	14,054.40	4,129.96	11.9846

RAIL AND RIVER LINE REVENUES

Passenger	$205,286.47		$35,741.74	14.8288
Freight	1,513,904.56	$124,744.22		8.9798
Miscellaneous	236,311.78		2,025.80	.8499
	1,955,502.81	124,744.22	37,767.54	4.6548

RAIL LINE EXPENSES

Maintenance and operation including replacements	$1,882,177.33	$78,178.16		4.3336

	1937	1936	1935	1934	1933	1932	1931
Operating ratio, railroad, percent	100.36	100.70	105.61	117.26	122.73	132.09	154.31

RIVER LINE EXPENSES

	1937	Increase over 1936	Decrease under 1936	Percent
Maintenance and operation	$83,997.09		$938.04	1.1044

	1937	1936	1935	1934	1933	1932	1931
Operating ratio, river line, percent	90.57	102.57	94.60	67.23	99.25	103.09	112.46

RAIL AND RIVER LINE EXPENSES

	1937	Increase over 1936	Decrease under 1936	Percent
Including replacements	$1,966,174.42	$77,240.12		4.0890

RAIL LINE DEFICIT

Maintenance and operation including replacements	$19,408.55	$1,125.92		6.1584

RIVER LINE PROFIT

Maintenance and operation	$8,736.94	$10,862.48		511.0456

RAIL AND RIVER LINE DEFICIT

Maintenance and operation including replacements	$10,671.61		$9,736.56	47.7092

RAIL AND RIVER LINE NET PROFIT

Net profit (expenses of operation of rail and river lines, expenses of miscellaneous operations and uncollectible railway revenues, less revenues of operation and non-operating income), excluding ocean line	$2,522.02	$19,965.91		114.4578

OCEAN LINE REVENUES

Passenger	$36,534.25			
Freight	134,544.62			
Miscellaneous	33,944.88			
	205,023.75	$205,023.75		

OCEAN LINE EXPENSES

Maintenance and operation	$379,611.67	$379,611.67		

OCEAN LINE DEFICIT

Maintenance and operation	$174,587.92	$174,587.92		

RAIL, RIVER, AND OCEAN LINE NET DEFICIT

	1937	Increase over 1936	Decrease under 1936	Percent
Net deficit, including operation of ocean line	$172,065.90	$154,622.01		
Deficit:				
1925			$1,575,139.08	
1926			1,017,860.22	
1927			839,424.58	
1928			799,095.66	
1929			916,599.21	
1930			1,213,155.78	
1931			577,474.24	
1932			401,123.92	
1933			257,083 73	
1934			178.973.33	
1935			73,674.66	
1936			17.443.89	
1937 (including emergency ocean line)			172,065.90	
Profit 1937 (excluding emergency ocean line)			2,522.02	
Total payroll	1,632,503.66	60.049.41		3.8188

Appended hereto is a chart showing comparative statement of revenue and expenses of The Alaska Railroad for the fiscal years 1924–37, inclusive.

OPERATION OF OCEAN-GOING STEAMERS

During October 1936, a maritime strike on the west coast tied up commercial shipping operating to Alaska, and as there was danger of a shortage of food supplies and other necessary commodities in the Territory, The Alaska Railroad under authority of an executive order issued by the President on November 17, 1936, chartered two vessels from salmon cannery operators, which with the Office of Indian Affairs' motorship *Boxer* and motorship *North Star*, opened ocean service from Seattle to southeastern and southwestern Alaska ports.

The two vessels which were chartered were not entirely suitable for economical commercial operation, owing to absence of cold storage cargo space and passenger accommodations on one and limited cold storage cargo space and passenger accommodations on the other, but due to the emergency and the lack of more suitable vessels, it was necessary that they be chartered, and minor repairs were made to adapt them to the railroad service. The steamship *Arctic* was chartered at Alameda, Calif., and the steamship *General W. C. Gorgas* at Seattle, Wash.

The motorship *Boxer* was dispatched from Seattle, Wash., on December 6, 1936, with cargo and passengers for southeastern and southwestern Alaska, with a round trip between Seward and Kodiak. The *Boxer* also made two trips to the westward and Aleutian Island points with cargoes brought from Seattle to Seward on the *Arctic* and *General Gorgas* before returning to Seattle.

The steamship *Arctic* loaded cargo at Seattle, Wash., for Seward and way ports, and departed on December 10, 1936, arriving back in Seattle on January 5, 1937. After unloading southbound cargo, the *Arctic* was returned to the owner at Alameda, Calif.

The steamship *General W. C. Gorgas* made two round trips between Seattle, Seward, and way ports, departing from Seattle on December 15, 1936, and January 15, 1937, returning to Seattle on February 9, 1937, and after unloading was returned to owner.

The Office of Indian Affairs' Motorship *North Star* returned from Alaska just prior to Christmas and was made available for the railroad. It was necessary for the railroad to expend $29,495.53 repairing and equipping this vessel for use before it was sent to southeastern Alaska with passengers and cargo.

The repairs and improvements on the motorship *Boxer* and motorship *North Star* were necessary to place these vessels in seaworthy condition and to meet the requirements of the United States Department of Commerce, and the cost would have to be borne by the Office of Indian Affairs at a later date when required for their service, if the railroad had not done this work.

In order to secure crews for the vessels, it was necessary to employ members of the maritime unions at the salaries paid by the Alaskan salmon packing companies, which were higher than the rate paid by the commercial steamship transportation companies operating to Alaska prior to the interruption.

Another factor which caused an operating loss was the lack of revenues on the return voyages. During the winter months, there is practically no shipping from Alaska to the States, and consequently return cargoes were not available.

The maritime strike was settled February 4, 1937, and the railroad discontinued operation of vessels as soon as they reached their home port thereafter.

The railroad has not had occasion in the past to operate ocean-going vessels in commercial transportation and in submitting the estimates for the operation of the railroad during the fiscal year 1937 no amount was included in anticipation of a loss from this source, which amounted to $174,587.92.

TRANSPORTATION

Weather conditions during the entire fiscal year were unusually severe. Temperatures during the winter were abnormally cold, and in addition, an abnormal amount of snow fell which in the spring created high waters in all of the streams crossed by the railroad, causing much trouble. Heavy rains during the spring and summer caused many mud and rock slides, and in the southern district more than the normal amount of snowslides occurred.

On March 19, a southbound passenger train derailed on the bridge at mile 85.6. No injuries were sustained by either the passengers or the members of the train crew. The point of derailment was on a 10° curve, and the resulting investigation failed to disclose the cause for

the derailment, the track, bridge, and equipment being in good condition.

New equipment placed in service consisted of one 21-passenger trailer car, to be used in conjunction with the Kalamazoo rail motor car purchased last year, and a coach seating 72 persons, purchased second hand and reconditioned in the Anchorage shops. The steel diner which was undergoing conversion into an observation car at the end of last year, was completed and placed in service in July.

A total of 7,038.22 tons of coal, consisting of 2,010.32 tons sacked coal and 5,027.9 tons bulk coal, consigned to points served by connecting carriers, passed outbound over Seward dock. This is an increase of 255.49 tons in sacked coal and an increase of 46.07 tons in bulk coal, or a total increase of 301.56 tons, as compared with that handled last year.

Canneries located at Anchorage shipped to Seattle via Seward canned salmon amounting to 2,344.6 tons, an increase of 1,135.7 tons over last year.

There also passed over Seward dock 1,251.12 tons of ore from points on the railroad, consigned to smelters in the States, an increase of 810.35 tons over last year and due largely to heavy shipments of antimony ore from the lignite district.

There was an approximate decrease of 886 passengers arriving and departing Seward on regular scheduled steamers this year, as compared to last year, caused by suspension of regular steamer service during the maritime strike.

MAINTENANCE

An average of 339 men were employed during the year in the maintenance of roadway and structures. Employment ranged from a high of 673 employed in June 1937, to a low of 165 enployed in December 1936.

Tie renewals totaled 140,727 untreated ties, 48,701 ties more than were placed in the track in 1936.

The retimbering of tunnel 354.7, unfinished at the close of last fiscal year, was completed in December 1936.

An old snow shed at mile 76.5 was torn down and those at mile 76.0 and mile 76.1 were repaired slightly to carry them through the winter of 1936–37, they to be abandoned in favor of a line change, the construction of which was started in June 1937. The south halves of bridges 25.7 and 14.5 were redriven, as were several other trestles. Part of the Seward dock, outside of the buildings, was replanked.

The Lowell Creek flume at Seward was cleaned out and repaired during June 1937, for the War Department.

Miscellaneous maintenance repairs were made to the various bridges, buildings, and other structures. Five regular bridge crews of about

65 men were used throughout the year in this work, supplemented by additional crews of approximately 50 men working for from 1 to 5 months of the year.

Three ditcher crews were used during the summer season, and occasionally at intervals in the winter, clearing slides and performing general work of ditching along the right of way.

Two steam shovels were operated at various times during the year, loading gravel and rock onto cars.

On June 18, 1937, about 1,000 cubic yards of rock broke loose from the top of the face of Curry rock pit and fell into pit, demolishing a steam shovel; no personal injuries were sustained, as the crew was not working at the time.

MECHANICAL

The rolling stock of the railroad was maintained and repaired in the main shops at Anchorage and auxiliary shops at Fairbanks, Healy, Curry, and Seward. All important and heavy maintenance repair work was performed in the Anchorage shops. The average number of employees in the mechanical department during the year was 135 employees.

The reconditioning of one second-hand coach, purchased during the year, was 95 percent complete at the end of June 1937.

MATERIAL

As in previous years, all coal consumed by the railroad was obtained from local mines, 42,160.96 tons being received during the year, comprised of 34,527.81 tons bituminous coal, and 7,633.15 tons lignite coal. Coal issued amounted to 40,164.05 tons, 1,153.61 tons more than last year. The average price per ton paid for coal was $3.2832, an average increase of $0.1166 per ton over last year.

During the year, 141,362 standard untreated cross ties were received. Piling to the amount of 34,220 lineal feet was purchased. Cordwood purchased on the Tanana and Yukon Rivers for the river steamers amounted to 1,525 cords.

The value of material on hand June 30, 1937, amounted to $420,943.17, which is $60,778.09 less than the balance carried at the end of last year.

CURRY HOTEL

Guest days at Curry Hotel totaled 5,662, a decrease of 97 under the number of guest days for 1936. In addition to the commercial guests, quarters were furnished to trainmen for a total of 3,160 days, an increase of 304 days as compared to last year. The net operating profit for the year was $41.72, a decrease of $1,006.83. The cost per meal was reduced from 82 cents per meal to 81 cents per meal. Reduced travel during the period of the maritime strike caused a decrease

in the operating profit for the year 1937, as compared with the preceding year.

COMMISSARY AND MESS HOUSES

The operation of camp mess houses and Anchorage commissary produced a net profit of $16,060.63 for the year, a decrease of $6,774.34 under the profit earned in 1936 and due to increased cost ot supplies and materials used in the operation of the mess houses, no change being made in the rate charged for meals.

HOSPITAL

Employees were hospitalized at the Anchorage base hospital for 2,475 patient days, compared with 1,912 days last year. The total patient days for all patients, including employees, was 6,358¼. The total last year was 6,210¼ days. The deficit from operating the hospital amounted to $11,544.19, as compared with $9,632.73 last year, an increase of $1,911.46.

Employees injured during the course of their employment totaled 279, of which number 118 resulted in no loss of time, 30 in loss of time less than 3 days, 86 in loss of time of 3 days or over and less than 30 days, and 45 in loss of time 30 days or over. Payment on account of beneficiaries under Employees' Compensation Act during the year amounted to $47,001.59; of this amount $35,053.88 was paid directly to beneficiaries in cases arising prior to July 1, 1936, and $10,015.52 to beneficiaries in cases arising during the fiscal year 1937, and miscellaneous expenses to beneficiaries totaled $1,932.19.

TOURIST TRAFFIC

Tourist traffic continued to increase, which was a result of the favorable publicity given to Alaska through the press and to the advertising campaign in national publications carried on by the railroad jointly with connecting steamship lines and western railroads.

As in the past, there continues three advertised routes to tourists that include as a portion of the journey a trip over the railroad. These are known as the Yukon Circle Tour, Golden Belt Tour, and the All Rail Tour. For the accommodation of those passengers making the round trip, Seattle to Seward and return on the same steamer, a side trip to Anchorage and Palmer was available. At Palmer, busses transport the tourists to the various points of interest.

During both the 1936 and 1937 tourist season, the Alaska Steamship Co. operated four vessels on the Seattle-Seward run, furnishing bi-weekly service.

The American-Yukon Navigation Co. operated one river steamer between Nenana and Dawson during the season of navigation, arriving at Nenana every second week.

AGRICULTURAL DEVELOPMENT

The railroad continued throughout the year to disseminate information on request to prospective settlers. These requests were quite heavy due to the press reports circulated about the Government-sponsored colonization project in the Matanuska Valley. However, but few settlers acted upon the information furnished and located in the railroad belt, due greatly to lack of capital necessary to undertake such a venture, and the further fact that all desirable land in the Matanuska Valley was withdrawn from settlement.

INVESTIGATION AND DEVELOPMENT OF MINERAL RESOURCES

The value of the mineral production increased rapidly and was the main source of revenue of the Alaska Railroad. The mineral production from the area served by the railroad had a value of approximately $11,000,000 in the calendar year 1936. This is greater than ever before attained. The direct benefit of the railroad to the mining industry is indicated by the fact that in 1923, at the completion of the railroad, the value of the mineral production from this area was one-seventh of the total production of Alaska, while in 1936 it was one-half.

Gold continued to be the chief metal produced, and all of the districts from Seward to Yukon River points were very active. Development of a low grade gold deposit in the Broad Pass district, which may furnish a shipping concentrate, was favorable and will be continued. Approximately 140,000 tons of coal was produced from the Healy River and Matanuska fields—the largest amount ever produced. Approximately 900 tons of antimony ore was mined and shipped to various smelters in the United States, and it is probable that this industry will continue.

The Mining and Geological Department of the Alaska Railroad, in cooperation with the Alaskan branch of the United States Geological Survey, examined mines, prospects, and mineralized areas, and furnished information to a large number of prospectors and developers of mining properties. Approximately 2,000 feet of underground development was completed at the Alaska Railroad's emergency coal mine at Eska, and late in the fiscal year the erection of a small power plant was started. With the completion of this project, the coal requirements of the Alaska Railroad can be met within a few week's notice.

GENERAL REMARKS AND OUTLOOK FOR TRAFFIC IN THE FUTURE

The program of improvements and rehabilitation was continued during the fiscal year 1937, consisting of ditching, bank widening, grade raising, ballasting and replacing wooden culverts with concrete

and corrugated iron pipe, placing rock to protect roadbed against erosion from rivers, streams and tide action, replacing deteriorated wooden bridges with steel bridges, and making line changes to eliminate deteriorated wooden snowsheds.

The Pacific Coast maritime strike in October 1936, resulted in the abrupt and complete severance of commercial shipping between the Pacific Coast and Alaska.

Because of appeals for ocean service from the Governor of Alaska, the Territorial Chamber of Commerce of Alaska, and individual chambers of commerce of the various cities to the President and the Secretary of the Interior, informing of food shortage and other necessary supplies and medicine, the Alaska Railroad, under authority of an Executive order issued by the President, dated November 17, 1936, chartered one ship from a fish canning company to render the service, but as it became apparent that the disuption would be of some duration, another fish company's ship was chartered, augmented by two smaller motorships, the *North Star* and *Boxer* of the Office of Indian Affairs, for service between Seattle and southeastern and southwestern Alaska ports, also Aleutian Islands. The maritime strike ended February 4, 1937, and the Alaska Railroad discontinued operation after the ships reached their home ports.

Due to the fact that no return cargo from Alaska is available during the winter months and that three of the ships were not equipped to handle passengers, and that approximately $35,000 was expended to recondition the Bureau of Indian Affair's vessels, the rendering of this service resulted in an operating loss of $174,587.92.

FINANCIAL

Gross operating revenues for the rail and river lines were $1,955,-502.81, an increase of $86,976.68, or 4.65 percent, over the comparable figure for 1936. An advance in the cost of material, supplies, and equipment created an increase of $77,240.12, or 4.08 percent in the operating expenses for the same period. The total for this year amounted to $1,966,174.42.

The operating profit derived from the rail and river lines amounted to $2,522.02, an increase of $19,965.91, or 114.45 percent. The operating profit included an expenditure of $7,448.99 made during 1937 for investigation of mineral or other resources, which amount, if deducted, would produce an actual operating profit of $9,971.01. Last year the profit was computed as $9,677.92.

Passenger earnings in 1937 decreased $34,702.19, or 15.01 percent. Freight earnings for the same period increased $110,689.82, or 8.27 percent. The rail-line revenue passengers in 1937 decreased 15,406 in number, as compared with last year, attributable to the cessation

of boat service to Alaska during the period of the maritime strike, also due to the reduction in short-haul passengers. Rail-line freight tonnage handled increased 6,707 tons, and is indicative of the continued improvement in business conditions in Alaska.

The pay roll for 1937 amounted to $1,632,503.66, an increase of $60,049.41 over the previous year. This increase is largely attributable to the application of the leave act, which was extended to practically all employees of the railroad.

During October 1936, 5,484.12 tons of scrap iron, an accumulation since 1929, was sold f. o. b. cars Seward, Alaska, to a Seattle concern, for which the railroad received $50,855.68, also $4,977.58 for loading cost on the ship at Seward. This transaction created earnings for employees of the Alaska Railroad in the amount of $25,590.48, and the railroad a profit of $30,242.78.

The act approved June 29, 1936 (Public, No. 836, 74th Cong.), provided for retirement of employees of the Alaska Railroad, Territory of Alaska, who are citizens of the United States, except clerical employees who are made subject to the Civil Service Retirement Act. During the year, 43 employees were retired because of age and 3 because of disability.

During May 1937, the railroad received an allotment of P. W. A. funds amounting to $730,000 for the construction of a steel bridge over Knik River; making line change from mile 75.8 to mile 76.3; ballasting roadbed; construction of four section-gang houses; completion of gravel fill on pile trestle approach at the south end of Nenana River bridge; and the construction and equipping of a hotel and necessary utilities and outbuildings to accommodate tourists to Mount McKinley National Park.

OFFICE OF SOLICITOR

Nathan R. Margold, *Solicitor*

THE tasks of the immediate staff of the Solicitor included the representation of the Secretary of the Interior in litigation in the courts of the District of Columbia, the drafting of proposed legislation and reports thereon, the representation of the Department before congressional committees, the preparation of land decisions and departmental opinions and findings, the handling of legal features of Indian reorganization, and the review and other disposition of all other legal matters.

During the past year the Solicitor has represented the Secretary of the Interior in various actions contested in the courts of the District of Columbia. The Department has prevailed in all cases that came on for hearing during the past year, one in the court of appeals, and four in the district court. Three of these controversies concerned public lands; the other two involved Indians. The Solicitor and his staff have also assisted the Department of Justice in the prosecution and defense of actions in other courts.

In the United States District Court for the District of Columbia, 19 war minerals relief cases were disposed of by dismissal or by entry of consent decrees. There remain of record in that court 59 war minerals relief cases, the disposition of most of which is delayed by reason of the failure of claimants' attorneys to furnish necessary data. Numerous cases are still pending in the War Minerals Relief Commission, which, when disposed of, will be reviewed by the Solicitor's staff.

A quantitative summary of the work, exclusive of litigation, is set forth in the following table:

	Land decisions	Opinions of Solicitor	Indian matters	Miscellaneous matters [1]	Totals
Pending July 1, 1936	436	233	135	273	1,077
Received during the year	695	679	7,312	10,359	19,045
Total	1,131	912	7,447	10,632	20,122
Disposed of during the year	783	561	7,324	10,510	19,178
Pending June 30, 1937	348	351	123	122	944

[1] "Miscellaneous matters" include such transactions as the following: Contracts for the erection of buildings, road construction, supplies, etc.; reports on legislation; grants, transfers, and cancelations of mineral leases and permits; contracts with irrigation districts; grants and acquisitions of rights-of-way for power lines and for ditches and canals; withdrawals and restoration of lands; determination of power rates.

There is a decrease in the number of land appeals, due to the smaller number of routine matters—stock-raising homestead cases and ceded Indian lands cases—received during the past year. Non-routine cases continue their usual heavy volume.

Requests for formal opinions of the Solicitor continue to increase in number. In the year just past 679 requests for opinions were received, an increase of 189 over the submissions of the preceding year; and 561 formal opinions were rendered, as contrasted with only 334 during the preceding year. Of the opinions rendered in the fiscal year 1937, 333 were title opinions and 164 involved accident claims, as against 99 and 156, respectively, during the preceding year. At the close of the present year there were still 210 title cases pending in the Solicitor's Office, but a procedure has been devised to speed up this work in the future by stationing title examiners in the field to conduct the preliminary examinations.

In addition to these special categories, requests for opinions have covered the usual broad range. The most notable trend of the past year seems to be that the submissions to the Solicitor no longer reflect the addition to the Department of new bureaus or activities, but involve new questions arising in the course of administering existing agencies and functions. The following subjects are typical of the requests that were received and acted upon in the course of the year:

Power of the Secretary to grant and forfeit hot-water privileges at Hot Springs National Park under the act of March 3, 1891.

Nature and extent of the right of the United States, under the Boulder Canyon Project Act and the contract of December 1, 1932, with the Imperial irrigation district, to the net proceeds of any power development on the All-American Canal, in relation to the security for loans proposed to be made to the district by the Public Works Administration and the Rural Electrification Administration.

Authority of the Secretary to reserve waters for the natives of Alaska to protect their fishing rights.

Eleven questions relating to the interpretation of the Mineral Leasing Act of February 25, 1920, with particular reference to problems of lease royalties and issuance of leases in connection with unit plans.

Authority of the Department to limit the issuance of grazing privileges to a portion of the applicants within the preference class relating to section 3 of the Taylor Grazing Act, where the range within a grazing district is insufficient to provide for all applicants within the class.

Right of State game wardens to enter upon restricted Indian reservation lands.

Whether the act of March 3, 1891, bars a suit to reform homestead patents issued more than 6 years previously without reservation of minerals, where existing law required such reservation to be made.

Right of Indians and Indian Pueblos to enjoy equal consideration with other persons in the granting of grazing privileges under the Taylor Grazing Act.

Applicability of the Coatwise Load Line Act and the Convention for Safety of Life at Sea to boats operated by the Department between Seattle and Alaskan ports.

Whether the lands embraced in the various Mission Indian reservations in California remain in tribal ownership until trust patents have issued to allottees, and whether, prior to the issuance of such trust patents, Congress may abandon the distribution in severalty and adopt some other mode of distribution.

Whether the rates under section 5 (a) of the Boulder Canyon Project Act can be fixed as required by competitive conditions without regard to the general project financing requirements, if the rates called for by competitive conditions at the first or later readjustment should be insufficient to finance the project cost under the first sentence of section 5 of the act.

Special mention should be made of certain extended opinions prepared in the Solicitor's Office, two of them involving complicated questions under the amendatory War Minerals Relief Act of May 18, 1936, the other consisting of data prepared for the Secretary in connection with his decision on the complaint of the State of Nebraska against the construction placed by the Bureau of Reclamation on contracts made under the Warren Act between the United States and private irrigation districts on the North Platte River for the sale of surplus water from the Pathfinder Reservoir.

Many of the legislative measures sponsored by the Department at the first session of the Seventy-fifth Congress involved highly controversial issues and resulted in lengthy hearings which required extensive research and preparation as well as numerous appearances before congressional committees by the legislative specialists attached to the Solicitor's staff. Few of the measures sponsored by the Department were acted upon before the close of the fiscal year, due to delay in the general legislative program, but mention should be made of the following bills, supported by the Department, which progressed to final passage:

A bill (S. 1567) to provide for the production, conservation, and sale of helium gas by the Federal Government, and authorizing the acquisition of properties for the production thereof.

A bill (H. R. 7618) changing the policy of administration of the revested Oregon and California Railroad and reconveyed Coos Bay Wagon Road grant lands by authorizing the Department to carry out a program of sustained-yield management, and adjusting the distribution of receipts from said lands.

A bill (H. R. 5394) providing for the acquisition and subsequent addition to the Yosemite National Park of approximately 7,000 acres of virgin sugar pine timber.

Two bills (S. 2092 and H. R. 7642) to authorize the completion, maintenance and operation of the Bonneville Dam project on the Columbia River.

A bill (S. 1722), known as the "reindeer bill", to establish a permanent and self-sustaining economy for the Eskimos and other natives of Alaska by promoting native ownership and activity in the reindeer industry.

A bill (S. 2172) to prevent speculation in lands in the Columbia basin prospectively irrigable under the Grand Coulee project.

As in previous years, the drafting of regulations necessary to implement the many and varied statutes under which the Department operates has constituted an important part of the work of the Solicitor's Office. Among those deserving special mention may be cited the following:

Rules of procedure for the conduct of hearings and appeals from decisions of regional graziers denying such applications for grazing appeals under the Taylor Grazing Act.

Regulations of the Indian Arts and Crafts Board for the promotion of sales of genuine Indian products.

Regulations for credit operations under the Indian Reorganization Act and the Oklahoma Indian Welfare Act.

Regulations relating to oil and gas leases for lands within the boundaries of a unitized area, issued subsequent to the approval of the unit agreement for such area.

The work of the legal sections of the General Land Office and of the Geological Survey has increased progressively with the administration of oil- and gas-conservation measures, particularly with respect to the negotiation, drafting, and final approval of unit plans for particular oil and gas fields. Once again it is noted that, notwithstanding the blanket Executive order withdrawals of November 26, 1934, and February 5, 1935, there is as yet no diminution in the work coming from the Homestead Division of the General Land Office. This is accounted for by the fact that the withdrawals have been modified by subsequent Executive orders and by legislation, which have restored certain privileges under the public-land laws and also created new rights and privileges. Moreover, the modification and amendment, respectively, of the Executive order of November 26, 1934, and section 7 of the Taylor Grazing Act, by the act of June 26, 1936, has created a new class of business with resultant miscellaneous inquiries and applications for classification opening and entry.

The important business of administering the estates of deceased Indians, other than members of the Osage Tribe or of the Five Civilized Tribes, is handled by a staff which is still numerically inadequate despite improved organization and administrative procedure. Indian probate cases are currently a year behind, notwithstanding that the examiners completed, during the past year, 1,712 new cases and 47 rehearings. In this connection it should be pointed out that the

appraised value of the 1,712 estates reported by the examiners of inheritance was $3,208,229.46. The probate fees on these estates, amounting to $43,495, were covered into the Treasury. The probate fee in the average case is about $25, and the average examiner can complete some 200 cases a year. This means that each examiner earns for the Government about $5,000 a year. Yet the highest salary paid an examiner is $3,000, and the proposed salary of the additional examiner, allowed by the Budget for 1938 but stricken out by Congress, was only $1,800.

The work of the probate attorneys in Oklahoma assigned to assist the Indians of the Five Civilized Tribes continues to show improvement, as evidenced by expressed satisfaction on the part of many Indians, and complaints from those whose interests lie in exploitation. Closer liaison with the Department's Division of Investigations has materially aided the work of these attorneys. During the past year, the Oklahoma probate attorneys made 1,615 court appearances in cases involving property worth in the aggregate $5,481,480.50. They participated in 418 deed and lease approvals, resulting in a saving to the Indians of $334,128.97. The supervising probate attorney in Oklahoma approved attorney's fees, in individual amounts of more than $100, totaling in the aggregate $66,307.17.

The most notable feature of the year at the Osage Agency has been a check on guardianship matters there, initiated by the Osage tribal attorney, which disclosed laxities and discrepancies in many guardians' accounts. As a result steps are now being taken whereby the Osage Tribe will employ a competent auditor, who is also an attorney at law, who will currently check all Osage guardianships and thereby prevent overpayments or improper disposition of funds.

The legal staff attached to the Indian Irrigation Service has, at the request of the local United States attorney, prepared the appeal and briefs in the important water-right case of *United States* v. *Powers*, now pending in the Circuit Court of Appeals for the Ninth Circuit. The ultimate decision in that case will affect practically every Indian irrigation project in the country.

During the year emphasis in the work of Indian organization has shifted from the interpretation of the basic act, the issuance of regulations thereunder, and the approval of constitutions and charters, to the final task of assisting the Indian tribes in the actual carrying out of the powers vested in them by virtue of these documents. This has involved a continuous process of advising Indian tribes as to the extent of their powers, assisting them in the preparation of the many legal forms needed in carrying out their programs, and has also involved the problem of adjusting to the new order the procedure and routine of the Indian Office itself. Credit operations under the Alaska

Reorganization Act and the Oklahoma Indian Welfare Act have been initiated during the past fiscal year, necessitating the preparation by the legal staff of loan agreements, mortgages, and other incidental documents. Meanwhile the work of drafting constitutions and charters for tribes as yet unorganized has continued. During the fiscal year 1937 the Department's law officers considered 55 constitutions and 48 charters of incorporation for Indian tribes, of which 24 and 33, respectively, were finally approved.

The work of the Bureau of Reclamation has continued to require extensive legal services in Washington and in the field. Attorneys in the Washington office approved construction and supply contracts involving an aggregate expenditure of $22,553,571.99. In the field the fiscal year 1937 was marked by the final execution of the Truckee River Agreement, involving the regulation of water to be released from Lake Tahoe; and the drafting of the complicated contracts and mortgages necessary in connection with the repayment scheme for the Provo River project. Counsel for the Bureau of Reclamation prepared the briefs and made the arguments in the cases involving the land condemnation cases at Grand Coulee Dam, cases which involved the proper measure of damages to be paid for the property needed for the project. The appellate court sustained the position of the Government, with a resultant saving of many millions of dollars.

DIVISION OF INVESTIGATIONS

B. B. Smith, *Director*

THE principal work of the Division of Investigations during the last fiscal year was the investigation of cases involving public lands, especially the protection of public lands and the timber thereon from fraudulent entry and appropriation. Considerable work was necessary in the investigations of applications to lease under section 15 of the Taylor Grazing Act, it being necessary to obtain facts concerning the qualifications of applicants, live stock operations, water supply, prior use of lands, character of lands, carrying capacity, conflicts, improvements, lands leased from State and railroad, and rental value of lands. Complete sets of maps were prepared covering the status of all lands in the grazing districts. These maps not only portrayed the land office status but data was obtained showing the State and railroad lands leased, and lands owned by each applicant for a lease. Investigations were made involving State land exchanges, leases, isolated tract applications under the Taylor Grazing Act, homestead entries, final proofs, desert land entries, coal and timber trespass, mineral applications including oil and gas leases, State lieu selections, unlawful inclosures and irrigation projects.

On July 1, 1936, there were pending 7,295 field investigation cases. During the year 10,492 new cases were received; 7,890 cases were investigated, reported and closed leaving 9,897 pending investigations. Of the 9,897 pending investigations 2,773 are grazing leases under section 15 of the Taylor Grazing Act.

The following criminal and penal code violation cases were investigated during the fiscal year ended June 30, 1937:

Embezzlement	3
Fraudulent final prooof	1
Incendiary fires	2
Fraud sale oil and homestead lands	1
Fraud acquisition public lands	1

Perjury	1
Theft of Government property	1
Unlawful inclosure	1
False representation, employment	1
Grazing trespass	6
Timber trespass	20

Thirty-one persons were indicted during the year, twenty convicted, and two fined. Eleven cases are pending action.

Classification of railroad lands was made in several cases to determine whether or not the lands selected were actual mineral bearing in fact, and as a result thereof 88,000 acres with an appraised value of $100,000 was classified as mineral and eventually will be saved by the Government.

Attention has been given to, and investigations and reports made in connection with, coal leases concerning which the lessees have become delinquent in the payment of royalties. A number of lessees have submitted plans of reorganization to various United States district courts involving the National Bankruptcy Act. Where plans were filed, investigations were made to determine if the interests of the United States were properly protected. Assistance was rendered the Department of Justice in connection with these hearings before the United States district court in reference to the proposed plans for reorganization, and also with reference to the cancellation and collection of royalties. In one division these activities resulted in the cancellation of two coal leases and the collection in royalties of $8,738.

One of the most important cases now pending is that involving the liability of a coal company covering coal mined on land recovered after an erroneous sale by the State. The Government's claim in this case amounts to approximately $300,000.

Due to the results of field investigations $12,375.17 was turned into the United States Treasury, and 272,285.46 acres, representing fraudulent entries, etc., were cancelled and restored to the public domain. The acreage restored to the public domain, estimated at the minimum value of $1.25 per acre, represents a saving to the Government of $340,355.57.

Audits were made of Indian agencies and guardianships as well as concessionaires operating under contract in the various national parks and national monuments.

Many hearings were conducted in behalf of the United States by the special agents in charge of hearings, based upon investigations and reports submitted by the investigators, resulting in the restoration to the public domain of thousands of acres of lands in cases where fraudulent final proofs were attempted and the law not complied with.

PERSONNEL

The number of special agents as of June 30, 1937, employed in the Division was 79, of which number 64 were regular special agents and 11 were paid from emergency funds, and 4 temporary agents. In addition to the special agents there are 4 special agents in charge directing the special agents, under the supervision of the Director, at offices in Albuquerque, N. Mex., Billings, Mont., Salt Lake City, Utah, and San Francisco, Calif. A new field office was established with headquarters in Washington, D. C. The total force employed, including the Director, Assistant Director, reviewer, and clerks was 119.

WAR MINERALS RELIEF COMMISSION

Roscoe Fertich, *Commissioner*

I. ACT OF FEBRUARY 13, 1929 [45 STAT. 1166]

THE Secretary of the Interior made two awards totaling $3,020.03, and denied four claims under decree, during the fiscal year ending June 30, 1937.

An appropriation for payment of awards was made in the Treasury Deficiency Appropriation (Public, No. 121, 75th Cong., approved May 28, 1937) for $22,915.36. This amount included six awards aggregating $21,395.33, certified during the previous fiscal year, and which have been paid; and one award for $1,520.03, which was certified during the fiscal year under report, is unpaid, pending attachment proceeding against the Secretary of the Treasury.

The other award, for $1,500, certified during this fiscal year, is pending a future Treasury deficiency appropriation.

IN THE DISTRICT COURT OF THE UNITED STATES IN THE DISTRICT OF COLUMBIA

Seven cases were dismissed by the court for the reason that the corporations or partnerships had been dissolved before the petitions for review were filed under the act of February 13, 1929, and were not legally capable of maintaining a suit.

Seven decrees were entered during the fiscal year by that court, authorizing the Secretary of the Interior to review his previous decisions on matters of law.

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Record of Cases Filed Under the Act as Amended Feb. 13, 1929

Total cases filed			348
Total cases dismissed by the District Court of the United States in the District of Columbia		76	
Decisions by the Secretary of the Interior:	*Awards*	*Denials*	
To June 30, 1936	165	20	
July 1, 1936, to June 30, 1937	2	4	
	167	24	191
Cases pending in the District Court of the United States in the District of Columbia		58	
Decrees by District Court for the United States in the District of Columbia, pending in W. M. R. C. June 30, 1937		23	
		348	348

UNDER THE ACTS AS AMENDED IN 1936

Under the acts of 1936, 336 petitions for review have been filed.

Sixteen petitions for review under either or both of the 1936 acts have been rejected, as follows: denied under decree, no admissible loss found, 9; dismissed by court, no error in law by the Secretary of the Interior, 4; not identifiable with any claim filed under the act of March 2, 1919, 1; pending in court, filed under the act of 1929, 2.

II. ACT OF MAY 18, 1936 (49 STAT. 1355)

The Secretary of the Interior, when authorized by the District Court of the United States for the District of Columbia, will reopen previous decisions to consider the item of interest paid or accrued to the date of approval of this act, and makes awards for losses proven to his satisfaction to be allowable within the meaning of the relief act of March 2, 1919.

Eighty-nine petitions for review of loss by interest have been filed. Sixty-nine cases have been accepted for review of claim; the other 20 petitions were rejected as ineligible for the reason that a review of the item of interest is not directed in the decree from the court.

Three awards, totaling $740,412.11, were made by the Secretary of the Interior during the fiscal year.

This act set a limitation of $1,250,000 for the purpose of paying claims under this amendment. An appropriation of $500,000 (49 Stat. 1619, June 22, 1936) has been disbursed; the first two awards exceeded the appropriation by $132,428.02.

Public, No. 121, Seventy-fifth Congress, approved May 28, 1937, appropriated an additional $650,000 for payment of interest claims in accordance with the act approved May 18, 1936 (49 Stat. 1355).

A third award, $107,984.09, was made; of this amount $65,136.02 has been paid by the Secretary of the Treasury.

The above balances of awards, for $132,428.02 and $42,848.07, totaling $175,276.09, have been reserved by the Secretary of the Treasury.

There is a balance of $409,587.89 available to pay further awards under the interest act.

III. ACT OF JUNE 30, 1936 (49 STAT. 2040)

This act authorized claimants who failed to file suit under the 1929 amendment of the relief act, or whose suit so filed was abated by the court, to petition the Secretary of the Interior to review their claims as a matter of law in the light of decisions of the court in similar cases, and to make awards; and provided for the rights of deceased claimants to descend to their legal successors; and provided for the rights of dissolved corporations to descend to any officer, director, stockholder, or legal representative who shall be entitled to the benefits of this act; provided, that such claims be filed within 6 months of approval of the act.

Under this act, 231 petitions for review were filed within the time limit. The status of these petitions is as follows:

Accepted for review	133
Pending authority to file claim	14
Suits abated by court; grounds for reopening not established	22
In court under the act of Feb. 13, 1929, pending decision as to right of petition under the act of June 30, 1936	55
Withdrawn by attorney	7
	231

Public, No. 121, Seventy-fifth Congress, approved May 28, 1937, appropriated $100,000 for payment of claims in accordance with this act.

Four awards, totaling $43,883.84, were made by the Secretary of the Interior during the fiscal year. These awards have been paid by the Secretary of the Treasury.

$56,116.16 is available for further awards.

NOTE.—The number of petitions for review filed under the acts of May 18, and June 30, 1936, greatly exceeds the number expected would be filed. As provided by the act of June 30, 1936, the time limit for filing has expired; no additional petitions can be filed. Under the act of May 18, 1936, there is no time limit; a few more petitions may be expected.

DIVISION OF MOTION PICTURES

Fanning Hearon, *Director*

THE Division of Motion Pictures continued to produce and distribute motion and still pictures of the Department's activities.

Motion-picture production featured the most ambitious film the Department has attempted, Price of Progress, dealing with the destruction and conservation of natural resources; three Indian pictures; a presentation of the rehabilitation of the Virgin Islands; one on Boulder Dam and one on the Bureau of Reclamation in general; a story of the Ohio-Mississippi flood, and the beginning of a film record of Grand Coulee Dam. There were several others on national and State parks, the Civilian Conservation Corps and related subjects, making a total of 30 reels a year at a cost of $1,700 each.

These subjects and others produced by the Department in previous years are distributed at the rate of 500 shipments per week to theaters, colleges, schools, C. C. C. camps, and interested institutions, organizations, and groups. Audience estimates indicate 4 million persons saw the Department's films during the year.

Still picture contributions of the year were coverage of the Indian reservations, pictorial records of several proposed national parks and monuments, a national park winter sports series, continuance of work on Bureau of Reclamation projects, and probably the first complete photographic presentation of historical Fort Jefferson in the Gulf of Mexico.

An innovation was the inauguration of weekly motion-picture shows of Department films in the auditorium.

In the course of the year the Division's first Director, Mr. Ellsworth C. Dent, resigned and was replaced by Mr. Fanning Hearon, formerly of the National Park Service.

OFFICE OF EXHIBITS

G. C. Dickens, *Supervisor*

GOVERNMENT participation through exhibits in State, national, and international expositions, and at numerous scientific and otherwise educational conventions, has become an established policy. One important function of all Government departments and independent establishments should be to acquaint the general public insofar as possible with the many and varied activities and services being carried on by them.

Experience has proved that one of the best methods is provided by participation in expositions and the other gatherings above described. In carrying on this work the use of motion pictures, animated dioramas and models, stereopticon slides and colored transparencies, and murals has proved to be highly successful and adaptable. Further, in making presentations relating to our island and territorial possessions and the American Indian, experience has developed that the display and use of native handicraft is both desirable and important.

With the appointment of a Supervisor of Exhibits by the Secretary of the Interior under date of February 1, 1936, an Office of Exhibits under the Secretary's Office was established. The Supervisor of Exhibits has supervision over the Department's exhibits at the Greater Texas and Pan American Exposition, the Paris Exposition, and the Great Lakes Exposition. Further, the Office of Exhibits, through its diorama and model studio, is constantly at work preparing additional and new exhibit material, and is already making preliminary and tentative plans relating to the forthcoming Golden Gate International Exposition, the New York World's Fair, and the proposed expositions in Los Angeles, Oklahoma City, and Tampa.

Further, for distribution at the Department's exhibits the Office of Exhibits compiled, with the assistance of the various bureaus, the Public Works Administration, and the National Resources Committee, a booklet entitled, "Back of the Buffalo Seal", which contains printed matter and pictures descriptive of the work of the several organizations which are under the jurisdiction of the Secretary of the Interior.

BOARD ON GEOGRAPHICAL NAMES

George C. Martin, *Executive Secretary*

THE United States Board on Geographical Names is the organization through which the Government provides for uniformity in the use of geographic names on maps and in publications issued by the Federal Government.

The Board is essentially a cooperative organization. In it the Department of the Interior furnishes administrative and investigative facilities through which representatives of various governmental departments that make and use maps, and of geographic societies, determine policy in the use of geographic names and render decisions on names submitted for decision.

The Board consists of an advisory committee, on which various Government Departments and geographic societies are represented, which acts chiefly through its executive committee; and of an administrative and investigative unit, the Division of Geographic Names, in the office of the Secretary of the Interior. The personnel of the advisory and executive committees, on June 30, 1937, was as follows:

ADVISORY COMMITTEE

Mr. Clarence Batschelet, Geographer, Bureau of the Census, Department of Commerce.

Mr. Albert H. Bumstead, Chief Cartographer, National Geographic Society.

Mr. E. E. Carter, Assistant Forester, United States Forest Service, Department of Agriculture.

Dr. William H. Haas, Professor of Geology and Geography, Northwestern University, representing the Geographic Society of Chicago.

Dr. J. N. B. Hewitt, Ethnologist, Bureau of American Ethnology, Smithsonian Institution.

Lt. Col. Lawrence Martin, Chief, Division of Maps, and Incumbent, Chair of Geography, Library of Congress.

Dr. W. C. Mendenhall, Director, United States Geological Survey, Department of the Interior.

Mr. Raye R. Platt, Secretary, American Geographical Society of New York.
Mrs. Sophia A. Saucerman, Assistant Geographer, Department of State.
Commander Francis P. Traynor, Officer in Charge, Division of Maritime Security, Hydrographic Office, Navy Department.
Lt. Col. Lewis H. Watkins, G. S., Chief, Geographic Branch, Military Intelligence Division, War Department.
Mr. Charles C. Wenrich, Assistant Deputy First Assistant Postmaster General and Chief Clerk, Post Office Department.
Dr. Frank E. Williams, Professor of Geography, Wharton School of Finance and Commerce, University of Pennsylvania, representing the Geographical Society of Philadelphia.

EXECUTIVE COMMITTEE

Dr. W. C. Mendenhall, *Chairman* Lt. Col. Lewis H. Watkins
Mr. E. E. Carter

The advisory committee held 3 meetings during the year and the executive committee held 13 meetings at which 410 names were approved. The locations of the features thus named, and the organizations which submitted the names for decision, were as follows:

Geographic Distribution of Names

Alaska	92	Montana	8	North Dakota	2
Wyoming	67	Arizona	6	Massachusetts	1
New York	47	Maine	6	New Mexico	1
Alabama	34	Connecticut	5	South Carolina	1
Utah	29	Georgia	4	West Virginia	1
Washington	26	Michigan	3	Puerto Rico	1
Oklahoma	24	Mississippi	3	Virgin Islands	1
California	23	Nebraska	3		
Virginia	10	Louisiana	2	Total	410
Minnesota	8	New Jersey	2		

Organizations Requesting Decisions

National Park Service	145	United States Forest Service	16
United States Hydrographic Office	66	War Department	4
United States Geological Survey	53	Soil Conservation Service	3
United States Coast and Geodetic Survey	50	State organizations	3
Bureau of Chemistry and Soils	40	Bureau of Biological Survey	2
Societies and individuals	25	Miscellaneous	3
		Total	410

ADVISER ON NEGRO AFFAIRS

Robert C. Weaver, *Adviser*

SECURING for Negro citizens participation in the programs of the Department of the Interior, Public Works Administration, and associate agencies is the function of the office of Adviser on Negro Affairs. To this end a definite line of action has been devised which follows fairly closely the following outline:

1. *Interviews.*—*a.* With persons seeking employment in the Department of the Interior and the Public Works Administration.

b. With persons seeking to improve their status in the Department.

c. With departmental executives seeking information and advice on Negro personnel problems.

2. *Consultation.*—*a.* With Housing Division officials on matters pertaining to Negro participation on housing projects.

b. With administrative officials relative to complaints, requests, and suggestions from Negro employees in the Department.

3. Field investigation trips concerning matters of Negro skilled and unskilled labor on Public Works Administration housing and nonhousing projects.

4. Field trips and investigations into matters concerning Negro participation in recreational facilities provided by the National Park Service.

5. Trips to various centers of Negro population to make speeches and to consult with groups to acquaint them with the work the Department is doing.

6. Miscellaneous activities such as administering white-collar survey, consulting with the President's Committee on Vocational Education, and preparing for publication news releases and articles designed further to enlighten the American reading public on the part Negroes are now playing in the affairs of the Government, with special emphasis laid on the Department of the Interior and the Public Works Administration.

The highlights of the activities of the Adviser on Negro Affairs during the last year fall chiefly into the classifications of consultations and field investigations. Since June of 1936 either the Adviser on Negro Affairs or the Associate Adviser on Negro Affairs has visited at least 40 of the 50 housing projects now in process of construction. These visits had to do with matters of labor, which include meeting with union officials, labor groups of both races, leaders in communi-

ties, and sometimes with city and district government officials. In all cases there was but one motive in view, and that was to secure the participation of Negroes in the program of construction as well as the program of tenancy with as little friction as was possible. Some figures taken from the summaries of 10 field reports submitted by Dewey R. Jones, Associate Adviser, show to what degree these efforts have been successful. Of the total money spent for labor on Public Works Administration housing projects the following percentage was paid to Negro skilled and unskilled labor: On Riverside Heights in Montgomery, Ala., 27.4 percent to skilled and semiskilled, and 90.3 percent to unskilled; William Patterson Courts, also in Montgomery, Ala., 26.5 percent to skilled and semiskilled, and 86.2 percent to unskilled; Durkeeville in Jacksonville, Fla., 25.4 percent to skilled and semiskilled, and 90.1 percent to unskilled; Liberty Square in Miami, Fla., 4.8 percent to skilled, 10.1 percent to semiskilled, and 65.8 percent to unskilled; Techwood in Atlanta, Ga., 20 percent to skilled, 23.8 percent to semiskilled, and 72.6 percent to unskilled; University Homes, also in Atlanta, Ga., 20 percent to skilled, 13.1 percent to semiskilled, and 82.7 percent to unskilled; Jane Addams Houses in Chicago, Ill., 3.7 percent to skilled, and 14.9 percent to semiskilled and unskilled; Blue Grass Park in Lexington, Ky., 11.8 percent of skilled, 50.9 percent of semiskilled, and 49 percent of unskilled; Laurel Homes in Cincinnati, Ohio, 3.2 percent of skilled, 15.2 percent of semiskilled, and 68.5 percent of unskilled; University Terrace in Columbia, S. C., 35.05 percent of skilled and semiskilled, and 94.65 percent of unskilled.

The office of Adviser on Negro Affairs has been in constant touch with the situation at Grand Coulee Dam, and has advised with officials there as well as with Negro labor groups in order to secure for Negroes the right to work on this project. This was felt necessary in view of the unfavorable criticism to which the Department of the Interior was subjected as result of its failure to take similar steps in the construction of Boulder Dam. This office was directly responsible for the first Negro being employed at Coulee Dam, and has since kept in touch with that situation to insure the continued employment of qualified Negroes.

During the last year the Adviser on Negro Affairs has participated in the dedication of housing and other Public Works Administration projects. He has taken an active part in assisting the Director of Personnel for the Public Works Administration in his effort to secure for managerial and custodial positions in housing projects the best possible material available from those groups the projects were designed to serve.

In his capacity as administrator of a $470,000 survey of the training and employment of Negro white-collar and skilled workers the Adviser

on Negro Affairs has busied himself within recent months in supervising the editing of a printed report to be submitted to the Secretary of the Interior.

As consultant to the President's Committee on Vocational Education the Adviser on Negro Affairs supervised a study conducted by Prof. D. A. Wilkerson of Howard University, which shows in graphic form the degree to which Negroes have benefited or have not benefited from Federal funds spent on education. The Adviser on Negro Affairs is carrying a similar study still further, to be submitted to the President's enlarged and permanent committee on education for its final report.

The activities of the Adviser on Negro Affairs have been many and varied, but at no point have they been lacking in interest or, it is hoped, in usefulness both to the Department and to the people for whom the office was created.

ST. ELIZABETHS HOSPITAL

Roscoe W. Hall, M. D., *Acting Superintendent*

IN reviewing the events of the past year, the present conditions and the future needs of the hospital, possibly above all else we are confronted with the passing of Dr. William Alanson White who died March 7, 1937, after a third of a century of faithful and distinguished service as superintendent of the hospital. Appointed in 1903 during the administration of President Theodore Roosevelt, from the time of taking up his duties as a young physician of 33 to within a week of his death, after he had risen to national and even international fame, he worked with untiring zeal, patience, and devotion in the upbuilding of the hospital as an institution representative of the best that medical science could offer in the care and treatment of patients with mental and nervous diseases. Friend and protector of patient and employee, inspiring teacher and coworker, he brought to the solution of the daily problems of administration great knowledge, broad tolerance and undaunted courage. The welfare of the patients as the prime objective, insistence on nonrestraint, encouragement of the members of his staff in advancing in the knowledge of their profession while at the same time giving them freedom in the choice of the means to this end, were cardinal principles in the formation of his policies. He encouraged the patients to look to him for help in easing their suffering and relieving their fears. His service and influence reached far beyond the confines of the hospital. He constantly strove to uphold and further in the minds of the public the idea that the hospital for mental diseases is an institution for the healing of the sick and the solution of the problems of the maladjusted rather than an institution of the asylum type. In the words of a fellow physician: "As teacher, author, publisher, and practicing psychiatrist he wrought much influence on institutional policies, psychopathological concepts, and developing attitudes toward mental and nervous disease. Wherever the voice and pen of this great teacher have brought light, there one

perceives the best that modern psychiatry has to offer a troubled world."[1] The Secretary of the Interior appointed Dr. Roscoe W. Hall as acting superintendent of the hospital on March 8, 1937.

Dr. Herbert C. Woolley, first assistant physician, resigned February 1, 1937, and a vacancy exists in this position.

The vacancy that existed in the position of clinical director for the women's service was filled by the appointment of Dr. Evelyn B. Reichenbach, formerly of the Rochester State Hospital, Rochester, N. Y.

INSULIN SHOCK TREATMENT

For many months consideration has been given to the insulin shock treatment for dementia precox, but because of the dangerous and uncertain factors attendant upon this treatment the attitude of the hospital toward its adoption has been a conservative one. However, in view of continued favorable reports it has been decided to use this form of therapy in certain selected cases. To this end several physicians and nurses of the hospital staff were sent during the month of June to observe the use and effects of this treatment at Bellevue Hospital, New York City, and at Harlem Valley State Hospital, Wingdale, N. Y.

In the laboratory a method for determining phosphatase activity in blood has been worked out; also a new method for colorimetric evaluation of bromides in serum.

The collection of electrocardiograms was critically reviewed and a report on serial studies of cardiac arrhythmias prepared.

In addition to the lectures and clinics in psychiatry, psychology, and other subjects given by Dr. William A. White, Dr. Roscoe W. Hall, and the members of the hospital staff to several local universities and medical schools, the following lectures were delivered before the medical staff by visiting scientists:

October 31, 1936: *Les Obsessions*, Professeur Pierre Janet, Membre de l'Institut et Professeur College de France, Paris.

November 14, 1936: Psychopathology, Dr. Edward J. Kempf, Wading River, N. Y.

February 22, 1937: Hypoglycemic Therapy, Dr. Manfred Sakel, Clinic for Psychiatry and Neurology, University of Vienna, Vienna, Austria.

March 13, 1937: Effect on the Spinal Fluid of Various Anti-Syphilitic Drugs. Narcosis Therapy. Dr. J. H. Quastel, Bio-chemical Laboratory, Cardiff City Mental Hospital, Whitechurch, Glamorgan, Wales.

During the year approximately 260 general conferences of the medical staff were held before which 986 patients were presented for consideration of discharge, visits, parole, etc. There were 110 admission conferences for dianostic purposes and recommendation of treatment, 899 cases having been presented. For the consideration of unusual

[1] The Psychiatric Quarterly, vol. 11, no. 2, April 1937.

cases or medical problems 17 clinical-pathological conferences were held.

The hospital continues in a crowded condition. It must have more beds not only to take care of the increased number of admissions, but to provide adequate facilities to replace the 530 beds of the semipermanent buildings in the Richardson group. During the fiscal year 1937 the total admissions were 1,099, the largest number admitted to the hospital since 1921, the post-war year, when 1,199 were admitted. As a matter of fact, the number admitted in 1937 was the largest of any year, except the 3 years, 1919, 1920, and 1921, comprising the period after the World War. The net increase during the year was 277, an increase in the daily average patients of 165. Thus the increased number of beds that it was necessary to provide between July 1, 1936, and June 30, 1937, was 277.

In 1926 when a survey was made in the hospital through a resolution of Congress, the Comptroller General estimated that to comfortably fill the various buildings beds could be provided for 3,600 patients. Since that time additional beds have been provided as follows:

	Beds
Medical and surgical building	200
Tuberculosis building no. 1	80
Continued treatment buildings nos. 1 and 2	320
Male receiving building	400
Female receiving building	300
Total	4,900
Congress has authorized in the—	
Interior Department Appropriation Act for 1937 1 continued treatment building	180
Interior Department Appropriation Act for 1938 1 continued treatment building	180
Total	5,260

At the present time the hospital has more than 5,700 patients, and the semipermanent group containing 530 patients should be replaced, making a total shortage of 970 beds. Additional buildings should be provided at an early date to relieve this overcrowded condition and to provide beds for the patients in the semipermanent group. The buildings in this group constitute a fire menace, the temperature in them in the hot summer weather is almost unbearable, and the cost of maintaining them in repair is increasing very rapidly.

MOVEMENT OF POPULATION

On June 30, 1937, 5,667 patients remained in the hospital as compared with 5,390 on June 30, 1936, an increase of 277.

The total number of patients under treatment during the year was 6,489, as compared with 6,240 for the preceding year, an increase of 249.

The total number of admissions during the year was 1,099, as compared with 925 the preceding year, an increase of 174.

The total number of discharges for the year was 490, as compared with 552 in the preceding year, a decrease of 62.

The total number of deaths for the year was 332, as compared with 298 for the preceding year, an increase of 34.

The total number of discharges and deaths, combined, was 822, compared with 850 for the preceding year, a decrease of 28.

There were 50 burials in the hospital cemetery, as compared with 69 the preceding year, a decrease of 19. With the cooperation of the War Department the bodies of 38 service men, honorably discharged, were buried in the Arlington National Cemetery. The other 244 bodies were buried by private undertakers, in cemeteries in Washington and elsewhere throughout the United States.

The daily average patient population was 5,537.6 as compared with 5,373 the preceding year, an increase of 164.6.

Movement of Patient Population, Fiscal year 1937

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1936	2,751	838	3,589	1,133	668	1,801	5,390
Admitted during year ended June 30, 1937	523	196	719	247	133	380	1,099
Total number under care and treatment during year ended June 30, 1937	3,274	1,034	4,308	1,380	801	2,181	6,489
Discharged as—							
Not insane	3	2	5	1	0	1	6
Recovered	82	23	105	39	21	60	165
Improved	90	25	115	30	9	39	154
Unimproved	105	27	132	25	8	33	165
Total discharged	280	77	357	95	38	133	490
Died	140	67	207	78	47	125	332
Total of patients discharged and died	420	144	564	173	85	258	822
Number of patients remaining on rolls June 30, 1937	2,854	890	3,744	1,207	716	1,923	5,667

Supplies.—The supplies produced on the hospital reservation, including farm and garden products such as tomatoes, beans, parsley, spinach, squash, corn, turnips, etc., included the following: 285,544 gallons of milk, 124,362 pounds of fresh pork, 11,966 dozen eggs, 5,809 pounds of chicken, 25,291 bunches of beets, 15,200 bunches of carrots, 42,655 ears of green corn, 7,475 bunches of endives, 7,600 pounds of grapes, 1,134 bushels of kale, 27,921 heads of lettuce, 18,628 bunches of green onions and 29 bushels of dry onions, 985 bushels of mustard and mustard greens, 262 bushels of parsnips, 603 bushels of pears, 75 bushels of green peas, 135 bushels of green peppers, 1,064 bushels of sweetpotatoes, 2,481 pumpkins, 9,370 bunches of radishes, 343 bushels

of rape, 280 bushels of spinach, 1,007 squash, 2,625 bushels of Swiss chard, 2,843 bushels of tomatoes, 793 bushels of turnips and 335 bushels of turnip greens, 604 bunches of asparagus, 266 bushels of apples, 207 bushels of lima beans, 259 bushels of string beans, 807 bushels of cabbage, 291 bushels of cabbage sprouts, 645 bushels of collards, 132 bushels of cucumbers, and various other items of the same class.

In addition to the items mentioned, there were made at the hospital 24,059 gallons of ice cream. The farm produced forage as follows: 37 tons of alfalfa hay, 32 tons of soybean hay, 20 tons of soybean and sudan grass hay, 44 tons of timothy hay, 80 tons of wheat hay, 996 tons of corn ensilage, and 2,600 bushels of ear corn.

The shoe shop produced 12,211 pairs of various kinds of shoes and slippers, and in addition 2,482 pairs of shoes and slippers were repaired; 73 dozen men's belts, 2,123 brushes, and 96 floor brooms were made in the same department. The broom shop produced 5,200 common brooms and 65 whisk brooms. There were made in the mattress shop 2,331 mattresses, 2,133 pillows, and one chair cushion. In the bakery there were turned out 956,664 loaves of bread, 63,464 pounds of pastry, and 3,313,392 rolls. The laundry washed, dried, mangled, and ironed 12,914,568 pieces. The power plant manufactured 531,700,000 pounds of steam; the electrical department generated 3,633,340 kilowatts of electricity; there were pumped 526,556,000 gallons of water, and the refrigeration plant produced 7,589 tons of ice and refrigeration. In fact, all the steam, electricity, ice, and refrigeration used on the reservation was manufactured by the hospital.

In addition, large quantities of clothing for men and women were made in the sewing rooms and tailor shops, and articles of clothes, bed linen, and tableware were produced by the occupational therapy department throughout the institution. The patients on the wards, under the direction of the occupational therapists, made all the dresses furnished the patients, hemmed all the sheets and blankets, assisted in making stand covers, table covers, tablecloths, towels, wove stand covers, rugs, towels and similar items, and manufactured many hundreds of small toys and recreation items, including checkerboards, chessboards, and cribbage boards.

Dairy and cow barn.—The Holstein-Friesian herd was again tested for tuberculosis in April and found to be free from this disease. The herd, consisting of 247 cows, 8 bulls, and 160 heifers, is one of the largest accredited herds in the country.

The herd has been free from Bang's (abortion disease) during this period. Herd blood tests were made in July, October, and March. All animals were negative to the agglutination test.

Personnel.—The total number of employees on the hospital rolls June 30, 1937 was 1,697. There were 452 appointments during the

year, and 525 separations; 50 of the appointments and 173 of the separations were of the emergency class on temporary rolls.

During the year 2 of the old employees were retired from the service on account of age, and 20 on account of disability.

Administrative promotions (salary rating increases) were granted to 540 employees. Promotions in grade and position were granted to 75 employees.

Construction.—Federal project no. 17, of the P. W. A., was completed. This consisted of installing new porches on Oaks, Dawes, Garfield, Allison-C and Allison-D buildings.

Federal project no. 16, of the P. W. A., for increasing the water supply, has still some work to be done—an additional well which the contractor is installing.

Water connection has been made to the lower farm for fire protection, and additional fire hydrants installed throughout the hospital grounds.

Continued Treatment Building No. 3.—Plans were drawn and specifications prepared for Continued Treatment Building No. 3. When the bids were received the lowest bid was found to be more than the amount appropriated. A deficiency estimate was prepared and transmitted through the Department of the Interior and the Bureau of the Budget to Congress, asking for an additional appropriation which has recently been authorized and a contract is now under way looking toward the construction of this building.

Supplies.—Supplies were ordered in the amount of $1,162,000. In the purchasing of these items over 300 special contracts were drawn by the hospital for this purpose.

Radios.—The installation of radio sets with loud speakers has been extended; such speakers have been installed in the occupational therapy shops of the male receiving and female receiving buildings, serviced from the hospital sets in those buildings.

A hospital radio set with microphone connection for announcements for paging purposes was placed in service in the C—service supervisor's office. All wards in B, C, and M buildings are provided with speakers connected with this set, and it is hoped to continue such installations until practically the entire hospital has such outfits.

Fire protection.—Regular inspections were made of the whole hospital by the fire marshal for the purpose of protecting it from fire. During the year there have been 28 fire alarms, the property damage amounting to $503.94.

Library.—Additional books have been added to the medical library during the year, bringing the total to 15,115 volumes. Fifty-nine current magazines, twenty of them foreign, are regularly received in this library. Some of the magazines are sent to the various departments and the rest kept on file in the medical library. In addition to the

books in the library, others were obtained from the Surgeon General's library and from the Library of Congress as required.

Three hundred books were added to the patients' library, making a total of 16,380. Approximately 200 books were drawn daily, two-thirds of them fiction. There are about 3,600 books in constant circulation.

Social service.—The social service report from July 1, 1936 to June 30, 1937, showed the following:

Number of out-patients on rolls July 1, 1936	85
Number of out-patients on rolls June 30, 1937	114
Average number on rolls per month	104
Number of patients discharged from the rolls	164
Number of out-patients under care during the year	258
Average carried during one month (in- and out-patients)	212
New patients (out on visit)	194

NEEDS OF THE HOSPITAL

An estimate of $1,199,025 for the support, clothing, and treatment of the patients in Saint Elizabeths Hospital for the fiscal year ending June 30, 1939, is recommended. This is $49,275 more than was appropriated for 1938, and based on an estimate of 1,825 Federal patients. On June 30, 1937, there were 1,776 such patients in the hospital. We have unofficially been advised that there will be about 50 patients sent to the institution from the Pacific coast by the Navy Department in the near future. The number estimated, in view of this information seems very conservative. There was an increase of 277 patients in the hospital on June 30, 1937, over the same date of the previous year, and it is conservatively estimated that the number to be provided for during the year 1939 will be 5,850. In addition to the 1,825, chargeable to the Federal Government and authorized under the Interior Appropriation Act, the number that will probably be cared for in the hospital during the next year are: 3,700 beneficiaries of the District of Columbia; 90 beneficiaries of the United States Veterans' Administration; 135 beneficiaries of the United States Public Health Service; 30 beneficiaries of the United States Soldiers' Home; and 70 beneficiaries of the Indian Bureau. The funds for the beneficiaries of the District of Columbia will be appropriated for in the District of Columbia Appropriation Act; for the beneficiaries of the United States Veterans' Administration in the appropriation for the United States Veterans' Administration; the beneficiaries of the United States Public Health Service will be carried in the appropriation of the United States Public Health Service; the beneficiaries of the United States Soldiers' Home to be paid for from United States Soldiers' Home funds; and beneficiaries of the Bureau of Indian Affairs to be paid for by transfer from funds appropriated for conservation of health among Indians.

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The rate estimated for the care of the patients during 1939 is $1.80 per capita per day, the same as for the past preceding 3 years, notwithstanding the fact that the cost of food and other supplies seems to be increasing, and new legislation pertaining to vacation and sick leave to employees has a tendency to increase the cost.

Included in the estimate is $185,000 for repairs and improvements to buildings and grounds, the same amount that was included in the previous years. Out of this sum will come funds for keeping the various buildings in repair, including plumbing, heating, steamfitting, plastering, glazing, painting, etc., for the repair and widening of roads and walks, the maintenance of railroad tracks, etc.

The hospital continues to grow. The admissions seem to be increasing, and there is still a shortage of beds. One thousand two hundred and fifty additional beds should be provided to cover immediate needs and, as explained in the forepart of this report, including replacement of the semipermanent group, 530 beds would be required at once, and at the rate the population of the hospital is increasing by the time these beds could be provided even with 1,300 additional beds there would be few, if any, vacancies.

There is an estimate for 5 continued treatment buildings, each containing 180 beds, at a cost of $1,500,000. Two of these buildings are to be located adjacent to the continued treatment kitchen, where provision has been made for the preparation and service of food. The other three buildings are to be located in outlying districts to the east of the continued treatment kitchen, and as the food is prepared it is to be sent from this kitchen to the dining rooms included in the new buildings.

There is an estimate for $900,000 for 3 other continued treatment buildings, each containing 180 beds, to replace the semipermanent buildings erected in 1918 at a cost, including equipment, kitchen, and dining room, of $200,000, with an estimated life of from 15 to 20 years. These buildings have been in use more than 18 years and show a material deterioration. The cost of maintenance is very high and is increasing each year. A good part of the appropriation for repairs and improvements is expended in keeping these buildings in use. These buildings are more or less of a fire menace and should be replaced at an early date.

To take care of the additional number of patients admitted and the increase in the vacations and sick leave allowed employees additional personnel is required. This will include various types but more particularly ward service employees.

There is an estimate of $150,000 for a chapel, including preparation of plans and specifications, advertising, supervision of construction, and equipment. A chapel for the religious services for the patients at Saint Elizabeths Hospital was provided on the third floor of the

old center building in 1875. This chapel can accommodate about 500 patients. The hospital has over 5,600 patients, and is growing away from the site on which the old center building is located. It is considered advisable to erect such a chapel on the plot of ground on the east side of Nichols Avenue with a seating capacity of from 1,000 to 1,500, to be used by the various religious denominations having followers among the patients of the hospital. This chapel having its meeting place on the ground floor and located where noted will be not only more accessible to the patients, but many of the patients who are feeble or crippled will be in position to attend divine services who cannot attend under present conditions. Recommendations have been made by the various chaplains of the hospital for such an edifice.

There is an estimate of $250,000 for one additional 750-horsepower boiler, air compressor, brine pumps, and necessary utilities. The hospital recently installed three 750-horsepower boilers, which were sufficient for its needs at that time. Space was left for an additional boiler that would be required when the new buildings were erected. The growth of the hospital, with the recommendation for additional buildings, will require additional boiler, air compressor, brine pumps, and utility equipment.

There is an estimate of $750,000 to purchase farm land, to construct buildings to house patients who would work on farm, buildings to house employees, farm animals, dairy, piggery, poultry plant, plant for pasteurizing milk, making ice cream, and other necessary farm buildings, including expenditures for the purchase of land, preparation of plans and specifications, advertising, and supervision of construction.

The hospital consists of four plots of ground, in all about 800 acres. The last land purchased for hospital use was in 1891. At that time the hospital had about 1,500 patients, and over 600 acres were used for farm and garden purposes. Gradually new buildings have decreased the amount available for farm purposes. The hospital, while originally isolated some miles from the center of the city, at the present time on account of the growth of the city and the use of various forms of traffic, is now adjacent to the city and the center of a growing population. The dairy and piggery are in proximity to buildings occupied by patients. This is undesirable, if not objectionable.

One part of the farm is located about a half a mile from the main site, in what is known as Congress Heights. It has been recommended that a portion of this ground be turned over to the National Capital Park and Planning Commission for playgrounds for children; another part it is recommended be turned over to the District of Columbia for streets and roads. Parts of this same site have been taken by the city for widening streets.

Another plot of the hospital is about 4½ miles from Washington; a part of it is on low land, sometimes under water.

It is believed desirable to get between 5,000 and 6,000 acres of land, and to concentrate on farm projects in one place, increase the size of the dairy herd, the piggery, and the poultry farm, and build about six cottages, housing 40 patients each on this site. Through this arrangement an increased number of patients would derive the therapeutic benefits of healthful outdoor occupation. This would also result in an improved economic arrangement in that the hospital would be able to secure sufficient milk for all purposes, increase the quantity of pork products, and cure pork products, thus reducing the quantity of ham, bacon, and shoulder to be purchased, and increasing the quantity of poultry products, such as fowl and eggs.

While it is stated the additional expense required for the physical upkeep and operating would be about $25,000, less $5,000, the income from the enlarged farm, dairy, piggery, etc., would more than offset this, resulting in a net credit to the benefit of the Government.

Five hundred thousand dollars has been estimated for a building for storeroom, warehouse, laundry, and industrial shops, including preparation of plans and specifications, advertising, supervision of construction, and equipment.

During the past 25 years various changes have taken place in the hospital—the population practically doubled; about 10 or 15 new buildings added—but no change has been made in the storeroom and warehouse. The present storeroom, with cold storage equipment, is practically out of date and the storage facilities are insufficient to care for adequate quantities of current supplies. In order to house supplies that must be cared for and regularly issued to the various buildings, all sorts of out-of-the-way places have been utilized. The basements of many buildings housing patients have been used for storing furniture. It is difficult to give proper protection to articles in all classes of buildings, and there is possibility of shrinkage.

Saint Elizabeths Hospital has a shoe-manufacturing department, with 1 employee and about 60 patients, making all of the shoes used in the institution. A converted room under detached dining room is used for that purpose. This department is growing; it not only makes and repairs shoes, but makes belts, suspenders, and mats. A proper place with sanitary working conditions should be provided, and it is contemplated to have space available in a new store and warehouse building when authorized.

When the present laundry building was erected, the total amount of material washed and laundered each year was about 3,000,000 pieces. This has increased until at the present time there are over 12,000,000 pieces washed and laundered each year. It has outgrown the original building; small additions have been put on each side, but it is necessary to furnish more room. It is contemplated, if a new building is au-

thorized, to make space at one end of the first floor of this building for the laundry.

The manner of feeding the patients has vastly changed during the past few years. At the present time the more modern method of feeding by the cafeteria system is in use. This permits an election of the food by the patients and insures the service of hot food. No space is available near the older buildings that may be used to furnish adequate cafeteria service. It is contemplated to make one end of the ground floor of the new building for store and warehouse purposes available for such use.

REVISION OF LAWS FOR THE ADMISSION OF PATIENTS

A bill has been introduced in Congress, upon the recommendation of the District Commissioners, to change the method of admissions to Saint Elizabeths Hospital. The hospital cooperated with representatives of the District upon the form of the proposed bill.

PUBLICATIONS

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Introduction to "The Mentally Ill in America" by Albert Deutsch. Doubleday, Doran and Co., 1937.

Education in the Present World Crisis. The Educational Record, April, 1937. Pp. 235–241.

Eldridge, Watson W., principal medical officer:

Cleidocranial Dysostosis. American Journal of Roentgenology, vol. 34, July, 1935. Pp. 41–49. (With Simon, A., and Ramos, R.)

Karpman, Benjamin, senior medical officer:

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HOWARD UNIVERSITY

Mordecai W. Johnson, *President*

Seventy years of service.—During the school year 1866–67, with meager resources, a handful of students, and surrounded by an atmosphere of unfaith in the Negro's capacity for educational advancement, Howard University was launched with the purpose of providing able teachers and professional leaders for a distressed and scattered people. Today, after 70 years of service, the institution is a well-established university with 2,108 students enrolled in 9 undergraduate, graduate, and professional schools and colleges, with a plant and other assets valued at a sum in excess of $8,000,000, with 10,008 graduates at work in 43 States and 24 foreign countries, and with a faculty which now includes the largest community of Negro scholars in the world, who, in their accomplishments, represent victory over every obstacle toward cultural development which 70 years ago seemed insuperable.

As the founders desired, the majority of Howard University's 10,008 graduates have served as teachers, devoting their lives to the training of the youth and to the building of a system of education in the South. Six hundred others have become leaders in religion, while 1,777 others have become physicians and surgeons (approximately 48 percent of all Negro physicians and surgeons now practicing); 828 others have become dentists (approximately 48 percent of all Negro dentists now practicing); 1,195 have become lawyers (approximately 96 percent of all lawyers now practicing); 518 have become pharmacists; 136 have followed engineering and architecture and other applied science; while 148 have gone into commerce and finance. In every Negro population center of the United States these graduates are at work, and they have had a major share in the remarkable development of the Negro.

"Here is a record," said President Franklin D. Roosevelt, "of which the Negro race may be proud. It is a record of which America is proud."

Sixth year of the 20-year program.—The year 1936–37 was the sixth year of development of the 20-year program approved by the Government. It was a year of outstanding progress in the matter of new buildings and equipment and of measurable progress in the matter of the number and quality of students, the number and quality and work of the faculties, in financial receipts and management, and especially in favorable factors related to the developing graduate school.

President Roosevelt dedicates chemistry building.—The most significant event during the year was the visit of the President of the United States in October to dedicate the new chemistry building just finished by the Public Works Administration and formally turned over to the university on the day of his visit by the Secretary of the Interior. This building provides facilities for first-class work, comparable to the best available in the United States. The Public Works Administration also completed the erection of the heat, light, and power plant at a cost of $550,000. The President of the United States made an additional appropriation of $305,000 of Public Works funds so as to enable the university to begin construction on the new library building under a contract costing $1,105,000. He also made available to the university $525,000 of Public Works Administration funds for the construction of a long-needed new dormitory for men. Concerning these Public Works projects President Roosevelt said, "Howard University has shared as of right in our Public Works program. These Government-financed improvements in the facilities of this great center of Negro education should enable it to continue to provide for its students cultural opportunities comparable to those offered by other first-class institutions of higher learning in the country."

Advancing numbers and quality of students.—During the year 1936–37 Howard University experienced an increase of 138 in its enrollment, representing a total increase of 478 students since 1933–34, when the number of students reached the bottom of the depression trough. In all schools and colleges of the university a marked increase in the preparation of entering students was observed. Of the 111 new entrants in professional schools of the university 76, or approximately 68 percent, were equipped with 4 years or more of previous college and graduate training. The enrollment of the school of religion was entirely of graduate caliber and 190 or 72.1 percent of the students in the 4 professional schools of medicine, dentistry, law, and religion were degree-holding students. Of the 2,108 students in the entire institution 491 or 23.3 percent were persons holding 1 or more advanced degrees.

Graduate school goes forward.—The rapid development of high-school enrollment throughout the States of the Negro's majority residence, accompanied by the accrediting of high schools and colleges by the Southern Association of Secondary Schools and Colleges, was

making an increasing demand for teachers with graduate training of high caliber. There was widespread recognition by leaders in State education of the danger of establishing such graduate work hastily as a part of the program of the young State colleges just now beginning to secure accrediment as colleges, and of the necessity of providing one or more highly developed centers of graduate work in the area with departments well-manned by an adequate number of mature teachers and with related departments having equipment and resources for advanced work. Howard University stood out as the most promising center for such graduate instruction in the entire field. Two hundred and eighty-four students from 55 leading colleges and universities enrolled for graduate work during the year, 91 percent coming from institutions for Negro youth and 87.1 percent coming from the States of the South, the places of greatest educational need. This represented an increase of 42 in the number of graduate students and an increase of 27 in the number of institutions sending students for graduate work. Special new facilities were provided for graduate study in chemistry, including research rooms and research equipment in the new chemistry building; and the prospect of special rooms for graduate study, graduate seminars, and individual cubicles in the stacks of the new library building was inspiring.

Howard University graduates receive distinguished appointments.—The prestige of Howard University and the competence of her work were signalized by the confirmation and appointment of two of her graduates to the presidency of two of the leading institutions for the education of Negro youth; two of her medical graduates to be chief of staff in two of the leading hospitals for Negroes in the United States, one under Government auspices and one under private auspices; the appointment of one of her graduates to be Special Assistant to the Attorney General of the United States; of another to the judiciary in the State of New York; and the nomination of a dental graudate for the governing council of a great American city by a nonpartisan body of citizens of distinguished standing.

Forward steps in clinical medicine.—The department of surgery was reorganized under a full-time professor provided by a grant from the Rockefeller Foundation and the General Education Board. Under the same grant a new head for the department of medicine was appointed. Continued help was received from the General Education Board and the Rockefeller Foundation in the training of teachers for the preclinical and clinical sciences. The clinical teaching of tuberculosis was introduced. The city maternal and infant-welfare clinics were combined with those operated by the Howard University staff at Freedmen's Hospital, to provide a service of greatly increased efficiency.

Faculty growth in full-time members and in strength.—Judicious changes in the staff of the university brought about the transformation

of positions held by 27 part-time teachers into 11 full-time teaching positions and brought 4 net additions to the teaching staff of the university. The full-time staff now constitutes 57.1 percent of the persons employed and does 87.8 percent of the educational work. Significant research was being undertaken in 10 departments of instruction. Eight books and 110 scholarly articles were published during the year. The Journal of Negro Education had advanced to a circulation of approximately 600, had achieved recognition as the outstanding current publication in the field of Negro education and one of the best edited educational periodicals in the United States. Many members of the faculty were awarded fellowships and other financial encouragement by distinguished organizations and fully 10 percent of the full-time members of the staff were away on leaves of absence for further study in America and in Europe. Members of the faculty were increasingly represented on the programs of scientific and other scholarly societies, and four were chosen as representatives in world undertakings of a scholarly nature in the field of education, social science, and religion.

Increased income and balanced budget.—The current income of the university was increased by $91,000 over the income for the previous year. The budget was kept in balance and a surplus was made available for the retirement of the current deficit. The university continued to receive the support of educational foundations, grants and allowances being made during the year by the Rockefeller Foundation and the General Education Board, the Julius Rosenwald Fund, the Carnegie Corporation, the Emergency Committee in Aid of Displaced German Scholars, and the Oberlaender Trust. The university was thrilled to receive a $52,000 increase in its endowment, for traveling scholarships for promising youth, through the settlement of the estate of Lucy Moten, a colored school teacher of the city of Washington.

Outstanding needs.—The outstanding needs of the university, made increasingly clear by the work of the year were (1) an increase of 32 in the number of mature teachers of professorial rank, (2) an increase of $148,000 in the annual sum of money available for teachers' salaries, (3) a sum of $300,000 to double the gravely deficient book collection in our libraries, (4) the doubling of funds for scholarship and student aid, especially for teachers in service in the South, who receive low salaries and may not otherwise find it possible to pursue the graduate work which they need to increase their efficiency, and (5) funds for at least that minimum of research which is necessary to maintain a living mind in the members of the teaching staff.

STUDENTS

Enrollment for the year 1936–37.—The total enrollment of Howard University (see table following) for the year 1936–37 was 2,108, of whom 1,108, were men and 1,000 were women, as compared with

the total of 1,970 for 1935–36, of whom 1,072 were men and 898 were women. A net gain of 138 students, or 7 percent, is shown, as compared with a net gain of 63 students, or 3.3 percent in 1935–36. This enrollment represents a gross gain of 482 students since the low point of the depression in 1933–34.

Geographical distribution.—Of the regular students enrolled for the school year 1936–37, 95.8 percent came from the continental United States and 4.2 percent from without the borders of the United States, as compared with 95.2 and 4.8 percent, respectively, during 1934–35. The percentage of students coming from the District of Columbia was 27, as compared with 28.7 percent during 1935–36.

Forty States sent 1,871 candidates for degrees in 1936–37, as compared with 41 States sending 1,717 candidates for degrees in 1935–36. Divisional distribution of candidates for degrees is as follows: *From the North,* 470 students, as follows: New England, 55, the Middle Atlantic States, 272: the East North Central States, 94: the West North Central States, 49. *From the South,* 1,394 students, as follows: From the South Atlantic States, 1,177; from the East South Central States, 102. *From the West,* 7 students, as follows: Mountain States, 2; Pacific States, 5.

Summary of Students Enrolled in Howard University for the Years 1936–37 and 1935–36

Divisions of the university	Net enrollments							
	1936–37			1935–36			Total gain	Total loss
	Total	Men	Women	Total	Men	Women		
THE COLLEGES								
College of liberal arts	1,244	593	651	1,174	548	626	70	
School of engineering and architecture	52	52		52	52			
School of music	75	28	47	55	20	35	20	
Graduate school	284	110	174	236	134	102	48	
Total	1,655	783	872	1,517	754	763	138	
PROFESSIONAL SCHOOLS								
Theological college	(1)	(1)	(1)	8	7	1		8
Graduate school of theology	21	21		19	18	1	2	
School of law	70	68	2	62	56	6	8	
School of medicine:								
College of medicine	139	133	6	142	135	7		3
College of dentistry	38	38		38	37	1		
College of pharmacy	31	26	5	26	21	5	5	
Total	299	286	13	295	274	21	4	
Total in regular courses	1,954	1,069	885	1,812	1,028	784	142	
Special students in music, religion, law, dentistry	162	44	118	158	44	114	4	
Total	2,116	1,113	1,003	1,970	1,072	898	146	
Less duplications	8	5	3				8	
Grand total (net)	2,108	1,108	1,000	1,970	1,072	898	138	

[1] Discontinued.

Students of graduate caliber.—Seventy-six, or approximately 68 percent of the 111 students entering the freshmen classes of the professional schools for the first time during the school year 1936–37, were equipped with 4 years or more of previous college training. One hundred ninety or 72.1 percent of the students in the four professional schools of medicine, dentistry, law, and religion were degree-holding students. Of the 2,108 students in the entire institution, 491 or 23.3 percent were persons holding 1 or more advanced degrees.

Scholarship and student aid.—Scholarships within the university continued to be administered on the basic allotment of 7½ percent of all student fees, as provided by the trustees of the university. Work opportunities increased over last year, and the majority of our students availed themselves of the installment system of payment of fees.

In the undergraduate colleges 294 or 21.5 percent of the students received aid in some form, including 131 National Youth Administration work awards. Of a total enrollment of 284 in the graduate school, an average of 84 per semester received some form of aid. The major portion of this aid came from 55 National Youth Administration awards. Thirty students in the professional schools also received National Youth Administration awards. The university received a gift of $52,000 from the estate of Lucy Moton, a colored school teacher of Washington, to provide traveling fellowships for worthy students.

The aid of the National Youth Administration has been a decisive blessing. Even with its help we could give assistance to only 23 percent of all applicants. The scholarship resources of the university could be doubled without fully meeting our urgent needs.

GRADUATES

Number and distribution.—The total number of 226 students graduated in 1936–37 (see table below) represents a decrease of 18 graduates as compared with 244 graduates in 1935–36. There were 127 male graduates and 99 women graduates, as compared with 115 and 129, respectively, for the year 1935–36. The graduating classes of 1936–37 entered the university (in greater part) in 1933–34 when enrollment had reached its lowest point on account of the depression. Since that year enrollment has steadily risen and subsequent graduating classes are expected to show a corresponding increase.

Honorary degrees.—Three honorary degrees were conferred at commencement in June 1937. Franz Boas, anthropologist of Columbia University, New York; John M. Gandy, president of the Virginia State College, Petersburg, Va.; and David D. Jones, president of Bennett College, Greensboro, N. C., were awarded the degree of doctor of laws.

Total number of Howard graduates.—The total number of graduates of Howard University is now 10,008. Of this number the registrar

has over 6,000 correct addresses in 43 States, the District of Columbia, and 15 foreign countries, classified alphabetically by States, cities, sex, schools, and classes. The registrar of the university has made a special study of the economic status of these graduates, giving major attention to the classes of 1928 through 1935.

Summary of Students Graduated by Howard University for the Years 1936–37 and 1935–36

Divisions of the university	Graduates					
	1936–37			1935–36		
	Men	Women	Total	Men	Women	Total
THE COLLEGES						
College of liberal arts	44	64	108	38	94	132
School of engineering and architecture	1		1	6		6
School of music	1	2	3	2	1	3
Graduate school	12	24	36	20	25	45
Total	58	90	148	66	120	186
PROFESSIONAL SCHOOLS						
School of religion	7		7	6	1	7
School of law	15	2	17	4		4
School of medicine:						
College of medicine	34	1	35	33	2	35
College of dentistry:						
4-year course	11		11	5		5
Dental hygiene		5	5		6	6
College of pharmacy	2	1	3	1	1	2
Total	69	9	78	49	10	59

TEACHING STAFF

Number and distribution of teachers.—There were 248 members of the teaching staff during the school year 1936–37, of whom 144 were on full time and 104 were on part time, representing a full-time equivalent of 164 teachers. This represents a gain of 11 full-time teachers and a loss of 27 part-time teachers—a net full-time equivalent gain of 4 teachers.

Number of teachers in relation to the 10-year program.—In the 10-year program for Howard University agreed upon by the Government, definite objectives were determined in regard to the ratio of students to teachers in each division of the university. The status of our progress in relation to these objectives continues to be favorable, but it is not fully satisfactory and is in imminent danger of being thrown far out of balance by increasing enrollment, if concurrent increases in staff are not made. When the depression caused the enrollment of the university to drop, from 1931–32 to 1933–34 the university reduced its staff by 44 members, 30 of whom were full-time teachers and 14 of whom were on part time, together making the equivalent of 34.5 full-time persons. In the 3 years since 1933–34

enrollment has increased by 482 students, from 1,626 to 2,108, with commensurate increase in the teaching load. During this 3-year period, however, the university has been able to make only 10 new full-time additions to the staff. The consequence is that while the teaching staff in the college of liberal arts is adequate for the undergraduate load, in most departments, it is pressed to the limit of its resources with the added graduate load of 284. Ten teachers are now bearing loads of from 16 to 19 hours and there are 75 classes above 30 in numbers. This college will be urgently in need of additions in 1938–39.

In engineering and architecture the ratio of teachers to students is favorable, but the nature of the subject matter is such that five teachers are bearing loads of from 16 to 19 hours. In music the ratio is favorable, but an additional teacher specializing in the history and appreciation of music is required to meet the needs of the undergraduate college students.

The faculty of medicine has made great progress in providing able teachers for its preclinical branches and needs only to fill a few gaps. But in all the clinical branches it is in urgent need of additional teachers, particularly now in general medicine, obstetrics, pediatrics, venereal diseases, psychiatry, and tuberculosis. The grant of $100,000 made available by the General Education Board and the Rockefeller Foundation for the development of the departments of medicine and surgery has already made possible considerable improvement in the organization of the department of surgery and in the conduct of surgical service under the new full-time professor and head of the department. The selection and training of additional personnel in this department is very necessary. The professsor and head of the department of medicine has just been chosen and careful organization of this department is now in progress.

In the faculty of dentistry one teacher is needed. The school of law is now functioning on a minimum full-time teaching staff and is in need of another full-time member.

Full-time teachers.—Progress continues to be made in the problem of overcoming the preponderance of part-time teachers whose teaching is supplementary to their vocations. The full-time equivalent increase in our teaching staff for 1936–37 is only 4 persons; it is encouraging to note, however, that our full-time staff has increased by 11 persons over the year before, while the part-time personnel has decreased by 27 persons.

Maturity of the staff.—Of the 164 (full-time equivalent) teachers on the staff this year, 34, or 21 percent were professors; 23, or 14 percent were associate professors; 35, or 21.3 percent were assistant professors; 72, or 43.7 percent were in the rank of instructor or below. According to the 10-year program of development our present staff should have

the following distribution: 66 professors, 16 associate professors, 33 assistant professors, 49 instructors.

The full professorial staff is seriously undermanned. The disparity in maturity, however, is not as great as the figures would show. Several mature and very able teachers are in the associate professorial rank, awaiting advancement which has been long delayed for lack of adequate funds. The increased appropriation for salaries voted by the Congress for 1937–38 will enable the university to take a substantial step forward in improving this situation.

The teachers continue with eagerness their efforts after improved efficiency through further study. Seventeen members of the staff were on leave of absence for further study during the year just ended, representing 10 percent of the entire faculty.

Salaries of teachers.—In the 10-year program of development for Howard University the minimum, average, and maximum salary scale for teaching personnel was definitely fixed. The salary scale for Howard University as at June 30, 1937, was as follows: The median instructional salary had reached $1,800; no teacher was receiving less than the minimum instructional salary of $1,600; the average salary in the instructional rank had reached $1,869, which is $231 below the average of $2,100 agreed upon in the 10-year program. In the assistant professorial rank no teacher was receiving less than the minimum of $2,300 agreed upon; the median salary in this rank was $2,500, while the average salary in the assistant professorial rank had reached $2,650, which is $150 below the agreed upon average of $2,800. In the associate professorial rank the median salary was $3,500. No teacher was receiving less than the minimum of $3,000, while the average salary had reached $3,490 or $10 less than the average of $3,500 agreed upon. In the rank of full-time professor there were 10 teachers receiving less than the minimum of $4,000 agreed upon; the median salary was $4,000; and the average salary in the professorial rank had reached $4,491, which is $809 short of the agreed upon average of $5,000.

Here we place our finger upon the strategic center of further improvement. All able men in the field of education are agreed that competent instruction depends primarily upon an adequate number of mature and able teachers with salaries adequate to assure their full-time attention to their work. Howard University needs (1) to advance the salaries of men in its professorial rank; (2) to bring into that rank, by advancement, the worthy teachers who are prepared to do its work; and (3) to supplement the number of such worthy teachers by an adequate selection of additions from the ablest men available. This work is in the nature of the case, slow of accomplishment, but it should go forward steadily year by year, because every other improvement depends for its full significance upon this decisive step.

THE GRADUATE SCHOOL

General trends.—During the current year the graduate school continued the general trend of increased enrollment which has prevailed throughout the last 10 years. There was also an increase in the number of students giving their full time to graduate study. The base of support was also widened by a substantial increase in the number of institutions sending students to the graduate school. While these institutions represented all sections of the country and included many of the best established colleges and universities in the United States, 91 percent of the enrollment came from institutions for Negro youth and 81.7 percent of the entire enrollment came from the States of the South.

Emergency aid funds contributed by the National Youth Administration constituted a decisively constructive stimulus both to the number of enrollment and the number of students able to give their full time to their studies. New and first-class facilities for graduate work in chemistry were provided in the special rooms for graduate study and research and the adequate equipment available therefor in the new chemistry building, and the prospect of special graduate reading rooms, seminar rooms, and cubicles for individual study in the stacks of the new library building was inspiring.

Enrollment.—The total enrollment of graduate students for the year 1936–37 was 284, as compared with 242 for the year 1935–36. This represents a net increase of 42 students for the year and an increase of 241 students over the enrollment of 1926–27. These students came from 58 colleges and universities, including some of the most distinguished American institutions. Thirty-six institutions for Negro youth, however, sent 258 students or 91 percent of the entire enrollment.

Departments of instruction.—The 284 graduate students for the school year 1936–37 did their work in 17 departments of instruction. One hundred fourteen or 40 percent of the students did their work in education, psychology, and philosophy; 74 or 26.1 percent did their work in the social sciences of economics, sociology, social work, history, and political science; 50 or 17.6 percent did their work in the natural sciences and mathematics, including bacteriology, botany, zoology, chemistry, and physics; and 46 or 16.2 percent did their work in English, German, and the romance languages and literatures.

Scholarship and student aid.—The university had the following scholarships available for the graduate school during the current year: Tuition scholarships voted by the board of trustees, $3,300; tuition and room for especially able students, $3,000, National Youth Administration, $22,151; other work, $150; LaVerne Noyes, $115. Total amount available for scholarships, $28,716. With this amount the university was able to help 82 students in the first semester and

87 students in the second semester. The amount of aid given was somewhat more than twice the amount available last year. The margin of unhelped need was still very great. By far the larger number of Negro public-school teachers in the South receive salaries under $500 per year. If these teachers are to do the serious graduate study which is needed to insure the sound development of the public school system they must receive substantial scholarship and fellowship aid.

Degrees conferred.—Thirty-six degrees were conferred on 12 men and 24 women. Twenty-three were masters of science and 13 were masters of arts.

The future of graduate work.—The rapid development and accreditment of public high schools and colleges for Negroes in the States of their majority residence within the last 10 years has created an acute and growing need for mature teachers with thoroughly competent training on the graduate level. The soundness of the educational structure throughout these States depends primarily upon the caliber of graduate instruction which is made available to meet this situation.

Howard University is the most promising center for such graduate work in the entire area. The rapid increase in the enrollment in the graduate school from 43 in 1926–27 to 284 in 1936–37 is an index both of the rapidity with which the need has developed and of the remarkable opportunity which now confronts Howard University in this field. The fact that during the current year able graduates from 58 institutions came to Howard University for graduate instruction is an indication of the faith and hope which centers here. It is of the utmost importance to the States of the Negro's majority residence and to the people of the Nation that all possible steps now be taken to place the graduate work at Howard University on a sound and thoroughly competent basis and to enable the university to select and to train on the graduate level young men and women of unusual promise. In such a program certain immediate steps are urgent: (1) The book collection of the university should be doubled within a period of 5 years; (2) special scholarship and fellowship funds for graduate students should be provided; (3) funds should be available for at least that minimum of research which is necessary to maintain a living mind in the members of the staff who teach graduate students; (4) salaries of the mature teachers on the staff of the university should be so increased as to enable them to give their entire time to their work without worry; and (5) the number of such mature, well-paid teachers should be immediately increased.

THE COLLEGE OF LIBERAL ARTS

The new plan.—With trustee approval the new plan of study prepared by the faculty of the college of liberal arts becomes effective in September 1937, for all entering freshmen. This plan provides for the official establishment of a system of majors; a larger prescription of work for freshmen and sophomores; a reduction from 7 to 2 in the number of degrees offered by the college; greater emphasis upon social science and natural science and less upon foreign languages and mathematics; and the introduction of certain compulsory courses looking toward the physical and cultural welfare of the student.

Freshman orientation.—For 2 years an experiment in orientation and guidance has been under way to determine the most pressing needs of Howard college freshmen. A program of work in this field was developed and then applied to half of the freshmen. At intervals both halves were examined in personality growth, in reading, in study habits, and in general achievement, while the first half was examined in the course content only. The superiority of the first half over the second half, the division having originally been made along parallel lines, was so marked as to establish the value of the course, which it is hoped can next year be given to all freshmen.

Students.—The student registration during the year 1936–37 was 1,244, of whom 593 were men and 651 women. This is an increase of 70 over 1935–36.

Student activities.—The Howard players gave eight dramatic presentations during the year. At the intercollegiate tournament held at Hampton Institute, April 2, 1937, they won first prize. The debating society participated in six intercollegiate debates, all of which were nondecision events. The usual intramural and intercollegiate athletic games were carried on in football, basketball, track and field, tennis, swimming, rifle, boxing, wrestling, hockey, archery, and dancing. Howard college students published *The Hill Top* and *The Stylus*. They were active in intercollegiate student affairs of a national character.

Graduates.—During the year, 108 degrees were conferred as follows: A. B., 29; S. B., 19; S. B., in commerce, 4; A. B., in education, 36; S. B., in education, 10; S. B., in home economics, 7; S. B., in art., 3.

Faculty.—There were 84 active members of the faculty of the college of liberal arts during the academic year 1936–37. Of these, 22 were professors, 12 associate professors, 18 assistant professors, 25 instructors, and 7 assistants. There were 8 appointments. Ten teachers were on leave of absence for further study, and 10 others have been granted similar leave for the coming year. Faculty publications during the year 1936–37 included 6 books, 58 articles in scholarly periodicals, and 28 book reviews.

Needs.—Among the more urgent needs of the college of liberal arts are additional teachers in romance languages, commerce, political science and education, a structure for a little theater, a suite of rooms to serve as studios for the department of art, the completion of the remodeling of Thirkield Hall in harmony with already existing plans, certain very necessary repairs and improvements in the gymnasium on both the men's and women's sides, and approximately $4,000 annually for the purchase of equipment and supplies for technical purposes in the departments for which such provision is not now being made.

MILITARY SCIENCE AND TACTICS

Official appraisal.—At the annual exhibition and review held on June 1, 1937, the student cadets displayed great zest and precision. Col. Richard Wetherill and Maj. Emil W. Leard, in charge of R. O. T. C. units in this area, declared that the Howard University unit was one of the best, and they were unreserved in their praise.

Enrollment.—The enrollment in military science and tactics during the year 1936–37 was 215 in the first semester and 312 in the second semester—an average of 263. This enrollment was distributed as follows: First semester, basic students 196, advanced students 19; second semester, basic students 259, advanced students 53.

Commissions awarded.—Sixteen students were awarded commissions as second lieutenants in the United States Army.

THE SCHOOL OF ENGINEERING AND ARCHITECTURE

Enrollment.—During the school year 1936–37 the school of engineering and architecture provided instruction for 69 students, 52 of whom were preparing for entrance into the professions of civil engineering, electrical engineering, and architecture. These students came from 18 States and the Virgin Islands. An increasing number came with from 2 to 4 years of previous college preparation.

Graduates and their employment.—One student received the degree of B. S. in electrical engineering, magna cum laude, June 1937. This graduate immediately found work in the field of his choice. Last year there were six graduates, and the senior classes for next year will enroll eight. The university now has 65 graduates in the engineering and architectural fields, distributed as follows: Architecture 12; civil engineering 3; electrical engineering 26; mechanical engineering 24. All of these graduates are employed. Several government departments are providing employment for Negro technical graduates. Outstanding among them are the Housing Division, Public Works Administration, United States Department of the Interior, the Civilian Conservation Corps and the Resettlement Division, United States Department of Agriculture.

Faculty.—The active faculty of eight full-time members include one associate professor, two assistant professors and five instructors. One associate professor and one assistant professor were on leave of absence. All staff members are experienced engineers or architects; 50 percent hold professional registration, distributed among the following States: North Carolina, Ohio, Pennsylvania, and Virginia. Eighty percent hold graduate degrees in engineering or architecture; one member holds the degree of doctor of philosophy.

Five lectures were presented to the student body by visiting engineers and architects during the year.

Needs.—Much of the present equipment, now obsolete, needs to be replaced. Laboratory and drafting room space equivalent to approximately 6,000 square feet are needed for a new electronics laboratory, an extension to the materials testing and mechanical laboratories, and to provide for two special small instrument rooms. The dean also states that two additional engineering and one architectural instructor are needed.

THE SCHOOL OF MUSIC

Outstanding features of the work during the year.—Enrollment was increased by 26 students. There was great improvement in the caliber of students. The concert series designed to furnish inspiring musical entertainment for students, faculty, and the citizens of Washington, continued to be a success. The Carnegie Corporation of New York provided the university with a valuable set of phonographic records, an excellent phonograph, and musical literature for the teaching of music in the college. This set has proved a great asset to the school of music by providing on the campus facilities for study and research in the history of music, public school music, orchestra, and conducting.

Number and distribution of students.—The school enrolled 223 students during the year, as compared with 197 during the previous year, representing an increase of 26 students or 11.3 percent. Seventy five of these students were registered in the regular degree courses in piano, organ, voice, violin, and public school music, while 148 were registered in the junior department.

Faculty.—There were 13 members of the faculty of music during the year. Ten of these gave full time to the work while three others gave time equivalent to one and one-half full time teachers. Two of these teachers were professors, three were assistant professors, six were instructors, and two were assistants.

One major appointment was made during the year in the department of piano. Six members of the faculty appeared in 19 recitals in 10 States. One appeared in recital at the White House.

Graduates.—Three students were graduated at commencement time. Two of these received the degree of bachelor of school music and one the degree of bachelor of music.

Musical organizations.—The university choir, the university glee club, the women's glee club, and the university orchestra have all been active during the year and have had many favorable public appearances. The university glee club appeared with the head of the department of public school music in recital at the White House. The department of violin has organized a new string quartette composed of advanced students in the department, for the purpose of playing chamber music. During the year this string quartette read the works of Haydn, Mozart, and Beethoven, and performed some of the works of Haydn and Mozart.

Needs.—This school needs a teacher of history and appreciation of music for service primarily to undergraduate students in the college of liberal arts. It needs also 15 upright and 4 grand pianos to replace worn-out instruments which have been in use for over 20 years.

SCHOOL OF MEDICINE

The school of medicine is the functional organization which represents the cooperative interests of the entire medical unit of the university without superseding the direct authority from the independent faculties to the board of trustees. The autonomous member units are the college of medicine, the college of dentistry, and the college of pharmacy. Freedmen's Hospital, an independent institution built upon grounds owned by the university, is functionally a part of the university medical unit.

COLLEGE OF MEDICINE

Outstanding events of the year.—(1) The progress made in reorganization of the surgical service in Freedmen's Hospital and the improvement in teaching of surgery under direction of the full time professor and head of the department; (2) appointment of a full time professor and head of the department of medicine effective July 1, 1937; (3) introduction of clinical teaching of tuberculosis made possible through cooperation of the District of Columbia Tuberculosis Association and Health Department; (4) grant of $300 by the National Tuberculosis Association which made possible publication of six issues of the College Health Review by the department of bacteriology, preventive medicine and public health, for the purpose of stimulating interest nationally in the health of Negro college students, with special reference to prevention and control of tuberculosis; (5) combination of the city maternal and infant welfare clinics at Freedmen's Hospital with those operated at the hospital by the Howard University staff with a view

toward improvement of service to the public and of providing better teaching facilities for medical students; and the provision of a full-time assistant in obstetrics-gynecology to supervise home deliveries; (6) provision for supervision of home deliveries by students in placing this work in charge of a full-time assistant of obstetrics, under the control of the head of the department of obstetrics-gynecology.

The addition of two residents; one each in medicine and surgery, has proved to be an important step forward. The hospital has requested a reduction of internes from 24 to 18, the other six places to be filled by assistant residents. This, if granted by the Department of the Interior, will provide the resident staff with a greater number of more experienced men and, at the same time, will improve the value of the interneship as a fifth year of medical education.

Students.—Of a total of 250 applicants, 220 satisfied minimum requirements for admission. Forty-three freshmen students were admitted. The greatest number of medical students registered at any one time during the year was 139.

During the year the school furnished instruction to 298 students distributed as follows: medicine, 138; dentistry, 38; dental hygiene, 11; pharmacy, 31; liberal arts, 41; nurses, 39.

Graduates.—Of a total official faculty of 108, 25 were full time teachers and 83 part time. One principal appointment, that of professor and head of the department of surgery was made effective July 1, 1936. A full time professor and head of the department of medicine has been appointed effective July 1, 1937.

One General Education Board Fellow completed a year of post-graduate study of tuberculosis at the Henry Phipps Institute for Tuberculosis, University of Pennsylvania, and reported July 1, 1937, for duty as part time instructor in medicine (tuberculosis). One General Education Board Fellow has been appointed to study neuropsychiatry at the University of Iowa.

There have been 18 scientific publications by members of the faculty duting the year. In addition, nine members contributed eight articles on The Health Status and Health Education of Negroes in the United States appearing in the Yearbook, No. VI of the Journal of Negro Education, July 1937.

Hospital facilities.—Since the value of clinical teaching must be conditioned by the type of care rendered to the patient, it is important that the Freedmen's Hospital, which we utilize for teaching purposes, shall be adequately provided with physical facilities, nursing service, social service, and clinical service; that the university make with the proper authorities, such arrangements as will guarantee to it unquestioned right to select the professional staff of the hospital, to establish and maintain appropriate standards of patient care and to select and control the clinical material for teaching purposes.

COLLEGE OF DENTISTRY

General trends.—The dean of the college reports that this is the best year of his administration. The slow but steady increase in enrollment continued. There was an increase also in the number of graduates. The clinic increased its work and its receipts by 14.5 percent, and "the second semester closed with more work accomplished by students and teachers than in any other one year of the present administration."

Enrollment.—The total enrollment in the college of dentistry continued gradually to increase. In 1933–34 there were 41 students; in 1934–35 there were 44; in 1935–36 there were 47 and in 1936–37 there were 49.

Oral hygiene.—The department of oral hygiene completed its third year of work. This unit is making satisfactory progress. During the current year 11 students enrolled.

Graduates.—At the commencement season 11 graduates were awarded the degree of doctor of dental surgery and 5 students in oral hygiene were awarded the certificate of graduation.

The clinic.—The total clinic income for the year was raised from $5,657 to $6,480, an increase of $823 or 14½ percent. This increase of income is an index of the increased capacity of our students to do clinic work and of the better development of the clinic as a teaching unit and a useful health-serving agency for the community.

General university health project.—Since last October the college of dentristry has been cooperating with the department of physical education of Howard University in a general health project. Each student who takes the course in physical education (and this includes practically all freshmen in the college of liberal arts) is given a complete X-ray and clinical examination of the mouth, a report of which is forwarded to the department. The final grade in physical education is partially contingent upon the completion of the treatment indicated.

Physical plant improvement.—Much of the serious overtaxing of services in the college of dentistry has been relieved by the provision of additional laboratory facilities on the ground floor, by the installation of additional laboratory benches, storage cabinets, and new hot water facilities, and by the painting of the main and ground floors. This work was done from the funds and under the supervision of the Public Works Administration. It has substantially improved the working facilities of the college of dentistry and greatly heightened the morale of the staff and the students.

Faculty.—There were 13 members of the faculty of dentistry during the year, 11 of whom were giving their full time to the work while 2 others were giving part time service equivalent to 1 full time teacher. These members were distributed as follows: Two associate profes-

sors, two assistant professors, six instructors, and one assistant. There was one major appointment. The work of improvement through further study encouragingly continued. One member returned from graduate study. Two members were on leave for further graduate work during the year while two other members of the staff have obtained leave of absence for further study during the coming year.

Needs.—The primary need of the college of dentistry is an increased number of able students. The present low enrollment is not an index of the state of need. Among the Negro population of the counry the need for dental service is acute. While there is 1 dentist in the United States to every 1,700 members of the general population there is one Negro dentist to each 3,389 of the Negro population. In the States of the South the need is so great that in a State like Mississippi there is only 1 dentist for each 34,818 of the Negro population. (2) The faculty needs one additional full-time teacher. (3) The completion of the renovation begun, according to the original plan, involving (a) the installation of insects' screen, (b) minor structural changes on the main floor, (c) completion of renovation in basement. (4) The reequipment of the clinics throughout. This will involve the installation of units, chairs, and X-ray equipment.

COLLEGE OF PHARMACY

Curriculum.—The curriculum in pharmacy now in force is the new 4-year curriculum designed to meet the requirements of the American Association of Colleges of Pharmacy. The graduates of 1937 were the first to be awarded degrees on the basis of this new curriculum.

Registration.—Thirty-one students registered for all classes at the beginning of the past year. Fourteen were freshmen.

Graduates.—There were three graduates from the college of pharmacy who received the degree of bachelor of science in pharmacy.

Faculty.—The faculty for 1936–37 has been the same as for 1935–36, with two full professors, two instructors in pharmacy, full time, and one instructor, part time.

Equipment.—Scientific equipment of this college is quite adequate for the present and compares favorably with that of other small colleges. Improvements and additions will be needed in the near future, as the college develops and enrollment increases. Enlarged space in the library is greatly needed for students and teaching staff.

SCHOOL OF LAW

General trends.—The new location of the school of law on the main campus of the university has proved eminently satisfactory to teachers and students, and has been highly commended by the leaders in the profession.

Enrollment.—There were 72 students in the school of law during the school year 1936–37. This represents an increase of 10 or 12½ percent over the enrollment of 1935–36 and doubles the enrollment of 1933–34. These 72 students came from 38 colleges and universities in 21 States and 3 foreign countries. This represents an expansion of the base of supply by nine institutions and one State.

Enrollment again increased from 62 to 72. The sources of enrollment broadened their base from 23 to 24 States (21 States and 3 foreign countries) and from 29 to 38 colleges and universities. The high caliber of entering students continues to be impressive.

Of these 72 students 29 were new entrants. Thirty-one, or 71.4 percent of these 29 new entrants had done 4 or 5 years of college work.

The school of law is thus not only attracting an increasing number of new students, but is steadily widening the area of confidence among supplying institutions, and attracting their high calibered students.

Graduates.—Seventeen graduates received the degree of bachelor of laws in 1936–37 as compared with five in 1935–36. This is the largest graduating class since the establishment of the full-time day school of law.

Since the last annual report was submitted graduates of the Howard University school of law have successfully passed bar examinations and have been admitted to the practice of law in the following jurisdictions: District of Columbia, Michigan, New York, New Jersey, Oklahoma, Virginia, and West Virginia.

Faculty.—The faculty of the school of law is now composed of eight teachers, distributed in rank as follows: professors, two; associate professors, two; assistant professors, four; lecturers, one. Four of these teachers gave their full time to the work and four gave part time. One major appointment of the faculty was made during the year and one member of the staff resigned to accept the appointment of the President of the United States to a judicial position in the Virgin Islands.

The library.—The circulation during the year increased from 2,043 to 3,657. The total attendance for the year was 3,940 persons.

Number of volumes now in the library, 17,076; received on purchase, 1936–37, 323; as gifts, 1936–37, 535; added as bound periodicals, 1936–37, 90; periodicals received on purchase, 1936–37, 34; as gifts, 1936–37, 16.

Outlook and needs.—When the 3-year full-time day school of law was first established, it was clearly an experiment. From the point of view of number of students, caliber of students, and wide confidence of supporting institutions, the experiment is a success and has a hopeful future. The work done by the school is clearly an urgent necessity for the colored people of the United States are heavily undermanned in legal leadership. While they constitute an approxi-

mate tenth of the population they have only 1,250 out of 160,000 members of the legal profession—less than 1 percent. A first-class law school serving this needy tenth of the population is manifestly a great national service. The major needs at present are money for an addition full-time teacher, funds for books, and for scholarships for gifted, needy students.

SCHOOL OF RELIGION

Financial support.—The school of religion receives no support from Federal funds. Its work is maintained wholly by income from endowment and gifts from private sources.

General trends.—During 1936–37 the school of religion completed the transition to an entirely graduate basis. This year's enrollment was entirely graduate in character and the numbers were decisively encouraging. Work was also established leading to the degree of master of arts in the graduate school The library collection increased from 1,443 to 2,100 volumes.

Enrollment.—In the first semester of the year 1936–37, 26 students were enrolled in the school of religion. During the second semester there were 22 students.

Graduates.—Nine students were graduates from the school of religion on commencement day. Seven received the degree of bachelor of divinity and two received from the graduate school the degree of master of arts in religious education.

The faculty.—The faculty of the school of religion for the current year consisted of nine members, two of whom were giving their full time to the work and seven were giving part-time service equivalent to the full-time service of four, making a full-time equivalent teaching staff of six persons. This staff was distributed as follows: professors, three; instructors, five; lecturer, one. Two members of the staff returned from service in India where they went as representatives of national religious organizations. Members of this staff published two books and three scholarly articles during the year.

Outlook and needs.—When 4 years ago the trustees undertook to establish the interdenominational school of religion on a purely graduate basis, the project was clearly an experiment. From the point of view of students it now appears that the experiment will surely succeed. The outstanding needs of the school are now 3: (1) funds to provide 4 additional full-time teachers, (2) funds to provide a substantial increase in the number of books available in the library, and (3) funds to provide an adequate and attractive building. The present wooden structure is both inadequate and unattractive. Toward this project the university now has $18,000, which came as gift from John A. Cole, an honorary member of the board of trustees. Mrs Franklin D. Roosevelt made an additional contribution during the current year.

THE LIBRARY

The new building.—The outstanding event of the year was the beginning of construction of the new founders library, for which $1,105,000 of Public Works Administration funds was appropriated by the President of the United States in November.

Moorland Foundation.—The total number of items in the collection now totals 10,354, which includes 6,119 books, 3,654 pamphlets, 382 bound periodicals, 199 masters' theses. The rate of purchase and gifts has slowed considerably. Whereas 1,021 items relating to the Negro were purchased in 1935–36, only 139 books and pamphlets were purchased in 1936–37.

Accessions and cataloging.—New accessions for the year total 2,851 purchased books, 1,406 gift books, and 696 new bound periodicals, or a total of 4,953 accessions. There were cataloged 2,911 titles, or 3,872 books. The cataloging of all bound periodicals in the main library was begun with 43 titles, or 723 volumes completed.

Veterans' Bureau books.—From this collection 1,846 books were distributed. After distributing for 10 years, more than 140,000 books, or about 85 percent of the original number received, this service feature has been discontinued.

Size and circulation.—The number of books now accessioned in the libraries of the university totals 106,360. Of these 10,775 are in the school of medicine, 19,478 in the school of law, 2,143 in the school of religion. During 1936–37 a total of 5,901 books was accessioned, a total of 769 periodical titles received, and a total circulation of 114,446 recorded.

Immediate needs.—The immediate needs of the library are (1) $300,000 to secure books and periodicals, to purchase the available collections of books on Negro life for the Moorland Foundation, (2) an enlarged staff to care for the work in the new building, and (3) professional classification and salary scale for the staff.

BUILDINGS AND GROUNDS

Buildings under construction.—The following table shows the list of building projects in process during the year ended June 30, 1937. These buildings were going forward under the funds and direction of the Federal Emergency Administration of Public Works.

Building Projects in Process, Year Ending June 30, 1937

No.	Description of project	Date authorized	Total appropriations
2	Construction and equipment of a chemistry building	May 4, 1939	$626,300.00
5	Construction and equipment of a library building	Feb. 14, 1931	1,105,000.00
8	Construction and equipment of a heat, light, and power plant	Feb. 17, 1933	555,576.99
9	Construction and equipment of dormitories for men	Oct. 4, 1935	525,000.00

The status of the above listed projects as at June 30, 1937, was as follows: Project No. 2—chemistry building. Building completed. Presented to the university by the Secretary of the Interior and dedicated by the President of the United States in October, 1936. Building in use throughout the school year 1936–37.

Project No. 5.—Construction and equipment of a library building—President of the United States set aside an additional appropriation of $305,000 for this project, in November 1936. Contract was let and work had progressed above the first floor. Cornerstone was laid in June by the Honorable Oscar L. Chapman, Assistant Secretary of the Interior and Senator Robert La Follette.

Project No. 8.—Construction and equipment of a heat, light, and power plant—project completed—test practically completed. Certain minor adjustments were being made prior to the final acceptance of the project by the Federal Government.

Project No. 9.—Construction and equipment of dormitories for men. First bid proposals received. Completed plans and specifications rejected by the Secretary of the Interior on account of the abnormally excessive cubic foot cost. Preparation is being made for the advertising for new bid proposals with the expectation that wider competition will produce estimates within the appropriation.

FINANCES

Assets.—The total assets of the university at June 30, 1937, were $8,262,481.45, exclusive of the unexpended balances of government appropriations for the chemistry building, the heat, light, and power plant, the library and the men's dormitories. Of the total assets $1,095,881.24 represents assets in the physical plant extension fund, made possible through private gifts from the General Education Board and the Julius Rosenwald Fund; $959,593.54 represents endowment (an increase of $49,581.18 over the previous year); $5,978,237.08 represents plant fund assets (an increase of $197,653.49 since the last report) exclusive of the unexpended balances of government expenditures for buildings, as indicated above. The remaining $228,769.59 represents assets of the current fund.

Income and expenditures.—The total income for the year 1936–37 was $1,427,441.31, including current and capital funds. This represents a gross decrease of $265,274.95 under the total income for 1935–36. The total income for current purposes, however, was $1,115,-351.34, or an increase of $91,232.74 over the income for current purposes for 1935–36. There was an increase of 6.3 percent in the income from private sources and a corresponding decrease of 6.3 percent in the proprotion of income from government sources.

The total expenditures for all purposes, current and capital were $1,411,240.86, representing a gross decrease of $281,475.40 under the

total expenditures for 1935–36. The total current expenditures for 1936–37 were $1,099,150.89, representing an increase of $73,667.39 over the current expenditures for 1936–37.

Balanced budget.—The budget was kept at balance and there was an excess of income in the amount of $16,200.45 available toward the retirement of the accumulated deficit.

Audit and supervision.—The auditing of all the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress and by the Public Works Administration were expended under the supervision of the Secretary of the Interior.

FREEDMEN'S HOSPITAL

Dr. T. Edward Jones, *Surgeon in Chief*

IN submitting his first annual report, representing, however, but 7 months of his official incumbency, the surgeon in chief pays a high tribute to his predecessor, Dr. William A. Warfield, who held the position for more than 35 years.

The statistical data for the year shows that there were 5,587 indoor patients under treatment, an increase of 524 over the previous year. Of these 880 were private or pay patients, 2,705 were District of Columbia indigents, and 2,003 were United States indigents. Of the total number under care 329 died. The remainder were discharged either as cured or improved to the extent that hospitalization was no longer necessary. Eight hundred and twenty-eight babies were born in Freedmen's Hospital. One thousand eight hundred and thirty-five major operations were performed. Eight thousand three hundred and thirty-three emergencies were treated. One thousand three hundred and forty-one ambulance calls were made. Thirty-six thousand, and fifteen visits were made to the outdoor clinics.

PERSONNEL NEEDS

The most urgent need is an increase in the nursing personnel. At many periods throughout the day 1 nurse is compelled to care for 24 patients, whereas it is a requirement by the District Board of Nursing that under normal circumstances 1 nurse should be assigned to every 4 patients, and the tours of duty should be only 8 hours. Because of this shortage of nurses the hospital admissions have been reduced in order to give the patients a semblance of care approaching efficiency.

An increase in the clerical force is recommended as absolutely necessary if proper hospital records are to be kept and the administration of the hospital efficiently maintained.

The handicap of the social-service department grows more acute as additional demands are daily being made, and two additional social-service workers are needed if this department is to continue its function

efficiently, providing social case study and furthering the professional treatment on an individual basis.

The housekeeping and dietary departments are woefully undermanned. Six additional orderlies and six additional maids are required if the hospital is to be kept in a proper state of cleanliness.

In the dietary department, because of a shortage of cooks, it frequently happens that a dishwasher has to assume the duties of a cook. Four additional cooks, two utility men, and two dishwashers are needed.

With the present force of ambulance drivers, it is not infrequently that a driver is required to work 12 hours per day, if the ambulance is to respond to calls received. An additional driver is requested. The same long hours apply to the telephone operators, if the service is to be covered without the present use of orderlies and maids who have only a limited experience with telephone requirements. As a result of their inexperience innumerable complaints are received from the public, to say nothing of the retardation of the efficient handling of official business.

The demands made upon the drug department have more than doubled since the present space and personnel were originally set up. This means that additional space must be provided and two assistant pharmacists added in an effort to cope with the ever-increasing-requirements.

PHYSICAL ASPECTS

Attention is directed to the physical needs of the hospital which are inadequate in every phase. All painted areas are sadly in need of repainting. Roofs are leaking in many spots, some of which are directly over the patients' beds. These beds are evacuated in the presence of heavy rains. It is further set forth in the report that the plumbing, some of which is more than 30 years old, offers a distinct hazard. Any day major defects may assume such proportions that hospital activities will have to suspend.

Repairs to roadways are most forcibly recommended.

COLUMBIA INSTITUTION FOR THE DEAF

Percival Hall, *President*

DURING the fiscal year there were under instruction in the advanced department of the institution, known as Gallaudet College, 87 men and 54 women, a total of 141, representing 38 States and Canada. This is a decrease of four as compared with the preceding year. In the primary and grammar department, known as the Kendall School, there were under instruction 38 boys and 36 girls, a total of 74. This is an increase of five as compared with the preceding year. Of the total in this department 69 were admitted as beneficiaries of the District of Columbia. There were admitted to the institution 42 males and 28 females; discharged 35 males and 18 females.

The courses of instruction were practically the same as in the past year with the addition of a course in the principles of teaching for the seniors.

There has been practically no advance made in the building program, which calls first for a memorial building to Edward Miner Gallaudet, to house library, printing office, new laboratories, recitation rooms, etc. There are needed besides extensions to old laboratory building, present gymnasium, and new units for housing pupils of the primary department as well as an additional cottage for use of an instructor. No additional buildings have been provided for the institution since 1918, though in the meantime the number of students and pupils has increased 25 percent. Better fire protection should be provided by laying of larger water main and installation of modern fire hydrants.

An interesting problem on the most exact method of communication between teacher and pupil is being studied at our institution with funds provided by the National Research Council. There are other problems that should be carried on for the benefit of the education of deaf pupils throughout the country, and a provision should be made for a permanent research worker.

A regular meeting of the Convention of American Instructors of the Deaf was held at New York under the auspices of Columbia University and was attended by a number of members of our faculty who took part in the program. A special meeting of the Conference of Executives of American Schools for the Deaf was also held at this time, and the president of the institution laid before this meeting recommendations for work along lines of improving the education of the deaf.

The total receipts, including balance on hand July 1, 1936, were $176,691. Expenses were $174,196. A reserve of $502 was returned to the treasury, leaving a balance of $1,993. The invested funds of the institution in the hands of the treasurer total in value approximately $85,000.

On presentation day, June 5, six degrees of master of arts in the normal department were granted, nine degrees of bachelor of arts in course, and five degrees of bachelor of science in course were conferred. The honorary degree of master of arts was conferred on three former graduates of Gallaudet College who are now well known educators of the deaf, namely, Henry J. Stegemerten, principal, School for the Colored Deaf and Blind, Overlea, Md.; Odie W. Underhill, instructor, School for the Deaf, Morganton, N. C.; and Nathan Zimble, principal, School for the Deaf, Little Rock, Ark.

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