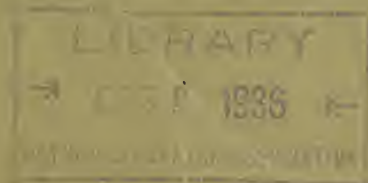
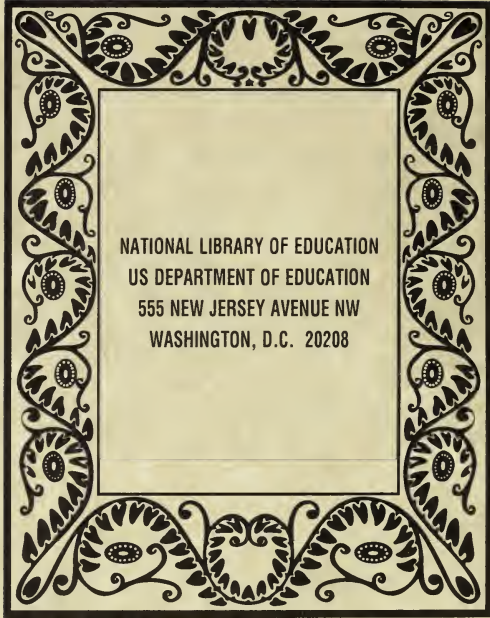


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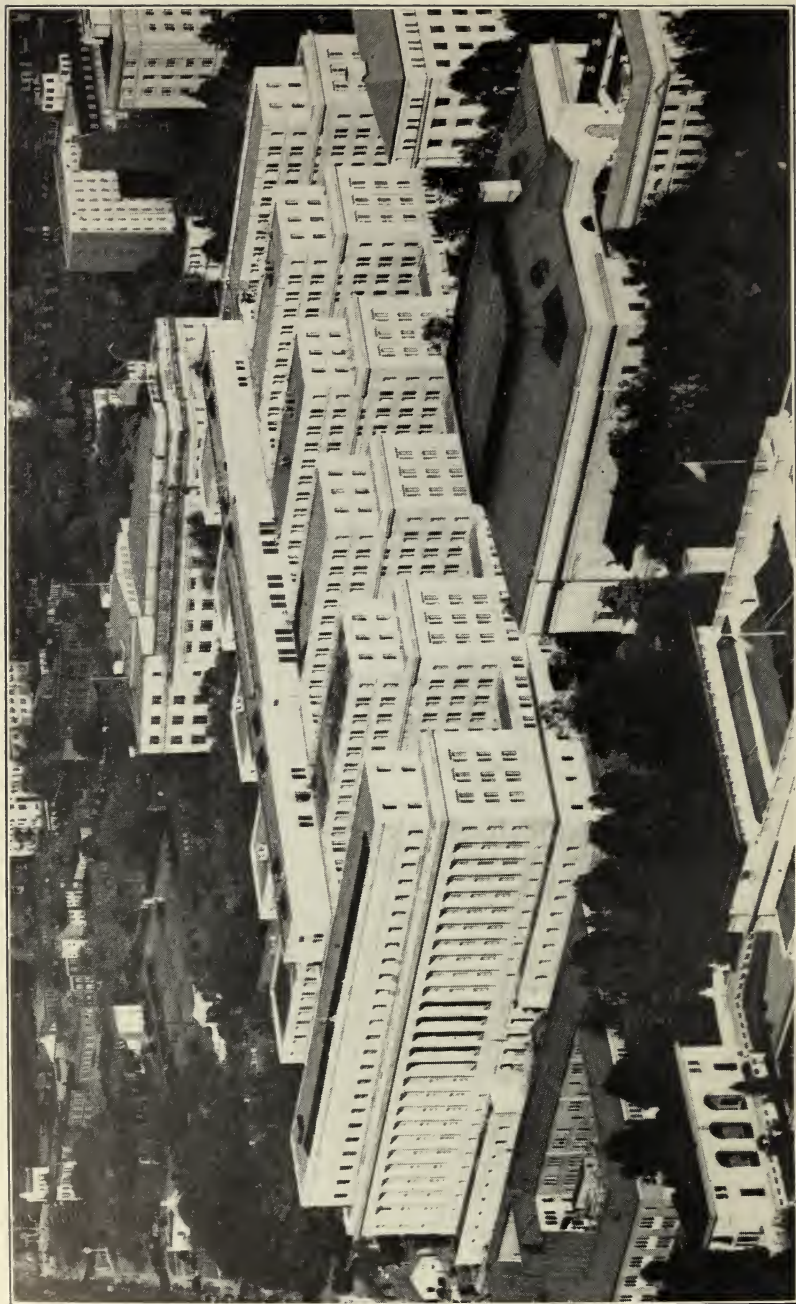
FOR THE FISCAL YEAR ENDED JUNE 30

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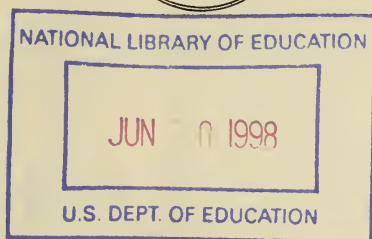


THE NEW DEPARTMENT OF THE INTERIOR BUILDING.

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR



FOR THE FISCAL YEAR ENDED JUNE 30
1936



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United States. Dept. of the Interior.

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: I have the honor to transmit the annual report of the Department of the Interior for the fiscal year ended June 30, 1936.

The work of the Department of the Interior is concerned predominantly with the custodianship of a vast national estate. More than 95 percent of the annual and permanent appropriations made for the work of the Department during the fiscal year 1936 are for taking an inventory of the natural physical resources of the United States, for undertaking the wise development and use of such resources, and for the education, health, and recreation of the people of the nation. It is a department of conservation—conservation of those physical and human resources on which depend the future of America.

Water, land, and minerals—these three comprise the base for a program of conservation of natural resources. Knowledge of their existence in quality, quantity, and location, followed by wise development of water resources, prudent use of land and its products, and orderly exploitation of mineral deposits, without waste, will insure a sound and permanent foundation for the material welfare of the citizens of the United States.

A RECORD FOR RECLAMATION

The advancement made during the year in the conservation of the waters of the arid West through the construction program of the Bureau of Reclamation by far outdistanced that recorded in any previous year. With the expenditure in the fiscal year of \$52,336,329.32, operating projects were improved, new projects were completed for the protection and the creation of agricultural communities in the arid States, and several worthy, self-liquidating projects were launched. The employment provided in this undertaking was an important factor in advancing recovery throughout the West.

Boulder Dam was completed. The treacherous Colorado River was permanently harnessed for the benefit of the people of the Pacific Southwest. The threat of flood and drought was forever removed from the Imperial Valley of California.

In addition, three other dams, smaller, but in their districts not less important than Boulder Dam, were completed and put in service. Work progressed satisfactorily on nearly a score of dams designed by the Bureau of Reclamation to regulate and make useful the waters of as many streams from Washington to Texas.

But new and additional construction does not tell the whole story of reclamation for the year. It was a profitable and successful period for the operating projects. Reservoirs in use caught ample

waters for irrigation. Crops were good and crop prices were satisfactory.

Even with a new and severe drought developing as the fiscal year drew to a close, the prospects for the summer of 1936 on Federal reclamation projects were most encouraging. With two exceptions, reclamation reservoirs filled as the spring thaws ran off the mountainous watersheds. However, the shortages in prospect for these two projects apparently would leave them in no danger of disastrous crop losses. Proration of water would be necessary, but the areas to be served still would be in a position incomparably better than the unprotected dry regions that surrounded them.

The fiscal year of 1936, by its actual results, gave a new demonstration of the benefit to the West and the nation of our national reclamation policy.

OTHER NOTEWORTHY ACHIEVEMENTS

Among the achievements of this department during this administration was the successful organization and operation of the Grazing Division. Set up to curb overgrazing on public lands, this Division has operated differently than most Government bureaus. A system of self-regulation by stockmen under Federal supervision is working out to the benefit of some 142 million acres of public land as well as to the satisfaction of the users of the public domain. After a series of public hearings throughout the western grazing country, with the General Land Office, the Geological Survey and local stockmen cooperating, grazing districts were set up with local directors, and the program of conserving grazing land is now well under way.

The long period of exploitation of the American Indian has ended. The Wheeler-Howard Act made mandatory a complete change in Indian policy. Until this reform, two-thirds of the 139 million acres owned by Indian tribes in 1887 had been lost, tribal bonds had been disrupted and an increasing number of Indians had been rendered landless. The Wheeler-Howard Act prohibits the sale of Indian lands except to the tribes. It provides for consolidation of Indian lands. It sets up a process which enables Indians voluntarily to return their individual landholdings to a tribal status.

There is no compulsion upon any Indian tribe or reservation to accept the benefits of the Wheeler-Howard Act. Each tribe is given the privilege of deciding by an election whether it wants to accept or reject the advantages offered. Thus far, the great majority of tribes have enthusiastically voted for the new policy.

Since the death of the petroleum code, the Connally Act has made it possible to check overproduction of this valuable and irreplaceable resource. The Petroleum Conservation Division now is carrying on this work. This administration is the first to undertake any Federal regulation of petroleum.

Consolidation of all Federal park activities under the National Park Service by Executive order has brought about, for the first time, a unified administration of the various national parks and monuments. The Congress has empowered the Secretary of the Interior to designate outstanding historic sites for preservation by the Nation. A Branch of Historic Sites and Buildings has been set up in the National Park Service under an assistant director.

THE INVENTORY OF LAND, WATER, AND MINERALS

Surveying and platting, examination and classification of the public and Indian lands; geologic and topographic surveying and mapping of the country; examination of the geologic structure, the mineral resources and products of the national domain; gaging streams and determining the water supply of the Nation and reporting on the best methods of utilizing water resources; and making statistical reports on the mineral resources of the United States and of the world have long been functions of the Department.

An inventory of the natural resources of America is being made. The task is great, appropriations are relatively small, and the work proceeds slowly. Since we must know what and where our resources are before a comprehensive plan for their utilization can be made and, since intelligent planning must precede wise development and prudent use in the interest of conservation, there should be a speeding up of stock taking so that it will be completed within a short span of years. Segments of an accelerated program of inventory taking have been authorized by the Congress, but so far no appropriation has been made.

DEVELOPMENT OF WATER RESOURCES

Selection of sites for reservoirs and other hydraulic works necessary for the storage and utilization of water for irrigation and the prevention of floods and overflows; the development of water-supply systems for domestic use, power, irrigation, and other beneficial uses on Indian lands or for the Indian people; and the construction of irrigation systems and regulating reservoirs, often with incidental development of water-power in the public-land States constitute a major function of the Department and have played an important part in the upbuilding of the West by the pioneers and their descendants.

Private development of water resources affecting the public lands for irrigation, domestic purposes, power, mining, and other beneficial uses, under the auspices of the Department, has paralleled the development through public funds, although since 1920 the Federal Power Commission has had jurisdiction over the major portion of the new developments of water powers, in cooperation with this and other interested departments.

The most spectacular of the accomplishments of the year was the completion of Boulder Dam, an unprecedented event in the annals of engineering. No longer can floods from above Grand Canyon threaten devastation to the fertile lands and costly improvements of the Yuma and Imperial Valleys. The turbulent waters of the Colorado will be stored in a peaceful reservoir, Lake Mead, whence, as needed, they will be discharged to develop hydroelectric power, to irrigate hundreds of thousands of acres of arid lands and to augment the domestic water supply of the metropolitan district about Los Angeles.

PROGRESS OF GRAND COULEE

Substantial progress has been made toward the completion of two other vast projects for the utilization of the water resources of the

West. The foundation abutments of Grand Coulee Dam, key structure of the Columbia Basin project in the State of Washington, have been built, and surveys and plans for the Kennett and Friant Reservoirs of the long-dreamed-of Central Valley project of California are well under way. Many other surveys, investigations and construction projects for the further conservation and use of the water resources of the public lands have been completed or are in progress. Proof of the soundness of the policy of reclaiming the arid lands of the West lies in the results obtained from Interior Department projects. In 1936 about 2,900,000 acres of land raised irrigated crops of a value of nearly \$107,000,000.

Water supplies of the public domain have been supplemented by the addition of 2,240 acres to the public water reserves; by the acquisition of 100 wells drilled by the Utah Drought Relief Commission; by the drilling of 26 wells and the constructing of 152 water holes and small stock reservoirs and the laying of 27,000 feet of pipe line as part of an emergency conservation work program; and by the conditioning as water wells of 3 wells drilled for oil or gas.

Supervision was exercised over 172 power projects under permit or grant by the Secretary of the Interior and 145 projects of the Federal Power Commission.

UTILIZATION OF MINERAL RESOURCES

Until recent years the national policy for mineral resources of the public lands involved only exploitation by private interests. The leasing of restricted Indian lands for minerals has long been the practice, and within the last two decades Congress adopted a policy of leasing public lands for the production of coal, oil and gas, oil shale, phosphate, potash, sodium, and, within limited areas, of sulphur, gold, silver, and quicksilver. This has brought to a practical end private acquisition of lands containing these important minerals.

The act of August 21, 1935, constitutes an important forward step in the leasing policy for oil and gas that will reduce materially speculative operations using the public reserves as a base. It will also provide for a more business-like development of the oil and gas resources of the public lands, and will result in a return to the Government of a proper share of the value of the mineral production. Under this act, the proceeds of public-land mineral development will be returned to the States from which they are produced, in part, directly, for the support of schools and roads and in part, indirectly, through Federal construction of irrigation systems. Helium, alone, is reserved for exclusive exploitation by Federal agencies for governmental purposes. Mineral production under the supervision of the Department in 1936 had a value of about \$70,000,000.

Supervision of the exploitation of publicly owned mineral resources to assure an orderly development and the maximum practicable ultimate production without waste and with due regard to the safety and welfare of miners and others is an important conservation activity of the Department.

COORDINATION OF OIL AND GAS CONSERVATION

On March 31, 1936, there was established in the Department a Petroleum Conservation Division to assist in coordinating all oil and gas conservation activities of the Department as well as to supervise operations for the control of interstate and foreign commerce in oil and oil products under the act of February 22, 1935 (49 Stat. 30).

Research in production and in processing methods, dissemination of information with respect thereto, and education in mine-safety rescue and first-aid methods conducted by the Department is an allied activity of great importance and value to the mineral industries.

One hundred and ten patents to mining claims were issued in 1936 under the lode and placer laws and 270 contests regarding such claims were disposed of, showing that interest still persists in prospecting for and developing the metalliferous minerals of the public domain. Under the mining laws a claim may be taken up and all the minerals therein mined and disposed of without notice to the Department. Only when an application for a patent is made is the claim made of record in the United States Land Office and then, if discovery has been made, title to the land passes from the United States on payment of a nominal fee. Particularly now that most of the land of the public domain is dedicated to some public purpose or is under some system of administration, is such a method of handling mining claims unbusiness-like and contrary to the public interest. Some simple system of permitting the discovery and development of minerals under a prospecting permit and lease subject to supervision that would protect the public interest without hampering the operations of the permittee or lessee would mean a forward step in mineral-land administration. Minerals still on Indian lands are subject only to a lease under a system that works well. Its extension to the reservations of the public domain is recommended.

INCREASE IN MINERAL-LEASE BUSINESS

The mineral-lease activity on the public domain, which normally grows at the rate of about 10 percent a year, showed an increase of about double that amount both in production and revenue in 1936. Receipts for the year from mineral leases aggregated about \$4,444,000 of which 37½ percent were payable to the States in which the producing areas were located and 52½ percent were covered into the reclamation fund. It is believed that values fully as great were saved through the activities of the supervisory forces cooperating with the operators. This is practical conservation.

Of unusual importance are oil and gas. About 15 percent of the Nation's petroleum reserves are believed to be on the public domain, but production has been held down to about 3.8 percent of the total for the United States during a year of continued surplus of producible oil.

Noteworthy progress has been made during the year in the promotion of unit operation for fields in which lands of the United States are an important factor. By the end of the year no less than 800 such plans had been filed for consideration. Twenty of these were approved and are now in force, and 186 were withdrawn or rejected.

The remainder were in various stages of consideration or revision. The object of unitization is that of more properly conserving the oil and gas resources involved, and it is the consensus of opinion in the industry that greater ultimate production at less cost will be the result of changing from individual operation of the several holdings in a unit field to operation under a cooperative or unit agreement. State control of the quantity of production has been materially strengthened during the year by a denial under Federal law of interstate or foreign commerce in oil produced contrary to State laws and regulations.

Production of oil and gas from Indian lands amounts to between three and four percent of the nation's total, while production from naval petroleum reserves, also under supervision of the Department of the Interior, amounts to about 0.4 percent of the aggregate. Though retention of oil in the ground is the national policy with respect to the naval reserves, some production is forced by operations on interspersed private lands. Such production is diminishing year by year.

Production of coal on the public domain increased about 12 percent during the fiscal year 1936 and constituted about 1.1 percent of the output for the United States. Much effort is put forth to secure the adoption of plans and methods that will assure the maximum ultimate production. Successful efforts of the Department in behalf of safety are attested by the fact that the death rate from explosives in mines has been reduced 90 percent in the last 30 years; that during the last 5 years mines in the United States have had the lowest accident rate in their history; that the accident rate in mines under the supervision of the Department is materially lower than in mines not on Government lands; and that of 51 awards to bituminous coal mines or operators by the Joseph H. Holmes Safety Association for the calendar year 1935 two were to departmental lessees. Cooperation of operators in accomplishing these results is gratefully acknowledged.

Further development of potash mines on lands of the United States until they are capable of supplying the entire needs of the country is worthy of special mention. Production on Indian lands of lead to the extent of 3.1 percent and of zinc to the extent of 10.4 percent of the Nation's total is also an item of importance.

MINING AND REFINING RESEARCH

Research on mining and refining methods and practices in the fiscal year resulted in the approval of 18 devices for use in mines and the addition of 25 new explosives and 3 new models of a blasting device to the permissible list; the development of a new methane indicator; the perfecting of a new method of extracting manganese electrolytically; the demonstration of several methods of treating domestic chromite ores; the development of a method of gaging capacity of gas wells with minimized waste; the improvement of methods of purifying clay, feldspar, and other low-grade nonmetallics by froth flotation; the perfection of a method of determining minute quantities of benzol in blood and urine; and the discovery that silica is an important factor in caustic embrittlement in steam boilers. Eight thousand samples of coal and coke were analyzed. Bearing strength

and plasticity of potash salt, applicable particularly to mines now operating on Federal land, was determined; various substances for use in rock-dusting mines were tested; studies of Diesel locomotives were concluded; and helium was produced and furnished for the spectacular stratosphere flight conducted by the National Geographic Society and the Army Air Corps.

LAND SURFACE—ITS PROTECTION AND USE

The Federal landed estate outside of Alaska has dwindled from a billion and a half to a little more than 400 million acres, or about a fifth of the total area of the 48 States and the District of Columbia. Thirty-five percent of this remainder is or will be included in grazing districts, 34 percent is within the existing boundaries of national forests, more than 14 percent is in Indian reservations, over 2 percent, together with about an equal area donated by States and private citizens, is in national parks and monuments, over 7 percent is in military, naval, and miscellaneous reservations or in areas withdrawn for public purposes, and nearly 7 percent is unappropriated public land withdrawn from entry but available to satisfy outstanding grants and for other purposes.

Further grants of public lands under existing legislation are virtually at an end, although there remain for settlement outstanding grants and unperfected public-land entries aggregating between 15 and 20 million acres. The final disposal of lands in these categories and the exchange of other lands and the consolidation of holdings will present problems for solution for a number of years. Administration of the remaining national estate under enactments by Congress constitutes the principal public-land activity now in prospect. The four main questions of administration of nonmineral lands are concerned with forage cover, forest cover, parks, and Indians. The problems involved should be coordinated to the greatest possible extent in order that the estate as a whole shall be of maximum benefit to the Nation.

The administration of the Indian lands has ever been an important item in the Department's guardianship of the American aborigines. The development of a system of Federal national parks and monuments of outstanding scenic, recreational, and historic value has been and is the work of the Department of the Interior. After more than 50 years of advocacy by this Department, the Congress, in 1934, adopted a program of administration, conservation, and rehabilitation for the vast area of public grazing lands under the jurisdiction of the Secretary of the Interior. The only major land-administrative activity that is not now, though it was originally, within the jurisdiction of this Department is concerned with the lands within national forest boundaries. According to reports of the Forest Service, more than half the area within these boundaries is not available as a source of merchantable timber and is considered to be chiefly valuable for grazing and the maintenance of a useful forage cover. The administration and use of such lands should be coordinated or combined with those of the far greater area of lands of similar general character in grazing districts under the jurisdiction of the Department of the Interior.

TWO NEW NATIONAL PARKS

Visitors to national parks and monuments for the travel year that ended September 30, 1935, numbered 7,676,400, an increase of 21 percent over the preceding period. The new Shenandoah (Virginia) and Mammoth Cave (Kentucky) national parks were admitted to the system. Areas of several other national parks and monuments were increased, and 11 new national monuments and other historic areas were conditionally authorized by Congress. Allocation of \$705,000 from an emergency fund was made for the acquisition of lands within the area of the proposed Isle Royale National Park in Michigan, on which to provide work for C. C. C. camps in cooperation with the Department of Conservation of the State of Michigan. A nation-wide survey of historic buildings and sites and a comprehensive study of public parks and recreational area programs and possibilities in the United States were initiated. Forty-six recreational demonstration projects in 24 States, readily accessible to 30 million people, were undertaken in cooperation with agencies outside of the Department, and nearly half a million acres are being acquired for this purpose.

The land-recording activities of the year included the receipt of original entries, selections, and filings for 425,834 acres; final entries for 1,937,529 acres; issuance of patents for 2,216,684 acres and certification of 253,903 acres under State grants—leaving 16,862,271 acres in unperfected entries at the close of the year. Under the Taylor Grazing Act there were received 19 applications for exchange of private lands, 261 for that of State lands, and 266 applications for sale and 2,255 for lease. All this in addition to applications for grazing rights within grazing districts.

EFFORTS TO SAVE THE PUBLIC RANGE

The grazing act of June 28, 1934 (48 Stat. 1269), as amended on June 26, 1936, sets aside 142 million acres of public land to be divided into grazing districts and provides for their orderly use, improvement, and development in order to stabilize the stock industry on the public range. By the end of the fiscal year 1936, 37 such districts, including a gross area of about 200 million acres, of which about 80 million acres were public land, had been created and more than 15,000 licenses for the grazing of more than 8,396,000 animals had been issued. Nominal fees of 5 cents per month for cattle and horses and 1 cent per month for sheep were adopted for present purposes, and \$48,271 in fees were collected during the year. Thus were initiated control of the public range and conservation of its soil and forage cover in the interest of the stock industry and for all useful purposes that the range lands might serve.

The aid of the stock industry itself in initiating, developing, and administering this wholesome national policy was assured by the election from the stockmen of 523 district advisors to work with officials of the Department. A program of range improvement was undertaken involving water development; construction of trails, bridges, fences, and cattle guards; control of rodents and insect pests; eradication of poison plants; protection against erosion as well as other work designed to make the range more useful. With the in-

crease of the public-land area available for grazing districts to 142 million acres by the act of June 26, 1936, it is anticipated that upwards of 400 million acres will be included within the boundaries of grazing districts within a year on request of the users of the range. This area, together with some 80 million acres of grazing lands within national forests, will make nearly half a billion acres capable of orderly regulation for grazing.

HUMAN WELFARE

The Department of the Interior is charged with responsibility for an internationally known hospital for the treatment of mental diseases, a hospital administered and operated by a staff almost exclusively of the Negro race, and other hospitals for care of the Indians that have a total capacity of about 5,000 beds.

In the field of education the Department maintains an institution for instruction of the deaf, including a department that offers the only educational program in the world for the higher education of the deaf, and a department for the training of teachers of the deaf; a university for the higher education of the Negro race; and many day schools, boarding schools, vocational schools, and colleges for the instruction of the Indians.

The Department, through the Office of Education, also conducts research into and disseminates information regarding foreign and domestic methods and systems of education, promotes vocational education, and administers substantial grants to educational institutions for the benefit of agriculture and the mechanic arts.

Under the heading of human welfare should be mentioned mine health and safety activities and the widespread recreational facilities afforded by public park and parkway systems. An earnest effort was in progress during the year to expand and coordinate all existing public facilities for recreation and outdoor sport. In 1936 literally millions of the citizens of the United States enjoyed fishing, hiking, horseback riding, boating, swimming, skiing, mountain climbing, and other outdoor activities in natural wilderness areas of unusual importance administered by the Department of the Interior. These recreational areas are supervised by employees trained to educate the visitors concerning the birds and animals, plants and trees, as well as on matters of historical, geological, and archeological interest.

NEW DEAL FOR INDIANS

Just prior to the beginning of the fiscal year the Congress passed the Indian Reorganization Act, already referred to, which makes provision for the economic rehabilitation of the Indian, for the organization of the Indian tribes so as to manage their own affairs, and for the civic and cultural freedom and opportunity of the Indian. Outstanding among the social-welfare activities of the year has been the progress made under and in line with this act. More than two-thirds of the Indian tribes have accepted this legislation, and constitutions for the governance of tribal affairs have been approved or are in process of being perfected. Already profound changes are taking place in Indian communities through the increased interest of the Indian in his social and economic affairs.

TERRITORIES AND ISLAND POSSESSIONS

The Division of Territories and Island Possessions exercises supervisory functions in connection with the Federal Government administrations of Alaska, Hawaii, Puerto Rico, the Virgin Islands, Baker, Howland, and Jarvis Islands; also the Alaska Railroad, Alaska Road Commission, Alaska Reindeer Service, Alaska Insane, Puerto Rico Hurricane Relief Loan Section, Hawaiian Homes Commission, the Virgin Islands Co., and the Government-owned Bluebeard Castle Hotel, St. Thomas, Virgin Islands.

Through the Puerto Rico Reconstruction Administration, Puerto Rico Hurricane Relief Loan Section, the Virgin Islands Co., Alaska Rural Rehabilitation Corporation, and the Hawaiian Homes Commission, long-range programs and policies for the improvement of economic and social conditions in the respective territories and possessions are being effectively carried out under the general supervision of the Division.

A comprehensive reconstruction program is now well under way in Puerto Rico, covering rural rehabilitation, rural electrification, slum clearance and housing, reforestation, and construction of public buildings. This program is being administered by an agency independent of the Interior Department. 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.

The Matanuska colonization project, under the direct supervision of the Alaska Rural Rehabilitation Corporation, during the second summer just passed has demonstrated that it is solidly established. The ultimate effect of this development upon the economy, conditions of living, and population of the Territory, cannot be over-estimated.

In the Virgin Islands, the sugar and rum industries are being restored to the important position they once held. Handicraft is being encouraged, small industries are being built up, and the tourist trade developed. Thanks to the policy of this administration, there is virtually no unemployment in the Virgin Islands.

The recently reorganized Hawaiian Homes Commission is proving to be energetic and enthusiastic in the discharge of its duties and there is every reason to believe that its businesslike management and vigorous enforcement of policies and regulations will prove beneficial to the Hawaiian people and assure the perpetuation of the race.

Quarterly expeditions out of Honolulu, T. H., are conducted in connection with the colonization projects on Baker, Howland, and Jarvis Islands, and valuable scientific data for use in connection with anticipated development of air routes to the South Seas, New Zealand, and Australia is being compiled.

In Hawaii the rehabilitation of the Hawaiian race is going forward under new legislation and a new commissioner. A survey of possible water supplies for irrigation on the island of Molokai has been authorized.

CONCLUSION

Reports of the several bureaus and other administrative agencies of the Department, setting forth in detail the operations under their

jurisdiction, are submitted herewith. All lead to the conclusion that the conservation of water, land, and minerals, with due attention to specific problems of human welfare, is soundly established as the major departmental policy. Substantial progress in each and every activity is recorded. Many of the accomplishments of the year were made possible only through the financial or personnel aid of the Public Works Administration, the E. C. W. camps, the Resettlement Administration, the Works Progress Administration, and other agencies whose objective has been to relieve unemployment through the performance of useful work.

Once again I commend to your consideration the desirability of changing the name of the Department of the Interior to that of the Department of Conservation—a name more expressive of its fundamental purpose and nature. Such a designation would give conservation an authority heretofore lacking, it would promote an increased consciousness of conservation as a Government policy, not only in the minds of officials but among the people of the United States generally, and it would place upon the personnel of the Department a definite responsibility for advancing the cause of conservation to the end that the resources of the United States may be used for the maximum benefit of every citizen of the country.

Very respectfully,

HAROLD L. ICKES,
Secretary of the Interior.

THE PRESIDENT,
The White House.

REPORT BY DIVISIONS AND BUREAUS

THE SOLICITOR

NATHAN R. MARGOLD

The immediate staff of the Solicitor was reduced from 21 to 19 regular members during the course of the past fiscal year. However, five attorneys have been specially assigned to this staff for the examination of land titles in connection with land acquisitions which are a feature of the Indian reorganization program. Otherwise, there has been no noteworthy change in legal personnel either in Washington or in the field.

The tasks of the immediate staff of the Solicitor have included the representation of the Secretary of the Interior and, in two important cases, the Federal Emergency Administrator of Public Works in litigation in 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 the legal features of Indian reorganization and the disposition of such miscellaneous legal matters as are involved in the business of the Department.

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 six such cases in the Court of Appeals for the District of Columbia and has been defeated upon but two occasions. Three of these controversies concern public lands, three were war minerals relief cases, one was a matter of Indian enrollment, and one arose out of the administration of a reclamation project. The two cases in which the Solicitor has represented the Federal Emergency Administrator of Public Works have involved the vital question of the constitutionality of basic features of the low-cost housing and slum-clearance program of the Public Works Administration. The issues in controversy have yet to be decided by the Supreme Court of the United States.

In the Supreme Court of the District of Columbia 62 war minerals relief cases were disposed of by dismissal or by entry of consent decrees. There remain of record in that court 78 war minerals relief cases, the disposition of which has been delayed by the failure of the local courts to decide definitely the question whether the

rights claimed survive the death of the claimant or the dissolution of a claimant corporation. However, the fact that during the session just ended Congress legislated with reference to the abatement and transferability of war minerals relief claims (sec. 2 of act of June 30, 1936, Public, No. 847, 74th Cong.) will undoubtedly speed the ultimate disposition of the pending cases.

A quantitative summary of the work, other than litigation, disposed of by the Solicitor and his immediate staff during the past year, is embodied in the following table:

	Land decisions	Opinions of Solicitor	Indian matters	Miscellaneous matters ¹
Pending July 1, 1935.....	315	77	206	239
Received during year.....	1,600	490	7,839	11,117
Total.....	1,915	567	8,045	11,356
Disposed of during year.....	1,479	334	7,910	11,083
Pending June 30, 1936.....	436	233	135	273

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 cancellations 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.

It will be noted that public-land cases and miscellaneous submissions for opinions of the Solicitor continue to increase in number. The number of such matters received during the year ended June 30, 1936, represents an increase of about 50 percent over the number received during the preceding year.

Of the 334 opinions rendered, as contrasted with 237 during the preceding year, about one-third were accident cases and 99 were title opinions. The number of title opinions is not an index to the volume of title work since the usual title opinion involves numerous tracts of land, each with a distinct chain of title. While the problem of title examination in connection with the numerous acquisitions of land under the Wheeler-Howard Act is less acute than a year ago by reason of the recent special assignment of five attorneys to this office to aid in this work, the prospective doubling of the Indian land purchase program during the coming year makes it doubtful whether the title section has been augmented sufficiently to dispose of this work with dispatch. Moreover, no additional attorneys have been provided to assist in the examination of the numerous titles involved in purchases by the National Park Service under its expanding program for providing new park and recreational facilities. With more than 100 title cases from all sources pending at the end of the year and with the anticipated increase of such work it will prove increasingly difficult for the present staff of title attorneys to keep pace with the land acquisition sections of the Indian Office and the National Park Service.

In addition to these special categories, requests for opinions have covered the usual broad range. As the statutes under which various bureaus of the Department act multiply with every session of Congress and the enterprises of the Department become more numerous and varied, the interpretation of statutes and their exposition in relation to particular undertakings becomes a larger task. Each year the variety, as well as number, of questions submitted for opinion witnesses the importance and the manifold aspects of the function performed by the legal officers of the Department in directing and safeguarding administrative action. The following subjects are illustrative of the submissions acted upon during the year:

Power of the Department to regulate the sale of liquor upon private premises within national parks.

Authority of contracting officers to waive time limitations and other provisions in Government contracts.

Extent of the visitorial power of the Bureau of Mines with respect to privately owned mines.

Necessity for State authorization for Federal appropriation of underground water by means of wells to be developed on the public domain.

Restrictions upon the ownership of mining property by persons employed in the Bureau of Mines.

Limitations upon the investment of land-grant college funds by a State.

Validity of oil and gas leases for scattered tracts in the North Dome Kettleman Hills.

Present right to perfect title to allotment selections made before the passage of the Wheeler-Howard Act.

Extent of Indian title within the Red Lake and San Carlos Reservations.

Three sessions of Congress have now elapsed since the organization of a legislative section in the office of the Solicitor for the better handling of the specialized tasks of drafting bills adequate to meet particular departmental needs and objectives, preparing and reviewing departmental reports and recommendations concerning pending legislation, and representing the Department at congressional hearings upon particular measures. Steadily increasing success in obtaining congressional action in accord with proposals and recommendations of the Department attests to the thorough research, technical expertness, and skill in advocacy which have characterized the performance of these important tasks. Thus, during the second session of the Seventy-fourth Congress, almost every important bill sponsored by this Department, with the exception of the bill to change the name of the Department, was enacted.

Among the bills thus sponsored the following measures are specially noteworthy:

The act of June 26, 1936 (Public, No. 816, 74th Cong.), extending the benefits of the so-called Indian Reorganization Act to the Indians of Oklahoma; and the act of May 1, 1936 (Public, No. 538, 74th Cong.), extending similar benefits to the Alaskan Indians.

The act of June 26, 1936 (Public, No. 827, 74th Cong.), amending the so-called Taylor grazing law to increase the area which may be included in grazing districts from 80,000,000 acres to 142,000,000 acres, thus assuring planned and orderly use of practically the entire area of the public domain which is suitable for grazing rather than for cultivation.

The act of June 23, 1936 (Public, No. 770½, 74th Cong.), providing for a comprehensive Nation-wide study by this Department in conjunction and cooperation with local authorities to the end of developing and coordinating adequate park and recreational facilities throughout the United States.

The act of June 22, 1936 (Public, No. 749, 74th Cong.), providing the Virgin Islands with an organic act characterized by universal suffrage and an increased measure of local participation and control in local government.

A large amount of legal work, both in Washington and in the field, has been required for the accomplishment of Indian tribal organization under the so-called Wheeler-Howard Act. At the end of the fiscal year, 43 separate tribal constitutions had been drafted, accepted by the tribes concerned, and finally approved by the Secretary of the Interior. In 24 other cases substantial progress had been made toward the adoption of constitutions. As a further step in organization, the Wheeler-Howard Act authorizes the incorporation of tribal groups. Only one corporate charter has been issued, although work is in progress on more than 20 such charters.

The exercise of tribal authority with respect to such matters as tribal lands and funds, traders, personnel and taxation necessarily involves much legal detail. Thus, many legal problems have already arisen in the administration of the affairs of reorganized Indian communities. Such problems will continue to arise and to require extensive legal services as is true in the administration of the affairs of ordinary municipalities and similar organized communities.

The preparation of new or greatly revised departmental regulations has been a necessary step in administering much new legislation and in carrying out departmental policies calculated to accomplish the conservation of natural resources through better administration of the public domain and conservation of human values through the better administration of Indian affairs. Thus, the preparation of departmental regulations has been an important work of attorneys in the various bureaus as well as of members of the immediate staff of the Solicitor. The following regulations deserve particular mention:

Amended regulations governing the mineral development of the public domain, including oil and gas, sodium, and phosphate regulations.

Regulations governing timber operations and grazing upon Indian reservations.

Amended regulations governing the practice of attorneys before the Department.

Regulations governing appeals from the decisions of the Director of Grazing.

The work of the legal sections of the Geological Survey and the General Land Office has increased noticeably as the administration of conservation measures has progressed. Extensive legal services have been required in the consummation of unit plans for the cooperative development of particular oil and gas fields. In the General Land Office the superimposition of conservation laws, including the Taylor grazing law, upon the old and familiar public land laws is creating many new legal problems. The efforts of claimants to establish equities in public lands antedating the present general withdrawals continue to be numerous and ingenious and to require careful legal analysis.

The important business of administering the estates of deceased Indians is being handled by a staff which is numerically inadequate despite improved organization and administrative procedure. The present staff of nine examiners of inheritance in the field and three attorneys in Washington can effectively handle somewhat less than 2,000 estates in 1 year. There are now about 3,000 estates awaiting administration. Such undesirable accumulation of work and the resultant complication in administration can be avoided only by adding to the present probate staff.

Reclamation projects in various stages of development have required extensive legal services in Washington and in the field. For example, the Provo River project, still in its early stages, has required the organization of a new water users association on one division, the negotiation of a large repayment contract upon another division, and the carrying out of the legal detail necessary to bring newly organized metropolitan water districts within the project as stockholders in water users associations. Even old and established projects present their legal problems. Thus, the complex organization of the Owyhee project with its numerous independent contracting entities has been simplified by the devising of a single omnibus contract which has been accepted by the various irrigation districts involved. Again, for some projects the negotiation and drafting of contracts for the sale of power are important tasks. In connection with the Boulder Canyon development the most recent of a series of such contracts has been a contract with the State of Nevada for the use of power generated at Boulder Dam.

DIVISION OF INVESTIGATIONS

LOUIS R. GLAVIS, *Director*

The regular annual appropriation for the Division of Investigations for the purpose of conducting investigations for the Department of the Interior for the fiscal year 1936 was \$391,700.

The average number of active field investigators, exclusive of special agents in charge, was 65; average number of clerks employed in divisional offices, 18; total average force employed, including special agents in charge, and the Washington office force, 88.

Due to the activities of field investigators, \$19,063.67 was collected and turned into the Treasury, and 424,564.02 acres restored to the public domain, representing fraudulent entries, etc., canceled on proceedings based on their reports.

INVESTIGATIONS

On July 1, 1935, there were pending field investigation 8,167 cases. During the year 12,345 new cases were received; 13,217 cases were investigated, reported, and closed, leaving 7,295 cases pending investigation. Four cases were turned over to the Post Office Department as the result of investigations made in the field; and five criminal cases were presented to the Department of Justice during the year; four convictions were secured in criminal cases and one indictment returned during the fiscal year.

FEDERAL EMERGENCY ADMINISTRATION OF PUBLIC WORKS

The Division of Investigations conducts all investigations for the Public Works Administration. The staff personnel on June 30, 1936, including the central office at Washington, consisted of 10 special agents in charge, 220 special agents, and 152 other employees.

Cases investigated by the Division of Investigations relate to expenditure of Public Works Administration funds, collusion and fraudulent bidding where contractors and subcontractors are involved, wages and disputes arising from rates of pay, irregularities in the employment of labor and use of materials, underpayment of employees, repayment to contractors of wages of employees, contracts relating to housing projects, governmental personnel, and mis-

conduct of officers and employees of the Public Works Administration, activities of the National Reemployment Service and other governmental agencies, to which Public Works Administration funds are allotted.

These investigations, having to do with the allotment and expenditure of large sums of money, enabled the administrative officers to uncover numerous frauds and irregularities and prevent substantial losses to the Government.

Saving was accomplished by and through investigations covering such items as cancelation or rescission of contract bids and awards where fraud or collusion was found to exist, rescission of allotments for loans and/or grants due to irregularities or fraudulent representation; lack of economic soundness in projects investigated, inadequate financial ability of the borrower or his inability to liquidate loans, and the use of insufficient or inferior material in construction work.

There also were included penalties imposed on contracts for violation of the 8-hour law on Federal projects, reduction in allotments where it was found that the borrower had included excessive amounts in estimates covering overhead and engineering fees, reduction of allotments due to fictitious estimates and excessive appraisals covering the purchase of lands for projects, sites, and savings effected by requiring a change in the method of construction from force account to a contract basis.

The Division of Investigations also effected other savings. One of the more important of these was reimbursement of wages to labor where such pay was wrongfully withheld by contractors through what has been designated as the "kick-back racket." It is estimated that this saving to labor by such reimbursements amounted to \$182,137.83 for the fiscal year.

Nineteen thousand seven hundred and twenty-six cases were investigated and reported by special agents of the Division of Investigations. Included in the foregoing were 60 criminal prosecutions, of which 18 cases received court action, 39 cases resulted in indictments, and 1 case received a prison sentence.

OIL ENFORCEMENT

The Director of Investigations performed all investigations, under the supervision of the Secretary of the Interior in the enforcement of the provisions of the act of Congress of February 22, 1935 (Public, No. 14), generally known as the Connally Act.

During the first 6 months of the fiscal year, the Division of Investigations (oil enforcement) maintained eight offices, which on January 1, 1936, were reduced to four, namely, Kilgore and Houston, Tex., Chicago, Ill., and Washington, D. C.

Federal Petroleum Agency No. 1, with headquarters at Kilgore, Tex., was created by Executive Order No. 7024-B dated April 25, 1935, under authority of the Connally Act. The Secretary of the Interior designated this agency to exercise all duties and functions pertaining to investigations necessary to the enforcement of the Connally Act.

The marine unit with headquarters at Houston, Tex., was engaged in the enforcement of the Connally Act insofar as the movement of petroleum and its products into interstate or foreign commerce by water-borne vessels was concerned.

The Chicago office conducted investigations on shipments of petroleum and its products from producing areas.

The Washington office was comprised of an administrative force and a branch of the marine unit which compiled statistics on the movement of petroleum and its products by tankers and barges.

The personnel of the Division of Investigations engaged in the enforcement of the Connally Act as of July 1, 1935, numbered 82. The personnel absorbed by the Petroleum Conservation Division as of May 1, 1936, as a result of the Secretary's order no. 1054, dated March 14, 1936, and no. 1067, dated May 1, 1936, numbered 34.

The total obligations incurred by the Division of Investigations (oil enforcement) amounted to \$147,751.

The total number of cases investigated was 1,255, of which 8 Criminal Code cases and 99 cases of violations of the Connally Act were referred to the Department of Justice.

BOARD ON GEOGRAPHICAL NAMES

GEORGE C. MARTIN, *Executive Secretary*

The work of the Board on Geographical Names is essentially a service which the Department of the Interior renders to other governmental organizations and to the public. The principal function of the Board is to insure uniformity in the use of geographic names on maps and in publications issued by the Federal Government. As the official authority on the use of geographic names by the Government, the Board decides unsettled questions as to the form, spelling, or application of geographic names, and considers new names proposed by Government officers. Its decisions, according to Executive Order No. 399, are "to be accepted by the departments of the Government as the standard authority."

The Board also serves as an informally recognized standard authority in the nongovernmental use of geographic names. In this capacity it renders decisions on geographic names at the request of local authorities, institutions, publishers, and individuals. The Board is also called upon, by Government, State, and local officials, educational institutions, scientific societies, publishers, teachers, and others, to furnish information on many geographic subjects other than names.

The broad geographic scope of the Board's activities, and the extent to which it serves other organizations, are shown by the following tabulation of cases that have been before it for formal action during the year, grouped by the location of the features and by the organizations that submitted the names.

Geographic distribution of names

Alaska.....	342	Washington.....	8	South Dakota.....	2
California.....	103	Michigan.....	6	Nevada.....	2
New York.....	63	Arizona.....	6	Oregon.....	2
Wyoming.....	56	Illinois.....	5	Dominican Republic..	2
Louisiana.....	49	Missouri.....	5	Mexico.....	2
Utah.....	43	Colorado.....	4	Russia.....	2
Oklahoma.....	36	New Jersey.....	4	China.....	1
Texas.....	35	New Mexico.....	4	Dutch East Indies...	1
New Hampshire....	33	North Carolina.....	4	Peru.....	1
Alabama.....	28	Connecticut.....	3	Idaho.....	1
South Carolina....	21	Florida.....	3	Iowa.....	1
Minnesota.....	21	Hawaii.....	3	Mississippi.....	1
Maryland.....	19	Nebraska.....	3	West Virginia.....	1
Virginia.....	12	Tennessee.....	3	Virgin Islands.....	1
Massachusetts.....	11	Wisconsin.....	3		
Maine.....	11	North Dakota.....	2	Total.....	980
Georgia.....	9	Ohio.....	2		

Organizations requesting decisions

U. S. Coast and Geodetic Survey--	253	Library of Congress-----	3
U. S. Hydrographic Office-----	187	Soil Conservation Service-----	2
U. S. Geological Survey-----	156	Bureau of the Census-----	1
National Park Service-----	133	Bureau of Foreign and Domestic	
Societies and individuals-----	91	Commerce-----	1
U. S. Forest Service-----	77	Post Office Department-----	1
Bureau of Chemistry and Soils....	31	Secretary of the Interior-----	1
U. S. Board on Geographical		The White House-----	1
Names-----	22		
State organizations-----	16	Total-----	980
Bureau of Biological Survey-----	4		

Although the work of the Board is administratively under the direction of the Secretary of the Interior, in whose name, and with whose approval, the decisions of the Board are promulgated, its investigations are made with the cooperation of, and its decisions are rendered by, an advisory committee of 14 members, consisting of representatives of various departments that make and use maps, and of geographic societies. This advisory committee operates chiefly through its executive committee of three members. The routine administrative and investigative work of the Board is performed by a small organization in the office of the Secretary of the Interior. These two units have been operating since December 10, 1935, under a single name, in accordance with a departmental order.

The advisory committee held three meetings during the year, at which interim action of the executive committee was considered and approved, and questions of general policy and procedure were discussed.

The executive committee held 14 meetings during the year, at which 472 geographic names were approved. In addition to the names that were automatically rejected by the approval of the above, six other proposed new names were rejected as unsuitable. The committee had before it, at the end of the year, eight names which had been considered without final action.

The work of the Board has increased far beyond that of the preceding year, when 267 names were approved. Decisions were rendered during the year ending June 30, 1936, on 478 names, and 502 cases were on hand June 30, in various stages of completion.

A pamphlet entitled "Decisions Rendered Between July 1, 1934, and June 30, 1935", was issued in February 1936. Manuscript of a pamphlet entitled "Decisions Rendered Between July 1, 1935, and June 30, 1936", has been submitted for publication.

DIVISION OF GRAZING

F. R. CARPENTER, *Director*

The purpose of the act of June 28, 1934 (48 Stat. 1269), known as the Taylor Grazing Act, is to "stop injury to the public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range, and for other purposes."

This act is a new development in the national policy for the conservation of natural resources, and few laws entrusted to the Federal Government so vitally affect the livelihood of so many people. Both from the standpoint of national conservation and of the livestock industry, it is of transcendent importance. This act has the approval of the country as a whole, and the administration of it has been received generally with enthusiasm by those affected in the public-land States of the West. Through the aid of hundreds of these people, rules and regulations governing grazing have been prepared, ways of conserving the forage resources of our public lands worked out, and methods of administration devised to provide equitable rights to all. The current report deals with the activities of the second year of administration of the act.

During the first year, the Department was engaged principally in preliminary steps necessary for the carrying out of the terms and provisions of the law, the establishment of an organization, the devising of rules and regulations, the working out of plans for cooperation, and numerous other duties and activities for the administration of 80 million acres of public grazing lands.

The second year has been devoted to enlarging the area brought under control, improving the rules and regulations as a result of the experience gained, perfecting the details of organization, and the institution of administrative control over areas through cooperative agreements with local interests as provided in section 2 of the act. Range survey studies and the measuring of private holdings to determine the commensurate ratings of various applicants for grazing privileges have been initiated in all of the States involved, and in the States of New Mexico and Arizona material of great assistance to administrative officers is now available.

The matter of wildlife protection has been given every possible consideration. Agreements have been reached with the Bureau of Biological Survey for the establishment of game ranges under the joint jurisdiction of the Departments of the Interior and Agriculture. The Division has adopted what is known as the New Mexico plan, which provides for representation by the wildlife interests of that State upon the advisory boards whose functions are to assist in the administration of all grazing areas. Similar proposals have been made to the game interests of other States, and progress is being made toward a satisfactory solution of this important problem.

One essential element of the administration of the Division of Grazing is the advisory boards, consisting of 523 representative and able stockmen elected by the licensees of the various districts. Through their knowledge of local conditions and usage, the Division has access to information and advice concerning every point and section of the country under jurisdiction of the act. These boards function in an advisory capacity and their value to the administration of the act cannot be overestimated. A tribute should be paid to the loyalty and untiring efforts which members have applied to solving the problems before them. This system of home rule under Federal administration and supervision, instituted as one of the main objects and integral parts of the Taylor Grazing Act's administration by the Department, has been highly successful and satisfactory to the stockmen.

On January 13 and 14 a meeting was held in Salt Lake City, attended by four delegates from each of the district advisory boards, totaling 800 persons, and including representatives of the Department, the Division of Grazing, the General Land Office, and other Federal, State, and livestock organizations interested in the grazing work. The meeting, which was called by the Secretary, was in the nature of a get-together to discuss the problems of grazing, to find possible weaknesses, and to make plans for betterment of the administration, as well as to discuss future policies. Information obtained at this meeting was used as a basis for formulating the 1936 rules and regulations covering the issuance of grazing licenses.

The end of the fiscal year 1936 finds 37 grazing districts under administration, including substantially 80,000,000 acres of public grazing lands. During the year, more than 15,000 licenses were issued for the grazing of livestock, involving a total of more than 8,000,000 animals.

On June 26, 1936, an amendment to the original Taylor Grazing Act was passed. This amendment provides, among other changes, an added allotment of 62,000,000 acres, making a total of 142,000,000 acres available for inclusion in grazing districts. This will permit

the placing in grazing districts of practically all of the public domain grazing lands which are of such character as may be administered suitably in grazing districts.

To make available information concerning the activities of the Division, the Secretary of the Interior has authorized a quarterly publication, the *Grazing Bulletin*. The first two issues of the bulletin were published in March and in June.

ORGANIZATION

The organization of the Division of Grazing has been developed on the principle of decentralizing administration as far as consistent. Following this principle, an administrative office has been established in Washington, a regional field headquarters office in Salt Lake City, Utah, and nine regional offices located at Salt Lake City, Utah; Reno, Nev.; Burns, Oreg.; Boise, Idaho; Billings, Mont.; Grand Junction, Colo.; Albuquerque, N. Mex. and Phoenix, Ariz.

This provides ready access to responsible administrative officers of the Division by the persons affected by the act, brings about a better understanding of the problems involved, and speeds administrative action. 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 60 permanent employees, 13 of which were attached to the Washington office and 47 to the various field offices. This involves an increase of 25 employees during the year, including 13 graziers, 4 junior range examiners, and 8 clerical employees of various grades. All new personnel in the grazier and range examiner class are western men from one of the States in which the grazing act is operative, and so far as possible, men have been employed and assigned to work in the State in which they reside.

ADMINISTRATION OF GRAZING DISTRICTS

The administration of grazing districts involves application and enforcement of rules and regulations pertaining to the use of the range, and the establishment and fixing of boundaries of such districts. It also includes issuance of licenses, term permits, and range allotments; the handling of appeals and protests arising from action taken upon applications for grazing privileges; maintenance of range improvements; application of range management plans; and wildlife protection.

Subsequent to the rules and regulations issued during the first year of the act, Division of Grazing Circular No. 3 providing for the appointment of one district advisor in each grazing district in the

State of New Mexico to represent wildlife and recreational resources was approved August 21.

Circular No. 4, entitled "Rules and Regulations Governing Appeals from Decisions of the Director of Grazing", was approved October 7, 1935.

Circular No. 6, entitled "Procedure for Enforcement of Penalties for Violation of the Act of June 28, 1934, and Rules and Regulations Issued Thereunder", was approved December 9, 1935.

Following the general meeting of departmental officials and stock interests in Salt Lake City on January 13, 1936, when certain changes in the rules and regulations were recommended, a revised set of general rules for administration of grazing districts was prepared and approved March 2, which superseded previous Circulars Nos. 1, 2, 4, and 6. These regulations provided for the first time the payment of a fee for grazing privileges, which is established at 5 cents per month for each head of cattle or horses and 1 cent per month for each head of sheep or goats. By order approved May 15, the rate to be charged was clarified to the effect that where a grazing period involves a fraction of a month, the grazing fee for such fraction shall be charged on a daily basis, prorated on a 30-day month.

GRAZING DISTRICTS

As of June 30, 1935, there were 32 established grazing districts under the Taylor Act. During the year just ended, 5 more districts were established on the recommendation of State committees, making a total of 37 districts. These districts include a gross area of 198,338,000 acres, of which 79,805,186 acres are vacant, unreserved, unappropriated public lands.

Fifteen thousand eighty-one temporary licenses were issued during the year for 8,396,351 head of livestock, a detailed summary of which is shown in the attached 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 revokable for violation of the terms thereof.

Applicants for licenses were originally classified in the following preferential order:

1. Qualified applicants with dependent commensurate property with prior use.
2. Qualified applicants who have prior use but not adequate commensurate property.
3. Qualified applicants with dependent commensurate property but without prior use.

In accordance with recommendations of the Salt Lake City meeting, a change in the order of preferred applicants was effected by the rules of March 2, which specify the following preferential classes:

1. Qualified applicants with dependent commensurate property with priority of use.
2. Qualified applicants with dependent commensurate property but without priority of use.
3. Qualified applicants who have priority of use but not commensurate property.
4. Other qualified applicants.

Grazing licenses issued by Division of Grazing, Department of the Interior, for 1935

State	Cattle	Horses	Sheep	Goats	Total	Licenses
Arizona.....	31,156	1,933	184,438	21,190	238,717	385
California.....	85,146	4,135	222,328	-----	311,609	576
Colorado.....	231,080	682	719,177	164	951,103	2,155
Idaho.....	90,904	11,479	709,702	3	812,088	882
Montana.....	40,924	17,387	174,841	14	233,166	489
Nevada.....	247,012	24,411	733,903	212	1,005,538	689
New Mexico.....	372,994	19,417	532,714	119,434	1,044,559	1,702
Oregon.....	197,676	25,036	420,991	18	643,721	1,173
Utah.....	238,011	22,186	2,383,837	31,446	2,675,480	6,501
Wyoming.....	42,073	4,393	319,604	-----	366,070	529
Total licenses.....	-----	-----	-----	-----	-----	15,081
Total livestock.....	-----	-----	-----	-----	-----	8,396,351
Total cattle.....	-----	-----	-----	-----	-----	1,576,976
Total horses.....	-----	-----	-----	-----	-----	131,059
Total sheep.....	-----	-----	-----	-----	-----	6,515,835
Total goats.....	-----	-----	-----	-----	-----	172,481

52 percent of all cattle licensees were owners of less than 50 head of stock.

38.5 percent of all sheep licensees were owners of less than 500 head of stock.

93.1 percent of all cattle licensees were owners of less than 500 head of stock.

86.3 percent of all sheep licensees were owners of less than 3,000 head of stock.

A number of users of the public lands cannot meet the requirements set forth in the regulations for a grazing license, and the problems arising from this condition have been among the most difficult to solve in the administration of the act to date. The Division is fully cognizant of the hardship which may result from immediate ejection of these persons from the range, and in all cases adequate time was granted in which to make other provisions for the handling of their livestock.

The termination of free and unrestricted grazing which has prevailed for so long has naturally resulted in some violation of the rules and regulations providing for the administration of the public ranges. However, these violations have been remarkably few. A large number of alleged trespasses have been investigated, trespass notices served, and trespasses abated. Many cases have also been investigated for violation of the terms of the licenses. Approximately 100 motions for review of the decisions of the regional graziers have

been filed and are now pending local hearing. Many of these are expected to be adjusted without the necessity of a hearing.

Court proceedings have been found necessary in a number of cases of continued trespass in which parties have failed to remove their stock after due notice. An outstanding case involving violation of the rules and regulations during the year was that of the *U. S. v. Joe Odiago and Cleto Achabal*, in which the defendants challenged the constitutionality of the Taylor Act. In a decision rendered June 22, Federal Judge John H. McNary of the United States District Court for Oregon overruled demurrers filed in behalf of the defendants with the following opinion:

It is settled by the highest judicial authority that, "All public lands of the Nation are held in trust for the benefit of the whole country" and that the Constitution vests in the Congress all the rights incident to the private ownership of such lands.

The provision of the act authorizing the Secretary of the Interior to establish grazing districts and make such rules and regulations as shall be necessary to accomplish the purposes of the law, does not constitute a delegation of legislative power but creates administrative duties. Obviously the fixing of boundaries of grazing districts so as to prevent overgrazing and soil deterioration is a matter of detail, and a necessary subject of inquiry and determination by an administrative officer.

The Secretary of the Interior is authorized by the act to make rules regulating permits and preferences not inconsistent with the provisions of section 3 of the act.

The defendants were held for trial before the United States District Court for Oregon which is expected to be held during the October session of 1936.

COOPERATIVE AGREEMENTS

Section 2 of the Taylor Grazing Act provides that—

the Secretary of the Interior * * * shall make such rules and regulations and establish such service, enter into such cooperative agreements, and 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 * * *.

Under the authority granted in the section above quoted, the Secretary on March 17, 1936, approved a form to be followed in entering into cooperative agreements with local associations of stockmen. This particular form of agreement was drawn to provide for grazing administration in Montana, where the public lands in grazing districts constitute only about 25 percent of the area and are intermingled with State, county, tax default, railroad, and other privately owned lands. It is, however, adaptable for use in any State where a similar situation may exist.

Licenses are issued to those entitled to them by the board of directors of the association under the general supervision of the Division of Grazing.

This method is meeting with approval, and agreements have been entered into with nine associations in Montana. A number of local associations in other States are in the process of organization, and it is expected that in the near future numerous agreements will be submitted to the Secretary for approval.

IMPROVEMENTS

The Taylor Act provides for the construction, purchase, and maintenance of range improvements within grazing districts, and that 25 percent of all collected fees when appropriated by Congress are returnable for this purpose. No money was available from this source during the past year, but a diversified range improvement program has been carried on through the C. C. C. camps. Stock-water development, construction of trails and fences, rodent and insect control, and soil erosion activities are under way, and the accomplishments are described more fully later in this report. The Division has also acquired approximately 100 wells distributed over grazing districts in the State of Utah from the Utah Drought Relief Commission. These wells afford increased utilization of available resources in areas where permanent water was formerly lacking, and are a distinct asset to the grazing ranges of this State. The wells are operated by the Division through the temporary employment of local help.

STOCK DRIVEWAYS

Administration of established stock driveways within grazing districts was placed under the jurisdiction of the Division of Grazing April 20. These driveways are reserved under the provisions of the act of December 29, 1916 (39 Stat. 865 U. S. C., title 43, sec. 300). It is the purpose of the Division to effect at the earliest possible date a practical system of driveways within districts which will involve revision of many of the existing withdrawals.

WILDLIFE PROTECTION

In cooperation with the Bureau of Biological Survey, the Division has begun a program of wildlife conservation through the establishment of game ranges to be managed cooperatively by both agencies. Ten areas containing an approximate total of 10,000,000 acres have been agreed upon, and Executive orders have been issued establishing the following:

Desert game range, Nevada-----	May 20, 1936.
Hart Mountain game range, Oregon-----	Sept. 6, 1935.
Charles Sheldon refuge, Nevada-----	May 6, 1936.

The preparation of orders establishing other ranges is almost complete and their establishment should be consummated within a short time. Under the terms of these orders, the right to forage resources of the lands will be reserved for a definite number of wildlife, with the remaining forage to be utilized by domestic animals. The Division has also fully cooperated with the Bureau of Biological Survey in the establishment of refuges for waterfowl and game, which will be administered entirely by the Bureau of Biological Survey.

The Secretary of the Interior on August 21, 1935, approved Division of Grazing Circular No. 3 entitled "Special Rules for Grazing Districts in New Mexico", which embodies the so-called New Mexico plan. In substance, it provides that in addition to the regularly elected district advisors for each grazing district established under the Taylor Grazing Act in New Mexico, there be appointed one district advisor in each grazing district to represent wildlife and recreational resources. Such district advisor shall have the same qualifications as the elected advisors, except that he need not be an owner of livestock, and he shall be nominated by the land-use committee of the New Mexico State planning board. This board advisor will be appointed by the Secretary of the Interior in the same manner and form as the other district advisors.

The plan provides that the utilization of grazing district lands by domestic livestock shall be in accord with the following fundamental principles for conservation and propagation of wildlife and other natural resources upon the public domain. In allotting range resources, allowance will be made for a reasonable utilization by wildlife. Game and bird refuges may be established within grazing districts. In areas determined by the Secretary of the Interior, upon consideration of all interests involved, to be of higher value for and better adapted to production of wildlife than to domestic stock, preference shall be given to such higher use. Should game animals become overabundant, the State or Federal laws will be invoked to limit by removal, through hunting or otherwise, game animals until a reasonable number has been attained. All permittees on grazing districts shall comply with State and Federal game laws, and officials of the Department of the Interior will cooperate in enforcement of these laws. This plan has met with the approval of the varied interests of New Mexico, and the game interests of other Western States are now being consulted to work out similar arrangements. From an individual standpoint, the ranchers and livestock men are themselves the greatest conservators of the wildlife in the West.

Many of the large ranches are literally game reserves and bird refuges, where grouse, sage hens, pheasants, deer, and antelope abound and are afforded such protection as the owners of the ranches on which they roam are able to give them.

CLASSIFICATION OF LANDS

The work of the Division with respect to the classification of lands embraces chiefly the range-survey program by which fundamental basic data is secured to build range-management plans. These surveys embrace both reconnaissance and detailed studies pertaining to the character of range lands with respect to their present condition and carrying capacity, proper seasons of use, classes of livestock to which adapted, needed range improvements, and other pertinent data which must be secured in making plans both for current use and ultimate rehabilitation of the forage resources.

It further includes the preparation of status maps showing the ownership of all lands within grazing districts and a measure of the basic ranch properties of applicants which must serve as a basis for ascertaining the commensurate rights of each individual to grazing on the public lands.

A considerable amount of data of this kind was previously obtained by the Geological Survey, and this information is now available to the Division of Grazing. All phases of this work are now under way in all the grazing districts under administration, and it is being pushed as rapidly as possible with the available means. During the year, the Division has acquired and compiled considerable additional information through the cooperative efforts of the various State agricultural colleges, the Division of Investigations of the Department of the Interior, and other Federal agencies.

The end of the fiscal year finds the preparation of status maps approximately 60 percent completed; the analysis of basic range properties, approximately 25 percent completed; and necessary field work on range studies, approximately 10 percent completed.

The Division is also charged with the classification of lands with respect to their value for agricultural purposes as required by the various land laws. These classifications involve recommendations for designations under the enlarged and stock-raising homestead acts, a determination of the value of watering places for public purposes, classification of lands applied for under section 7 of the Taylor Grazing Act, and determination of the propriety of approving applications under sections 8, 14, and 15 from the standpoint of the public benefit where lands involved in these applications fall within boundaries of grazing districts.

Recommendations for designations of lands under the enlarged and stock-raising homestead acts have been substantially terminated by the Executive orders of November 26, 1934, and February 5, 1935, withdrawing public lands for classification. During the year, 1,711 cases under these acts were acted upon, embracing principally those filed prior to the Executive withdrawals, and on June 30, only 110 such cases were still pending action by the Division. During the year, 1,120 acres were designated under the enlarged homestead act in 6 States, increasing the total acreage so designated at 268,468,865 acres; 7,295 acres of land were designated under the stock-raising homestead act in 11 States, increasing the outstanding area to 102,436,542 acres.

One thousand one hundred fifty cases have been received for action by the Division under sections 7, 8, 14, and 15 of the Taylor Grazing Act, and a total of 72 applications under these sections have been acted upon.

During the fiscal year, 2,240 acres in 8 States were included in public water reserves, and 80 acres in 1 State were excluded from such reserves, resulting in a net increase of the gross public water reserve areas in 12 States to 510,388.

Action on pending applications under sections 14 and 15, which involve lands in present and proposed grazing districts, has necessarily been delayed pending a study of the areas involved to determine the practicability of administration of the land as a part of the district. Field offices are now engaged in preparing reports on the advisability of eliminating certain areas including scattered tracts of public land from districts in order that they may be disposed of under these sections of the act.

EMERGENCY CONSERVATION WORK

On July 1, 1935, 7 C. C. C. camps engaged in range improvement work were being operated by the Division, and plans were formulated for receiving 53 additional camps under the expanded program of Emergency Conservation Work. However, a revision in the general program and a reduction in the total number of C. C. C. companies reduced the quota of camps allotted to the Division to 45—an increase of 38.

Each State, with the exception of Montana, was allotted a number of camps, and the entire public-domain area was divided into three regions for efficient administration and supervision of work projects. Region 1 comprises the States of Colorado, Utah, Wyoming, and Idaho, with regional headquarters at Salt Lake City, Utah. Region 2 comprises the States of Oregon, Nevada, and California, with regional headquarters at Reno, Nev. Region 3 comprises the States

of New Mexico and Arizona, with headquarters at Albuquerque, N. Mex.

Construction of camps was delayed, and the entire quota was not officially turned over for occupancy and operation until the middle of October, so that the actual increase in work accomplished and completed over that done by the seven camps during the fifth enrollment period, April 1, 1935, to September 30, 1935, was not appreciable.

The rigors of winter prevented a full-time schedule for the sixth enrollment period, October 1, 1935, to March 31, 1936, but satisfactory progress was made and the various livestock organizations, district advisory boards, stockmen, and interested citizens have expressed their satisfaction and appreciation for the improvements made in the range areas.

On April 1, 1936, the E. C. W. branch of the Division was fully organized and functioning efficiently, and work programs recommended and approved by the advisory boards of the grazing districts were ready for execution by the C. C. C. companies under the technical supervision of the Division and the appointed supervisory personnel.

The public domain range lands are generally located in areas of low precipitation, with a maximum of 15 inches per year. Accordingly, the work projects, outlined and approved by the stockmen and the advisory boards, directed toward water development and means for the movement of stock, have been given preference. Water-development projects have contributed considerably to an actual increase in water resources and have been a means of better utilizing the forage resources of the range. By judiciously placing these water developments difficulties sustained in former years through a lack of water will be eliminated and will accomplish a great deal toward placing the livestock operator on a more substantial plane of operation. Four hundred twenty thousand man-days were expended on water-development projects, including wells, flood eradication, construction of reservoir and other storage facilities during the year.

The construction of fences to control the movement and grazing of livestock, construction of stock trails, truck trails, and minor roads to facilitate movement through grazing districts, and the construction of corrals form other major parts of this construction program. Rodents definitely destroy incalculable amounts of forage annually, and the control of these pests has been undertaken with the cooperation of the Bureau of Biological Survey in infested areas. The program also includes campaigns against the destructive mormon crickets, the eradication of noxious and poisonous plants, and erosion-control measures.

The following is a summary of the most important accomplishments of the year:

Water holes and small stock reservoirs (completed) (capacity 30,000,000 gallons).....	152
Wells.....	26
Pipe lines (for stock water).....feet.....	27, 000
Truck trails.....miles.....	1, 336
Minor roads.....do.....	321
Stock trails.....do.....	135
Bridges.....	27
Fences.....miles.....	260
Corrals.....	68
Cattle guards.....	58
Rodent control.....acres.....	2, 600, 000
Noxious and poisonous weed eradication.....do.....	80, 000
Insect-pest control.....do.....	48, 000

In addition a large volume of work has been completed on erosion-control structures involving the construction of more than 30,000 check dams, diversion ditches, terracing, channel excavations, and stream-bank protection.

FIRE AND FLOODS

Emergency work has been done by the enrollees in time of fire and flood. During floods in New Mexico which almost destroyed the city of Las Cruces and cost millions of dollars in damage to the surrounding valleys, the C. C. C. workers were highly praised by local officials for the heroic part they played during the disaster. Besides giving assistance in the flood-stricken districts, a dike was built near the town of Hatch which saved the town from destruction.

Enrollees have given valuable aid in fighting fires, and approximately 8,600 man-days of labor were consumed for this purpose. Through cooperative agreements with other Federal and State agencies, use of C. C. C. enrollees of any camp is made immediately available for any fire emergency.

EDUCATIONAL PROGRAM

The educational program is an important part of each C. C. C. camp, and it has been planned to fit the requirements of the individual enrollee. The chief objectives of the program are vocational, character, and citizenship development, with specific consideration given to job training. Every opportunity is given the enrollees to master 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

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 Emergency Conservation Work organization of the Division has grown from a total of 133 persons on July 1, 1935, to 585 persons on July 1, 1936. The personnel has been employed with particular attention to the supervision necessary for the specialized work projects and the administration incident to Emergency Conservation Work.

A survey of the range areas and a full realization of the imminent need for stabilizing the stock industry by improvement means, indicate that in order to supply properly and adequately the needs of 142,000,000 acres of range lands, now or to be included in 50 grazing districts, requires at a minimum 200 200-man C. C. C. camps for a minimum period of 10 years. By judiciously locating the camps and with smaller units working from the base camp in each grazing district according to seasonal conditions and construction or type of camp, it is believed the entire area can be easily and efficiently served. The quota of 45 camps now allocated to the Division permits only a very small portion of the public domain to receive range improvements. The participation of the Division of Grazing in Emergency Conservation Work should be decidedly increased and the activities expanded.

DIVISION OF TERRITORIES AND ISLAND POSSESSIONS

ERNEST GRUENING, *Director*

The Division of Territories and Island Possessions was created by Executive Order No. 6726, issued by the President on May 29, 1934. This order provided for the transfer of all functions pertaining to Puerto Rico, previously vested in the Bureau of Insular Affairs, War Department, to the new Division to be administered under the supervision of the Secretary of the Interior. In accordance with the intention of the order to centralize and coordinate territorial affairs, the activities pertaining to Alaska, Hawaii, and the Virgin Islands, already under the jurisdiction of the Department of the Interior, were transferred to the new Division. These activities included not only general supervision of the respective governors' offices, but also the Alaska Railroad, the Alaska Road Commission, Alaska reindeer, Alaska insane, the Virgin Islands Co., the Government-owned Bluebeard Castle Hotel at St. Thomas, Virgin Islands, Puerto Rico Hurricane Relief Loan Section, and the Hawaiian Homes Commission.

The supervisory relationship of the Division of Territories and Island Possessions to the activities under its jurisdiction was cemented during the year by inspection trips of its officials to Alaska, Hawaii, Puerto Rico, and the Virgin Islands; also the governors and other officials of the respective Territories and possessions visited Washington for the purpose of presenting problems and securing the assistance of the Division in their solution. This interchange of visits and conferences has brought about a feeling of mutual understanding and cooperation which provides a firm foundation for effective administration in the future.

Through the Puerto Rico Reconstruction Administration, the Virgin Islands Co., the Alaska Rural Rehabilitation Corporation, and the Hawaiian Homes Commission, long-range policies for the improvement and economic social welfare of the Territories and possessions are being effectively carried out under the supervision of the Division. A general outline of these activities is set forth later in this report.

During the year, Baker, Howland, and Jarvis Islands were, by Presidential order, placed under the jurisdiction of the Division and

Congress made an appropriation for their colonization. These equatorial islands are situated in the Pacific Ocean south of Hawaii and headquarters for their direct administration have been set up by the Division in Honolulu. The first expedition under the supervision of the Division was organized with the cooperation of several other Government departments in June, and four colonists, with food, supplies, water, etc., were placed on each of the three islands to make weather observations and compile scientific data for use in connection with possible future air routes to the South Seas, New Zealand, and Australia.

VIRGIN ISLANDS

The Division has been active in supervising the administration of the government of the Virgin Islands and in carrying out the program for economic and social rehabilitation. Under date of August 21, 1935, the President issued an Executive order placing the administration of relief, work relief, and useful projects for the islands under the jurisdiction of the Governor of the Virgin Islands, subject to the supervision of the Secretary of the Interior. This order has had the effect of coordinating all Federal relief activities in the Virgin Islands.

The United States Government purchased 5,000 acres of land together with 2 sugar mills, a distillery, warehouses, 10 villages, machine shops, garages, wharves, livestock pens, and miscellaneous agricultural buildings. A P. W. A. allotment of \$2,000,000 was made available to acquire these properties, to recondition them with new machinery, to construct new villages and to purchase tractors, trucks, work animals, and, in general, to create a reconditioned agricultural and industrial plant.

The Virgin Islands Co. is the corporation organized to manage and operate these properties. The company has raised 4,000 crates of tomatoes and shipped them to the New York market. The company has planted and cultivated 1,500 acres of sugarcane. Each year the company purchases \$45,000 worth of sugarcane grown by 700 small growers. Last spring the company sold 25,000,000 pounds of sugarcane to the privately owned LaGrange Sugar Factory and rum distilleries on the island of St. Croix. Tractors and farm equipment are rented to all persons and corporations applying. All of the sugarcane purchased by the company and part of the cane raised by the company has been processed into 500,000 gallons of straight cane juice rum, which has been placed in charred oak barrels to be aged.

The Congress of the United States has enacted legislation authorizing the Virgin Islands Co. to pay taxes into the treasury of the

islands. This income is to assist the local legislatures to provide funds for school, hospitals, island public works, and police and fire protection.

The Virgin Islands Co. program has been established to create commerce, furnish employment to approximately 1,000 persons, improve living conditions and gradually to relieve the Congress of the United States from making annual appropriations for the support of the islands' schools, hospitals, and other municipal expenses.

PUERTO RICO

As referred to in the report of last year, a comprehensive reconstruction program has been put into effect covering rural rehabilitation, rural electrification, slum clearance and housing, reforestation, and construction of buildings for the University of Puerto Rico.

Legislation was obtained from the Seventy-fourth Congress by which, beginning with the fiscal year to end June 30, 1938, Puerto Rico is entitled to share in appropriations which may become available for apportionment under the Federal Aid Road Act of July 11, 1916, under the same terms and conditions as any of the several States. Under another act, approved August 23, 1935, bank deposits in Puerto Rico may be insured, thus affording the same protection to depositors there as now given to depositors in the United States under the Federal deposit insurance laws. Also pursuant to recommendation of the Governor, we obtained extension of the Liquor Enforcement Act of 1936 to Puerto Rico.

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. Two loans were paid off during the year. There are now 3,613 loans outstanding, which were originally contracted in the amount of \$5,655,760. Prior to making adjustments, the total sum due the United States, including unpaid interest, now exceeds \$6,000,000.

The following changes have occurred among officials of the government of Puerto Rico, who are appointed by the President:

Hon. Martin Travieso was confirmed as associate justice of the supreme court on March 19, 1936, succeeding Hon. Pedro de Aldrey, retired.

Hon. Benigno Fernandez Garcia was confirmed as attorney general on June 18, 1936, succeeding Hon. Benjamin J. Horton, resigned.

Much political unrest has existed in Puerto Rico, due in large part to long-standing unemployment and the real need of relief for the poorer people. Col. Francis E. Riggs, chief of the insular police, was

assassinated on February 23, 1936. The agitation continued, and eight of the Nationalist leaders were tried and convicted on charges of conspiring to overthrow the United States Government by force. Maj. Enrique de Orbeta, a native Puerto Rican, was appointed by the Governor to succeed Colonel Riggs and he assumed the duties of the office on June 2, 1936.

Three bond issues aggregating \$3,973,000 were sold on behalf of the government of Puerto Rico. Refunding bonds amounting to \$3,778,000 were awarded to the highest bidder at 100.209, to bear an interest rate of $2\frac{3}{4}$ percent per annum. The proceeds from this issue were used to retire seven outstanding issues, which were callable prior to maturity, and bearing higher rates of interest, thus making a substantial saving in interest charges.

ALASKA

Promoting the orderly development of Alaska's resources and the establishment on its 6,000 square miles of territory a greater permanent population, the Division of Territories and Island Possessions has been actively interested in all those factors of administration and legislation affecting the course of Territorial affairs.

Protection of the welfare of the native population, conservation and utilization of Alaska's natural resources, the increased local production of foodstuffs, better transportation facilities within the Territory and with continental United States, more equitable and better coordinated Federal appropriations, and more satisfactory conditions of service of Federal representatives residing in the Territory have appeared to be immediate considerations for the attainment of major ends. In these fields, the year has witnessed important and basic developments. The extension of the economic and social benefits of the Indian reorganization act to Alaska has paved the way for the security of approximately one-half of the present population of the Territory, whose stabilized future is not only an essential act of humanitarianism but also an important item of wholesome advance.

The Matanuska colony, under the auspices of the Federal Emergency Relief Administration, during its second summer has demonstrated that it is solidly established. Undoubtedly, the success of its settlers, as it becomes more thoroughly demonstrated, will lead to an increased agricultural population and a greater production of necessary foodstuffs. Already other farming districts, notably the Kenai Peninsula, report numbers of settlers who, upon individual initiative, have acquired homesteads. The ultimate effect of this development upon the economy, conditions of living, and pop-

ulation of the Territory cannot be overestimated. In keeping with this movement and enabling the Alaska University at Fairbanks to further demonstrate its value as an educational and service center, was the extension of the Adams, Purnell, and the Capper-Ketcham Acts to the Territory. Community service and agricultural demonstration activities, essential aids to pioneering effort, sponsored for several years by the university, can now be more adequately expanded.

The deliberations of the Inter-Departmental Committee have resulted in additional emphasis upon the conviction that the progress of Alaska and the needs of its population may better be served by the increased coordination of the plans and activities of the several departments represented in Alaska. In this connection, plans have been formed for a unified attack upon Alaska's transportation and budgetary problems with a view toward securing more adequate appropriation for the development of its natural resources, a better system of roads, additional air transportation aids, and more adequate harbor facilities. At the same time, overland transportation between Alaska and continental United States has taken an important step forward because of the enactment of a law authorizing the President to negotiate with the Canadian Government for the location, survey, and construction of an international highway.

Additional recognition of the value of local autonomy has been secured through the enactment of the law to enable incorporated municipalities to incur bonded indebtedness, thereby relieving Congress of the consideration of local problems in which it can have but causal interest and extending to organized local communities direct control of their financial programs.

Alaska Railroad employees, hitherto excluded from the benefits of any Federal retirement provision, by virtue of congressional action are now included in that body of Federal employees for whom cooperative retirement plans have been established. Needless to say, this legislation is considered by the personnel of the Alaska Railroad as a noteworthy accomplishment.

In these contributions to the welfare and development of Alaska, the Division of Territories and Island Possessions has taken active participation in directing the affairs of the Governor's office, the Alaska Road Commission, the Alaska Railroad, the Alaska Reindeer Service, in arranging for the care of Alaska insane, and through its liaison capacity in relationship to the other branches of the Department having activities in Alaska, as well as by its participation in the conferences of the Inter-Departmental Committee on Alaska and hearings of committees of Congress.

HAWAII

While the Territory of Hawaii is a comparatively self-contained political subdivision, the Division of Territories and Island Possessions has been concerned with several of its major problems.

By act of Congress of July 9, 1921, known as the Hawaiian Homes Commission Act, 1920, large areas of public lands of the Territory were set aside to be administered by the Hawaiian Homes Commission for the benefit of native Hawaiians, in order to rehabilitate the Hawaiian race and prevent the decrease and possible extinction thereof. Under an amendment to section 202 of this act passed by the Seventy-fourth Congress—Public 223—a new commission was appointed by the Governor to administer this activity. The Secretary of the Interior designated George K. Larrison as his representative to cooperate with the commission and to report on its activities directly to this Department. The new commission is proving to be energetic and enthusiastic in the discharge of its duties and there is every reason to believe that its businesslike management and vigorous enforcement of policies and regulations will prove beneficial to the Hawaiian people, and assure the continuance and possible expansion of the homes project.

As a further benefit to the Hawaiian people and in the interest of diversified farming and increased productivity for the approximately 40,000 acres which are administered by the Hawaiian Homes Commission on Molokai, a water survey was authorized by the Secretary of the Interior. The object is to determine the possibilities of diverting the flows of perennial streams located on the north side of East Molokai to supply the arable portions of the islands where the Hoolehua homesteads are located. When the present survey is completed, it will be definitely determined whether the proposed irrigation project is practical from the engineering point of view and also if the amount of land to be reclaimed will justify the expense involved.

During the fiscal year, the Territory has received generous allotments of funds from the Federal Government for relief and various construction projects. Also, under the provisions of Public Act 204 of the Congress of the United States, approved July 15, 1935, the city and county of Honolulu was authorized by the President during the fiscal year to issue bonds in the amount of \$700,000 for public improvements designed to control the floodwaters of certain valleys on the island of Oahu. The total amount of bonds authorized for issuance by the city and county of Honolulu was \$1,200,000, leaving a balance of \$500,000 to be expended, with the President's approval, during the coming fiscal year to complete the projects now under way.

PETROLEUM ADMINISTRATIVE BOARD

G. W. HOLLAND, *Director*

The duties of the Petroleum Administrative Board in assisting the Administrator for the Petroleum Industry in the administration of the Code of Fair Competition for the Petroleum Industry terminated with the decision of the United States Supreme Court on May 27, 1935, in the case of *United States v. Schechter Poultry Corporation* (295 U. S. 495).

From July 1, 1935, to April 1, 1936, in compliance with Executive Order No. 7076, the Board carried on studies and research with respect to the petroleum industry. Studies were completed and the following reports were published: Report on the Cost of Producing Crude Petroleum, Operation of New Pool Plans of Orderly Development Under the Code of Fair Competition for the Petroleum Industry, and the Final Report of the Marketing Division.

During the period from July 1935, to April 1, 1936, the Petroleum Administrative Board advised with the Secretary of the Interior on the enforcement of the act of Congress of February 22, 1935 (49 Stat. 30), generally known as the Connally Act, and so referred to hereinafter.

PETROLEUM CONSERVATION DIVISION

The Secretary of the Interior, by order no. 1054 dated March 14, 1936, established the Petroleum Conservation Division, effective April 1, 1936. The Division advises and assists the Secretary of the Interior in the enforcement of the Connally Act and in the administration of Federal Tender Board No. 1 and Federal Petroleum Agency No. 1; is 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; 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.

An interstate oil compact, ratified by the States of New Mexico, Colorado, Illinois, Kansas, Texas, and Oklahoma, was approved by Congress on August 27, 1935, and in response to a request from

the Interstate Oil Compact Commission, the Division assigned a member of the staff to work with a subcommittee of the Commission in an analysis, indexing, and compilation of State laws, with a view toward uniformity in State oil and gas conservation statutes.

The Rodessa field in Louisiana and Texas has been under observation, personnel of Federal Petroleum Agency No. 1 having been assigned to observe developments and to assist the States in oil and gas conservation and the prevention of the movement of contraband oil in interstate commerce.

FEDERAL TENDER BOARD NO. 1

The original Federal Tender Board which was established by the Secretary of the Interior on October 18, 1934, under authority of the National Industrial Recovery Act, approved June 16, 1933 (48 Stat. 195), was terminated by the decision of the Supreme Court of the United States dated January 7, 1935, on section 9 (c) of that act in the *Panama Refining Company case* (293 U. S. 388). Federal Tender Board No. 1, with headquarters at Kilgore, Tex., was established by Executive Order No. 6980-C, March 1, 1935, under authority of the Connally Act, and operates in a designated area known as the East Texas field, comprised of the counties of Gregg, Upshur, Smith, Rusk, and a part of Cherokee County.

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. Excess oil has been produced in the East Texas field since the first proration orders were issued by the State, estimates of excess production from the discovery of the field in October 1930 up to July 1, 1936, varying from 80,000,000 to 100,000,000 barrels. The amount of such excess production in June 1936 was estimated at 5,000 barrels daily, compared with 75,000 barrels daily in June 1935, a decline of 70,000 barrels.

The East Texas oil field, which has produced approximately 1,000,000,000 barrels of oil, is from 3½ to 10 miles wide and about 50 miles long. On July 1, 1935, it contained 124,000 productive acres; a year later, 130,000 acres. On June 30, 1936, there were 20,848 producing wells, a gain of 2,977 wells during the fiscal year. The

density of spacing changed from one well to 6.92 acres on July 1, 1935, to one well to 6.21 acres on June 30, 1936.

Approximately 90 percent of the crude oil produced in the field is transported to the Gulf coast through 14 pipe lines. Practically all of the remainder is refined in the field, the products being transported in tank cars and trucks.

On July 1, 1935, the Railroad Commission of Texas listed 73 refineries in the field, of which 28 were operating and 45 were shut down. On July 1, 1936, there were 59 refineries, 17 of which were operating and 42 were shut down. On July 1, 1935, there were 17 natural-gasoline plants as compared with 19 on July 1, 1936. The production of natural gasoline increased from 6,840 barrels to 10,000 barrels per day over the year.

The average gravity of east Texas crude oil is 39.5°. It has a paraffin-asphalt base and produces by skimming about 33 percent of gasoline and by cracking as much as 70 percent.

The posted price of crude oil was \$1 a barrel from July 1, 1935, until January 6, 1936, when it was raised to \$1.15 per barrel.

Under State authority the total allowable for the field was 160,476,943 barrels for the fiscal year, and the Railroad Commission of Texas reported actual production of 157,953,452 barrels, and the United States Bureau of Mines reported 173,580,000 barrels. The production of natural gasoline totaled 2,734,243 barrels, and the butane production 115,483 barrels. Reservoir pressure declined from 1,227.80 pounds per square inch on July 1, 1935, to 1,182.44 pounds per square inch on June 30, 1936, a decrease of 45.36 pounds per square inch. Crude oil production equaled approximately 3,500,000 barrels for each pound decline in pressure.

The production of gasoline and naphtha in the east Texas field totaled 8,322,169 barrels, kerosene 665,432 barrels, fuel oil and residuum 3,323,865 barrels, and gas oil and distillate 1,218,147 barrels during the fiscal year. Of a total of 16,379,339 barrels of petroleum products, including butane and natural gasoline, 12,226,761 barrels were shipped by tank car.

During the fiscal year, the Federal Tender Board received 6,207 applications for tenders, 3,789 being for permits to transport 209,131,673 barrels of crude oil, and of which 3,668 applications involving 207,569,560 barrels were approved, 103 involving 1,292,573 barrels were not approved, and 18 involving 269,540 barrels were pending as of June 30, 1936. There were 225 applications covering 3,218,567 barrels for tenders on natural gasoline, of which 214 involving 3,080,437 barrels were approved, 1 involving 5,256 barrels was not approved, and 10 involving 132,874 barrels were pending. Butane applications numbered 24, involving 203,429 barrels, of which 21 involving 156,682 barrels were approved, 3 involving 46,747 barrels

were pending. Applications for tenders on refined products numbered 2,169 involving 12,224,553 barrels; 2,065 involving 11,227,832 barrels were approved; 93 applications involving 914,244 barrels were not approved and 11 applications involving 82,447 barrels were pending at the end of the fiscal year. The following table summarizes the action taken by Federal Tender Board No. 1 and Federal Petroleum Agency No. 1 upon applications for certificates of clearance received during the fiscal year.

Applications for certificates of clearance, Federal Tender Board No. 1 and Federal Petroleum Agency No. 1, July 1, 1935, to June 30, 1936

	Crude oil	Natural gasoline	Butane	Gasoline	Other refined products	Total
Received:						
Number.....	3,789	225	24	790	1,379	6,207
Barrels.....	209,131,673	3,218,567	203,429	6,653,054	5,571,499	224,778,222
Approved:						
Number.....	3,668	214	21	758	1,307	5,968
Barrels.....	207,569,560	3,080,437	156,682	6,443,821	4,784,011	222,034,511
Not approved:						
Number.....	103	1	0	28	65	197
Barrels.....	1,292,573	5,256	0	161,388	752,856	2,212,073
Pending (June 30, 1936):						
Number.....	18	10	3	4	7	42
Barrels.....	269,540	132,874	46,747	47,845	34,632	531,638

FEDERAL PETROLEUM AGENCY NO. 1

Federal Petroleum Agency No. 1, created by Executive Order No. 7024-B, dated April 25, 1935, under authority of the Connally Act, was designated by the Secretary of the Interior 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. This agency was under the supervision of the Division of Investigations (oil enforcement) from the beginning of the fiscal year until May 1, 1936, when it was placed under the supervision of the Petroleum Conservation Division.

During the first 6 months of the fiscal year the Division of Investigations (oil enforcement) maintained eight offices, which on January 1, 1936, were reduced to four—namely, Kilgore and Houston, Tex., Chicago, and Washington.

The primary activity of the marine unit, with headquarters at Houston, Tex., during the fiscal year was to obtain information covering shipments of petroleum and petroleum products. By May 1, 1936, four motorboats formerly under the direction of several regional offices had been transferred to Houston. In June the marine unit was reduced to one boat in active service and two boats in storage, one boat having been transferred to the National Park Service.

The Chicago office during the fiscal year ended June 30, 1936, confined its activities to investigations of inbound shipments of petroleum products from producing areas which came under the jurisdiction of the oil enforcement unit. A periodical check of railroad records and marine terminal records was made. An average of approximately 70 cases per month was investigated.

During the fiscal year, the agency received from the tender board 6,207 applications, involving 209,131,673 barrels of crude petroleum, 6,653,054 barrels of gasoline, and 8,993,495 barrels of other products. Examination of these tenders resulted in 5,968 being reported on favorably to the board, 197 not approved, and, as of June 30, 1936, 42 were pending. The 197 applications not approved included those withdrawn by applicants, those rejected, and those filed by the board without action.

During the year, the agency discovered many trucks transporting East Texas crude oil without Federal tenders from Texas to Louisiana for delivery to refineries in that State. For the period, 125 criminal cases were developed and approximately 75 percent of the violators were apprehended after warrants were issued. Cases were developed and presented against the Louisiana refineries receiving this oil and injunctions obtained.

A special investigation of the Conroe field, with respect to contraband oil, was started on January 13, 1936, but was not completed at the end of the fiscal year.

Throughout the fiscal year, continuous efforts were made by the agency to detect criminal violations of the Connally Act and to prepare and present cases to the Department of Justice. From October 1935 to the end of the fiscal year, 396 investigations were assigned to members of the staff and 196 cases were referred to the Department of Justice.

Federal authorities and the Railroad Commission of Texas have cooperated in the investigations made pursuant to Federal and State law.

During the fiscal year funds available for the Petroleum Administration of the Department of Interior, including the Petroleum Administrative Board, Petroleum Labor Policy Board, Petroleum Conservation Division, Division of Investigations, Federal Tender Board No. 1, and Federal Petroleum Agency No. 1, totaled \$714,361, which was obligated for \$565,632, leaving an unexpended balance of \$148,729 as of June 30, 1936. The gross fund was comprised of allotments of \$214,361 from National Industrial Recovery and Public Works Administration, and of a direct appropriation of \$500,000 in the deficiency bill approved August 12, 1935. Of the allotted funds the Petroleum Administrative Board obligated \$167,659 and the Petroleum Labor Policy Board obligated \$27,749, leaving an unex-

pending balance of \$18,953 when the activities of these agencies terminated on March 31, 1936. From April 1 to June 30, 1936, the Petroleum Conservation Division obligated the deficiency appropriation for \$15,560, and during the entire fiscal year this appropriation was obligated for \$206,913 by the Federal Tender Board No. 1 and the Federal Petroleum Agency No. 1, and for \$147,751 by the Division of Investigations (oil enforcement), leaving an unexpended balance of \$129,776.

As of July 1, 1935, the Petroleum Administration had 263 employees, 110 with the Petroleum Administrative Board, 17 with the Petroleum Labor Policy Board, 54 with Federal Tender Board No. 1 and Federal Petroleum Agency No. 1, and 82 with the Division of Investigations (oil enforcement). At the end of the fiscal year the number of employees had been reduced to 97, of which 19 are in Washington and 78 in the field. The appropriation available for the year beginning July 1, 1936, has been reduced to \$300,000 and personnel adjustments pending at the close of the fiscal year have resulted in a further reduction in the number of employees.

The following table shows the expenditures made of available funds:

Personal services

	Emergency fund	Appropriation	Total
Agency:			
Division of Investigations (Oil Enforcement).....		\$107,564	\$107,564
Petroleum Conservation Division.....		14,060	14,060
Petroleum Administrative Board.....	\$140,075		140,075
Petroleum Labor Policy Board.....	22,763		22,763
Federal Tender Board No. 1 and Federal Petroleum Agency No. 1.....		153,376	153,376
Total.....	162,838	275,000	437,838
Miscellaneous:			
Materials and supplies.....	2,313	27,351	29,664
Communication.....	2,345	3,565	5,910
Travel.....	13,290	35,556	48,846
Transportation of things.....	65	1,679	1,744
Printing and binding.....	2,586	4,922	7,508
Rent of buildings.....	11,567	8,102	19,669
Repairs and alterations.....	362	119	481
Equipment.....	42	13,640	13,682
Not otherwise classified.....		290	290
Total obligated.....	195,408	370,224	565,632
Unobligated.....	18,953	129,776	148,729
Total funds available.....	214,361	500,000	714,361

	Washing- ton office	Field	Total
Personnel as of June 30, 1935:			
Petroleum Administrative Board.....	101	9	110
Petroleum Labor Policy Board.....	17		17
Federal Tender Board No. 1 and Federal Petroleum Agency No. 1.....		54	54
Division of Investigations.....	21	61	82
Total.....	139	124	263
Number of employees as of June 30, 1936: Petroleum Conservation Division (including Federal Petroleum Agency No. 1 and Federal Tender Board No. 1).....			
	19	78	97

WAR MINERALS RELIEF COMMISSION

ROSCOE FERTICH, *Commissioner*

Acting under the War Minerals Relief Act (40 Stat. 1272) as amended February 13, 1929 (45 Stat. 1166), the Secretary of the Interior made 26 awards and 7 disallowances during the fiscal year ending June 30, 1936.

Six awards, totaling \$5,840.61, carried over from the previous fiscal year, and 13 awards, totaling \$83,582.17, made during the present fiscal year, were paid through the Treasury deficiency appropriation (Public, No. 440, 74th Cong., approved Feb. 11, 1936); and 7 awards, totaling \$19,800.68, were paid through the Treasury deficiency appropriation (Public, No. 739, 74th Cong., approved June 22, 1936). A total of \$109,223.46 was paid during this fiscal year.

Six awards, totaling \$21,395.33, were certified to the General Accounting Office prior to June 30, 1936, to be paid through a future Treasury deficiency appropriation.

Record of cases filed under the act as amended Feb. 13, 1929

Total cases filed.....			348
Total cases dismissed by Supreme Court of District of Columbia.....			67
Decisions by the Secretary of the Interior:			
	<i>Awards</i>	<i>Denials</i>	
To June 30, 1935.....	139	13	
July 1, 1935 to June 30, 1936.....	25	7	
	-----	-----	
	164	20	
	-----	-----	184
Cases pending:			
In Supreme Court of the District of Columbia.....			74
Decrees by Supreme Court of the District of Columbia, pending in			
War Minerals Relief Commission June 30, 1936.....			23
			----- 348

ACTION IN THE SUPREME COURT OF THE DISTRICT OF COLUMBIA

Thirty-four cases were heard and dismissed upon final order of the court, which held: (1) Conduct of milling and smelting operations and the manufacture of ferro-alloys not to be within the meaning of the War Minerals Relief Acts; (2) profits in one operation by a claimant may be considered in arriving at a net loss in all

operations by a single claimant; (3) failure of plaintiff to prosecute cases; (4) claims not assignable by operation of law, and death of claimant and dissolution of corporation relieved the Government of liability under the act; (5) that the court could not review as matter of law an item not considered by the Secretary of the Interior.

Ten decrees were entered by the court during the fiscal year ending June 30, 1936, authorizing the Secretary of the Interior to review previous decisions made by him.

ACTION IN THE COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA

Néil Crowley, as receiver of the Cuyuna-Minneapolis Iron Co., no. 6537, March 23, 1936: Court upheld the right of a receiver to prosecute the claim under the 1929 amendment of the Relief Act.

W. L. Gazzam, no. 6602, March 30, 1936: Court remanded the case to Supreme Court of the District of Columbia to give petitioner opportunity to show his right to sue on the claim and to receive the award—if one is made—on the partnership's behalf.

Tungsten Reef Mines Co., no. 6554, May 11, 1936: Court sustained a decision of the Supreme Court of the District of Columbia that an item of loss was not subject to review by that court as a matter of law unless the item had been previously considered and denied by the Secretary of the Interior.

IN THE SEVENTY-FOURTH CONGRESS

Amendments to War Minerals Relief Act of March 2, 1919 (40 Stat. 1272):

Public, No. 602, approved May 18, 1936, authorized the Secretary of the Interior to open or reopen previous decisions to include interest paid or accrued to the date of passage of the act when proven to his satisfaction to be allowable losses within the meaning of the Relief Act of March 2, 1919, as amended. This act sets a limitation of \$1,250,000 for this purpose. An appropriation of \$500,000 was included in the deficiency appropriation (Public, No. 739, approved June 22, 1936).

Seven claims were filed under this act, before June 30, 1936.

Public, No. 847, approved June 30, 1936, authorized claimants who failed to file suit under the 1929 amendment of the Relief Act to petition the Secretary of the Interior to review their claims upon matters of fact 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 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 benefits of this act: *Provided*, That such claims be filed within 6 months of approval of this act.

NATIONAL BITUMINOUS COAL COMMISSION

C. F. HOSFORD, Jr., *Chairman*

By the Bituminous Coal Conservation Act of 1935, approved by the President on August 30, 1935, there was created in the Department of the Interior a National Bituminous Coal Commission, the five members of which were duly appointed by the President on September 21, 1935.

The basic act specified that the provisions of section 4 "shall be formulated by the Commission into a working agreement to be known as the Bituminous Coal Code." Immediately after its organization on September 28, 1935, the Commission proceeded to the formulation of the code and by its order no. 1, dated October 9, 1935, promulgated the code. This was followed by the issuance to producers of forms of acceptance of the code, and on May 18, 1936, acceptances had been received from 4,332 producers whose 1934 tonnage totaled 251,745,140 tons and constituted 70 percent of the entire national production.

The act divided the coal fields of the United States into 23 districts and, for the purpose of establishing minimum prices, grouped these districts into 9 minimum price areas. On October 9, 1935, the Commission issued instructions for the election of members of the 23 district boards of coal producers, as provided in the act, and by November 1, 1935, district boards had been organized in practically all districts. These district boards, under the general supervision of the Commission, were required to assist in the establishment of minimum prices and in the general administration of the act.

One of the major functions of the Commission was the establishment of minimum prices for all kinds, qualities, and sizes of coal produced and marketed in the United States, and prior to the decision of the Supreme Court in the case of *Carter v. Carter Coal Company et al.* rendered on May 18, 1936, the Commission had completed a large part of the work incident to the establishment of minimum prices in all minimum price areas and had actually established and put into effect minimum prices in some of the western price areas. In order to facilitate the compiling of statistical information necessary to the establishment of minimum prices the Commission directed

the organization of statistical bureaus in each of the districts. These bureaus collected from the code members within the respective districts data on producing costs as required by the act and submitted the compilations therefrom to the Commission, which computed the weighted average cost of production for the various minimum price areas and reported its findings to the district boards for use in the determination of proposed minimum prices for all kinds, qualities, and sizes of coals produced within the respective districts. As a further step in the establishment of minimum prices the Commission directed the classification of all coals of all code members within the various districts, and, prior to the establishment of minimum prices for a price area, required representatives of all district boards within the minimum price area to coordinate proposed minimum prices in the various common consuming markets, under the direction of the Commission. In addition to these informal conferences, formal public hearings were held in Washington as well as in the producing fields relative to the establishment of minimum prices. When the Supreme Court decision of May 18, 1936, invalidated the minimum price provisions of the act, the work necessary to the establishment of minimum prices for coals produced in minimum price area no. 1, which comprised approximately 90 percent of all coal produced in the United States, was practically completed.

Under authority of section 18 of the basic law, the Commission, in conjunction with the consumers' counsel, opposed before the Interstate Commerce Commission the application of the class I railroads in the United States for a continuance of emergency freight surcharges on bituminous coal beyond their original expiration date, June 30, 1936 (I. C. C., Ex parte 115). These surcharges were conservatively estimated as amounting to \$30,000,000 annually and constituted a very heavy burden on a depressed industry and on the consumers of bituminous coal, with the additional effect of reducing the coal tonnage shipped by rail. The Commission was represented at hearings and also submitted testimony and exhibits to the Interstate Commerce Commission in support of the position taken. In addition, it filed a brief jointly with the consumers' counsel setting forth both the detailed factual evidence and the arguments against any continuance of the freight surcharges on bituminous coal.

The decision of the Interstate Commerce Commission in this matter, handed down on June 9, 1936, denied the petition of the railroads for a continuance of the surcharges indefinitely beyond June 30, 1936. It authorized a temporary extension for 6 months but required a reduction during this period in the maximum surcharge on coal and coke from 15 cents to 10 cents per ton. This decision will, in a degree, relieve the bituminous-coal industry of a heavy burden

and will represent savings of millions annually to consumers of bituminous coal.

During the year the Commission initiated studies and investigations required under section 16 of the act, which section reads as follows:

SEC. 16. The Commission shall study and investigate the matter of increasing the uses of bituminous coal and the problems of its importation and exportation; and shall further investigate—

(1) The economic operation of mines with the view to the conservation of the national coal resources.

(2) The safe operation of mines for the purpose of minimizing working hazards, and for such purpose shall be authorized to employ the services of the Bureau of Mines.

(3) The rehabilitation of mine workers displaced from employment, and the relief of mine workers partially employed. The Commission's findings and recommendations shall be transmitted to the proper agency of the Government for relief, rehabilitation, and subsistence homesteads.

(4) The problem of marketing to lower distributing costs for the benefit of consumers.

(5) The Commission shall, as soon as reasonably possible after its appointment, investigate the necessity for the control of production of bituminous coal and methods of such control, including allotment of output to districts and producers within such districts, and shall hold hearings thereon, and shall report its conclusions and recommendations to the Secretary of the Interior for transmission by him to Congress not later than January 6, 1936.

The work of the Commission in the immediate future will be limited to the consummation of the studies required under section 16 of the act and to the continued representation of the bituminous coal industry before the Interstate Commerce Commission as provided under section 18 of the act. By a decision of the Comptroller General of the United States, dated May 25, 1936 (A-75704), it was held that these sections of the act were in nowise impaired by the decision of the Supreme Court invalidating certain provisions of the statute.

At no time has the staff of the Commission reached the quota anticipated due to the fact that numerous court actions directed by producers against the collection of the tax provided for in section 3 of the act and the injunctions granted by the courts in many of these cases seriously impeded the work of the Commission, and also because it was not until February 11, 1936, that the bill appropriating funds for the use of the Commission was passed by Congress. Prior to that time the Commission operated with a skeleton organization borrowed from the National Recovery Administration. Following the decision of the Supreme Court the staff of the Commission has been reduced to the number necessary for completion of the various studies being conducted.

The Bituminous Coal Conservation Act of 1935 was the first Federal statute enacted to regulate a major natural resource industry by

the establishment and enforcement of minimum prices, and although the injunctions obtained by various producers and the decision of the Supreme Court invalidating its price provisions made the act inoperative to a large extent, nevertheless the work of the Commission and the data compiled as to conditions in the industry will prove of definite value in determining upon a regulatory program within the constitutional limitations upon the power of Congress to deal with the broad subject of conservation of natural resources and regulation of natural resource industries.

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 being carried on by them, and to inform the public of the services rendered by each department and establishment.

Experience has proved that one of the best methods by which the public may be made acquainted with the activities and services of the Government 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.

In the past, with exception of one Government department, there has been no organized effort throughout the various Government departments and establishments to plan, coordinate, and supervise the activities of the various bureaus, divisions, and offices in each department and establishment in connection with Government participation in expositions. Such participation having become an established policy, however, as indicated above, and expositions having become so regular and frequent, it has been deemed advisable by several of the Government departments to establish an exhibits office to plan, coordinate, and supervise the exhibits and displays which will portray the work of the bureaus in each of the departments and establishments. 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, and the official referred to has supervision over the Department's exhibits at the California Pacific International Exposition, the Texas Centennial 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 San Francisco and New York expositions.

Further, for distribution from Washington and at the Department's exhibits at various expositions the Office of Exhibits during the past few months, with the valuable assistance of the various bureaus within the Department, and the assistance as well of the Public Works Administration and the National Resources Committee, compiled 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.

The results obtained thus far have quite clearly demonstrated the desirability and importance of an Office of Exhibits in the Interior Department, and it is believed that future developments will tend to demonstrate this fact even more conclusively.

DIVISION OF MOTION PICTURES

FANNING HEARON, *Acting Director*

The Division of Motion Pictures was established on November 25, 1935, by Order No. 1005-A. This order consolidated the motion and still picture activities and personnel of the Department, except the cooperative production of the Bureau of Mines and the specialized work of the Geological Survey.

The major purpose of the Division has been to provide educational film service for C. C. C. camps under technical supervision of the Department. This has been accomplished by production, purchase, and distribution of suitable films.

Another important purpose of the Division has been that of producing still and motion-picture records of the activities of the Department and of the C. C. C. for their record value and for educational use. The motion pictures are being used extensively by schools and other nontheatrical institutions. Prints from still negatives are used by newspapers, magazines, and book publishers. Enlargements are prepared for decorative use among Government offices, and for educational exhibits.

Other departments and bureaus have requested and received the cooperation of the Division in the production and distribution of motion and still pictures of their activities. This has included cooperation with the Veterans' Administration, Department of Commerce, Emergency Conservation Work, Resettlement Administration, and others.

The physical equipment of the Division includes two adjoining photographic laboratories, an enlarging laboratory, a motion-picture laboratory, and facilities for the proper storage, care, and distribution of finished films and pictures. The laboratories are equipped to accomplish all ordinary and many special requirements.

Exhibitions of motion pictures loaned by the Division during the past year were attended by more than 1,000,000 persons in C. C. C. camps, schools, colleges, and other institutions. Untold millions saw still pictures of the national parks, reclamation projects, and Indian activities. Enlargements and special exhibits of photographs have been on display throughout the United States. There have been many more requests for films, slides, and photographs than could be accommodated.

The Division is well organized and efficiently equipped to take an important part in that vital program which the Federal Government is approaching effectively—that of keeping the people intelligently and impartially informed of its far-flung activities.

THE ADVISER ON NEGRO AFFAIRS

ROBERT C. WEAVER, *Adviser*

The activities of the office of the Adviser on Negro Affairs may be divided into two groups: Those matters which concern the Department of the Interior and the Public Works Administration; and those things which are outside the direct province of the Department of the Interior and the Public Works Administration.

This office has watched constantly the employment of Negro skilled and unskilled labor on Public Works Administration projects. In this connection it suggested, and had approved, at the initiation of the program of the Housing Division a nondiscrimination clause which establishes prima facie evidence of discrimination. It has cooperated with the Labor Department in effecting negotiations with local union officials, and has investigated local labor conditions so as to determine the availability of qualified Negro workers. During the last year, 10 Public Works Administration housing projects have been submitting monthly reports to the Adviser on Negro Affairs relative to the operation of this clause. To date four projects are practically completed, and in each instance the compliance with the nondiscrimination clause has been obtained. In this work the cooperation of the Inspection Division and the Labor Relations Division of the Public Works Administration has been most helpful. On the basis of past experience, the clause based on prima facie evidence of discrimination has proven to be a successful means of protecting Negro labor on Federal projects.

In addition to the work in relation to labor policy and practices on housing projects, the Adviser on Negro Affairs has kept in touch with the Housing Division and has cooperated with that division in handling matters of policy in relation to plans for the management of low-rent housing projects. He and his staff have visited these projects when the need has arisen, and have kept abreast of developments in connection with the housing program of the Public Works Administration. On general Public Works Administration projects the office of the Adviser on Negro Affairs has supplemented and cooperated with the work of the Labor Relations Division of the Public Works Administration in an effort to prevent and correct discrimination against Negro labor. This office has gathered data relative to Public Works Administration projects designed for Negro

occupancy or use, and has disseminated this information when requests have been received.

In January of 1936 the Works Progress Administration granted an allotment to the Adviser on Negro Affairs for the initiation of a white-collar survey among Negroes. This allotment provided for the expenditure of \$467,042, to be used for a survey of the training and employment of Negro white-collar and skilled workers. This office was sponsor for the project, and the Adviser on Negro Affairs is the administrator of the survey. The survey operated in 87 cities in 30 States and the District of Columbia. All field work has been completed. Editing, coding, and tabulation will be conducted in New York City and Nashville, Tenn. At the peak of production the survey gave employment to 1,899 workers. Of this number 315 were nonrelief, and 1,584 were relief. At the request of local Works Progress Administration administrators and of workers formerly connected with this survey, the office of the Adviser on Negro Affairs is planning to submit additional surveys which will be sponsored by this office, and will give employment to workers who have not yet been absorbed in the white-collar projects of the Works Progress Administration.

In the fall of 1935, at the request of the Tennessee Valley Authority, the Adviser on Negro Affairs made a survey of the Tennessee Valley Authority. This study concerned itself with the program of the Tennessee Valley Authority and its relation to the Negro community and the Negro farmer. It also made specific recommendations relative to housing, employment, and classification of Negro workers attached to the Tennessee Valley Authority.

The Adviser on Negro Affairs has interested himself in the promotion of qualified Negro employees in the Public Works Administration and the Department of the Interior. He conducted recently a survey of the employment status of Negroes in these departments in an effort to advise more effectively in this connection. In instances where complaints of discriminatory practices have been voiced, the office of the Adviser on Negro Affairs has stimulated investigations and reviewed corrective measures undertaken.

In March of 1936 the Associate Adviser on Negro Affairs investigated charges of discrimination on the Coulee Dam Project. As result of his trip and negotiations, Negroes have been employed on that project. In spite of the fact that the dam is located in an area in which few Negroes reside and labor is being taken from persons living in areas contiguous to the project, there has been a steady increase in the number of Negro workmen employed on the project since the initial employment of a Negro laborer was made as result of the activities of this office.

The Adviser on Negro Affairs has maintained his contacts with other governmental agencies and has submitted memoranda, suggestions, and advice to these agencies in response to their requests. He has prepared speeches and articles relating to the impact of the program of the Public Works Administration upon Negroes and has cooperated with the United States Information Service in answering a hundred or more requests relative to various phases of the Negro's economic, educational, and social status in this country.



BUREAU OF RECLAMATION

JOHN C. PAGE, *Acting Commissioner*

Dwindling revenues have emphasized the necessity for increasing the number of sources from which flow the funds for reclamation. In 1902, when Federal responsibility toward the arid and semiarid western public land States was recognized with the enactment of the Reclamation Act, the sale of public lands constituted an important source of revenue. Funds from this source were relied upon to make the then new reclamation policy effective.

Today the situation is entirely altered. Salable public lands have been exhausted. The remaining public domain has been withdrawn, and a new policy has been established with regard to it. Nearly all of it has been set aside as a permanent public range to be administered by the Federal Government and conserved for perpetual use by the people. This was a logical step, long overdue, but now that it has been taken it focuses sharply the imperative need for the discovery of new sources of revenue to the reclamation fund.

Revenues to the reclamation fund from the sale of public lands have dropped from \$9,430,573.98 in 1908 to \$154,567.65 this year. During this long period of diminishing revenue from this source, Congress has recognized the need for added sources of revenue to the reclamation fund. A very valuable addition was made by the Oil Leasing Act of February 25, 1920. Royalties received from the exploitation of oil on the public domain in 1924, added \$6,693,908.15 to the reclamation fund. This year only \$2,053,152.48 was received due to effective application of an oil conservation policy. Thus, the one important supplementary revenue to the reclamation fund is seen to be diminishing.

The only revenue to the reclamation fund which can be called stable at this time is that received from repayment of project construction costs by those benefiting. A moratorium granted and extended by Congress has postponed or curtailed these repayments for a space of 6 years. Even with the resumption of the annual repayments in full, and this resumption is an immediate prospect, revenues to the reclamation fund will be insufficient due to the vanishing receipts from other sources, to uphold the long-recognized responsibility of the Federal Government toward these arid and semiarid public land States. There can be no overemphasis of the immediate urgency of the requirement for augmented revenues to the reclamation fund.

WORTH OF POLICY PROVED

The value of the Federal reclamation policy in knitting together the western third of the Nation, in sustaining the people and in stabilizing the agriculture of the far western States, in moderating the effects of droughts and similar disasters has been demonstrated repeatedly in recent years. The 1935 crop season was one of about normal precipitation throughout the West. It followed an acute drought of the previous year, and preceded what appeared to be (at the end of the 1936 fiscal year) another drought of great severity. There was sufficient water for all Federal reclamation projects in 1935, just as there had been during the drought of 1934, and prospects for the 1936 irrigation season, despite the threatened drought, were good. Federal projects are prosperous. Only two projects went into the 1936 season with low reservoirs, and the visible stored water supplies for these was sufficient to eliminate the possibility of serious losses.

CONSERVATION OF SMALL STREAMS

The time has arrived when serious consideration must be given to an additional conservation activity in the arid and semiarid west; namely the control of the floods of small streams and the preservation of their waters for beneficial use. The extended period of deficient rainfall, now 7 years long, has emphasized the importance of this work. Failure to control and to use this resource is an offense against the theory of conservation as well as an economic loss. State authorities have investigated possibilities presented by their small waters. They have reported finding several hundreds of opportunities for construction of small reservoirs costing from \$5,000 to \$50,000 and serving from a few hundred to a few thousand acres. If this work is to be fitted into the national plan for control of floods, regulation of streams and beneficial use of water supplies, the Bureau of Reclamation logically must be the agent through which this is effected. Investigation should be made by the Bureau to determine the extent of these opportunities and the feasibility of projects on small streams. Standard designs should be made for structures suitable for these small developments, and standard plans mapped out for construction of these projects.

IMPROVED CONDITIONS OF FEDERAL PROJECTS

The Operation and Maintenance Division, newly organized, assisted materially during the year in establishing closer contacts with the operating projects and creation of a better attitude on the part

of water users. Federal projects generally were in an improved condition as a result of increased settlement. Irrigated farms attracted many from among those who were looking for new opportunities as a result of general improvement in the agricultural outlook and those who previously were dry farmers but who were dislodged by the drought of 1934. On the Owyhee project in Oregon 107 public land farm units were offered. In addition, 27 were offered on the Vale project in the same State and 28 on the Sun River project in Montana. Settlement proceeded quite satisfactorily.

CONSTRUCTION PROGRAM GOES FORWARD

The great construction program of the Bureau of Reclamation went forward expeditiously throughout the year. Three storage dams, begun since emergency funds first were made available, were completed and put in service. They are the Rye Patch Dam of the Humboldt project, the Hyrum Dam of the Hyrum project, and the Agency Valley Dam of the Vale project. These dams already are stabilizing important communities in the States of Nevada, Utah, and Oregon, respectively.

LAKE MEAD

The death of Dr. Elwood Mead, for more than a decade Commissioner of Reclamation, on January 26, 1936, was a severe loss to the Bureau of Reclamation and the country. To commemorate his fine, long service to the West he loved, the Division of Geographic Names gave the name Lake Mead to the great body of water created by Boulder Dam on the Colorado River. This lake, already the largest artificial lake in the world, grew steadily larger throughout the year, until it reached a length of 91 miles at the close of the fiscal year. At capacity it will be 115 miles long.

CONSTRUCTION ACTIVITIES DURING FISCAL YEAR

During the fiscal year, an extensive construction program was prosecuted with funds remaining from the Public Works allotments and with additional funds allocated by the Emergency Relief Administration. There were constructed 160.2 miles of roads, 1.6 miles of railroad, 55.3 miles of transmission lines, 523.1 miles of canals and drains, 40 tunnels with a total length of 46,022 feet, 4,875 canal structures, 192 bridges, and 630 culverts. There were excavated 46,107,497 cubic yards of earth and rock, making the total to date 402,317,184 cubic yards. The Bureau used 1,159,958 barrels of cement and placed 890,959 cubic yards of concrete. Construction of

five storage dams and one diversion dam was started. The Denver office organization exceeded 800 employees for the increased activities and a continuation of the design and specification work for the Tennessee Valley Authority.

Boulder Dam was accepted as complete from the Six Companies, Inc., March 1, and the work under the contract with Babcock & Wilcox is still in progress. Installation of electrical equipment and machinery in the power-house has been continued throughout the year with Government forces. Storage in Lake Mead reached a maximum of 8,978,000 acre feet on June 30.

Construction work on the Columbia Basin project, Washington, has been the major undertaking during the year. The principal contractors, Mason-Walsh-Atkinson-Kier, have excavated 6,272,100 cubic yards of earth and rock by means of the belt-conveyor system, and have completed the aggregate and cement storage and concrete mixing plants. In the west abutment section, which rises more than 90 feet above bedrock, 625,000 cubic yards of concrete have been placed.

The Columbia River highway bridge, including realignment and enlargement of the pier due to movement of the east river bank, has been completed. Dormitories, residences, a garage, and fire station have been constructed, and sidewalks and street paving have been completed in the Government camp site.

Construction is under way on the Casper-Alcova project, Wyoming. W. E. Callahan and Gunther & Shirley were awarded the contracts for construction of tunnels nos. 3, 4, 5, and 6 and Alcova Dam. Seminoe Dam is being constructed by the Winston Bros., Morrison-Knudsen, and Utah Construction Cos., under a \$2,759,804 contract. Schedules 1, 2, and 3, covering earthwork, tunnels, and structures of the Casper Canal, have been completed. Government buildings at Seminoe Dam site and residences at both the Alcova and Seminoe sites are under construction by Dutlox, Kendall & Hunt, Inc., of Denver, Colo.

During the year, 28,500,000 cubic yards have been excavated, which totals 39,678,000 cubic yards to date on the All-American Canal. Work has been continued by the W. E. Callahan and Gunther & Shirley Cos. and by Lewis Chambers Co., and Mittry Bros., on their contracts, which were started in July 1935. The Morrison-Knudsen, Utah Construction Co., and Winston Bros. are constructing the Imperial Dam and desilting works under a contract amounting to \$4,374,240 and the concrete aggregates for the structures are being prepared by the Triangle Rock & Gravel Co. and Charles Holmes, who were awarded a contract on their bid of \$149,900.

The Malheur River and Dead Ox siphons have been completed on the Owyhee project by Parker-Schram, Consolidated Steel Corporation, and J. A. Terteling & Sons, and numerous contracts have been in force for earthwork and structures for both the north and south canals and laterals. Principal contractors have been Morrison-Knudsen Co., who held three contracts totaling \$236,294; J. A. Terteling & Sons, whose seven contracts amounted to \$112,407; and George B. Henley, whose seven contracts totaled \$62,675.

On the Carlsbad project, New Mexico, work was started on the construction of the Alamogordo Dam, a 135-foot earth-fill structure across the Pecos River in De Baca County, which will store 115,000 acre-feet of water for the irrigation of lands in the vicinity of Carlsbad. The contractor on the dam is the Hallet Construction Co., of Crosby, Minn., and the contract price is \$1,132,547. The contract was 15 percent complete at the end of the year.

Construction of the Island Park Dam, an 85-foot earth-fill dam, was started on the Upper Snake River Storage project, Idaho, to form a reservoir on Henrys Fork with a capacity of 114,000 acre-feet. The contract, awarded to the Max J. Kuney Co. of Spokane on its bid of \$478,838, was 14 percent complete at the end of the year. Reservoir cleaning is being done by the Nevada Construction Co., of Nevada, Mo., for \$66,890.

In Wyoming work was started on the Bull Lake Dam, a 75-foot earth-fill structure, to store 155,000 acre-feet of water for the Riverton project. The contract, which was awarded to the S. J. Groves & Sons Co. of Minneapolis at a price of \$653,398, was 7 percent complete at the end of the year. Work was also under way on the distribution system for 35,000 acres of land on the Heart Mountain division of the Shoshone project. A contract for the construction of three tunnels on the Shoshone Canyon conduit was awarded to the Utah Construction Co. of Ogden, Utah, at a price of \$614,510, on which the work was 18 percent completed.

Contracts were awarded for the construction of Caballo Dam on the Rio Grande project, New Mexico, and of the Unity Dam on the Burnt River project, Oregon. The successful bidder on Caballo was Mittry Bros. Construction Co. of Los Angeles, and on Unity it was J. A. Terteling & Sons of Boise. The bid prices were \$957,018 and \$273,989, respectively. Work had not been started on either at the end of the year.

In Arizona major work was started on two projects. Work was inaugurated on the Gila Valley project with the beginning of construction on the main canal by Boyce & Igo, of Baton Rouge, under a \$273,600 contract, and by Mittry Bros. Construction Co., of Los Angeles, under a \$681,575 contract. On the Salt River project im-

provement work on two dams was started. The Allied Bridge & Construction Co. of Omaha and the Central Bridge & Construction Co. of Wahoo, Nebr., are making alterations on the spillway of Stewart Mountain Dam for a price of \$150,724, and Dan Teeters & Co. of Garnet, Calif., are making spillway alterations at Roosevelt Dam for \$53,930.

Major work on canals and laterals was started during the year on several other projects. On the Payette division of the Boise project, J. A. Terteling & Sons of Boise has a \$292,415 contract for tunnel construction. On the Roza division of the Yakima project, Washington, the Morrison-Knudsen Co. has a \$993,840 contract for tunnel construction, and J. A. Terteling & Sons has a \$275,213 canal construction contract. J. A. Terteling & Sons has a \$424,978 contract for canal construction on the Ogden River project, Utah. On the Sun River project, Montana, Martin Wunderlich of Jefferson City, Mo., completed a contract for canal construction, which he was awarded on a bid of \$211,085. In addition, construction of laterals was started by T. G. Rowland of Salt Lake City, Utah, and by Rue Bros., of Bismarck, N. Dak., on contracts of \$43,531 and \$78,882, respectively.

Improvements were started on the Arrowrock Dam on the Boise project and the Kachess Dam on the Yakima project. The Arrowrock Dam is being raised 5 feet by T. E. Connolly of San Francisco, for a contract price of \$395,040. At Kachess, John Klug, of Nyssa, Oreg., is constructing a spillway on a contract awarded at a bid price of \$48,778.

Three dams in addition to Boulder were completed during the year. The 75-foot earth fill Rye Patch Dam on the Humboldt project, Nevada, was completed in June. Agency Valley Dam, a 93-foot earth fill structure on the Vale project, Oregon, was completed in December 1935. The contract for the construction of the 90-foot earth fill Hyrum Dam on the Hyrum project, Utah, was completed in August 1935.

In addition to Grand Coulee there were four dams still under construction at the end of the year on which work had been started previously. Work on Parker Dam, which is being constructed for the Metropolitan Water District of Southern California, was under suspension at the beginning of the year but was resumed in October, and by the end of the year the contract was about 25 percent complete. In Utah, work was carried on throughout the year at the Pine View Dam on the Ogden River project but, owing to the heavy snow, work was suspended for several weeks during the early spring on the Moon Lake Dam of the Moon Lake project. Work on the

Taylor Park Dam on the Uncompahgre project, Colorado, was suspended for several months during the winter because of snow, but was resumed in the spring and by the end of the year the contract was 26 percent complete.

In addition to the larger contracts enumerated, the Bureau had under way during the year construction work incidental to the major construction jobs. The work of completing the Hamilton Dam on the Colorado River in Texas was turned over to the Lower Colorado River Authority at the end of the year.

STATISTICAL DATA

The area irrigated in 1935 with water from Government works was 2,935,616 acres, an increase of 98,411 acres over that for 1934.

The area cropped was 2,861,136 acres, an increase of 104,438 acres.

The total value of crops was \$106,781,294, an increase of \$5,837,580 compared with 1934 and of \$22,589,561 compared with 1933.

Construction payments in cash and credits from power and other sources received during the fiscal year 1936 were \$399,372.09, a decrease of \$275,200 compared with the previous year.

Payments for operation and maintenance were \$996,115.12, a decrease from the previous year of \$82,780.92.

Total payments amounted to \$1,395,487.21 compared with \$1,753,468.13 in 1935, a decrease of \$357,980.92. Income to the reclamation fund from all sources during the fiscal year was \$4,838,211.47, or \$322,200.12 more than for the previous year.

The operation and maintenance expense for the year was \$1,204,053.44, an increase over the previous year of \$72,005.78.

Excess of operation and maintenance cost over receipts for the year amounted to \$207,938.32, compared with an excess of cost over receipts of \$53,151.62 for the previous year.

Construction work was carried on with funds provided under the National Industrial Recovery and Emergency Relief Acts. Operation and maintenance of the irrigation, drainage, and power systems was carried on with direct appropriations from the reclamation fund, money advanced by the water users organizations, and revenues from power operations.

The act of June 13, 1935, extended the provisions of previous acts granting temporary relief to water users on irrigation projects, and construction charges coming due for the year 1935 were not required to be paid. This explains the reason for the small payments as given under this heading.

CONTRACTS

During the past fiscal year the Bureau entered into a total of 4,455 contracts, their nature and the amounts involved being summarized as follows:

Nature of contract	Number of contracts	Amount involved
Cooperative investigations.....	2	\$103,000.00
Supplies.....	1,471	1,360,980.46
Material.....	1,016	10,762,802.86
Equipment.....	424	4,570,897.82
Miscellaneous services.....	267	142,850.18
Construction work.....	95	20,791,895.05
Land purchases, including improvements.....	242	475,718.26
Land sales, including improvements.....	4	1,900.00
Leases to the United States.....	78	78,289.06
Leases from the United States.....	299	66,060.55
Compromise of damages.....	1	12,000.00
Rental of Government equipment.....	5	376.00
Rental of water.....	261	96,513.59
Sale of surplus electrical energy.....	74	121,599.70
Sale of water rights to towns.....	1	1,370.00
Sale of water rights under the Warren Act.....	49	14,855.20
Sale of water rights within projects.....	6	25,120.82
Adjustment and relief.....	3	84,432.56
Transfer of project operations.....	1	-----
Miscellaneous.....	156	80,950.63
	4,455	138,791,612.74

¹ Estimated in part.

SETTLEMENT

Considerable activity was marked on the Federal reclamation projects. On the Vale and Owyhee projects, Oregon, about 1,000 acres were sold by the Vale-Owyhee Land Settlement Board, and in addition a number of tracts were disposed of by real-estate agents. On the Yakima project, Washington, numerous inquiries were received from the drought-stricken areas, and interest in valley lands increased perceptibly. Public land openings were held on the Shoshone (Wyoming), Belle Fourche (South Dakota), Sun River (Montana), Vale (Oregon), and Owyhee (Oregon-Idaho) projects. More than 10,000 acres were included in the tracts opened, and this acreage was divided into 170 farm units, averaging in size from 5 to 160 acres. The desire for land where irrigation assures productivity was evidenced by the large number of farmers filing application at these openings.

EMERGENCY CONSERVATION WORK

The drought of 1934 was responsible for the first allocation of C. C. C. camps to the Bureau of Reclamation for the purpose of improving the conservation of water supplies in the irrigated lands in the semiarid West. During that summer, an average of only three camps were so employed, which was increased to an average of nine camps during the summer of 1935. The fiscal year 1936 witnessed

the fourfold expansion to an average of 35 camps located on 23 reclamation projects in 14 western States.

Accomplishments by E. C. W. camps on the reclamation projects enhance the security of the United States in those projects and tend to assure the return of the money advanced by the Government for reclamation and associated developments. Regulated relief in distressed areas and conservation work of a highly beneficial nature in the protection and utilization of water supplies and natural resources are simultaneously provided through Emergency Conservation Work.

Major items of accomplishment completed to June 30 in the approximately 2 years since the first E. C. W. camps began field operations on the reclamation projects are as follows:

Earthwork for irrigation dams.....	cubic yards..	352,062
Clearing and cleaning of irrigation channels.....	square yards..	21,054,514
Clearing of irrigation reservoir areas.....	acres..	1,898
Concrete lining of irrigation canals.....	square yards..	145,474
Earth excavation for irrigation channels, canals, and ditches		
	cubic yards..	771,050
Irrigation water control structures, other than dams.....		2,076
Rodent control along canal banks and on irrigated lands....	acres..	509,500

GILA VALLEY PROJECT, ARIZONA

Actual construction of the Gila Valley project began June 1, 1936, under contract with Mittry Bros. Construction Co., which calls for 243,000 cubic yards of canal excavation and 92,500 cubic yards of tunnel excavation. Boyce & Igo, awarded a contract covering 3,200,000 cubic yards of canal excavation, were ready to start actual operations at the close of the fiscal year. These two contracts involve \$955,175 of the \$1,800,000 allocated from Emergency Relief funds. The construction of headworks and desilting basins are included in the contract with the Utah Construction Co., Winston Bros. Co., and Morrison-Knudsen Co., Inc., for construction of Imperial Dam. The total estimated cost of the first unit of the project is \$20,500,000. Designs are now being prepared for the Gila River siphon and other structures between Imperial Dam and the pumping plant near Blaisdell.

SALT RIVER PROJECT, ARIZONA

Gross returns from crops were \$18,639,000, which is \$2,000,000 more than last year, and nearly midway between the low yield of \$9,700,000 in 1932 and the high yield of \$26,000,000 in 1928. Crop receipts increased 12 percent, bank deposits 46 percent, and Phoenix building permits 300 percent over last year. Water supply is promising, and employment, wages, food and commodity prices have in-

creased. Water in storage June 30 was 694,000 acre-feet. Large quantities of pumped water are being used. The gross power revenue was \$50,000 over last year, but necessity to use more steam power made the net revenue \$50,000 less. Work is progressing on the \$6,000,000 Bureau program for building the Bartlett Dam on the Verde River and making improvements on the Salt River dams. Normal project operations are being carried out on a cash basis and work is in progress on the plan to refinance the bonded indebtedness.

ALL-AMERICAN CANAL PROJECT, ARIZONA-CALIFORNIA

The estimated cost of the All-American Canal system is \$38,500,000, of which \$20,150,000 had been allotted by the end of the fiscal year. Construction contracts awarded during the year totaled \$6,006,563.11. The largest of these was for the construction of Imperial Dam and desilting works at contract price of \$4,374,240.60. Canal excavation by Government forces was completed, 1,767,658 cubic yards of excavation having been moved during the year at a field cost of \$312,776.31. Of the entire 80 miles of All-American Canal now under construction, 45.5 miles have been completed, approximately 30,478,000 cubic yards of material excavated, and 11,300 cubic yards of concrete poured. A camp for Government employees was built near Imperial dam site. Other completed works include a 33,000-volt transmission line from the Siphon Drop power plant on the Yuma project to Imperial Dam and an oil-treated construction road from Laguna Dam to Imperial Dam. Excavation is in progress on the entire length of the canal. Designs and specifications for the many structures required along the canal line including bridges, crossings over the Alamo and New Rivers, Pilot Knob wasteway, checks, drops, turnouts, etc., are being prepared, and advertisement for these structures will be issued as rapidly as possible.

YUMA PROJECT, ARIZONA-CALIFORNIA

While crop values declined slightly during 1935, economic improvement was reflected by an increase exceeding 50 percent in local bank deposits. Values of livestock, motor vehicles, and farm equipment also showed substantial gains. Prices for farm commodities were in general remunerative and the year was a successful one for project farmers.

Three local cooperative marketing organizations were successfully engaged in marketing citrus, alfalfa (hay and seed), and cotton. Credit was available through six agencies, one of which is Federal, one cooperative, and four private.

Under terms of contract dated February 5, 1931, regarding advance payment of operation and maintenance, the Yuma County Water Users' Association had paid on July 1, 1936, some \$43,000 over the sum then due. Outstanding operation and maintenance charges at the close of June 30, 1936, on the reservation division and the auxiliary project were the lowest for a number of years.

BOULDER CANYON PROJECT, ARIZONA-NEVADA

Construction was completed for practically all the project's major features. The working forces were reduced gradually from 3,334 to 1,505.

Work was completed by Six Companies and was accepted by the Government on February 29. The Bureau took over the contractor's plant and equipment for use without charge until October 1 in the completion of plugs in tunnels 1, 2, and 3, switchyards, structures, and installation of powerhouse equipment.

The dam was practically completed, automatic elevators were installed in the Arizona and Nevada shafts, and installation of terrazzo floors in utility and elevator tower lobbies was in progress on June 30.

All work was completed on spillways and intake towers. Pouring of concrete anchors, piers, and thrust blocks was finished in all penstock headers, penstocks, and outlet tunnels. Excavation of the powerhouse highway tunnel adits to the stoney gates and the trail to the Arizona stoney gate was completed in October and placing of concrete lining was finished in May 1936. The first concrete for the downstream plugs in tunnels 2 and 3 was poured in the plug in tunnel 2 on August 21, 1935, and this plug was practically completed on June 30, 1936. Installation of emergency gates in the plug in tunnel 2 was in progress. Slide gates in the plug in tunnel 1 were permanently closed on May 1. In June, pouring of the remaining section of the plug in tunnel 1 was in progress. Construction of the canyon wall valve house and installation of gates and needle valves was completed. Elevators to the valve houses were installed by the contractors.

Construction of the powerhouse building and the Los Angeles switchyard was practically completed. Work was in progress on the Southern Sierras yard. The Arizona extension of the Black Canyon highway was finished and opened to traffic. Installation of power plant machinery by Government forces was in progress throughout the year.

On June 30 the turbine and relief valve scroll cases for unit N-1 were ready for concrete backfill; unit N-2, including lubrication system and governor system, was about 75 percent completed; unit

N-3 was being prepared for pressure test, and unit N-4 was ready for turbine runner installation. The turbine for unit A-8 was approximately 90 percent installed. Installation of the station service unit and penstock was practically completed.

The generator stator and housing for unit N-2 was set in place and installation of the split or parting coils in the stator was in progress. Erection of rotors for units N-1 to N-4, inclusive, and A-8 and stators for units N-1, N-3, and N-4 and A-8 was completed and ready for placing in final position. Installation of generator voltage oil circuit breakers in units N-1 to N-4, inclusive, and A-8, respectively, and the 23,000-volt bus structure at elevation 663 in units N-1 to N-4, inclusive, was completed. Erection of transformers was completed and the transformers were placed in permanent position. Installation of practically all of the control equipment was in progress.

The Babcock & Wilcox Co. completed erection of penstock and outlet plate-steel pipes. All systems except the upper Arizona penstock were successfully tested and preparations were under way at the end of the fiscal year to test this pipe.

At the end of the fiscal year the reservoir was approximately 95 miles long, contained 8,978,000 acre-feet of water, covered an area of approximately 62,450 acres, and its water surface elevation was 1,015.50, 120.5 feet above the lower gate sills of the intake towers. The flow at Grand Canyon was 26,300 cubic feet per second on June 30, and the outflow through the plug gates 11,600 cubic feet per second. On February 10, the lower cylindrical gate of the Arizona downstream intake tower was opened allowing the upper Arizona penstock system to be filled, after which the needle valve farthest downstream in the Arizona valve house was opened letting the first regular flow through the penstock system and canyon wall outlet works. The upper Arizona system was closed on June 10 and the upper Nevada system put in operation for the first time.

CENTRAL VALLEY PROJECT, CALIFORNIA

A project headquarters was established at Sacramento, in October 1935, followed by the location of divisional offices at Kennett, Friant, and Antioch. Cooperatively, the State water project authority is negotiating for water and rights-of-way contracts, and assisting in hydraulic studies, the General Land Office is making resurveys, and the United States Division of Investigations is appraising mining properties. On the Kennett division the Bureau has completed relocation surveys for 30 miles of railroad; surveys of four alternative dam sites—Kennett, Keswick, Baird, and Table Mountain. Exploratory work is 50 percent complete on Kennett dam site. Surveys

have been completed of Friant dam site, for Government camp sites, and for 37 miles of the two main canals. Exploratory work is 75 percent completed at Friant dam site. On the Contra Costa division, preliminary surveys for 30 miles of main canal have been completed.

ORLAND PROJECT, CALIFORNIA

The irrigated acreage in 1935 remained practically the same as for the two previous seasons but the per acre crop value, \$26.05, was \$7 less than for the year 1934. This loss was offset by the higher prices received for butterfat and whole milk. Since dairying is one of the project's major activities, there was a noticeable improvement in economic conditions as a whole. The supply of water was not only ample but there was a carry-over of 30,000 acre feet at the end of the season.

PARKER DAM PROJECT, CALIFORNIA

Parker Dam, under construction on the Colorado River with funds contributed by the Metropolitan Water District of Southern California, will serve as the diversion structure for the district's aqueduct. Work was resumed on October 15, 1935, following the approval on August 30, 1935, of the rivers and harbors bill. Work completed included the excavating and timbering of two 29-foot horseshoe shaped diversion tunnels in the Arizona abutment having a combined length of 3,465.92 feet, and the rough grading of the permanent access road to the dam on the California side. The construction contract as a whole was about 25 percent completed at the close of the fiscal year.

GRAND VALLEY PROJECT, COLORADO

In the 1935 season 16,185 acres were irrigated on 512 farms. The average crop value per acre was \$29.05, which was \$8.30 less than for the previous year, the decrease being attributed largely to the reduction in the price of beans. Beans and alfalfa were the principal crops, with smaller acreages of sugar beets, corn, oats, potatoes, tomatoes, and wheat.

The operation and maintenance charges were continued at \$1.40 per acre. The beet-sugar factory at Grand Junction was not operated on account of the small acreage. The Colorado Potato and Bean Growers' Association functioned well during the year, and handled a large part of these crops for project farmers.

The local farmers are working a gradual recovery from the depression. An ample supply of water was available from the Colorado River for all needs.

PINE RIVER PROJECT, COLORADO

This project is located in La Plata County in the southwestern part of Colorado in the San Juan Basin. It embraces about 56,000 acres of irrigable land and involves the construction of a storage reservoir of about 65,000 acre-feet capacity. The estimated cost of the project is about \$3,000,000.

An item of \$1,000,000 was included in the Interior Department appropriation bill approved June 22, 1936, for commencing construction of the project.

UNCOMPAHGRE PROJECT, COLORADO

During the irrigation season of 1935, 1,609 farms were irrigated, 770 by owners, and the average crop value was \$23.39 an acre, an increase of \$1.45 per acre over the previous year. The sugar factory at Delta handled all beets raised on the project, and most of the potatoes and onions were marketed through cooperatives. Three cooperative gasoline stations did a thriving business. The \$325,000 rehabilitation program started in October 1934, involving repairs to or replacement of canal lining and replacement of numerous canal structures, was prosecuted with a large force during the winter. The program will be completed early in 1937.

Taylor Park Dam and Reservoir is being constructed on the Taylor River, 32 miles northeast of Gunnison, Colo. When completed the reservoir will store 106,230 acre-feet of water to supplement the natural flow rights of the project water users from the Gunnison River.

BOISE PROJECT, IDAHO

Under an allotment of \$600,000 by the Emergency Relief Administration, contract was let in January for raising Arrowrock storage dam and repairing downstream face and spillway. Work was retarded in the spring by a high flood discharge in the river, but it was well under way at the end of the year. The distribution system of the Arrowrock division was in charge of the water users' board of control and the Government controlled the storage and diversion works and power plant. Crop yields and values showed a material increase over the preceding year on account of a less deficient water supply and the choice of new and more profitable crops. The division is fully settled. With an Emergency Relief Administration allotment of \$1,000,000 construction of the Black Canyon Canal for the Payette division was begun. Four tunnels were under construction and additional tunnels, canals, and other structures were ready for advertisement. Settlement of the Payette division lands will be delayed until the main canal is completed.

Operation and maintenance of the Deadwood Reservoir and Black Canyon Dam, power plant, and pumping plant was carried on by Government forces.

MINIDOKA PROJECT, IDAHO

The total value of crops grown in 1935 was \$2,851,268. On the gravity division 1,560 farms were irrigated and 854 on the pumping division. About 60 percent of the farms were operated by owners and 40 percent by tenants. Operation and maintenance charges on both gravity and pumping divisions were well paid up. Construction charges on the pumping division were again paid out of power profits, while on the gravity division most of the settlers took advantage of the moratorium permitting a postponement of one-half their construction charges.

There was a heavy snowfall over the Upper Snake River drainage area during the winter 1935-36 with a resultant abundant run-off. Both Jackson Lake and American Falls Reservoirs were filled in the spring of 1936 with a spill of some 620,000 acre-feet from American Falls and 130,000 acre-feet from Jackson Lake. More than 713,000 acre-feet were diverted on the project in 1935, or an average of about 7 acre-feet per acre.

UPPER SNAKE RIVER PROJECT, IDAHO

Actual construction of Island Park Dam began on October 28, but because of severe winter conditions little was accomplished until spring. At the end of the fiscal year the work was 11 percent completed. Diamond drilling and test pits were completed for the Grassy Lake Dam. Plans and specifications were being prepared at the end of the year. Final location was made of the cross cut canal and diversion dam across Henrys Fork. These are necessary to make water stored in Island Park Reservoir available to canals in the district which take water out of the Teton River. Bids for this work were opened on June 25. Investigations were in progress to determine the feasibility of a small reservoir at Squirrel Meadows.

BITTER ROOT PROJECT, MONTANA

The Bitter Root project has 26,191.34 acres of irrigable land of which an area of 16,000 is being farmed. There are 325 families, making a project population of about 1,250 people. To supplement the present storage water supply a feeder canal seven miles long and designed to carry 100 second feet was constructed from an adjoining watershed. Five thousand acre-feet were delivered to the main canal from this source.

FRENCHTOWN PROJECT, MONTANA

There are 36 farms in the district with an average of 140 acres per farm. Some of the larger farms will be subdivided and sold to new settlers. The project lands are being dry farmed. The principal crops are small grains, which are in good condition. The work included location surveys for the main canal and lateral system, construction of 17 miles of main canal, and construction of 105 minor main canal structures. Work was started on the main canal, diversion dam, and also on the laterals. All contract work on the project will be completed by October 31, 1936 and the system will be ready for the 1937 irrigation season.

HUNTLEY PROJECT, MONTANA

A total of 651 farms were operated in 1935, 348 by owners and 303 by tenants.

The Wool Growers' Association is active and markets practically all of the lambs and wool grown on the project. During the past year 36,000 pounds of wool and 3,000 lambs were marketed. Work on the Anita reservoir dam, a small storage unit, with a maximum height of 45 feet and a storage capacity of 450 acre-feet, will be completed during the present year. Other construction consisted of work on jetties, straightening the river channel, and building a 400-foot cribbed wing dam.

MILK RIVER PROJECT, MONTANA

Construction in progress consisted in the renewal in kind with concrete of 60 original timber structures in the Malta and Glasgow divisions and the completion of repairs on St. Mary canal. Operation and maintenance of the entire system was carried on by Government forces with funds advanced by the districts. The demand for water was heavy but no shortage occurred. The area irrigated exceeded that of any previous year. Although the 1936 irrigation season was dry and the demand for water exceeded the supply, crops were fair and good prices were anticipated. Investigations of the proposed Fresno dam site were completed.

SUN RIVER PROJECT, MONTANA

The crop program followed since 1929 of changing the large grain acreage to alfalfa, sweetclover, forage, and cultivated crops was continued during 1935 and early 1936. Good progress was made with 7,500 acres of seed peas and a general increase in soil-building crops. The water supply continued good. The weather was un-

usually dry and windy. The planting of shelterbelts and control of noxious weeds continued. The Fort Shaw and Greenfields irrigation districts continued to operate the completed work successfully. Progress on extensions to lateral system, drainage, and canal improvements was made with N. I. R. A. and E. R. A. funds. Eighteen miles of drain were completed; Pishkun Canal and 10 miles of Sun River slope canal were greatly improved. Fifty-five miles of laterals and structures on the East Greenfields bench under contract were about 70 percent complete. Contract on Mill Coulee wasteway and 8 miles of laterals northwest of Fairfield, and 15 miles of lateral Sun River slope division were about 50 percent complete.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

The lower Yellowstone project, which is being operated and maintained by the board of control under district contracts with the Bureau, is situated on the west side of the Yellowstone River in eastern Montana and western North Dakota. April 20 to October 10 is the maximum period of water deliveries. Irrigated farms on the project numbered 524. The irrigated area was 38,638 acres which exceeds the previous year by 2,190 acres. During the current year 59 percent of the irrigated farms were operated by owners or managers and 41 percent by tenants. There is a gradual trend toward farm ownership.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The reserved works features of the project, comprising the Pathfinder and Guernsey Reservoirs, Whalen diversion dam, distribution and power systems, were operated and maintained by the Bureau. The canal, lateral, and drainage systems were operated and maintained by the four project irrigation districts. Reserved works features were operated without unusual difficulties or expenditures. Tentative plans for water conservation under consideration by district officials constitute the most important future need of the project. Of the total irrigable area comprising 235,000 acres, 90 percent was in cultivation and 82 percent cropped or pastured. The number of farms irrigated was 2,756. Crop yields were normal and the economic condition of farmers showed further improvement in spite of lower prices for hay and grain. The available water supply was about 1.1 acre-feet at farmers' headgates. On account of spring rains, this irrigation supply was adequate to mature most crops. For the 1936 season the water supply will be 1.2 acre-feet. Spring rains were below normal, however, and less water will be available for late season use than was available last year.

HUMBOLDT PROJECT, NEVADA

The contract for the construction of the Rye Patch Dam was completed June 1, 1936. All transactions for the purchase of lands and water rights in the Battle Mountain area were completed during the year. Dragline operations began on swamp drainage and river channel improvements. The 1935 water supply amounted to 25 percent of decreed rights, which seriously curtailed production. The 1936 water supply will fully supply the decreed rights owing to the beneficial regulatory effects of the Rye Patch Dam, and it is estimated that 10,000 acre-feet of storage will be carried over to 1937.

NEWLANDS PROJECT, NEVADA

During the fall of 1935 and the spring of 1936, heavy storms in the Sierra Nevada Mountains supplied water sufficient to fill Lahontan Reservoir and raise Lake Tahoe to an elevation of 6,225.90 feet, the highest since 1928. This storage gave the Newlands project a sufficient water supply for the season, the results above average in crops of alfalfa hay and grains. Much beneficial work was accomplished with the aid of two E. C. W. camps located on the project. This work consisted of replacement of worn-out structures, construction of new structures, lining of laterals, rock and brush riprap, strengthening of canal banks, clearing growth from water channels, etc.

TRUCKEE RIVER STORAGE PROJECT, NEVADA

Topographic, test pit, and diamond drill explorations of the two possible dam sites at Boca and geological studies were completed during the year. Negotiations were under way for right-of-way. The electors of the district at the election of April 7, 1936, ratified the repayment contract and the Truckee River agreement. The Truckee-Carson irrigation district also ratified the Truckee River agreement at the election. The project received a 70 percent water supply during 1935 owing to deficient natural flow and low stage of Lane Tahoe. A full water supply is assured for the 1936 season because of the 3.67-foot recovery of Lake Tahoe.

CARLSBAD PROJECT, NEW MEXICO

Extension of the east embankment of Lake McMillan by E. C. W. forces was completed in August 1935. Work at Lake Avalon, which included raising the dam 6 feet by earth fill protected by rock masonry and additional protection of all spillway channels by rock riprap, was completed in June 1936. A contract was negotiated with the Carlsbad irrigation district December 3, 1935, for the expenditure

of not to exceed \$2,500,000, to build Alamogordo Dam and line with concrete a portion of the canal and lateral system. Construction of the dam was authorized and contract awarded to the Hallett Construction Co. of Crosby, Minn., on January 25, 1936, for \$1,132,547. The crop season of 1935 was characterized by an ample water supply and good yields and prices for the principal crops. Economic conditions were generally good. Construction will be continued at Alamogordo Dam and plans are being completed for concrete lining.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

The distribution system will now serve more than 156,000 acres. Construction work during the past year consisted in the reconstruction or reconditioning of the main trunk drain in the Mesilla Valley, and the enlarging of several culverts, bridges, and flumes. Irrigation requirements necessitated the operation and maintenance of the entire distribution system, but because of the local financial condition it is not possible to properly maintain the drainage system. The total cost of the project operation and maintenance was \$323,017 as compared with \$370,000 in 1930 when all desirable maintenance work was performed. The water users in general at this time are in good financial condition.

UMATILLA PROJECT, OREGON

The operation of the east and west divisions of the Umatilla project were continued under the respective irrigation district organizations, the combined irrigated area of the two divisions being approximately 12,000 acres. On the east division the economic situation was better at the close of the year than at any time since 1929. Poultry is rapidly becoming the major industry on this project as it has been demonstrated that turkeys and eggs can be produced as reasonably as at any other point in the Northwest, a condition which is due largely to the cooperative organizations' efforts in both marketing and providing cheap feeds.

VALE PROJECT, OREGON

Beginning 1934 the project was operated by Government forces for the Vale Oregon irrigation district, financed by collections from 309 water users. Nearly all lands for which water is available have been settled. Crops were diversified, alfalfa being the principal crop. Cooperative organizations in the older adjoining sections handled most of the produce. The Vale-Owyhee Land Settlement Association operated with Nyssa, Oreg., as headquarters. Construction of the Agency Valley Dam was completed by the contractors

December 13, 1935. Construction of Willow Creek laterals, consisting mostly of excavation, was started October 8, 1935, by C. C. C. forces.

KLAMATH PROJECT, OREGON-CALIFORNIA

In Tule Lake division work on the extension of the distribution and drainage systems was resumed and the enlarging and strengthening of dikes was completed. Enlargement and extension of the drainage system in the Klamath irrigation district was completed. The farm income for 1935 was about the same as for the previous year. Crops were universally good, and commodity prices satisfactory. A number of potato growers experienced heavy losses owing to early October freezes and below-zero temperature on November 2. The outlook for 1936 is excellent, with an abundant water supply. All crops are average or better, and indications are that farm income will be the greatest on record. An amendatory contract, providing for the suspension of charges on certain lands, was executed by the Langell Valley irrigation district.

OWYHEE PROJECT, OREGON-IDAHO

Construction of irrigation works is 89 percent complete. Storage and canal systems and laterals in Mitchell Butte division are practically completed and laterals in Dead Ox Flat division are 25 percent complete. Pumping plants for Advancement irrigation district were completed and there remain the enlargement of the Payette-Oregon Slope and Ontario-Nyssa pumping plants and rehabilitation of Gem plant to complete this feature. Four drains have been completed in the old districts. Some work remains to complete a number of minor features.

Delivery was made of a full irrigation supply to Advancement and Kingman districts and to about 6,400 acres of new lands, and of a partial gravity supply to Ontario-Nyssa and Gem districts. The latter released sufficient Black Canyon power to provide the remaining pumping districts with a full supply of power for pumping. Repairs were made and puddling and priming and riprapping of canals and laterals were carried on.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

No construction in progress other than replacement of wood structures with concrete as a maintenance feature and miscellaneous betterments under the E. C. W. program camp BR-2. A slight water shortage occurred in 1935, but production was fairly satisfactory

and crops had a total value of \$1,000,000. Severe drought persisted throughout the fiscal year and with the reservoir only 42 percent full, the supply was entirely inadequate for 1936. Twenty-eight percent of the project farms are occupied by owners, 33 percent by tenants, and 39 percent have no resident operators, although the latter are mostly in production under rental.

COLORADO RIVER PROJECT, TEXAS

Under contracts with the Lower Colorado River Authority, the Bureau is constructing this project at an estimated cost of \$20,000,000. Rehabilitation of camp at Hamilton Dam was begun October 7, 1935. On March 17, 1936, actual construction was begun, and excavation and drilling of grout holes was started. On May 18 the first concrete was placed in the dam by the Bureau. Awards were made for reservoir clearing and for construction of the North dike. Bids were opened for the construction of Arnold Dam and the production of concrete aggregates for both dams, but no awards were made. On July 1 in accordance with a revised contract dated June 11 all work on the two dams was turned over to the Authority. Future work will cover the construction of the Marshall Fork flood-control dam above Austin, Tex.

HYRUM PROJECT, UTAH

The purpose of the Hyrum project is to provide a supplemental water supply for lands in the vicinity of Hyrum, Wellsville, and Mendon, Utah, in the southern part of the Cache Valley. Hyrum Reservoir was practically completed in August 1935, and the canal system was finished in the spring of 1936. Operation and maintenance was turned over to the South Cache Water Users' Association May 1, 1936. The parapet walls along the road on the top of the dam will be constructed in the fall of 1936, which will complete the construction of the project as planned.

MOON LAKE PROJECT, UTAH

Work was continued on the Moon Lake Dam. The outlet tunnel, stripping of the foundation for the dam, and the excavation of the cut-off trench are about completed. Construction of the Duchesne feeder canal, Midview Dam, and Midview lateral is progressing. These latter features are being constructed with the use of an E. C. W. camp aided by expenditures of project funds. Final surveys are being made on the Yellowstone feeder canal. A supplemental water supply consisting of 40,000 acre-feet of storage and some natural

flow for the irrigation of 65,000 acres of land under existing canal systems will be provided. The estimated cost of the project is \$1,500,000.

OGDEN RIVER PROJECT, UTAH

The purpose of the project is to supply a much needed supplemental water supply for lands already largely in a high state of cultivation. Construction of the project, begun in fiscal year 1935, was continued throughout fiscal year 1936, work being done on Pine View Dam and appurtenant works, the Ogden Canyon conduit, the Ogden-Brigham canal, and the South Highline canal. The project was about 64 percent completed at the end of the fiscal year. It is planned to continue and probably finish the construction of the project during fiscal year 1937.

PROVO RIVER PROJECT, UTAH

A repayment contract was executed by the Provo River Water Users' Association for the construction of the Deer Creek division, which includes the construction of the Deer Creek Reservoir on Provo River, the enlargement of the Weber-Provo diversion and Provo River canal, and the construction of the Duchesne tunnel. The Deer Creek Reservoir will have a capacity of 150,000 acre-feet. A supplemental water supply will be provided for 40,000 acres of highly developed lands and also for two or three metropolitan districts in Utah and Salt Lake Counties. The estimated cost of the division is \$7,600,000. A second division includes the construction of a dike across Utah Lake and the revision and deepening of the Jordan River outlet from the lake.

SANPETE PROJECT, UTAH

Construction work was started on the Ephraim tunnel by the contractor September 30, 1935. By the end of the fiscal year, 2,000 feet of the total of 7,200 feet were excavated. The two feeder canals leading to the tunnel were completed in November 1935. A second division of the project will include the construction of the Spring City tunnel 5,000 feet long with short feeder canals leading thereto. This tunnel was advertised for construction in 1935, but bids were rejected. It is expected the tunnel will be readvertised in the late summer season of 1936.

STRAWBERRY VALLEY PROJECT, UTAH

The principal construction work during the fiscal year consisted in the continuation of operations on the Currant Creek feeder canal.

When completed this feature will augment the project water supply by picking up the run-off from some 8 square miles which formerly was not a part of the Strawberry watershed. A proposed addition to the power system is pending. A low-head installation is contemplated just below the existing project plant. Steady increase in the firm power load makes the new development imperative within the near future. The greatest resettlement need is the removal of farmers from marginal tracts to the more productive farm units.

WEBER RIVER PROJECT, UTAH

The Echo Reservoir, which was constructed on the Weber River, 1929-31, was filled to its capacity of 74,000 acre-feet in 1935. In providing a supplemental supply for 70,000 acres of highly developed lands in Ogden and Weber Valleys and 15,000 acres in Provo Valley, the reservoir was directly responsible for the largest crop production in the history of the areas.

COLUMBIA BASIN PROJECT, WASHINGTON

An allotment of \$20,250,000 was made under the Emergency Relief Act, to continue work on the project. Of this amount, \$20,000,000 was for construction of the Grand Coulee Dam, power plant, and appurtenant works, such as the Government camp, construction railroad, highway, bridge, reservoir surveys, and purchase of lands for right-of-way. The \$250,000 allotment was provided for the preparation of topographic and land ownership maps and a classification of lands to be irrigated under the project. Construction of the dam and power plant was continued under a modified contract altering the plans and providing for the construction of foundations for a dam which will eventually extend to a spillway crest at elevation 1,260. The estimated value of the revised contract amounts to \$36,869,150. Major items of work under the contract include diversion and care of the river, excavation for dam and power-house, amounting to approximately 16,000,000 cubic yards, and the placing of 4,500,000 cubic yards of concrete.

At the close of the fiscal year the contractor had excavated 13,840,000 cubic yards and placed 710,840 cubic yards of concrete. Cofferdams enclose areas on both east and west sides of the river. Construction of cross-river cofferdams will be commenced in the near future. The contractor's construction plant includes a 60-inch belt conveyor, a sand and gravel plant, two concrete mixing plants having a combined capacity of 14,000 cubic yards of concrete per 24-hour day, and cement storage silos. Contracts were completed during the

fiscal year covering the construction of buildings and street improvements in Government camp and erection of a highway bridge. Buildings include 77 residences, 2 dormitories, school, garage, fire station, warehouse, administration building, and 61 temporary buildings. Under the project for economic surveys, work was started October 15, 1935, with headquarters at Ephrata, Wash. About 100 men are engaged on section line retracement and topographic surveys on Columbia Basin irrigable lands. At the end of the fiscal year 46,225 acres had been mapped.

OKANOGAN PROJECT, WASHINGTON

In the spring of 1936, 785 feet of 3-inch lining were placed in the main canal, and 3,250 feet of worn-out pipe line were replaced. There still remain some 25,000 feet of pipe line, miscellaneous sizes, to be replaced. The gravity system of the project furnished "New" right lands with $2\frac{1}{2}$ acre-feet of water during 1935. The final estimate for 1936 is 2 feet per acre. In 1935 there was a small increase in irrigated acreage on the project, which irrigated acreage will probably be unchanged in 1936.

YAKIMA PROJECT, WASHINGTON

Sunnyside and Tieton divisions.—Irrigated areas remain practically unchanged. Average per acre crop values for 1935 were \$39.51 for the Sunnyside and \$105.49 for the Tieton division. Live-stock value increased.

Kittitas division.—An area of 56,481 acres was irrigated, an increase of 8.5 percent over 1934. The average per acre crop value was \$24.27, an increase of 28 percent. There was a substantial increase in the number of horses and cattle and in the value of livestock.

Kennewick division.—The net acreage cropped was 2,072, and the average per acre value \$54.99.

Storage division.—An ample supply of storage was available. A parapet wall and auxiliary air duct were constructed at Cle Elum Dam. Construction of the Kachess Dam spillway was begun in May 1936. Clearing operations by E. C. W. camps at Clear Creek and Kachess Reservoirs were in progress.

Roza division.—Actual construction of this division, a \$15,000,000 project, to irrigate 72,000 acres, was started on January 28, 1936. The work involves the construction of a diversion dam, power and pumping plants, transmission lines, drainage ditches, 100 miles of main canal, tunnels, siphons, and about 500 miles of laterals. A repayment contract dated December 13, 1935, was obtained from the

Yakima-Benton irrigation district. At the close of June 1936, contracts had been awarded and work was in progress on 18,000 feet of 17-foot diameter horseshoe-type tunnel and 5 miles of open canal of 2,200 cubic feet per second capacity. Contracts for the construction of the diversion dam, Yakima River siphon, and 2 miles of additional canal will be let during the fiscal year 1937.

CASPER-ALCOVA PROJECT, WYOMING

Construction was continued with National Industrial Recovery and Emergency Relief allotments. Lining of tunnel no. 2, Casper canal, was completed by contract, bringing the canal to station 190. Contracts were awarded for construction of permanent buildings at Seminoe and Alcova dam sites, Seminoe and Alcova Dams, and four tunnels of the Casper canal. Construction was commenced, by contract, on the two dams and tunnels 5 and 6, and by Government forces, on the sewer, water, and light system for the permanent camp at Seminoe dam site, and on the excavation of the Casper canal from station 190 to 3,138. Construction will be commenced, by Government forces, on Casper canal structures and the lateral system for the first unit of the project. A contract was entered into, during the year, with the Casper-Alcova irrigation district for repayment of irrigation system construction costs, with a maximum liability of \$3,080,000.

RIVERTON PROJECT, WYOMING

In 1935, with an ample water supply, there was a marked improvement in crop yields per acre, though crop values were less. In 1936 there is an increase of 25 percent in the number of settlers and the irrigated area with prospect of further substantial increase in 1937. Few settlers are leaving the project. Practically all settlers have paid the water rental charges. The outlook for crops is favorable. Better transportation facilities are needed. Contract for the construction of Bull Lake Dam was let, and the construction work was well under way. Maintenance work was unusually heavy.

SHOSHONE PROJECT, WYOMING

In 1935, 956 farms were irrigated and the supply of irrigation water was ample. Settlement of the Willwood division is practically complete. Nine farm units have not yet been opened to entry. Construction work was started on the Heart Mountain canal system. A contract was made for the construction of tunnels 1, 2, and 3, Shoshone Canyon conduit, and good progress was made by the con-

tractor. Ten miles of canal and 7,000 feet of structure sites were located by Government forces. On the Willwood division 4.3 miles of drain were constructed by Government forces.

SECONDARY INVESTIGATIONS

Investigations of proposed projects were carried out at a total cost of \$264,000, mainly with funds allotted under the National Industrial Recovery Act of June 16, 1933, or advanced by local interests. Principal among these were:

ARIZONA-CALIFORNIA

Silt surveys of the Colorado River were continued.

COLORADO

Survey of the Colorado-Big Thompson transmountain diversion was continued; and survey of the Blue River-South Platte transmountain diversion and investigation of a number of storage sites on the western slope were begun.

COLORADO-NEW MEXICO

Survey and investigation of a number of dam and reservoir sites in the Rio Grande Basin were in progress, including those of Wagon Wheel Gap, Vega-Sylvestre, and Conejos sites.

IDAHO

Survey of reservoir sites in the Boise-Weiser-Payette drainage area was commenced in November and the investigation of reservoir sites on the Upper Snake River was completed.

MONTANA

Investigation of the Buffalo Rapids project was completed and a report made in August 1935. Surveys are in progress of the proposed Gallatin River project.

MONTANA-IDAHO

The survey of the Madison River diversion project was continued and a progress report issued in November 1935.

NEBRASKA

A survey of the irrigation possibilities along the lower Platte River was continued together with study of the electric power market.

NEVADA

A report on irrigation of lands in southern Nevada by utilization of power from Boulder Dam was made.

OREGON

Extensive surveys and investigation of the Deschutes project were made and a progress report submitted in July. A survey of the Grande Ronde project was also made and progress report made in October.

SOUTH DAKOTA

Investigation of irrigation possibilities in the Black Hills in the vicinity of Rapid City was in progress.

UTAH

Surveys of projects in the Salt Lake Basin were continued, including the Dixie and Gooseberry projects, and investigation of an aqueduct for the Salt Lake City Metropolitan District.

COLORADO RIVER BASIN

Topographic mapping and land classification of large areas in the Colorado River Basin under section 15 of the Boulder Canyon Project Act were continued.

HAWAII

Surveys were commenced of irrigation possibilities on the island of Molokai.

TABLES

RECLAMATION TABLE 1.—Consolidated financial statement, June 30, 1936

DEBIT SIDE

Construction account:

Primary projects:

Cost of irrigation works:

Original construction.....	\$247,263,236.68	
Supplemental construction.....	12,667,321.06	
Value of works taken over.....	2,056,939.90	
Total construction cost.....		\$261,987,497.64

Operation and maintenance prior to public notice, net.....	\$2,813,958.94	
Operation and maintenance deficits and arrearages funded with construction.....	5,404,793.82	
Penalties on water-right charges funded with construction.....	1,804,536.15	
		10,023,288.91

Total..... 272,010,786.55

Less income items:

Construction revenues.....	\$7,015,063.03	
Contributed funds.....	1,777,257.33	
Nonreimbursable appropriation, Rio Grande Dam.....	1,000,000.00	
		9,792,320.36

262,218,466.19

Less abandoned works, nonreimbursable cost, and charge-offs.....

17,110,064.60

Balance payable..... \$245,108,401.59

Yuma auxiliary project:

Cost of irrigation works.....	\$902,837.00	
Impounded funds, economy acts.....	504.96	
		\$903,341.96

Less construction revenues..... 1,085.47

902,256.49

48,806.46

Palo Verde flood protection cost of reconstruction and repairs.....

Tennessee Valley Authority:

Cost of designs.....	\$484,911.25	
Less contributed funds.....	484,911.25	

Secondary projects and general investigations:

Cost of surveys and investigations.....	3,601,198.66	
Less contributed funds.....	657,988.67	

2,943,210.09

775,644.21

General offices' expense undistributed.....

Plant and equipment..... 1,163,259.92

Materials and supplies..... 2,166,046.93

Accounts receivable:

Current accounts.....	\$1,089,811.43	
Deferred accounts.....	177,957,185.13	

179,046,996.66

Undistributed clearing cost accounts.....

131,513.16

Unadjusted debits, disbursement vouchers in transit.....

51,961.99

Cash:

Balance on hand:

Reclamation fund.....	\$10,999,261.08	
Special funds.....	55,834.78	
National Industrial Recovery allotments.....	17,824,436.00	
Emergency Relief allotments.....	36,451,372.69	
Funds transferred from other departments.....	1,515,769.26	
Contributed funds.....	16,416.73	
		\$66,863,090.54

In special deposit and in transit..... 31,488.08

66,894,578.62

Total debits..... 499,232,676.02

RECLAMATION TABLE 1.—Accretions to reclamation fund, by States—Continued

CREDIT SIDE

Security for repayment of cost of irrigation works:		
Contracted construction repayments.....	\$221,813,639.71	
Yuma auxiliary contracted repayments.....	596,815.38	
		\$222,410,455.09
Current accounts payable.....		5,471,500.74
Deferred and contingent obligations.....		1,529,687.38
Reserves and undistributed profits.....		8,189,131.11
Operation and maintenance results, surplus.....		613,950.03
Unadjusted credits, collection vouchers in transit.....		1.47
Government aid for reclamation of arid lands:		
Reclamation fund.....	\$162,556,801.54	
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.....	47,371,000.00	
Emergency Relief allotments.....	50,520,000.00	
Funds transferred from other departments.....	1,569,100.00	
Special funds:		
Increase of compensation.....	2,797,960.33	
Rio Grande 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, semiarid, swamp, and cut-over timberlands.....	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.....	239.23	
		282,734,734.34
Less nonreimbursable appropriation, Rio Grande Dam.....		1,000,000.00
		281,734,734.34
Less impairment of funds:		
Abandoned works.....	\$2,833,484.62	
Nonreimbursable construction cost.....	822,921.59	
Operation and maintenance cost uncollectible.....	453,272.39	
Charge-offs, act of May 25, 1926.....	14,651,474.08	
Washington office cost since Dec. 5, 1924.....	1,682,560.83	
Attendance at meetings.....	1,815.90	
Giving information to settlers, cost.....	7,852.46	
Prepaid civil-service retirement fund.....	2,340.33	
Returned to Treasury, miscellaneous receipts.....	11.91	
		20,455,734.11
		261,279,000.23
Less impounded funds, economy acts, reclamation fund.....		261,047.09
		261,017,953.14
Total credits.....		499,232,676.02

1 Contra.

RECLAMATION TABLE 2.—Available funds, expenditures, and balances, fiscal year 1936

Items	Funds									
	Reclamation	Yuma auxiliary	Colorado River levee system	Palo Verde flood protec- tion	National Re- covery Act	Emergency Relief allot- ments	Transfers from other agencies	Contributed funds		
Balance on hand July 1, 1935.....	\$7, 683, 224. 41	\$143, 406. 09	\$36, 604. 91	\$562. 97	\$38, 791, 461. 46	-----	\$45, 181. 07	\$26, 910. 87		
Receipts:										
Proceeds from sale of public lands.....	154, 567. 65	-----	-----	-----	-----	-----	-----	-----		
Proceeds from Oil Leasing Act.....	2, 053, 152. 48	-----	-----	-----	-----	-----	-----	-----		
Proceeds from potassium royalties.....	79, 873. 55	-----	-----	-----	-----	-----	-----	-----		
Proceeds from Federal power licenses.....	86, 831. 87	-----	-----	-----	-----	-----	-----	-----		
From project collections.....	2, 321, 417. 58	-----	2, 522. 59	-----	113, 211. 25	\$42, 115. 87	7, 447. 64	-----		
Contributed funds.....	142, 368. 34	-----	-----	-----	-----	-----	-----	16, 700. 00		
Transfer act of May 9, 1935.....	-----	-----	50, 000. 00	1 562. 97	1 10, 080, 000. 00	50, 520, 000. 00	1, 669, 100. 00	-----		
Appropriations and allotments from general fund.....	-----	-----	-----	-----	-----	-----	-----	-----		
Total.....	12, 621, 435. 88	1, 037. 75	89, 127. 50	-----	28, 824, 672. 71	50, 562, 115. 87	1, 721, 728. 71	43, 610. 87		
Expenditures:										
Disbursements.....	1, 522, 174. 80	1, 037. 75	33, 292. 72	-----	11, 000, 236. 71	14, 110, 743. 18	205, 959. 45	27, 194. 14		
Balance on hand July 1, 1936.....	10, 999, 261. 08	-----	55, 834. 78	-----	17, 824, 436. 00	36, 451, 372. 69	1, 515, 769. 26	16, 416. 73		

1 Contra. Reversion to General Treasury.

RECLAMATION TABLE 3.—Accretions to reclamation fund, by States

States	Sale of public lands		Proceeds from oil leasing act		Total to June 30, 1936
	Fiscal year 1936	To June 30, 1936	Fiscal year 1936	To June 30, 1936	
Alabama.....			\$4,021.80	\$178,871.43	\$178,871.43
Arizona.....	\$14,943.87	\$2,674,521.22		159.86	2,674,681.08
California.....	18,266.65	8,170,201.09	1,072,287.21	12,357,464.51	20,527,665.60
Colorado.....	12,411.35	10,263,309.20	61,731.45	558,924.16	10,822,233.36
Idaho.....	8,448.91	7,055,907.65	2,050.77	17,447.06	7,023,354.71
Kansas.....		1,033,058.76			1,033,058.76
Louisiana.....			3,252.93	42,311.24	42,311.24
Montana.....	21,664.97	15,328,256.57	49,312.02	1,145,367.69	16,473,624.26
Nebraska.....		2,094,196.82			2,094,196.82
Nevada.....	987.32	1,022,417.19	252.00	5,363.37	1,027,780.56
New Mexico.....	27,966.48	6,636,842.72	166,727.06	695,628.71	7,332,471.43
North Dakota.....	348.26	12,218,084.34	11,606.85	137,705.49	12,355,799.83
Oklahoma.....		5,929,061.55			5,929,061.55
Oregon.....	5,887.72	11,963,388.64		10.28	11,963,398.92
South Dakota.....	1,962.03	7,730,106.50	125.23	1,636.59	7,731,743.09
Utah.....	7,426.70	4,231,029.34	48,190.95	465,581.41	4,696,610.75
Washington.....	2,262.35	7,445,740.13		33,749.63	7,479,489.76
Wyoming.....	31,991.04	8,620,640.02	633,594.21	33,548,244.17	42,168,884.19
Total.....	154,567.65	112,366,771.74	2,053,152.48	49,188,465.60	161,555,237.34
Proceeds, Federal water power licenses.....					¹ 740,332.54
Proceeds, potassium royalties and rentals.....					² 261,231.66
Grand total.....					162,556,801.54

¹ Proceeds for fiscal year, \$86,831.87.² Proceeds for fiscal year, \$79,873.55.

RECLAMATION TABLE 4.—Consolidated statement by projects, of construction cost of irrigation works, of construction cost of 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 arrears, and penalties		Construction revenues, contributed funds, and nonreimbursable appropriation (conts)		Abandoned works, non-reimbursable cost and authorized charge-offs		Total repayable	
	Fiscal year 1936	To June 30, 1936	Fiscal year 1936	To June 30, 1936	Fiscal year 1936	To June 30, 1936	Fiscal year 1936	To June 30, 1936	Fiscal year 1936	To June 30, 1936	Fiscal year 1936	To June 30, 1936
Arizona:												
Gila.....	\$24,737.16	\$24,737.16		\$115,993.50			\$12.10	\$12.10			\$24,775.06	\$24,775.06
Salt River.....	294,346.12	13,038,568.71		378,038.73			30.00	30.00			294,316.12	10,503,766.49
Arizona-California: Yuma.....	280.02	9,373,406.10					18,521.53	220,553.62			13,977.73	9,737,908.94
California:												
Central Valley.....	289,895.48	289,895.48									289,895.48	289,895.48
Orland.....	296.40	2,400,584.48									1,2,628.08	2,396,764.37
Colorado:												
Grand Valley.....		5,017,465.36		138,621.28							1,3,854.52	4,078,480.26
Uncompabgre.....		6,970,848.66		311,103.02							424,862.72	6,198,138.91
Idaho:												
Boise.....	88,530.02	16,107,778.85		422,283.48							28,592.26	16,768,735.01
Boise-Payvette.....	167,830.34	1,905,918.80									167,830.34	1,905,918.80
King Hill.....		19,232,462.26										
Mimido.....	176.40	375,004.92		318,762.27							8,767.27	18,139,984.25
Upper Snake River.....	197,443.39	342,963.68		52,868.10							197,402.39	374,963.92
Montana:												
Bitter Root.....		747,641.05										
Chain Lakes.....	32,114.52	63,868.78									43,247.81	790,888.86
Fremontown.....	83,291.82	56,964.39									32,114.52	65,868.78
Huntley.....	12,712.53	1,539,990.46		1,000.16							83,291.82	86,494.59
Milk River.....	11,468.86	6,913,515.45		437,102.94			6,431.10	24,863.01			19,534.57	1,862,070.26
Sun River.....	489,054.29	8,130,044.73		1,341.06			5.00	74,305.81			10,098.85	5,641,405.30
Montana-North Dakota:												
Lower Yellowstone.....		3,685,433.14		1,529.32							488,306.08	8,229,195.26
Nebraska-Wyoming: North												
Plateau.....	328.00	19,285,929.61		743,294.42							1,4,573.07	4,115,034.98
Nevada:												
Humboldt.....		1,015,641.44									1,4,327.76	20,972,290.38
Newlands.....		7,956,907.07		1,215.44				4.00			419,842.98	1,015,637.44
Truckee storage.....		60,101.65						52,347.53			1,4,609.03	3,509,106.79
New Mexico:												
Carlsbad.....	169,772.22	1,634,422.09		17,751.77							31,808.52	60,101.65
Hondo.....		339,491.68		32,952.01							187,821.18	1,295,493.97

RECLAMATION TABLE 5.—Accounts receivable, construction water-right charges

State and project	Due		Collected			Uncollected June 30, 1936
	Fiscal year 1936	To June 30, 1936	Cash		Other credits to June 30, 1936	
			Fiscal year 1936	To June 30, 1936		
Arizona:						
Salt River.....	\$152,490.30	\$6,811,234.71	\$152,490.30	\$6,811,234.71		
Yuma auxiliary.....	¹ 6,420.37	588,799.71	¹ 5,274.97	585,248.04	\$1,672.80	\$1,878.87
Arizona-California: Yuma.....	20,529.37	3,834,783.11	¹ 4,736.87	3,270,265.11	562,394.46	2,123.54
California: Orland.....	3,506.88	822,750.84	5,380.71	779,195.81		43,555.03
Colorado:						
Grand Valley.....	10,897.60	170,080.89		80,729.94	89,350.95	
Uncompahgre.....	146.71	490,269.48	34.71	427,282.43	62,987.05	
Idaho:						
Boise.....	¹ 4,456.24	4,011,585.48	¹ 4,456.24	3,984,392.19	27,193.29	
Minidoka.....	103,696.16	8,108,304.02	25,538.76	7,246,747.91	839,038.87	22,517.24
Montana:						
Huntley.....	1,703.78	560,839.96	659.41	468,082.31	92,674.85	82.80
Milk River.....	¹ 5,095.20	71,667.56		3,002.76		68,664.80
Sun River.....	1,509.09	220,419.55	274.18	206,497.82	13,252.69	669.04
Montana - North Dakota:						
Lower Yellowstone.....	1,603.03	293,760.98	1,305.80	292,796.30	964.68	
Nebraska-Wyoming: North						
Platte.....	127,089.10	4,104,347.75	9,608.97	2,790,528.78	1,254,781.58	59,037,939
Nevada: Newlands.....	21,490.88	1,206,511.54	15,325.30	1,131,308.74	73,635.92	1,566.88
New Mexico: Carlsbad.....	15.90	885,710.89	15.90	885,629.64	81.25	
New Mexico - Texas: Rio						
Grande.....		3,092,524.45		2,781,599.45	310,925.00	
Oregon: Umatilla.....	2,483.29	543,057.17	2,259.29	401,929.48	5,190.89	135,936.80
Oregon-California: Klamath.....	3,052.05	1,147,504.19	7,169.75	1,140,303.09	4,292.90	2,908.20
South Dakota: Belle Fourche.....	2,505.15	626,634.24	343.29	546,198.33	80,435.91	
Utah:						
Salt Lake Basin.....		1,222.50		1,222.50		
Strawberry Valley.....	¹ 56,610.54	1,317,134.96	¹ 32,075.35	1,306,221.74	10,913.22	
Washington:						
Okanogan.....	2,825.94	137,475.86	2,825.94	137,475.86		
Yakima.....	144,248.77	6,878,761.73	51,726.31	6,641,749.90	36,363.75	200,648.08
Wyoming: Shoshone.....	2,010.59	984,321.01	422.29	820,318.76	163,657.89	344.36
Total.....	529,232.24	46,909,702.58	228,837.48	42,739,961.60	3,629,807.95	539,933.03
Paid in advance of due dates.....			¹ 64,651.71	913,609.41	³ 221,047.40	
Refunds.....				98,926.60	3,212.84	
Total collections.....			164,185.77	43,752,497.61		
Contributed funds applying to construction cost not included in above table.....			¹ 3,999.98	1,777,257.33		

¹ Contra.² Other credits for fiscal year, \$244,995.96.³ Decrease for fiscal year, \$9,809.64.

RECLAMATION TABLE G.—Accounts receivable, operation and maintenance charges (after public notice)

State and project	Due		Collected			Uncollected June 30, 1936
	Fiscal year 1936	To June 30, 1936	Cash		Other credits to June 30, 1936	
			Fiscal year 1936	To June 30, 1936		
Arizona: Yuma auxiliary.....	\$15, 012. 96	\$483, 405. 89	\$20, 619. 53	\$466, 035. 10	\$11, 705. 76	\$5, 665. 03
Arizona-California: Yuma.....	112, 992. 53	3, 885, 436. 24	97, 977. 43	3, 666, 185. 72	177, 604. 50	41, 646. 02
California: Orland.....	32, 617. 07	667, 760. 45	30, 125. 91	606, 128. 34	24, 818. 88	36, 813. 23
Colorado:						
Grand Valley.....	49, 695. 62	408, 211. 86	36, 195. 62	373, 711. 86	33, 000. 00	1, 500. 00
Uncompahgre.....		1, 008, 683. 69		977, 809. 79	30, 873. 90	
Idaho:						
Boise.....	18, 929. 03	2, 190, 166. 77	21, 929. 03	2, 137, 517. 05	52, 649. 72	
King Hill.....		60, 711. 27		59, 192. 22	1, 519. 05	
Minidoka.....	52, 159. 03	2, 123, 412. 74	44, 916. 65	1, 993, 320. 98	129, 843. 66	248. 10
Montana:						
Huntley.....		554, 787. 34		543, 594. 31	11, 193. 03	
Milk River.....	39, 636. 61	371, 097. 68	42, 938. 20	352, 722. 84	1, 662. 25	16, 712. 59
Sun River.....		168, 718. 50		164, 366. 28	4, 352. 22	
Montana-North Dakota: Lower Yellowstone.....	¹ 1, 921. 45	338, 562. 56	¹ 1, 921. 45	338, 557. 93	4. 63	
Nebraska-Wyoming: North Platte.....	20, 848. 47	1, 931, 978. 69	17, 575. 51	1, 856, 382. 44	65, 098. 35	10, 497. 90
Nevada: Newlands.....		1, 174, 591. 57		1, 135, 901. 55	38, 680. 02	
New Mexico: Carlsbad.....	40, 189. 32	973, 594. 57	40, 189. 32	956, 721. 86	16, 872. 71	
New Mexico-Texas: Rio Grande.....	289, 089. 23	4, 338, 659. 63	253, 258. 61	4, 058, 056. 02	236, 403. 61	44, 200. 00
North Dakota:						
Buford-Trenton.....		2, 317. 41		2, 317. 41		
Williston.....		34, 042. 75		34, 042. 75		
Oregon:						
Umatilla.....	3, 286. 37	388, 888. 02	2, 306. 36	380, 654. 05	7, 253. 96	980. 01
Vale.....	12, 363. 08	23, 149. 67	12, 363. 08	23, 149. 67		
Oregon-California: Klamath.....	50, 442. 68	1, 340, 969. 27	50, 312. 70	1, 305, 999. 26	30, 536. 22	4, 433. 79
Oregon-Idaho: Owyhee.....	250. 00	500. 00	250. 00	500. 00		
South Dakota: Belle Fourche.....	71, 304. 07	1, 203, 613. 43	71, 304. 07	1, 194, 237. 44	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.....	227, 373. 65	5, 606, 757. 99	222, 192. 28	5, 418, 829. 81	66, 492. 28	121, 435. 90
Wyoming: Shoshone.....	2, 211. 83	556, 284. 79	2, 104. 03	531, 432. 76	23, 705. 43	1, 146. 60
Total.....	1, 037, 480. 10	30, 584, 615. 38	964, 636. 88	29, 311, 178. 32	² 988, 157. 89	285, 279. 17
Paid in advance of due dates.....			¹ 16, 708. 11	122, 199. 21	³ 258. 34	
Penalties and interest.....			6, 860. 93	519, 719. 87	20, 480. 00	
Refunds.....				38, 228. 87	156. 00	
Total collections.....			954, 789. 70	29, 991, 326. 27		

¹ Contra.² Other credits for fiscal year, \$41,039.31.³ Increase for fiscal year, \$236.03.

RECLAMATION TABLE 7.—Accounts receivable, rental of irrigation water

State and project	Due		Collected		Other credits to June 30, 1936	Uncollected June 30, 1936
	Fiscal year 1936	To June 30, 1936	Cash			
			Fiscal year 1936	To June 30, 1936		
Arizona:						
Salt River.....		\$2, 246, 726. 01		\$2, 246, 726. 01		
Yuma auxiliary.....	\$968. 48	13, 396. 93	\$621. 00	13, 049. 45		\$347. 48
Arizona-California: Yuma.....	9, 268. 93	556, 913. 02	9, 840. 81	544, 258. 83	\$12, 654. 19	
California: Orland.....		121, 450. 85		121, 450. 85		
Colorado:						
Grand Valley.....	10, 897. 70	522, 828. 26	10, 896. 07	514, 091. 93	6, 500. 67	2, 235. 66
Uncompahgre.....	1, 690. 61	1, 226, 460. 37	351. 52	1, 219, 394. 40		7, 065. 97
Idaho:						
Boise.....	8, 050. 00	806, 038. 57	8, 050. 00	801, 318. 07	4, 720. 50	
Minidoka.....	57, 301. 11	740, 243. 04	57, 306. 11	736, 860. 03	3, 383. 01	
Montana:						
Huntley.....	588. 83	12, 440. 25	588. 83	12, 440. 25		
Milk River.....	591. 78	238, 327. 50	576. 78	227, 965. 72	1, 208. 14	9, 153. 64
Sun River.....	241. 06	132, 592. 55	862. 92	130, 512. 40	1, 366. 62	713. 53
Montana - North Dakota:						
Lower Yellowstone.....	534. 60	136, 583. 60	342. 00	136, 005. 98		577. 62
Nebraska-Wyoming: North Plate.....	1, 812. 88	346, 756. 52	1, 838. 13	346, 746. 52	10. 00	
Nevada: Newlands.....		28, 291. 16		22, 114. 31	6, 176. 85	
New Mexico:						
Carlsbad.....	382. 68	40, 499. 27	382. 68	40, 482. 02		17. 25
Hondo.....		9, 129. 70		9, 129. 70		
New Mexico-Texas: Rio Grande.....	28, 717. 92	1, 507, 458. 70	29, 519. 94	1, 493, 313. 66		14, 145. 04
North Dakota:						
Buford-Trenton.....		31. 75		31. 75		
Williston.....		2, 117. 28		2, 117. 28		
Oregon:						
Umatilla.....	1, 171. 80	97, 449. 32	1, 671. 80	71, 172. 52		26, 276. 80
Vale.....	1 208. 15	21, 917. 70	137. 22	21, 211. 17		706. 53
Oregon-California: Klamath.....	43, 840. 07	398, 685. 29	45, 118. 08	395, 734. 09	25. 00	2, 926. 20
Oregon-Idaho: Owyhee.....	12, 272. 75	16, 922. 15	12, 253. 85	16, 868. 25		53. 90
South Dakota: Belle Fourche.....	414. 50	10, 331. 90	642. 80	10, 314. 10	17. 80	
Utah: Strawberry Valley.....		17, 596. 13		17, 596. 13		
Washington:						
Okanogan.....		110, 645. 28		108, 061. 09	2, 584. 19	
Yakima.....	1 5, 945. 55	177, 982. 57	2, 218. 40	176, 592. 82		1, 389. 75
Wyoming:						
Riverton.....	23, 865. 34	64, 661. 67	21, 178. 92	58, 015. 94	6, 550. 73	95. 00
Shoshone.....	10, 727. 43	95, 945. 00	8, 329. 87	92, 193. 36	3, 590. 79	160. 85
Total.....	207, 184. 77	9, 700, 422. 34	212, 727. 73	9, 585, 768. 63	2 48, 788. 49	65, 865. 22

¹ Contra.² Other credits for fiscal year, \$5,795.45.

RECLAMATION TABLE 8.—Financial statement, Boulder Canyon project, June 30, 1936

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102. Fixed capital under construction.....	\$99, 805, 891. 33
103. Other physical properties.....	1, 283, 577. 23
104. Investigations, Colorado River Basin.....	229, 944. 23
104. Investigations, Parker-Gila project.....	67, 052. 29
105. Interest during construction—Other capital expenditures.....	10, 338, 522. 03

Total investments (schedule 2)..... \$111, 724, 987. 11

RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1936—Continued*

ASSETS AND OTHER DEBITS—Continued

II. CURRENT AND ACCRUED ASSETS

121. Treasury cash:		
For advances to Colorado River Dam fund.....	\$14,135,906.79	
Colorado River Dam fund.....	144,801.67	
N. I. R. A.—Parker-Gila project.....	26.52	
Collections in transit.....	38,399.39	
Total Treasury cash (schedule 1).....	14,319,134.37	
122. Disbursing officers' cash (schedule 1).....	205,783.63	
124. Accounts receivable.....	67,580.95	
Total current and accrued assets.....		\$14,592,498.95

IV. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionment accounts.....	1 \$23,645.01	
143. Field cost adjustments.....	566,557.66	
145. Jobbing accounts.....	2,608.59	
146. Prepayments.....	9,962.13	
171. Unadjusted debits.....	44,269.08	
Total deferred and unadjusted debits.....		599,752.45
Total assets and other debits.....		126,917,238.51

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.....	13,240,000.00	
Total long-term liability:		
205.2. Appropriated but not advanced.....	14,135,906.79	
205.3. Appropriated and advanced.....	99,124,093.21	
205.4. Less: Impounded, Legislative Economy Act.....	1 137,653.66	
206. N. I. R. A. allotment—Parker-Gila project.....	93,000.00	
Total long-term liability.....		113,215,346.34

XI. CURRENT AND ACCRUED LIABILITIES

211. Audited accounts payable:		
211.1. Contractor's earnings—current.....	\$1,914,519.72	
211.11. Contractors' earnings—holdback.....	209,285.90	
211.2. Labor.....	105,202.49	
211.3. Purchases.....	57,968.59	
211.4. Freight and express.....	370,104.87	
211.5. Passenger fares.....	722.97	
211.9. Miscellaneous.....	44,149.00	
Total audited accounts payable.....	2,702,003.54	
214. Matured interest.....	10,312,890.45	
Total current and accrued liabilities.....		13,014,893.99

XII. OTHER CREDITS

220. Consumers' meter deposits.....		15.00
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XIII. DEFERRED AND UNADJUSTED CREDITS

231. Unadjusted credits.....		128,465.94
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XV. APPROPRIATED SURPLUS

251. Appropriated surplus not specifically invested.....		585,517.24
Total liabilities and other credits.....		126,917,238.51

1 Contra.

RECLAMATION TABLE 9.—*Appropriations and cash statement, Boulder Canyon project, June 30, 1936*

TREASURY CASH

	Regular appropriations	N. I. R. A. allotment	Total	N. I. R. A. Parker-Gilla project
Appropriations and allotments.....	\$75,260,000.00	\$38,000,000.00	\$113,260,000.00	\$93,000.00
Advances to Colorado River Dam fund.....	61,277,358.70	37,846,734.51	99,124,093.21	
Balance not advanced.....	13,982,641.30	153,265.49	14,135,906.79	
Colorado River Dam fund:				
Advanced from appropriation to fund.....	61,277,358.70	37,846,734.51	99,124,093.21	
Collections deposited in fund.....	400,783.42	21,331.15	422,114.57	26.52
Total advances and collections.....	61,678,142.12	37,868,065.66	99,546,207.78	93,026.52
Disbursements by General Accounting Office.....	4,974,315.63	54,245.70	5,028,561.33	
Advances to disbursing officers.....	56,563,786.68	37,809,058.10	94,372,844.78	93,000.00
Total withdrawals.....	61,538,102.31	37,863,303.80	99,401,406.11	
Balance.....	140,039.81	4,761.86	144,801.67	26.52
Repay collections in transit.....				
Miscellaneous collections in transit.....	38,399.39		38,399.39	
Treasury cash—Available for expenditures.....	12,161,080.50	158,027.35	12,319,107.85	
Treasury cash—Reserve.....	2,000,000.00		2,000,000.00	
Total treasury cash (G. L. 121).....	14,161,080.50	158,027.35	14,319,107.85	26.52

DISBURSING OFFICERS' CASH

Advances and appropriation transfer adjustments.....	\$56,574,020.57	\$37,815,687.98	\$94,389,708.55	\$93,000.00
Disbursing officers' disbursements.....	56,447,298.57	37,762,547.29	94,209,845.86	67,079.06
Disbursing officers' checking balance.....	126,722.00	53,140.69	179,862.69	25,920.94
Collections by disbursing officers.....	441,777.79	27,779.75	469,557.54	26.52
Collections deposited and appropriation transfer adjustment.....	441,777.79	27,779.75	469,557.54	26.52
Collections not deposited.....				
Total disbursing officers' cash (G. L. 122).....	126,722.00	53,140.69	179,862.69	25,920.94

RECLAMATION TABLE 10.—*Financial statement, All-American Canal, June 30, 1936*

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102. Fixed capital under construction..... \$7,393,107.36

II. CURRENT AND ACCRUED ASSETS

121. Treasury cash:

For advances to Colorado River Dam fund.....	\$6,500,000.00
N. I. R. A. and Emergency Relief allotment.....	10,234,245.26
Contributions—Imperial irrigation district.....	4,224.62
Collections in transit.....	779.25
Total Treasury cash.....	16,739,249.13

122. Disbursing officers' cash..... 3,636,503.06

124. Accounts receivable..... 1,665.61

 Total current and accrued assets..... 20,377,417.80

RECLAMATION TABLE 10.—*Financial statement, All-American Canal, June 30, 1936—Continued*

ASSETS AND OTHER DEBITS—Continued

IV. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionments.....	\$8,838.34	
143. Field cost adjustments.....	271,396.68	
146. Prepayments.....	1,231.49	
171. Unadjusted debits.....	32,488.59	
		<hr/>
Total deferred and unadjusted debits.....		\$296,278.42
		<hr/>
Total assets and other debits.....		28,066,803.58
		<hr/> <hr/>

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.....	11,500,000.00	
		<hr/>
Total long-term liability:		
205.2. Appropriated but not advanced.....	6,500,000.00	
205.3. Appropriated and advanced.....	20,500,000.00	
		<hr/>
		27,000,000.00

XI. CURRENT AND ACCRUED LIABILITIES

211. Audited accounts payable:		
211.1 Contractors' earnings—current.....	\$423,981.89	
211.11 Contractors' earnings—holdback.....	516,733.68	
211.2 Labor.....	16,858.17	
211.3 Purchases.....	15,574.50	
211.4 Freight and express.....	81,018.36	
211.5 Passenger fares.....	348.30	
211.9 Miscellaneous.....	568.03	
		<hr/>
Total current and accrued liabilities.....		1,055,082.93

XII. OTHER CREDITS

226. Contributed funds—Imperial irrigation district.....		10,000.00
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XIII. DEFERRED AND UNADJUSTED CREDITS

231. Unadjusted credits.....	\$640.82	
231.1 Unadjusted credits—Yuma project.....	469.13	
		<hr/>
Total deferred and unadjusted credits.....		1,109.95

XV. APPROPRIATED SURPLUS

251. Appropriated surplus not specifically invested.....		610.70
		<hr/>
Total liabilities and other credits.....		28,066,803.58

RECLAMATION TABLE 11.—Appropriations and cash statement, All-American Canal, June 30, 1936

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	\$11,500,000.00	\$20,500,000.00	\$6,500,000.00	\$10,000.00
Advances to Colorado River Dam Fund.....						
Balance not advanced.....					6,500,000.00	
Advanced from appropriation.....						
Collections deposited.....	9,594.43	3,090.60	263.19	12,948.22		
Total advances, etc.....	6,009,594.43	3,003,090.60	11,500,263.19	20,512,948.22		10,000.00
Disbursements by General Accounting Office.....	61,164.24	16.17	497.21	61,677.62		
Advances to disbursing officers.....	5,198,703.36	1,518,321.98	3,500,000.00	10,217,025.34		10,000.00
Total withdrawals.....	5,259,867.60	1,518,338.15	3,500,497.21	10,278,702.96		10,000.00
Balance.....	749,726.83	1,484,752.45	7,999,765.98	10,234,245.26		
Repay collections.....	780.00		*.75	779.25		
Total Treasury cash.....	750,506.83	1,484,752.45	7,999,765.23	10,235,024.51	6,500,000.00	

DISBURSING OFFICERS' CASH

Advances and appropriation transfers.....	\$5,198,878.34	\$1,518,321.98	\$3,500,000.00	\$10,217,200.32		\$10,000.00
Disbursing by disbursing officers.....	4,226,258.07	970,440.13	1,384,000.06	6,580,698.26		5,775.38
Disbursing officers' cash balance.....	972,620.27	547,881.85	2,115,999.94	3,636,502.06		4,224.62
Collections by disbursing officer.....	10,478.91	3,090.60	263.19	13,832.70		10,000.00
Collections deposited.....	10,478.66	3,090.60	262.44	13,831.70		10,000.00
Collections not deposited.....	.25		.75	1.00		
Disbursing officers' cash balance.....	972,620.52	547,881.85	2,116,000.69	3,636,503.06		4,224.62

RECLAMATION TABLE 22.—Irrigation and crop results on Government projects, 1935

State and project	Lands on projects covered by crop census				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		
Arizona: Salt River	242,935	231,463	228,435	\$18,638,893	\$81.60	93,967	54,320	65,338	\$3,817,957	\$58.43		
Arizona-California:												
Yuma.....	67,453	48,815	46,261	2,064,291	57.70	165	158	154	18,170	118.37		
Valley division.....	49,896	39,957	37,928	2,143,929	66.72							
Reservation division.....	7,743	3,208	2,932	126,979	43.30							
Bard division.....	6,004	4,433	4,258	197,653	46.40							
Yuma auxiliary (Mess).....	3,810	1,217	1,143	190,730	166.82							
California: Orland.....	20,634	13,786	13,116	341,625	26.05							
Colorado:												
Grand Valley.....	23,230	16,185	15,590	452,925	29.05	10,000	7,009	7,009	359,560	51.30		
Uncompahgre.....	75,654	60,968	60,868	1,423,621	23.39	1,650	1,550	1,490	38,740	26.00		
Idaho:												
Boise.....	165,783	147,372	146,243	3,659,231	25.02	144,068	136,911	128,052	3,174,000	24.79		
New York irrigation district.....	16,974	14,821	14,769	250,900	16.99							
Nampa-Moridian irrigation district.....	36,704	34,293	34,254	774,636	22.61							
Boise-Kuna irrigation district.....	47,560	42,900	42,890	923,636	21.53							
Wildor irrigation district.....	55,951	47,601	46,582	1,509,835	32.41							
Big Bend irrigation district.....	1,703	1,315	1,311	27,785	21.19							
Black Canyon irrigation district.....	6,891	6,442	6,437	172,439	26.79							
Minidoka.....	193,075	167,825	160,807	4,040,522	25.11	716,644	671,372	630,460	19,329,760	30.68		
Minidoka irrigation district.....	67,692	60,556	56,591	1,544,058	27.28							
Burley irrigation district.....	47,918	44,930	41,877	1,307,210	31.21							
Gooding division.....	77,465	62,339	62,339	1,189,254	19.08							
Montana:												
Butler Root irrigation district.....	17,375	15,053	15,053	308,769	20.51							
Huntley.....	29,473	23,728	23,728	702,840	29.62							
Milk River.....	134,657	65,412	65,412	1,306,085	23.57							
Atata division.....	56,652	23,137	23,137	405,217	17.52							
Glasgow division.....	22,133	6,762	6,702	81,472	12.05							
Chinook division.....	55,772	25,513	25,513	819,316	32.11							
Sun River.....	60,616	43,562	43,383	776,097	17.87							
Fort Shaw division.....	13,962	7,703	7,707	131,307	17.04							
Greenfields and Big Coulee division.....	46,714	35,779	35,676	644,790	18.07							
Montana-North Dakota:												
Lower Yellowstone.....	58,248	38,638	38,638	1,550,483	40.13							
District no. 1.....	38,000	26,076	26,076	1,079,242	41.39							
District no. 2.....	20,248	12,562	12,562	471,241	37.51							

RECLAMATION TABLE 22.—Irrigation and crop results on Government projects, 1895—Continued

State and project	Lands on projects covered by crop census				Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Irrigated acreage	Cropped acreage	Crop value	
	Irrigable acreage	Irrigated acreage	Cropped acreage	Total	Per acre	Total						Per acre	
													Total
Nebraska-Wyoming:													
North Platte.....	234,419	191,993	190,115	\$4,959,443	\$26.10	128,050	99,400	103,800	\$2,568,430	\$24.75			
Pathfinder irrigation district.....	112,132	81,744	80,263	1,862,206	23.20								
Gering and Fort Laramie irrigation district.....	54,793	53,405	52,708	52,708	31.80								
Goshen irrigation district.....	51,324	42,493	42,493	1,288,201	30.32								
Northport irrigation district.....	16,170	14,651	14,651	130,761	8.93								
Nevada: Newlands.....	69,524	42,233	42,522	696,912	16.39								
New Mexico: Carlsbad.....	25,055	24,433	17,103	831,712	48.63								
Rio Grande.....	155,000	120,075	114,658	7,731,007	67.40	77,000	44,358	44,316	1,526,530	34.45			
Elephant Butte irrigation district.....	88,000	65,425	61,417	4,213,011	68.60								
El Paso County irrigation district no. 1.....	67,000	54,650	53,241	3,518,896	66.00								
Oregon:													
Umatilla.....	14,298	11,674	11,275	195,211	17.31	842	682	666	18,000	27.03			
East division.....	8,163	7,412	7,107	113,827	16.02								
West division.....	6,135	4,262	4,168	81,384	19.50								
Yale.....	15,395	8,071	6,995	136,046	19.45								
Oregon-California:													
Klamath.....	61,127	50,536	49,462	2,222,938	44.94	59,545	36,925	35,665	1,155,070	32.89			
Main division.....	40,987	31,847	30,523	1,115,374	36.54								
Tule Lake division.....	20,140	19,189	18,939	1,107,564	58.50								
Oregon-Idaho:													
Owyhee.....	14,026	4,917	4,374	85,268	19.49								
Advancement irrigation district.....	690	530	524	15,182	28.43								
Kingman Colony irrigation district.....	1,288	878	874	17,261	19.75								
Mitchell Butte irrigation district.....	12,069	3,800	2,966	52,825	17.81								
South Dakota: Belle Fourche.....	72,861	39,225	46,051	1,026,675	22.30								
Utah:													
Salt Lake Basin.....						89,000	86,500	85,206	3,677,382	41.98			
Hyrum.....	7,488	7,488	7,488	158,986	21.23								
Strawberry Valley.....	41,829	36,293	36,067	836,827	23.20	7,164	6,589	6,589	171,007	25.96			
High Line division.....	18,888	15,699	16,527	250,943	16.16								
Spanish Fork division.....	14,043	12,603	12,596	324,805	25.79								
Springville-Mapleton division.....	8,898	7,991	7,944	261,079	32.86								
Washington:													
Okanogan.....	5,076	3,728	3,568	599,245	167.97								
Yakima.....	202,525	167,409	159,310	7,034,940	44.18	172,217	148,629	147,948	7,322,155	49.49			

Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts

Sunnyside division.....	102,551	84,828	70,561	3,143,676	30.51	277	1,204,080	1,256,970	43,179,631	34.35
Teton division.....	20,794	26,100	24,080	2,540,317	105.10					
Kittitas division.....	70,180	56,481	55,069	1,350,947	24.27					
Wyoming:										
Riverton.....	32,000	14,947	14,717	185,656	12.62	277				10.36
Shoshone.....	73,850	53,107	52,897	1,034,485	19.55					
Garland division.....	41,979	31,491	31,491	768,876	24.42					
Framme division.....	20,031	13,955	13,955	169,701	12.16					
Willwood division.....	11,840	7,661	7,451	95,908	12.87					
Total with irrigation, 1935.....	2,113,506	1,640,936	1,604,166	63,601,663	30.65		1,500,589	1,256,970	43,179,631	34.35
Warren Act lands.....	1,500,589	1,294,680	1,256,970	43,170,631	34.35					
Grand total of projects proper and Warren Act.....	3,614,095	2,935,616	2,861,136	106,781,294	37.30					
Grand total, 1934.....	3,494,645	2,837,205	2,756,698	100,943,714	36.65					
Increase.....	119,450	98,411	104,438	5,837,580	.65					

RECLAMATION TABLE 23.—*Summary of crop results on reclamation projects in 1935*

(NOTE.—These detailed figures are limited to crops covered by census on Government projects proper, excluding all crops in areas served with water under the Warren Act, but including nonirrigated crops grown on the projects.)

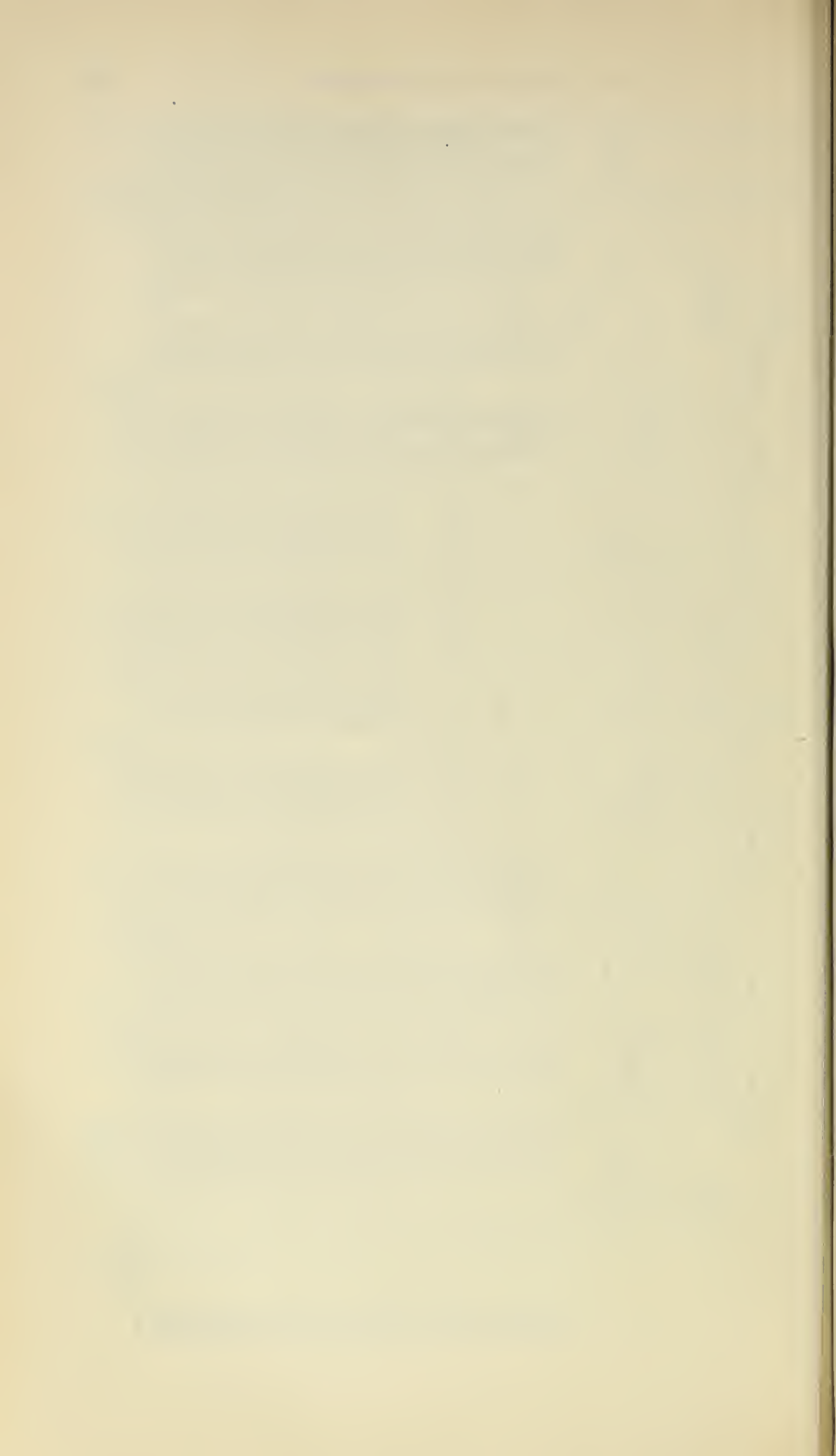
Crop	Average cropped		Yields		Crop value			
	Total	Per- cent of cropped	Total	Average per acre	Average per unit	Total	Average per acre	Percent of total value of all crops
Cereals:			<i>Bushels</i>					
Barley.....	75,371	4.7	2,869,161	38.1	\$0.41	\$1,177,909	\$15.65	1.9
Corn.....	78,960	4.9	2,077,502	26.3	.58	1,199,016	15.22	1.9
Oats.....	76,295	4.8	3,001,971	39.4	.31	936,185	12.25	1.4
Rye.....	1,619	.1	24,683	15.2	.48	11,745	7.26	.1
Wheat.....	170,220	10.6	4,921,513	28.9	.75	3,707,964	21.75	5.8
Total.....	402,465	25.1	12,894,830	32.1	.54½	7,032,819	17.45	11.1
Seeds:								
Alfalfa.....	25,551	1.6	83,036	3.2	6.34	525,621	20.55	.8
Clover.....	7,602	.5	33,373	4.4	6.15	205,338	27.05	.3
Other.....	29,386	1.8	518,544	17.7	2.37	1,227,251	41.70	2.0
Total.....	62,539	3.9	634,953	10.2	3.13	1,958,210	31.30	3.1
Hay and forage:			<i>Tons</i>					
Alfalfa hay.....	476,696	29.7	1,441,060	3.0	7.28	10,487,913	22.00	16.5
Clover hay.....	7,324	.5	11,009	1.5	4.79	52,695	7.20	.1
Other hay.....	107,304	6.7	155,829	1.5	9.20	1,433,758	13.35	2.2
Corn forage.....	17,851	1.1	70,270	3.9	3.83	269,278	15.07	.4
Other forage.....	158,643	9.9	51,183	.3	7.37	376,963	2.37	.6
Pasture.....	444,297	27.6	-----	-----	-----	2,703,599	6.08	4.2
Total.....	1,212,115	75.5	1,729,351	1.4	-----	15,324,206	12.65	24.0
Vegetables and truck:			<i>Bushels</i>					
Beans.....	33,530	2.1	660,273	19.7	1.28	847,950	25.30	1.3
Onions.....	2,672	.2	845,523	316.5	.39	326,161	122.00	.5
Potatoes, white.....	67,142	4.2	12,965,960	193.3	.34	4,439,361	66.20	7.0
Potatoes, sweet.....	1,827	.1	197,490	108.1	.71	140,336	76.70	.2
Tomatoes.....	59,985	3.7	5,306,550	88.4	1.23	6,535,620	103.80	10.3
Total.....	165,156	10.3	19,975,796	121.1	.61	12,289,428	74.40	19.3
Fruits and nuts:			<i>Pounds</i>					
Apples.....	24,210	1.5	355,395,675	14,700	.008	2,927,409	120.75	4.6
Peaches.....	3,738	.2	20,287,987	5,430	.022	442,821	118.50	.7
Pears.....	8,112	.5	79,858,231	9,840	.009	725,040	89.40	1.1
Prunes.....	2,133	.1	18,958,181	8,920	.012	233,944	109.70	.4
Citrus fruit.....	11,839	.8	166,292,580	14,050	.017	2,919,266	246.50	4.6
Small fruit.....	6,935	.4	20,823,919	3,000	.05	1,041,895	150.50	1.6
Miscellaneous.....	4,276	.3	4,011,069	950	.04	170,638	39.90	.3
Total.....	61,243	3.8	665,627,642	10,850	.013	8,461,013	138.00	13.3
Miscellaneous:			<i>Tons</i>					
Sugar beets.....	76,306	4.7	914,262	12.0	5.92	5,402,891	70.80	8.5
Cotton.....	132,693	8.3	128,120	.96	67.50	8,652,647	65.20	13.6
Cotton seed.....	132,693	8.3	57,224	.43	32.10	1,835,142	13.82	2.9
Other crops.....	139,961	8.7	-----	-----	-----	2,645,307	18.90	4.2
Total.....	481,653	30.0	-----	-----	-----	18,535,987	38.50	29.2
Grand total, projects.....	2,385,171	-----	-----	-----	-----	-----	-----	-----
Duplication.....	781,005	48.6	-----	-----	-----	-----	-----	-----
Total all crops for which detailed census was taken.....	1,604,166	100.0	-----	-----	-----	63,601,663	39.65	100.0
Total Warren Act crops.....	1,266,970	-----	-----	-----	-----	43,179,631	34.35	-----
Grand total.....	2,861,136	-----	-----	-----	-----	106,781,294	37.30	-----

¹ Bales of 500 pounds each.

RECLAMATION TABLE 24.—Irrigated and cropped acreage and crop values by years, 1906-35

	Federal irrigation projects				Warren Act land				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	1,20,100	\$244,900	—	—	—	—	22,300	1,20,100	—	—	\$244,900
1907	187,000	1,169,000	4,766,400	—	—	—	—	187,000	1,169,000	—	—	4,766,400
1908	289,500	1,260,500	7,575,800	—	—	—	—	289,500	1,260,500	—	—	7,575,800
1909	410,600	1,369,500	11,920,700	—	—	—	—	410,600	1,369,500	—	—	11,920,700
1910	405,100	413,000	37,476,400	—	—	—	—	405,100	413,000	—	—	37,476,400
1911	541,400	470,100	50,185,000	—	—	—	—	541,400	470,100	—	—	50,185,000
1912	588,400	540,000	64,010,400	—	—	—	—	588,400	540,000	—	—	64,010,400
1913	699,200	642,200	79,712,600	—	—	—	—	699,200	642,200	—	—	79,712,600
1914	761,300	705,400	96,218,100	—	—	—	—	761,300	705,400	—	—	96,218,100
1915	814,900	760,000	114,418,100	—	—	—	—	814,900	760,000	—	—	114,418,100
1916	923,000	858,300	32,816,000	147,234,100	—	—	—	923,000	858,300	147,234,100	—	32,816,000
1917	1,057,500	966,800	56,462,300	203,696,400	—	—	—	1,057,500	966,800	203,696,400	—	56,462,300
1918	1,141,500	1,051,200	66,821,400	270,517,800	1,501,100	—	—	1,141,500	1,051,200	270,517,800	1,501,100	66,821,400
1919	1,187,300	1,113,500	88,974,100	359,491,900	916,300	—	—	1,187,300	1,113,500	359,491,900	916,300	88,974,100
1920	1,223,500	1,153,800	66,171,700	425,663,600	981,900	—	—	1,223,500	1,153,800	425,663,600	981,900	66,171,700
1921	1,227,000	1,157,900	49,620,300	475,283,900	1,001,300	—	—	1,227,000	1,157,900	475,283,900	1,001,300	49,620,300
1922	1,202,130	1,169,100	50,300,900	525,044,800	983,300	—	—	1,202,130	1,169,100	525,044,800	983,300	50,300,900
1923	1,213,700	1,179,870	65,046,300	590,691,100	1,051,400	—	—	1,213,700	1,179,870	65,046,300	1,051,400	65,046,300
1924	1,290,900	1,216,800	66,488,600	657,179,700	930,700	—	—	1,290,900	1,216,800	66,488,600	930,700	66,488,600
1925	1,320,300	1,242,800	77,608,900	734,788,600	1,019,200	—	—	1,320,300	1,242,800	77,608,900	1,019,200	77,608,900
1926	1,411,000	1,361,500	60,664,900	795,453,500	1,097,200	—	—	1,411,000	1,361,500	60,664,900	1,097,200	60,664,900
1927	1,379,000	1,431,200	72,047,200	867,500,700	1,148,100	—	—	1,379,000	1,431,200	72,047,200	1,148,100	72,047,200
1928	1,482,100	1,489,200	81,077,800	948,578,500	1,235,000	—	—	1,482,100	1,489,200	81,077,800	1,235,000	81,077,800
1929	1,504,810	1,512,250	88,459,300	1,037,037,800	1,234,230	—	—	1,504,810	1,512,250	88,459,300	1,234,230	88,459,300
1930	1,552,144	1,550,967	65,007,270	1,102,045,100	1,286,046	—	—	1,552,144	1,550,967	65,007,270	1,286,046	65,007,270
1931	1,668,770	1,678,880	40,534,037	1,142,579,197	1,293,889	—	—	1,668,770	1,678,880	40,534,037	1,293,889	40,534,037
1932	1,868,770	1,878,880	31,531,162	1,174,110,359	1,214,461	—	—	1,868,770	1,878,880	31,531,162	1,214,461	31,531,162
1933	1,868,770	1,898,770	48,768,863	1,222,879,222	1,239,017	—	—	1,868,770	1,898,770	48,768,863	1,239,017	48,768,863
1934	1,532,124	1,527,104	60,928,969	1,283,808,191	1,283,081	—	—	1,532,124	1,527,104	60,928,969	1,283,081	60,928,969
1935	1,640,936	1,604,166	63,601,663	1,347,426,854	1,294,080	—	—	1,640,936	1,604,166	63,601,663	1,294,080	63,601,663

1 Estimated.



THE NATIONAL PARK SERVICE

(ARNO B. CAMMERER, *Director*)

Preeminence of the National Park Service as the leader in the recreational field reached new heights during the year, with the establishment of new parks, the continuation of the emergency programs, and the enactment of legislation providing for Nation-wide surveys of areas of interest from the recreational and educational standpoints.

Increase in the acreage of the national park and monument system was achieved through the establishment of the new Shenandoah (Va.) and Mammoth Cave (Ky.) National Parks—the latter for administration and protection only—and increases in the areas of several national parks and monuments through boundary adjustment. Establishment of 11 new national monuments and other historical areas was authorized by Congress, dependent upon conditions yet to be met. Primarily, the actual establishment of these new areas depends upon the acquisition of the necessary acreage by donation of lands or of funds to purchase them.

Public use of the national parks and monuments has pointed to the need for an expanded system. Visitors for the travel year ended September 30, 1935, amounted to 7,676,490, an increase of 21 percent over the preceding year. Preliminary estimates of travel to the scenic national parks for the period October 1, 1935, to June 30, 1936, indicate an increase of approximately 28 percent over the same period last year. As a corollary of this increased travel, the business of the operators of visitors' accommodations in the parks shows a like improvement.

As indicated by the increase in pre-season travel, winter use of the national parks reflected gains along a wide front. All possible encouragement is given to the development of informal snow and ice sports in areas suitable for such use, in accordance with the popular demand. Such sports, however, as in the case of summer amusement, are restricted to those compatible with the surroundings.

The warm interest in park activities and use displayed by President Roosevelt on his visit to several areas in the system, notably the Hot Springs, Abraham Lincoln, and Shenandoah National Parks and the Colonial National Historical Park, was a source of inspiration to the local officials, as well as to the Washington office. So also was the

sympathetic interest displayed by the Secretary of the Interior and other officials of the Department. The cooperation of the Director of Emergency Conservation Work and of specialists in various other Federal bureaus was invaluable during this period.

Cooperation furnished by the various emergency recovery organizations has been an outstanding factor in enabling the National Park Service to meet the increased demands upon it resulting from increased use of the parks and the addition of new areas to the system. Public Works, Emergency Conservation Work, Works Progress, and the Resettlement Administration made available Federal funds and adequate man-power, resulting in a wide variety of long-needed developments throughout the system of national parks and monuments.

Foremost among congressional legislation, affecting the national parks, was the act providing for the preservation of historic American sites, buildings, objects, and antiquities of national significance, which empowers the Secretary of the Interior to conduct a Nationwide survey of historic buildings and sites and makes it possible for the Federal Government to acquire those determined to be of sufficient importance to warrant such action; and the State Park Act, authorizing a comprehensive study, other than on lands under the jurisdiction of the Department of Agriculture, of the public park, parkway, and recreational-area programs of the United States, and of the several States and political subdivisions thereof, and of the lands throughout the United States which are or may be chiefly valuable as such areas, and to aid the States and the political subdivisions thereof in planning the development of such recreational areas.

Shortly before the close of the last session of Congress, an amendment authorizing the construction of the Grand Lake-Big Thompson transmountain diversion project in Rocky Mountain National Park, was deleted from the Interior Department appropriation bill. Inclusion of the item in the bill followed the allotment of \$150,000 of Public Works funds to make a survey of the project. Although the survey had not been completed, the Senate, on March 2, 1936, adopted an amendment to the Interior Department bill authorizing construction of the project. Various national conservation organizations vigorously protested the Senate amendment, upon the basis that the diversion project would violate the most sacred principle of national park conservation—that of freedom from commercial or economic exploitation—and that approval of such a project would establish a precedent for the commercial invasion of other parks. The National Park Service also protested the amendment, stressing the fact that such a project would be an alien and nonconforming use within a national park. Exhaustive hearings were held by the

subcommittee of the House Committee on Appropriations in charge of the Interior Department appropriation bill. The Bureau of Reclamation is continuing its survey of the project, under the \$150,000 Public Works allotment provided for that purpose.

Legislation was enacted authorizing prospecting and mining within the Glacier Bay National Monument. Numerous conservation organizations protested the passage of this bill. The mining operations authorized under the new law are to be subject to such general regulations as may be prescribed by the Secretary of the Interior.

A study has been made to determine the recreational possibilities at Boulder Dam under which the National Park Service would cooperate with the Bureau of Reclamation in planning the recreational developments along Lake Mead, the largest artificial lake ever created, extending as it does 115 miles behind Boulder Dam. In the meantime the National Park Service has supervised recreational development on the lake with Civilian Conservation Corps enrollees.

During the year, following a council meeting of national park superintendents in Washington, recommendation was made to the Secretary of the Interior for the regionalization of the National Park Service. Four regions were recommended, with headquarters in Richmond, Va.; Omaha, Nebr.; Santa Fe, N. Mex.; and San Francisco, Calif. Action on this general regionalization was deferred until fall. Meanwhile, the seven regions through which Emergency Conservation Work had been administered in the field by the National Park Service were reduced to four, in aid of economy. These E. C. W. regions coincide in boundaries with the regions recommended for general national park regionalization, but the headquarters of the third region have remained at Oklahoma City, Okla., instead of moving to Santa Fe, as proposed in the general plan.

Important steps were taken toward the establishment of international park and wildlife refuges along the Mexican-United States boundary, following the authorization by Congress in 1935 of the establishment of a Big Bend National Park and the recommendation of the Secretary of the Interior that the Mexican Government be invited to establish a national park in Mexico, adjoining the proposed Big Bend Park, the whole to be an international park similar to the Waterton Lakes-Glacier International Peace Park on our northern boundary.

Another token of international amity in the field of national-park administration was the exchange, during the year, of stones from the summits of the two great inactive volcanoes, Fuji and Rainier. On October 23, the Superintendent of the Mount Rainier National Park presented to the Japanese consul at Seattle a volcanic rock that

had been brought down from the summit of Mount Rainier and encased in a chest of native cedar. Two days later this stone was en route on the 4,900-mile journey across the Pacific, arriving in Japan November 8.

On November 14 mountaineer envoys of the National Park Division of the Sanitary Bureau of Japan reached the summit of Fujiyama, which was then covered by early winter snows, and brought to Tokyo a similar stone which, encased in cherry wood, was presented to the American Ambassador to Japan and now is en route to the United States and Mount Rainier National Park. Upon arrival, it will be placed in the park museum.

In connection with the investigation of park areas along the southern international boundary, it is my sad duty to record the tragic automobile accident that occurred at Deming, N. Mex., on February 25, which took the lives of Roger W. Toll and George M. Wright.

The loss of these two valued members of the National Park Service is, in the words of the Advisory Board of the Service, "a major disaster to the cause of conservation which they so nobly upheld and furthered" and one that will be felt for many years to come. Their high ideals, unswerving loyalty, and devotion to principle, added to a practical knowledge of national park work and sound judgment, made them outstanding in a group of executives of which the Service has always been rightly proud. The National Park Service has gained immeasurably through its association with them, and their loss is felt in a corresponding degree.

Service officials and personnel also were greatly saddened by the death on April 19 of Mr. and Mrs. Frederick H. Harvey in an airplane accident. Mr. Harvey, as vice president of the Fred Harvey system which operates facilities for visitors at the South Rim of the Grand Canyon, and chairman of the Western Conference of the National Park Operators, was not only a warm personal friend of the many Service people fortunate enough to know him, but he was also a keen executive, an outstanding civic leader, and a wise counselor to the National Park Service.

EMERGENCY CONSERVATION WORK

The National Park Service continued to participate in the Emergency Conservation Work program through supervising Civilian Conservation Corps activities in the various units of the national park and monument system in State, county, and metropolitan park areas, and in the Territory of Hawaii and the Virgin Islands.

On January 15, 1936, the general administration of Emergency Conservation Work activities in the national parks and monuments,

which since its initiation had been handled by the Chief Forester because of the intimate relationship of that program to the protection of national parks, was, in the interests of economy, transferred to the Branch of Planning and State Cooperation and consolidated with the administration of the larger State park Emergency Conservation Work program.

The largest number of camps operated in the national parks and monuments during the fiscal year was 117 in November 1935, and the smallest number was 80 in February and March 1936. The largest number of State park camps occupied during that period was 457 in October 1935, and the smallest 345 in June 1936.

Ten Civilian Conservation Corps camps were operated by the National Park Service in the Territory of Hawaii, one of these in the Hawaii National Park, and two camps were operated in the Virgin Islands.

All the emergency work in National and State park areas continued to receive the closest scrutiny and supervision from experienced engineers, landscape architects, foresters, wildlife experts, geologists, archeologists, and historians, in order that no important element of park values might be disturbed. Under the plan of regionalization technicians in these various lines were assigned to the four regions to assist in directing the work in the field.

The National Park Service pays tribute to the Emergency Conservation Work technicians and to the enrollees of the Civilian Conservation Corps for invaluable aid given in the protection of the national parks and in the handling of traffic and guiding of visitors. Forest-fire prevention and suppression, tree-disease control, sloping and planting of roadsides, protection of wildlife and of archeological and geological exhibits, construction of trails, automobile campgrounds, parking areas, and picnic grounds, and museum and guide service are among the Civilian Conservation Corps projects that have done most to maintain national-park standards and values.

WORKS PROGRESS ADMINISTRATION WORK CAMPS

During the period December 1, 1935, through June 30, 1936, the National Park Service cooperated with the Works Progress Administration by assuming the responsibility for the technical supervision of the work programs of 41 W. P. A. work camps.

The program was undertaken at the request of the State, county, and municipal agencies sponsoring the camps and with the concurrence of the Works Progress Administration. This program provided an extension of the services rendered to States, counties, and municipalities by the National Park Service in the conservation of natural resources and the coordinated and planned development of

recreational areas for public use. Projects were undertaken on 3 Federal, 22 State, 3 county, and 13 municipal park areas. Although the National Park Service directed the supervision of this program, responsibility for actual operation was vested in the Works Progress Administration.

The Works Progress Administration also requested the National Park Service to assume responsibility for a beach-erosion project on the North Carolina coast. At this time a definite project application is being compiled for the construction of sand fences and plantings of the resulting dunes.

RECREATIONAL DEMONSTRATION PROJECTS

One of the interesting phases of the expanded program of recreational development undertaken by the National Park Service, in cooperation with the State park authorities and State planning boards, has been the development of 46 land-use projects designated as recreational demonstration projects. With Resettlement Administration funds, nearly half a million acres of land were in process of being acquired, at a cost of approximately \$5,000,000 at the close of the fiscal year. The areas are being developed as Federal projects through the cooperation of the Resettlement Administration, Emergency Conservation Work, and Works Progress Administration, either for addition to the State systems of parks and recreational areas as concrete demonstrations in the better use of certain rural lands or for Federal administration in connection with some existing unit of the national park and monument system.

The 46 projects, located in 24 States, are readily accessible to 30,000,000 people. The majority of the projects are planned for the organized camp needs of major metropolitan areas. It is expected that at least 10 organized camps, each with a capacity of from 100 to 125 campers, soon will be in operation.

Wildlife and fire protection work has been initiated on practically all the areas. Recreational facilities other than the organized camps that have been developed include picnic areas, trails, and artificial lakes.

General development programs were prepared for many of these projects and technical supervision furnished by experts of the National Park Service.

COOPERATION WITH STATE PARK AUTHORITIES AND LEGISLATION THEREFOR

The passage of the State Park Act (H. R. 10104) just before the close of the Seventy-fourth Congress will, it is hoped, be a vital factor in making possible the continuation of the close relationship

between the States and the National Park Service already established, regardless of the extent to which the emergency work may be continued. Under this legislation the Secretary of the Interior, through the National Park Service, is authorized to make a Nation-wide study of public park, parkway, and recreational programs, including lands that may be valuable for such purposes, to the end that an adequate system of recreational areas may be developed, and to aid the several States and their political subdivisions in planning such areas. In cooperation with the National Resources Committee work is now under way upon the preparation of an outline of procedure to be followed in conducting the survey. Upon its approval by the Secretary of the Interior the outline will be taken up with the various Federal agencies concerned and with the governors and planning boards of the several States.

An important feature of the State Park Act is its recognition of the principal of regional planning and administration of recreation areas in which two or more States may be involved, and its authorization for such States to enter into agreements with one another with respect to the establishment, planning, improvement, and maintenance of such areas.

STATE AND MUNICIPAL RECREATION STUDIES INAUGURATED

For the purpose of determining the progress of the local park movement during the 5-year period ending December 1935, the National Park Service in cooperation with the National Recreation Association inaugurated a Nation-wide study of municipal, county, and metropolitan parks. The results of this study should prove of great value to the park and recreation movement and meet a real demand on the part of State and local park officials for such up-to-date information. Aviation and other trends in travel are being studied in relation to recreational planning.

Preliminary studies are also being made of the possibility of conducting an extensive survey of world parks.

LAND CHANGES IN NATIONAL PARK AND MONUMENT SYSTEM

With the establishment of two new national parks during the year, the adjustment of boundaries in eight parks and monuments, and the acceptance of donated lands in connection with the Blue Ridge Parkway, the total area of lands under the jurisdiction of the National Park Service on June 30, exclusive of the National Capital parks, was 15,489,821.73 acres. As of that date there were 26 national parks, 2 national historical parks, 67 national monuments, 11

national military parks, 10 battlefield sites, 4 miscellaneous memorials, 11 national cemeteries, and three parkways.

The 692 reservations comprising the National Capital parks, with an area of 6,986.61 acres, are administered as a separate unit of the system.

NEW NATIONAL PARKS

Shenandoah National Park, in Virginia, was established on December 26, 1935, when the Secretary of the Interior accepted from the State of Virginia deeds to 176,429.80 acres of land within the approved park boundaries. This acreage exceeds the minimum authorized by Congress by approximately 16,000 acres. Establishment of the Shenandoah National Park was authorized by act of Congress approved May 22, 1926, providing for the donation of the lands within the specified boundaries to the United States in fee simple.

Mammoth Cave National Park in Kentucky, was established on May 22, 1936, for administration and protection only, upon acceptance by the Secretary of the Interior of fee simple deeds to 24,538 acres, surface right deeds to 4,185 acres, and cave rights to 635 acres. World-famous since its discovery, believed to have been about 1797, Mammoth Cave proper was operated under private ownership until 1930 when it became the property of the State of Kentucky. Establishment of the Mammoth Cave National Park was authorized by act approved May 25, 1926.

LAND CHANGES IN EXISTING MEMBERS OF SYSTEM

Net increases to the national park and monument system through adjustments of boundaries of existing areas amounted to 9,595.579 acres, as follows:

Acadia National Park, Maine.—Donation of 1,452.417 acres and transfer of 25.96 acres to the jurisdiction of the Navy Department resulted in increasing the total acreage of the park to 15,408.907 acres.

Blue Ridge Parkway, Va.-N. C.—Donations of 2,365.84 acres of land, all in North Carolina, were made for the purpose of making possible the construction of the Blue Ridge Parkway, to connect the Shenandoah and Great Smoky Mountains National Parks.

Chickamauga and Chattanooga National Military Park, Tenn.-Ga.—Donation of approximately 3,000 acres increased the total area to approximately 8,533 acres.

Colonial National Historical Park, Va.—Acquisition of 1,900.47 acres through donation and purchase resulted in a total area of 6,150.499 acres. The status of Colonial was changed from that of a national monument to a national historical park by act of Congress approved June 5, 1936.

Craters of the Moon National Monument, Idaho.—Elimination by act of Congress of 480 acres left the total area at 49,121.90 acres. The lands were eliminated to round out the natural boundaries of the monument and to facilitate administration in connection with grazing.

Great Smoky Mountains National Park, N. C.-Tenn.—Acquisition by donation and purchase of 794.95 acres brought the total area of this park to 394,883.30 acres.

Kings Mountain National Military Park, S. C.—A donation of 40.09 acres of land, the first to be acquired, was made to the United States for this park.

Morristown National Historical Park, N. J.—Donation of 4.06 acres resulted in a total area of 957.44 acres.

Rocky Mountain National Park, Colo.—By proclamation of March 5, 1936, 1,832 acres were added to the park, making its total area 259,412.832.

STATUS OF NATIONAL PARK AND MONUMENT PROJECTS AUTHORIZED BY CONGRESS

Big Bend.—Establishment of this proposed park was authorized by act of Congress, approved June 20, 1935, with the provision that all lands needed therefor be donated to the Federal Government. At that time an invitation was extended to the Mexican Government to cooperate by establishing a park on the Mexican side, the two to form an international park. The idea appealed to the Mexican Government and a joint survey of the area was made by commissions appointed by the two Governments, and tentative boundaries agreed upon. These include some 800,000 acres in Brewster County, Tex., and 700,000 acres in the Mexican States of Chihuahua and Coahuila.

Isle Royale.—An allocation of \$705,000 from an emergency appropriation was made for the acquisition of lands within the area of the proposed Isle Royale National Park in Michigan, on which to provide work for C. C. C. camps. Two such camps have been at work reducing fire hazards and making limited improvements. These activities have been carried on in cooperation with the Department of Conservation of the State of Michigan.

Everglades.—The Everglades National Park Commission, appointed by the Governor of Florida, is preparing a program to acquire the necessary lands for conveyance to the United States Government. Legislation passed at the last session of the Florida Legislature provides that State lands outside the park may be traded for privately owned lands within the park area.

Badlands.—The establishment of this monument under the terms of the authorization of Congress approved March 4, 1929, is contingent upon acquisition by donation of the private lands and upon the construction by the State of an approach highway. The State of South Dakota has completed the highway and has purchased a portion of the private lands within the authorized boundary. On June 26, 1936, the President approved an act authorizing an extension to include certain lands adjacent or contiguous to the Badlands National Monument project, providing the entire monument area does not exceed 250,000 acres.

Ocmulgee.—This national monument was authorized by Congress in 1934 to preserve Indian mounds of great historical importance, contingent upon the donation of the lands involved to the United States. Through the efforts of local citizens of Macon, Ga., a total of 514.88 acres is contained in the four deeds which have already been accepted.

NEWLY AUTHORIZED PROJECTS

During the fiscal year Congress approved the establishment of the following 11 park and monument areas, contingent upon the acquisition, by donation, of the necessary lands:

- Ackia Battleground National Monument, Mississippi.
- Andrew Johnson Homestead National Monument, Tennessee.
- Appomattox Courthouse National Historical Monument, Virginia.
- Fort Stanwix National Monument, New York.
- Fort Frederica National Monument, Georgia.
- Homestead (Daniel Freeman) National Monument, Nebraska.
- Patrick Henry (Red Hill) National Monument, Virginia.
- Perry Victory and International Peace Memorial National Monument, Ohio.
- Richmond National Battlefield Park, Virginia.
- Spanish War Memorial Park, Florida.
- Whitman National Monument, Washington.

PROPOSED ADDITIONS TO THE NATIONAL PARK SYSTEM

Studies of areas of potential value as national parks and national monuments, and of desirable extensions to areas already acquired, were continued during the year. The importance of this work has been emphasized in the past few years by the need shown for a thorough plan of use of our natural resources, including recreational-land use.

At the beginning of the fiscal year, 224 active projects were on the Service's list of areas to be investigated as of possible national park or monument caliber. Preliminary investigations of many of these areas during the year resulted in a reduction in the list to 156 active projects. Some of these require further studies and others are awaiting investigation. The major park and monument projects pending before the Service, which received consideration or action during the past year, follow:

Grand Teton extension.—With the close of the Seventy-fourth Congress, another bill (S. 2972) for the extension of the boundaries of the Grand Teton National Park, Wyo., failed of passage because of the complexities surrounding the situation, both as to public and private interests. No hearings were held by the Senate Committee on Public Lands and Surveys upon the bill, and the amendments pro-

posed thereto by the Department of the Interior. The Department of Agriculture reported adversely upon the proposed legislation.

As introduced, the bill covering the proposed extension did not include Jackson Lake Reservoir. Careful consideration by this Service compels the conclusion that Jackson Lake Reservoir, together with a small area to the eastward, embracing Emma Matilda and Two Ocean Lakes, must be included in the extension. The Teton-Jackson Hole area is a great natural and recreational unit. Jackson Lake Reservoir lies at the base of the Teton Range. Some of the finest views of the Tetons are mirrored across it. The protection of its entire shore line from further scenic impairment and of the nearby roadway is of vital importance to the park project. The willow thickets, marshes, and cluster of lakes east of Jackson Lake are famous grounds for moose, otter, beaver, and wild fowl.

Extension of the boundaries of the park as provided in S. 2972, with the amendments proposed by the National Park Service, is necessary to provide a proper setting for, and approach to, the magnificent mountain range within the present park.

Proposed Kings Canyon National Park.—S. 2289, to establish the Kings Canyon National Park, Calif., also failed of passage in the Seventy-fourth Congress.

The Kings Canyon region is one of the superb, unspoiled scenic areas of our country. Ever since the days of John Muir, there has been constant effort to save this scenic portion of the Sierra Nevada from the ordinary forms of commercial exploitation permitted in a national forest reservation. Previous attempts to establish the Kings Canyon National Park have failed because of possible future commercial values of the area. It is evident, however, that with the recent development of additional hydroelectric power at Boulder Dam and elsewhere throughout the State, the power resources of the upper Kings Canyon watershed are not essential to the economy of the State. The proposed boundaries would exclude from the park the most valuable reservoir sites as well as the major portion of the essential grazing lands and hunting territory.

With the construction of a State highway into the Kings Canyon, the problem of conserving unimpaired the superlative scenic qualities of the area has become one of major importance. It is believed that national-park status would provide the only appropriate form of land use for the Kings Canyon region, which is one of the most important remaining areas in Federal ownership not yet added to the national-park system.

Proposed Mount Olympus National Park.—Exhaustive hearings were held by the House Committee on Public Lands on H. R. 7086, introduced in the previous session to establish the Mount Olympus

National Park, Wash., which would include the existing Mount Olympus National Monument. The committee reported the bill without amendment and with the recommendation that it be passed, but it failed in the closing days of the last session of Congress.

The purpose of the proposed national park is to preserve for the benefit and enjoyment of the people, the finest example of primeval forest in the Pacific Northwest; to provide suitable range and permanent protection for the herds of native Roosevelt elk and the other native wildlife of the area; and to conserve and render available to the people, for recreational use, these outstanding expressions of nature in addition to the magnificent mountain scenery and numerous glaciers of the Olympic Range.

The lands outside of the present monument, which it is proposed to include within the national park, are at present within the Olympic National Forest and are administered by the Department of Agriculture, subject to the logging practices of the United States Forest Service. Many of the trees within the proposed park area are centuries old and cannot be replaced once they are cut down. By giving the area national-park status, these trees would be saved from logging and would be made available for the inspiration of the people. The Department of Agriculture reported adversely upon the project.

The effect of the hearings on the bill proposing establishment of the Mount Olympus National Park, and the discussions generally, was to focus attention upon and to determine the appropriate use and proper administrative responsibility for an area of national-park quality.

Grand Canyon extension.—A bill (H. R. 12081) was introduced in the second session of the Seventy-fourth Congress which would abolish the Grand Canyon National Monument and add approximately 57 percent of its area to the Grand Canyon National Park. The remaining area of about 118,000 acres of private and public land is valuable principally for grazing and farming. No action was taken on the bill.

Hawaii extension.—The extension to the southeast of the Kilauea-Mauna Loa section of the park would provide for the inclusion of a shore-line section and might even insure the perpetuation of one of the few unspoiled native villages that remain on the islands. To accomplish this extension, H. R. 12306 was introduced in the second session of the Seventy-fourth Congress. No action was taken on the bill.

Hot Springs extension.—Public, No. 684, approved June 15, 1936, provides for a minor extension to Hot Springs National Park so that adequate entrances may be developed.

PROPOSED NEW NATIONAL MONUMENTS AND IMPORTANT
MONUMENT EXTENSIONS

National monument projects within the public domain.—Within the public domain in Colorado, Utah, and Arizona, are five proposed monuments containing unusual scenery, valuable archaeological relics, outstanding examples of erosion, and other exhibits of earth forces, in addition to an interesting assemblage of native plant and animal life. National monument status has been proposed as the most suitable and profitable use to which the areas in question could be put, as the lands involved are sparsely inhabited and apparently low in range productivity, mineral content, and in other commonly accepted commercial resources.

Two of these, the Kofa Mountains and Organ Pipe Cactus projects in southern Arizona, have been cleared through the Department of the Interior. Suitable wildlife protection for these two areas, together with the Green River area mentioned below, is planned in cooperation with the Bureau of Biological Survey of the Department of Agriculture. Should these monuments be established, it is expected that wildlife refuges will be established simultaneously with, and continuous to, them.

Public hearings were conducted by the Division of Grazing and the National Park Service, in cooperation with representatives of various interests in Colorado and Utah, for the purpose of solving various grazing problems connected with the other three public-domain monument projects—the Green River (which would include the present Dinosaur National Monument), the Escalante, and the Kolob Canyons areas. It is hoped that these deliberations will provide a fair and equitable adjustment of all interests concerned so that the proposed national monuments may be established.

Death Valley extension.—Five small extensions of the Death Valley National Monument, Calif., to include important springs and to provide a more complete geographic, biotic, and administrative unit, are under consideration. Approval has been obtained from the individuals and organizations that would be most intimately affected by the proposed boundary adjustments.

Wupatki extension.—Since the establishment of the Wupatki National Monument in Arizona, a dozen years ago, to preserve certain outstanding ruins on two segregated areas, investigations have revealed the presence of nearly a thousand other prehistoric ruins in the surrounding region. The plan to extend the monument to include an area of approximately 52.55 square miles for the protection of these newly investigated archeological sites already has cleared through the Department of the Interior, and the Santa Fe Railroad Co. has generously offered to donate certain sections of the territory involved.

PLANNING AND CONSTRUCTION ACTIVITIES

Prosecution of work under the various emergency programs throughout the fiscal year continued to place a heavy burden upon the engineering and landscape architectural staffs of the Service. In addition to the work carried on throughout the national park and monument system, including the National Capital Parks, the National Park Service through its technical representatives supervised similar work in State and local park areas, and recreational demonstration and Works Progress Administration projects in various regions.

The principal planning and engineering activities of the 12-month period, ended June 30, may be classified under four large programs: the Public Works program, the Emergency Conservation Work program, the Interior Department Appropriation Act for road and trail construction in national parks and monuments, and the Works Progress program.

Under the Public Works program, all general development, engineering, architectural, and landscape plans for \$12,000,000 worth of general physical improvements were prepared; and plans for and inspections of road and trail projects totaling \$27,000,000 in value were carried out in cooperation with the Bureau of Public Roads.

Similar service was rendered by the engineering and landscape personnel under the Works Progress program, which included physical improvements, recreational developments, road and parkway surveys and construction, and land utilization, to the total extent of \$3,500,000; and also in connection with Emergency Conservation Work camps in Federal and State areas.

Many projects planned during the preceding fiscal year entered the construction stage in 1936, and many were completed during the year. The experience gained during the previous year, and the stabilization of the engineering, landscape, and architectural staffs, made possible the production of the best results in the most efficient and economical manner.

Preparation of master plans for the national parks was continued as part of the program of advance planning, to embody present and future physical development of national-park areas in both graphic and written form. Twenty-eight new master plans were prepared during the year, making a total of 71 master plans now available for national-park areas.

Federal construction projects, in addition to highway and parkway work handled for the National Park Service by the Bureau of Public Roads, included such varied types of work as the structural design and technical specifications for improving or constructing buildings, minor roads and trails, electric elevators, dam and intake structures,

as followed by the enactment, on August 21, of legislation "to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance."

Inasmuch as provision for civil-service personnel in connection with the new branch included only three additional employees, it was necessary to supplement the staff with Emergency Conservation Work personnel. Civil-service examinations for positions in the field of history and archeology have been offered, however, looking toward the establishment of a more permanent staff.

The passage of the historic sites legislation makes possible, for the first time in the history of the United States, a broad program of study and preservation of historic resources throughout the country. The act authorizes the Secretary of the Interior, after necessary investigations have been made, to designate as national historic shrines those historic and archeologic sites possessing exceptional value in commemorating or illustrating the history of the United States. Provisions were made for cooperative agreements with States and with local and private agencies in the development and administration of historic areas, regardless of whether or not titles to the properties were vested in the United States. Although funds for the purchase and restoration of historic properties are contingent on congressional appropriations, it is expected that contributions made through the national-park trust fund, established by act of July 12, 1935, will greatly increase the working capital available.

To assist in the formulation of this program, the Historic Sites Advisory Board was created, composed of eminent authorities in the fields of history, archeology, and architecture. Its membership now includes Mr. Edmund H. Abrahams, Dr. Herbert E. Bolton, Dr. Hermon C. Bumpus, Mrs. Reau Folk, Hon. George de Benneville Keim, Dr. Alfred V. Kidder, Dr. Fiske Kimball, Dr. Waldo Leland, Mr. Archibald McCrea, Dr. Frank R. Oastler, and Dr. Clark Wissler.

The Advisory Board in meetings held on February 13 and May 7 crystallized procedure for the acquisition and designation of national historic sites and formulated policies for cooperation with other governmental agencies. A list of type sites, illustrating important phases in the history of the Nation, was submitted with specific recommendations for the Board's consideration. Favorable action was proposed by the Board and approved by the Secretary of the Interior on Derby Wharf and vicinity, Salem, Mass.; Harpers Ferry, W. Va.; and Old Main Building, Knox College, Galesburg, Ill.

State cooperation in the national program is shown by the proffered transfer from the State of Virginia to the Department of the Interior of the Civil War battlefields near Richmond; the donation of Fort Stanwix by the State of New York; and an appropria-

The Natchez Trace Parkway project was allotted \$1,500,000 of Works Progress Administration funds and plans were prepared and submitted to the State for more than 25 miles of right-of-way acquisition. Contract drawings for these sections were 50 percent complete by the end of the fiscal year.

Field reconnaissances and studies were made of a parkway to connect the Shenandoah National Park and the Blue Ridge Parkway with New England; an extension of the Mount Vernon Memorial Highway to Wakefield; and parkway connections between Washington and Gettysburg, and between Great Falls and Harpers Ferry.

HISTORIC AMERICAN BUILDINGS SURVEY

The Historic American Buildings Survey successfully continued field operations and moved into its third year of cataloging, measuring, and recording early American structures in the United States and possessions. When the works program of the Emergency Relief Administration closed in December 1935, over thirteen hundred structures had been fully measured and recorded; thousands of Survey drawings had been reprinted for architectural and historical libraries; and universities and private architects were adding to the collection by contributions. In January 1936 the Works Progress Administration incorporated the Historic American Buildings Survey in its Federal professional and service program under the technical direction of the National Park Service. At the end of the fiscal year a compilation of accomplishments showed that a total of 2,000 structures had been recorded in 12,000 drawings and 14,000 photographs for all programs.

RADIO COMMUNICATIONS IN PARK ADMINISTRATION

Radio communication continued to be of the utmost value in fire fighting and observation, and also in park administration. Early detection of fires, quick control, and direction of fire-fighting forces by means of the radiotelephone each year save from destruction forest areas, the scenic and physical value of which are many times greater than the cost of installing and operating this means of communication.

Radio sets have been added to the radio-communication systems of a number of the parks to meet the increasing communication demands of administration and protection.

HISTORICAL AND ARCHEOLOGICAL DEVELOPMENTS

The fiscal year 1936 saw great strides made in the expansion and coordination of the historical and archeological programs. Establishment of a branch of historic sites and buildings on July 1, 1935,

was followed by the enactment, on August 21, of legislation "to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance."

Inasmuch as provision for civil-service personnel in connection with the new branch included only three additional employees, it was necessary to supplement the staff with Emergency Conservation Work personnel. Civil-service examinations for positions in the field of history and archeology have been offered, however, looking toward the establishment of a more permanent staff.

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tion of \$50,000 by the Massachusetts Legislature for the purchase of property to be included in the proposed Derby Wharf national historic site in Salem, Mass. Similarly, properties have been contributed by other Government agencies, such as the site of Lord Fairfax's mansion, "Belvoir", by the War Department, and the customhouse in Salem, Mass., by the Treasury Department. Provisions for the gradual retirement of the Perry Victory Memorial Commission emphasizes the marked tendency to coordinate the responsibilities of restoration and preservation under a single administrative unit.

The National Park Service participated in an important way in the planning and development of several interesting State historical projects in cooperation with State historical societies, conservation commissions, and planning boards. These included the preservation of such places as Hopewell Furnace, colonial iron-making village in Pennsylvania; Fort Frederick, masonry fortification surviving the French and Indian War, in Maryland; Fort Macon, imposing seacoast defense in North Carolina; Moundville, Ala., one of the outstanding archeological sites of the southeast; and two mission restorations in the southwest. These projects mark an important step forward in cooperation between the National Park Service and the various States in the preservation of interesting sites which it would not be possible for the Federal Government to own and control.

Last year's annual report carries mention of the legislation providing for an appropriation of \$50,000 with which to make a survey of the old Indian trail known as the Natchez Trace, with a view to constructing a national road on this route to be known as the Natchez Trace Parkway. Studies on the authentic location and history of the trace were made and incorporated in the Natchez Trace, an Historical Survey, completed August 1935. Plans for the publication of this report are now under way.

Particularly significant was the extension of the expanded historical program into the area west of the Mississippi River, involving new and additional attention to the historical and educational aspects of the western national park areas, including the archeological sites in the Southwest. Investigations were made of a number of important sites representing significant phases in the history of the West, in particular those associated with the founding and growth of Oregon, Washington, and California. Within the regular scope of historical operations has been brought such work as the restoration of Mission Espiritu Santo at Goliad, in Texas, and of Mission La Purisima, near Santa Barbara, Calif. A number of western forts, such as Fort Lincoln, N. Dak., associated with Custer, Fort Sisseton, in

South Dakota, and Fort Ridgely, in Minnesota, have been the subject of planning and development.

Celebration of the fiftieth anniversary of the dedication in 1886 of the Statue of Liberty, now administered as a national monument, has stressed commemoration of its spiritual significance on a Nation-wide and all-year basis. Many leading national organizations have responded by carrying on programs keyed to the interest of their local units. Three such organizations have sponsored national contests and one an international contest.

Except for the reenactment of the dedication planned for October 28, 1936, in which it is expected the President, the Secretary of the Interior, and the French Ambassador will take part, no ceremonies are being held at the statue.

As facilities, such as administration and museum buildings, contact stations, roads, trails, markers, and shelters, have been completed through Public Works and Emergency Conservation Work Programs in eastern national historical areas, and as the literature, ranger-historian service, and museum exhibits—the product of 3 years of intensive work—have reached the stage of complete functioning, the system of national military areas has come to be one of the outstanding general groups of historical exhibits in the world.

NATURALIST ACTIVITIES

Many gains were made in the naturalist program to afford opportunities to the visitor for understanding and appreciating the natural features of the parks. Activities along this line were modified or augmented, as indicated advantageous by past experience. The effort to secure more mature men as ranger naturalists resulted in improvement in the program, as it has been demonstrated that men just out of college lack the background necessary for efficient nature guides and lecturers. All the major parks now give special training to newly appointed rangers and naturalists, and in some parks the bus drivers employed by the transportation lines are given similar training, to improve the type of information furnished to the visitor.

As in other lines of national-park endeavor, emergency personnel made possible extended improvements in educational service to the public. Emergency Conservation Work, Works Progress, and National Youth Administration programs all afforded assistance, especially in the field division of education which is located at Berkeley, Calif. The Berkeley headquarters also benefited for a short time by the State emergency relief administration program.

The staff of wildlife and geology technicians appointed to make careful check of Civilian Conservation Corps activities, for the pur-

pose of preventing injury to scientific features and of developing important research programs productive of basic information essential to judicious planning, was expanded to meet current needs.

An outstanding measure of cooperation was the award to the National Park Service of a Yale graduate fellowship for the year 1935-36, to be filled by a regular employee desiring to improve his ability by further graduate training unhampered by any specified curriculum. Park Naturalist Frank Brockman, of Mount Rainier National Park, filled the assignment most satisfactorily. This award has again been made available to a National Park Service employee for 1936-37. Such action on the part of Yale University is a stimulus to the park-naturalist staff to attain high standards of training and efficiency.

Transfer of the volcano observatory, in Hawaii National Park, and its volcanologist, Dr. T. A. Jaggar, from the United States Geological Survey to the National Park Service was effected on July 1, 1935. Dr. Jaggar, internationally known for his contributions to volcanology, has been in immediate charge of the observatory since its establishment in 1912. At the request of the Royal Society of London, Dr. Jaggar was detailed for 2 months to Montserrat, West Indies, to study the seismism of that island.

In the national parks the demand for educational aids continues unabated, as evidenced by attendance records and sales of publications. Contacts with various naturalist educational facilities passed the 3,000,000 mark. It is interesting to compare this figure with the 48,156 educational contacts reported in 1920, the season during which naturalist activities were first inaugurated.

The operation of guided trips to the glaciers and summit of the mountain by company employees for a fee, whereas trips conducted by park naturalists are free, long has presented a difficult problem in Mount Rainier National Park. In order that uniform service may be furnished in all parks, recommendation has been made that the Government take over and operate all guided trips in that park.

Great improvement is to be noted in the facilities for evening gatherings of campers. Fine new outdoor amphitheatres have been constructed in Rocky Mountain, Sequoia, and Zion National Parks.

NATURAL HISTORY SCHOOLS

The Yosemite School of Field Natural History opened for its eleventh session in the summer of 1935 with a group of 20 students from some 10 States in attendance. The class contained 14 men and 6 women, selected from approximately 70 applicants. The twelfth session convened June 22 and is now hard at work on its 7-week course. This school is becoming better known throughout the coun-

try, and men and women of higher background of training and experience are applying for entrance. Three men of the 1935 class held degrees as doctors of philosophy.

The junior nature school in Yosemite opened for its sixth season at the end of June 1935. The increase of interest and worth-while-ness of this effort were shown in the daily attendance. In 1934 there was an average of 81 children per day in attendance, while last year the average during the first week was 125 per day. The seventh session, now in progress, commenced June 29.

The fifth annual volcano session of the University of Hawaii summer school was held in the summer of 1935 at the Volcano House in Hawaii National Park. Nine courses of study were offered by 6 instructors and 84 students were registered. The instructors in the volcano session again cooperated with the national-park staff in putting on a series of evening lectures, and the naturalist service contributed to the instruction work.

LIBRARY DEVELOPMENTS

Libraries in the parks continue to grow. It is a pleasure to report considerable activity in improved housing and in classifying and cataloging. All books in the Washington office have been carded and indexed. A trained librarian has brought the Sequoia library into proper working condition. Hawaii has added more than 500 cards. It can be reported that practically all reference libraries have added many items through purchase and donation and have improved their catalogs. A special committee on national park libraries continues to function under the American Library Association

NATURAL HISTORY, MUSEUM, AND LIBRARY ASSOCIATIONS

In most major parks a natural history or museum and library association has grown up as a helpful organization able to finance and promote the educational and research program in a park in ways not open in Government operation. Legal status for such nonprofit organizations has now been procured and their positions materially strengthened, making possible additional programs of this type.

SCIENTIFIC RESEARCH AND DISCOVERIES

Much valuable information was gathered in the parks as the result of cooperation with other scientific agencies and institutions, such as the United States Geological Survey, Carnegie Institution of Washington, and National Geographic Society. Dr. N. E. A. Hinds, of the University of California, continued his study of Algonkian rocks in the Grand Canyon, and studies of the Archean rocks were continued by Drs. Maxson and Campbell, of the California Insti-

tute of Technology, who examined new areas by means of a boat. Glacial movements were recorded in cooperation with the International Geophysical Union. Dr. H. E. Gregory conducted geological studies in Bryce Canyon. Dr. Levi Noble continued research studies in Death Valley National Monument, which contains a myriad of complex geological examples. Dr. Howell Williams, under a grant from the Carnegie Institution of Washington, began a thorough study during the summer of 1936 of the volcanology of Crater Lake National Park. Dr. Warren D. Smith, of the University of Oregon, and Dr. David Griggs, of Harvard University, also conducted studies of the geological features of this park. Dr. Erzsebet Kol, privatdocent of botany, Szeget, Hungary, under an award from the International Federation of University Women, is making a study of the algae causing pink and green snow and is planning to visit the western parks and Alaska where these algae, living in snow, might be found.

Summer field parties were sent to the national parks by the International Geophysical Union, Princeton University, Clark University, California Institute of Technology, Western Research University, University of Colorado, Transsylvania College, Miami University, and Mississippi State College.

In addition many other geological activities were carried on, as reported in the following section.

ENLARGED GEOLOGICAL PROGRAM

Through the appointment of 21 geologists under the Emergency Conservation Work organization it was possible to work out programs for the preservation of the geological features of the national parks and monuments; to prepare descriptive material and make recommendation for trail locations which will lead to the appreciation of these features by the public; and to furnish technical advice concerning problems of economic and engineering geology pertaining to the emergency program.

An outstanding result of the work of these geologists was the preparation of 35 detailed geological reports on existing and proposed National and State park areas, 284 brief summaries of the geology of such areas, and 60 reports on specific developmental projects.

Among the notable achievements of geologists on the Service staff not previously reported were the following:

1. Excavation project at Fossil Cycad National Monument, revealing the presence of hundreds of specimens in place, justifying the retention of the area by the Federal Government as part of the national park and monument system.

2. Discovery of a new habitat of prehistoric man in the Longhorn Caverns State Park, Tex.

3. Excavation, under the guidance of geologists of the National Park Service, of fossil dinosaur skeletons at the Dinosaur National Monument. This exhibit, when completed, will not only show the bones in place but will contain reconstructions of these ancient monsters.

4. Discovery at the Petrified Forest National Monument of a stump and root system, about 15 feet in length, of a petrified tree entombed in a vertical position with leaves and cycad cones buried at its base. This, together with smaller samples unearthed, indicates that some of the trees grew within the boundaries of the present national monument, contrary to the older theory of growth elsewhere and drift.

5. Development of fossil exhibits on the Kaibab and Bright Angel Trails in the Grand Canyon, showing examples of extinct plants and animals in situ.

6. Display of fossil ginkgo trees, found entombed in lava flows of the Northwest.

7. Formation of a policy regarding cave development designed to prevent overdevelopment and consequent injury to cavern features of the parks.

8. Accumulation of geological evidence, which will be submerged by completion of Boulder Lake, for museum display.

9. Operation of seismograph at Lassen Volcanic National Park taken over by National Park Service.

10. Preparation of 6 reels of talking motion pictures illustrating general geological processes, and of 10 relief models showing the glacial history of New York State, and collection of geological specimens for museum and trail-side display.

New discoveries of geological data are being constantly made, the full value of which can be determined only as the investigations proceed.

COOPERATION WITH THE UNITED STATES GEOLOGICAL SURVEY

Arrangements were consummated with the United States Geological Survey for the assignment of some of its especially trained geological personnel to the study of specific problems, some of which are listed below:

1. Glacial history of Sequoia and Yosemite National Parks, now being studied by F. E. Matthes.

2. Reconnaissance of proposed Big Bend Park area made by C. P. Ross.

3. Problems of shore-line erosion and sand fixation at the Cape Hatteras State Park, investigated by C. Wythe Cooke.

4. The services of Dr. Herbert E. Gregory obtained for a reconnaissance geological investigation of the Colorado Plateau area and to report specifically on all areas in the region in which the National Park Service is interested.

MUSEUM DEVELOPMENTS

Interpretation of certain phases of the American scene by the museum method constitutes an enterprise of enormous proportions. With emergency funds as the structural foundation for expansion, museums in national parks made significant strides in 1935 and 1936. Prior to allotment of Public Works funds there existed 27 museums in 21 areas administered by the National Park Service; there are now 53 museums in 44 national parks and monuments. More than 70 percent of the allotment was expended in employing workers on these projects. The four central laboratories at which the preparation work for these museums is done are located at Berkeley, Calif.; Morristown, N. J.; Fort Hunt, Va.; and Washington, D. C., and are largely operated by Emergency Conservation Work and Works Progress funds.

In order to achieve a concerted representation of needs of the museums, a definition of responsibilities and confirmation of stated relationships of the Museum Division were executed on December 2, 1935. This centralization of museum duties gave the group concrete classification and embodied the various National Park Service museum activities into a closely allied unification of work.

During the year exhibit plans were completed, approved and placed in work for Vicksburg, Shiloh, and Chickamauga-Chattanooga National Military Parks, Hot Springs National Park, and Colonial National Historical Park in the East.

For the West exhibit plans were drawn up and approved for museums in Aztec Ruins, Bandelier, and Devils Tower National Monuments, and Rocky Mountain (Fall River Pass), and Wind Cave National Parks. In addition, considerable work has been accomplished in connection with plans for State park museums.

Each museum is designed to meet a special need. The exhibit schemes, devised by historians, curators, and artist preparators, limn in skillful and dramatic manner a story of particular portent in Americana. The old ideal of curios and scientific collections is left behind, and in its place is a careful series of devices charged with dynamic facts for minds peculiarly receptive to informational impulses at the time.

Another major project is the museum for the new Interior Department Building. The contents of the exhibits will have the speci-

fied result of delineating, in vivid and artistic style, the manifold relationships of the various departmental bureaus to the citizen in the course of his life.

This year saw an ever-increasing demand for National Park Service exhibits to find place in expositions. Among the more important expositions accommodated were the Texas Centennial, San Diego Exposition, and the Great Lakes Exposition.

WILDLIFE PROTECTION

Biologists of the National Park Service during the year participated actively in many conservation meetings, notably the North American Wildlife Conference and affiliated State wildlife federation meetings, meetings of the American Fisheries Society, American Ornithologists' Union, and the American Society of Mammalogists, State Civilian Conservation Corps educational advisers' conferences, and various conferences of State game officials and sportsmen's organizations.

The restoration of wildlife has been greatly aided by conservation measures taken through the Emergency Conservation Work organization. Wildlife sanctuaries have been rebuilt and streams restocked with fish, and numerous rearing pools built by the Civilian Conservation Corps enrollees in cooperation with Federal and State organizations.

A number of biological research projects, mostly to evolve practical management plans, were undertaken or continued. The study of bighorn, its habits and status, was continued in western parks and monuments. A faunal survey was made at Lava Beds National Monument with recommendations for extension of boundaries to insure protection to native fauna as well as to archeological material. At Mount Olympus National Monument the life histories of deer, elk, and cougar were studied. The Yosemite National Park pack and saddle horse range problem has been studied, and recommendations were made for future management to avoid undue competition with wildlife. An intensive study of the flora of Great Smoky Mountains National Park has continued. Already, some 3,000 plant specimens, representing approximately 2,000 species, have been collected in the park. Investigation of the fauna and flora of the Big Bend National Park project occupied the time of two observers for a month; this research is being continued during the present field season with special emphasis on the plants and mammals. Many other studies have been made, including winter deer foods of Wilderness State Park, Mich., the ivory-billed woodpecker in central Louisiana, birds of White Sands National Monument, N. Mex., coat colors of three squirrels of the Grand Canyon region, amphibians of the Great Smoky Moun-

tains, and deer and caribou of northern Minnesota. Results of some of this research have been published in technical and scientific journals. A bird and mammal check list was in course of preparation for all the national parks in the United States and Alaska, the section dealing with birds being brought practically to completion.

Research areas for the study of native biota have been established in Great Smoky Mountains National Park. At Sequoia reserves have been set up for the preservation of the fisher and golden trout. A research area at Pinnacles National Monument will give special protection to, and facilitate scientific study of, the duck hawk and other nesting raptorial species of birds in the monument.

ACTIVITIES IN FISH CONSERVATION

A very definite fish cultural policy for the national park system was developed. This policy conforms with the general policy of the national parks, which emphasizes the importance of perpetuating native fauna, and will also tend to improve fishing in park waters. Native species will be protected from the introduction of exotics in all waters where the latter have not already been planted, and will be favored in all other park waters where they are of equal or superior value from the standpoint of fishing.

Surveys have been made of many lakes and streams of national parks and monuments and the data filed for future use in restocking programs. A major activity of the supervisor of fish resources has been in connection with exploration of sites for a proposed hatchery for Glacier National Park, for which an allotment of funds has been made. Technical advice on fish problems, especially the elimination and prevention of future ingress of exotic species of fish in Yellowstone National Park, has been given administrative officers of the various areas.

During the past year, nearly 60,000,000 trout eggs were collected within the national parks. About 50 percent of the fish hatched from these eggs were distributed to waters of various States. Increased fishing demanded increased planting and, accordingly, over 30,000,000 fish were planted in national parks and monuments. A hatchery building was constructed at Greaty Smoky Mountains National Park, together with rearing ponds for the propagation of trout. Full cooperation has been given by the Bureau of Fisheries and State game and fish departments.

ANIMAL REDUCTION PROGRAM

It was necessary to carry out the reduction of elk for a second year in Yellowstone National Park and vicinity during the winter of 1935-36, and 2,933 head were removed from the northern range.

This work was undertaken by the park staff with the full cooperation of the Montana Fish and Game Commission. Hunting was allowed in Park County, Mont., and over 2,000 elk were killed by hunters. Some deaths occurred from natural causes or accident, but most of the remainder were live-trapped and shipped to Indian agencies and the Idaho State game department. After the reduction had been accomplished, a census of elk in the northern Yellowstone herd showed that there was a total of 10,281 animals remaining on the range.

In accordance with the established policy to maintain the number of bison of Yellowstone National Park within the carrying capacity of their range, 109 were removed alive. Ninety of these were shipped to the Crow Indian Agency and 10 to the Pine Ridge Agency for restocking purposes, and the remainder were sent to zoos.

SANITATION IN THE PARKS

Continued efforts were made, in cooperation with the Public Health Service, to safeguard the health of the nearly 8,000,000 visitors to the national parks and monuments through the installation and operation of proper sanitary facilities and the inspection of all such facilities to guard against inadequacy and deterioration.

In the main, the largest sanitary problems, particularly in connection with water-supply development and sewage disposal, have been solved; but constant vigilance was necessary to maintain the requisite health standards.

As last year, the greatest sanitary problems were presented in the newer eastern areas. In the newly established Shenandoah and Mammoth Cave National Parks, studies were made and plans drawn up for sewage-disposal projects and for the development of water supplies. Inspections and plans also were made for similar facilities in some of the eastern military and other historical parks; the special problems, such as mosquito control and study of conditions at swimming pools, were given attention.

Advice also was rendered, through Public Health Service channels, to officials associated with sanitation in State parks and Re-settlement Administration areas.

PUBLICATIONS AND PUBLICITY

The situation concerning the printing requirements of the National Park Service remains much the same as at the close of the last fiscal year. Printing funds are totally inadequate to meet the demands upon the Service for the issuance of information circulars and other publications. By the close of the fiscal year the supplies of the majority of information circulars for 1936 were practically ex-

hausted, with the greater part of the summer season still ahead, to say nothing of the winter season which is assuming important proportions in national-park administration. Keen concern has been expressed by the Advisory Board, appointed under the historic-sites legislation, over the inadequacy of the printing funds available.

During the year, through the use of regular printing funds, 650,000 circulars of information for free distribution were printed at the Government Printing Office, and also a special scientific publication entitled "Plants of Yellowstone National Park", which sells for 25 cents a copy. A reprint of Research and Education in the National Parks was issued, as well as three guide leaflets on Grand Canyon National Park.

Information to the public also was augmented by the issuance of motorists' guides for Crater Lake, Mount Rainier, Yellowstone, Yosemite, and Rocky Mountain National Parks, and for Waterton-Glacier International Peace Park, for distribution to autoists in those parks.

Copy for a new publication, Glimpses of Eastern Historical Areas, was prepared, edited, and sent to the Government Printing Office shortly before the close of the year. This, when published, will be the first printed material issued by the National Park Service on the historic areas transferred to its jurisdiction under the consolidation of Federal-park activities during the summer of 1933.

Through the cooperation of the Director of Emergency Conservation Work, reprints of Glimpses of Our National Parks and the National Parks and Emergency Conservation Work were authorized and are now under way at the Government Printing Office. Another publication, entitled "Ferns and Flowering Plants of Isle Royale", also is being printed at the Government Printing Office and will probably be ready for distribution by the end of the year.

A report of the work of the Historic American Buildings Survey was printed from emergency funds available for the prosecution of the project, and a report on the elimination of pollution of Rock Creek was published with funds available for the survey of this project.

Two other publications made possible through emergency funds were Park Structures and Facilities and Recreational Demonstration Projects. The former is a signal contribution to park work generally and meets the grave need for a medium through which to communicate standards for park architecture to the many agencies called upon to initiate structural programs in parks under the Emergency Conservation Work program. Its 246 pages of photographs, drawings, and comments focus on appropriate and recommended park structural practices. Printed in an edition of only 2,350 copies, available

for distribution in November 1935 within the Service and to cooperating Federal and State agencies, it already has exerted a marked and beneficial influence on the character and practicability of park buildings over a wide area. Another edition, more comprehensive in scope, is now in preparation. The recreational demonstration projects booklet illustrates graphically, through the project at Chopawamsic, Va., the work being done in this line of emergency endeavor.

The naturalist and wildlife staffs have been unusually prolific in preparing records and comprehensive scientific papers. Publications dealing with educational activities in the Civilian Conservation Corps camps include an outline of a course on the conservation of natural resources which was furnished to the United States Office of Education and a technical circular regarding the construction of relief models, which was supplied to the camps to furnish useful employment during inclement weather and to supply a demand for relief models to be used for display purposes.

Historians of the Service, in addition to preparing material for the pending new publication, *Glimpses of the Eastern Historical Areas*, also prepared copy for seven informal leaflets on the historic areas under the jurisdiction of the National Park Service. These and a number of other small pamphlets were published by the rotaprint method through the Department's Miscellaneous Service Division and were of great aid in furnishing information to the public.

POSTERS

The poster method of calling attention to the availability of the National and State parks as vacation areas was continued, six posters being issued during the year. As in the past, only limited editions could be printed, using emergency funds. Because of the popular and educational interest in poster displays, funds for an expanded poster program should be made available.

RADIO BROADCASTS

The broadcasting program of the Service for the first time this year took the form of dramatization. Through the courtesy of the National Broadcasting Co. a series of 13 programs, covering the major western parks, was broadcast over a national hook-up during the spring months. A marked increase in the demand for park publications followed the initiation of this program.

Radio script on scientific subjects also was prepared by the Service for issuance to independent stations throughout the country indicating a desire for such script. There has been an increasing demand for this material, and a number of the independent stations also used the script of the dramatized programs. In this connection it is

interesting to note the request for copies of each of the 13 dramatized versions for use by 54 colleges.

The National Park Service also cooperated with the United States Office of Education in the preparation of scripts for broadcasts on natural-history subjects which were exemplified in the national parks, and script also was prepared in the E. C. W. regional offices of the National Park Service.

In addition, numerous officers of the Washington office and the field appeared on national and local programs by direct invitation of the broadcasting companies or of commercial programs.

Before the close of the fiscal year arrangements had been completed for the broadcasting of the dedication, on July 3, of the Shenandoah National Park by President Roosevelt and Secretary Ickes, over Nation-wide hook-ups of the two main broadcasting companies.

PRESS RELEASES AND OTHER NEWSPAPER AND MAGAZINE PUBLICITY

During the year approximately 270 statements on national-park activities were prepared in the Washington office for release to the press, either through the Secretary of the Interior or the Director of Emergency Conservation Work. These covered broad phases of national-park work or policy matters. Other matters of interest primarily sectional or local were covered in releases direct from the national parks and monuments or from the E. C. W. regional offices.

In addition, a large amount of special material was prepared by request, for publication in encyclopedias, magazines, and newspapers throughout the country, and an even greater volume of material was furnished special writers to form the basis of such articles. On an average, two or three such requests from feature writers or newspaper correspondents were received each week at the Washington office.

LECTURES

In addition to the lectures given in the national parks and monuments as part of the educational program, the Washington office arranged for a series of 14 free lectures, open to the public generally, in the Interior Department Auditorium and the new United States Government Auditorium, on subjects relating or allied to the national parks and monuments. Most of the speakers on this series were local or visiting field scientists or technical advisers on the Service staff. In addition, the National Park Service was enabled, through a cooperative arrangement, to offer to several schools and other organizations, 26 lectures on certain national parks of the southwest. Several members of the Service staff also devoted a large amount of their

personal time to giving talks on national-park subjects to schools and other organizations in and near Washington, D. C. The field for this type of service is limited only by the personnel and funds available for such work.

VISUAL EDUCATION

Visual-instruction activities, formerly administered by the National Park Service, were merged with a Department motion-picture division. Demand for photographs, films, and slides has greatly increased, and it is fortunate that the emergency program has made possible considerable additions to the film and slide library.

FOREST PROTECTION AND FIRE PREVENTION

The allotment for forest protection and fire prevention for the fiscal year 1936 under the regular appropriation permitted allotments to the parks sufficient to meet only the barest needs for fire-protection personnel and equipment. As in the preceding fiscal year, all forest protection improvements, insect and tree-disease control, and type-mapping activities were financed from the emergency appropriation. The forest-protection accomplishments of the past year are, therefore, largely represented in the report of the Emergency Conservation Work program. That program made possible a continuance of the forest-protection-development projects within the national parks and monuments far in advance of what would have been possible under normal appropriations.

FOREST-FIRE PROTECTION

The western national parks and monuments, despite adverse fire-weather conditions and greatly increased public use, established a very creditable fire record for the season of 1935. The number of man-caused fires in the western parks was the smallest recorded for any of the past 5 years, while lightning fires showed a marked increase. The total number of fires in the western parks was approximately the same as the average for the past 5 years, and the acreage burned was the least for the past 8 years. Glacier National Park, with 1,446 acres burned, suffered the most damage. This was almost entirely due to two fires—Waterton and Chief Mountain.

Incendiary fires fortunately are of rare occurrence in the western national parks and monuments, but they constitute the foremost cause of conflagrations in the eastern parks, especially in the Mammoth Cave area. This is due largely to the private lands within these eastern areas, occupied by local residents and squatters who make a practice of using fire for clearing land for cultivation and for grazing purposes. As the private land situation is cleared up in these eastern

park areas, this trouble will in all probability diminish and, it is hoped, eventually be eliminated.

Annual fire statistics for the calendar year 1935 are given on pages 149.

As a means of improving fire detection and fire dispatching, large-scale panoramic photographs were taken during the year from 110 fire lookout stations and observation points within the national parks. These photographs, with orientation marked thereon, permit the protection personnel to visualize the area in which a lookout reports a forest fire, thus affording a much better understanding of topography and cover in the vicinity of the fire.

Some much needed fire equipment was procured during the past year, including five pick-up trucks equipped with water tanks and booster pumps for use with suppression squads. There is still a great need for additional fire equipment in many of the parks, particularly for modern fire trucks equipped with water tanks, pumpers, and hose.

INSECT CONTROL

Although insect-control work has been carried on by the C. C. C. in many of the western parks and monuments, there are still numerous insect epidemics in a number of the parks. The two most threatening are the mountain-pine-beetle epidemic, which has swept from adjacent forest areas into the subalpine forests of Yellowstone and Grand Teton National Parks in such intensity that control is futile, and the needle-miner infestation in the lodgepole-pine forests of Yosemite National Park, which threatens much of the subalpine forest of that park. The Bureau of Entomology and Plant Quarantine is cooperating with the Service in carrying on investigative and experimental work for the control of the needle miner in Yosemite, and in studies and technical advice relating to insect manifestations in numerous other parks.

The situation in Yellowstone is further complicated by a very serious winterkilling of the foliage of coniferous trees over several thousand acres. Whether these trees will recover is not yet definitely known.

In the Southwest an epidemic of *Ips*, threatening the piñon pine, was brought under control in Mesa Verde National Park and Colorado National Monument. The Black Hills beetle, which was so destructive several years ago, has again made its appearance on the North Rim of Grand Canyon and in Bryce Canyon, as well as on the adjacent national forests, and should receive prompt attention.

Spraying to control the western tent caterpillar on deciduous trees has been continued with success in all parks and monuments affected.

BLISTER-RUST CONTROL

No new blister-rust-control projects were initiated during the past year, but control operations were continued in Mount Rainier, Acadia, and Shenandoah National Parks. The work in all three areas was accomplished by C. C. C. enrollees.

TREE PRESERVATION AND REPAIR

During the year the important trees in 10 national cemeteries, 3 national parks, 11 national military and historical parks, 2 national monuments, and 1 national battlefield-site were given complete care from the standpoint of pruning, bracing, spraying, and root treatment, and trees of greatest importance were given special cavity treatment and lightning protecting by the specially authorized E. C. W. itinerant tree-preservation crew and C. C. C. personnel. Work of a similar nature was accomplished in National Capital Parks by an allotment of P. W. A. funds. The Service published seven bulletins on several phases of tree preservation. Two additional high-powered sprayers were purchased for use at Acadia National Park for insect control. A special allotment of E. C. F. made possible a successful attack on the Morristown National Historical Park cankerworm infestation when an autogiro was used to spray a forest area—probably the first time an autogiro was so utilized.

TYPE MAPPING

For the purpose of obtaining a detailed inventory and map of vegetation of the parks for use in planning protection, development, and use of the areas, the preparation of vegetative type maps was continued. Approximately 5,596,000 acres have been mapped to date, of which 2,201,000 acres were mapped during the past fiscal year.

During the preparation of these vegetative type maps, complete herbaria of all plants found have been prepared and new plants added in the park-museum material. A detailed check list and description of plants is being prepared. Several hundred new plants have been identified. In Grand Canyon National Park alone over 200 species have been identified which had not previously been reported in that area.

FIRE PROTECTION FOR BUILDINGS

The fire-protection engineer made fire-hazard inspections of buildings at Glacier, Mount Rainer, Yellowstone, Sequoia, Yosemite, and Great Smoky Mountains National Parks. Supplementary inspections were made at Colonial National Historical Park and Gettysburg National Military Park. The review of plans for buildings and water systems with reference to fire-protection requirements was active dur-

ing the year. One of the special activities of the fire-protection engineer is a study of the accident-prevention problem which is being considered by an interbureau committee appointed by the Secretary of the Interior, of which the fire-protection engineer is chairman.

ACCOMMODATIONS FOR THE PUBLIC FURNISHED BY PRIVATE CAPITAL

The long-established policy of the Department in regard to concessions for the accommodation of the public in the national parks was continued and further developed during the 1936 season. New operators were installed in several of the smaller areas recently transferred to the jurisdiction of the National Park Service. Negotiations at the present time are under way for the granting of a concession contract to one large, well-financed operator to handle all accommodations for the public within the newly established Shenandoah National Park.

The upward trend in the business of the park operators continued. With this increase in business, further improvements in facilities were under way as the fiscal year closed. The Utah Parks Co. is replacing the fine lodge building on the North Rim of the Grand Canyon which was destroyed by fire on September 1, 1932. Changing conditions in Yellowstone National Park have rendered necessary a consolidation of four park operators, the Yellowstone Park Hotel Co., the Yellowstone Park Transportation Co., the Yellowstone Park Lodge and Camps Co., and the Yellowstone Park Boat Co. The first definite result of this consolidation has been the approval of plans for a new lay-out at Mammoth Hot Springs which will comprise in one unit a variety of services ranging from first-class hotel service down to the simplest, most informal of cabin accommodations. In establishing this new lay-out, all of the old Mammoth Hotel structure, except the modern dining room unit and the modern hotel room unit, is being razed, and as soon as the new cabin buildings are erected the old Mammoth Lodge building and surrounding cabins will be demolished.

Increase in business in Yellowstone, combined with a change in type of accommodations demanded, resulted in an overflow of visitors desiring cabin accommodations at Old Faithful and the Canyon, while at the same time the Old Faithful and Canyon Hotels were not being used to capacity, the Mammoth Hotel was little used, and the Lake Hotel had not been opened at all. To meet this unbalanced use of existing facilities, the park operator, at the suggestion of the Service, reduced the differential between the lodge and hotel rates for the regular 3½-day all-expense tour to \$2. As a consequence, at the

close of the first month's operation during the 1936 season the house count of the hotels had more than doubled and the hotel revenues had increased almost to the same degree.

With the increased use of air-cooled equipment on transcontinental railroad lines and with increased use of busses and airplanes to reach the national parks, there has been a noticeable increase in the transportation within the parks. With this increased usage of transportation equipment, the operators in Yellowstone, Glacier, Yosemite, and Rocky Mountain National Parks have embarked on a program of replacing obsolete motor equipment with new and up-to-date busses.

The operation by private concessioners of the dock at Colonial National Historical Park and the concession building at Shiloh National Military Park, both recently constructed by the Government, was begun.

A policy was established under which the milk sold in any park or monument must be handled under sanitary requirements at least equal to the laws and regulations of the State in which the park or monument is located.

Cooperation and active participation were continued in the management of the concession operations of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., Washington, D. C., and the Mammoth Cave Operating Committee at Mammoth Cave National Park, Ky., the nonprofit distributing agencies furnishing accommodations for the public under the National Capital Parks and at Mammoth Cave National Park, respectively. It is interesting to note that the 1935 gross income of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., was \$1,903,077.79, as compared with \$1,460,081.30 for 1934, with an increase in profits from \$99,852.32 to \$157,941.16. The gross income from the hotels and caves in Mammoth Cave National Park for 1935 was \$166,888.45, with a net profit of \$65,442.71. The Mammoth Cave profits are donated to the United States for the purpose of additional land purchases to complete the Mammoth Cave National Park, and in the case of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., one-half of the net profits accrue directly to the Government as revenue with the remaining half being used for welfare and recreational purposes within the District of Columbia.

Committees composed of representatives of the Western Conference of National Park Operators and the National Park Service were appointed on April 3, 1936, to study problems connected with auto camps in the parks and to consider possible methods of reducing existing building costs in park areas.

NATIONAL CAPITAL PARKS

At the end of the fiscal year the National Capital parks system comprised 692 reservations totaling 6,986.61 acres. Of these reservations 690, totaling 5,604.11 acres, were located within the District of Columbia and 2 reservations, totaling 1,382.50 acres, were located in nearby Maryland and Virginia. The total acreage in Virginia was 1,155.01 and Maryland 227.49. This represents an increase of 55.59 acres during the fiscal year.

A bill was introduced in Congress to grant authority for the National Capital parks to assume jurisdiction, for the purposes of maintenance and operation, over the Chopawamsic recreational area, now in an advanced stage of development as a National Park Service-Resettlement Administration project. This area, located approximately 40 miles from the District of Columbia boundary between Quantico and Chopawamsic Creeks in Virginia, will ultimately comprise approximately 15,000 acres of land suitable for recreational usage. Work now in progress in the area will adapt it to camping and conservation purposes. At the end of the fiscal year two camps, one for boys and one for girls, were ready for occupation by underprivileged groups from the District of Columbia.

The record flood of the Potomac River occurring on March 18-19 necessitated the construction of an emergency flood control dike in West Potomac Park and extending into the Washington Monument grounds. The dike, constructed by the personnel of National Capital parks with the assistance of Works Progress Administration and Emergency Conservation Work labor, was completed in advance of the crest of the flood.

Noteworthy progress was made toward the completion of important projects under way at the beginning of the year, and many new projects undertaken during the year were completed or reached an advanced stage of progress. Of chief interest and importance among these were the continuation of construction work on the Mall and Union Square, the principal project undertaken in National Capital Parks under Public Works Administration authorization; the rehabilitation program for small parks and triangles; the completion of work undertaken in the development of the Takoma and Banneker Recreation Centers and the starting of work upon the improvement or development of five additional recreation centers; the removal of unsightly structures from the Washington Monument grounds and the construction of a permanent flood-control levee at this location; the development of Fort Dupont and Fort Bunker Hill Parks in the outlying districts; the continuation of preliminary work on Theodore Roosevelt Memorial Island, and the

completion of roadway in section 2, Rock Creek and Potomac Parkway, the connecting link which forms a continuous parkway throughout the length of the Rock Creek Valley, joining by continuous park highways the parkways of Montgomery County, Md., with those of the District of Columbia, including the Potomac Parks and the Mount Vernon Memorial Highway.

The total attendance in the National Capital Parks during the fiscal year was estimated at 45,700,000. Approximately 23,005 permits were issued for use of the 362 recreational facilities established at 44 locations throughout the National Capital Parks system.

The total appropriation for National Capital parks administration for the year 1936 was \$3,305,509.04, of which the sum of \$898,000 was included in the District of Columbia account for the operation and maintenance of parks; and \$242,085 in the United States account for maintenance of the Battleground National Cemetery, continuation of construction of the Arlington Memorial Bridge, and restoration of park areas damaged by flood. The Executive account for maintenance, Executive Mansion and grounds, totaled \$153,700.14. In addition to the above-mentioned regular congressional appropriations the sum of \$1,112,204.90 was allotted for construction work by the Public Works Administration, \$176,858 for Emergency Conservation Work projects, and \$722,661 emergency funds for roads and trails.

MAINTENANCE OF FEDERAL BUILDINGS

The National Park Service at the close of the fiscal year provided maintenance, operation, and protection for approximately 18,300,000 square feet of floor space, 16,000,000 of which were located in 47 Government-owned buildings and 2,200,000 in 90 rented buildings in the District of Columbia, and also for 7 memorials; and similar service was provided in 11 Government-owned buildings outside the District which have a total floor area of over 1,200,000 square feet. The new United States courthouse in New York City, comprising 655,787 square feet, and the new United States courthouse at Aiken, S. C., which has a floor area of 17,474 square feet, represent the latest acquisitions of out-of-town buildings. The personnel required and funds expended incident to providing this service were as follows:

	Expenditures	Personnel
Buildings in the District of Columbia.....	\$5,910,090	14,256
Buildings outside the District of Columbia.....	408,000	272
Total.....	6,318,000	4,528

¹ Includes 196 temporary.

Responsibility for the maintenance and operation of highly specialized mechanical equipment, valued at millions of dollars, in new Government office buildings increased materially. The complete air conditioning of six of the largest buildings required the operation of refrigerating equipment totaling 12,000 tons capacity, which represents the largest single concentration of refrigerating equipment located in this country.

All mechanical equipment in the central heating plant was maintained in operating condition during the year, so that a continuous supply of steam for heating practically all the Government buildings in the District of Columbia, and some few nongovernmental buildings, could be furnished. A total of 97,200 short tons of coal was consumed in the plant, with a total steam production of over 2,000,000,000 pounds.

Three hundred and thirty elevators, together with their machinery, were maintained and operated.

Among the various improvement projects executed under the Public Works program were:

Completion of alterations and changes at the Executive Mansion; installation of air-conditioning equipment in the Agriculture Administration Building; changing electrical-current supply to the Old Interior Building from direct to alternating; remodeling the former Potomac Park Apartment Building (after its purchase by the Government) to provide office space for the Housing Division of the Federal Emergency Administration of Public Works; and remodeling, repairing, and modernizing the building at 45 Broadway, New York City. Remodeling the front of the Old Patent Office Building, incident to the widening of F Street, was practically completed.

Plans and specifications are being drawn up for physical improvements and repairs to Government buildings under the jurisdiction of this Service, including the elimination of fire hazards. An amount of \$1,150,000 for this purpose was authorized in the deficiency bill, approved June 22. The projects involved will include such improvements to the electrical systems in various buildings as the replacement of defective and obsolete wiring and equipment, replacement of antiquated elevators and auxiliary machinery, and installation of sprinkler systems in areas where files are stored.

Several of the temporary wartime buildings in the Mall area and Temporary Building No. 5, located at Twenty-first Street and Constitution Avenue, were vacated and demolished during the year. The removal of the former provided room for improvements in connection with the Mall vista, while on the site on which the latter formerly stood a new building for the Federal Reserve Board is being constructed.

A school was established for the instruction of guards in safety and service. The subjects presented are instruction in legal duties and responsibilities, technique of patrol duties, courtesy and customs of the Service, fire equipment and fire fighting, and information on uniforms, firearms, and the flag.

SPACE-CONTROL PROGRAM

During the fiscal year, 197 leases were authorized and the rental of the Government in the District attained a peak of approximately 2,766,000 square feet of space in 123 buildings, at an annual rental of approximately \$2,640,000. In transferring agencies into new and expanding locations, 376 moves were made. Detailed analyses of space reports were secured from all departments and agencies of the Government and compiled and prepared for ready reference. A survey was made of the space in all the owned and leased buildings occupied as general filing rooms, which in some cases brought about the transfer of files from usable office space to less desirable space in storage buildings. A survey of laboratories now maintained by the various departments of the Government is being made to ascertain the types of activities carried on in the different buildings in the District.

NEW INTERIOR DEPARTMENT BUILDING

The new Department of the Interior Building, being erected as a Public Works project under the supervision of the Procurement Division of the Treasury Department by the George A. Fuller Co., general contractors, which is expected to be ready for occupancy in February 1937, also will be administered by the National Park Service. It will do much to relieve the crowded space conditions under which the Federal Government now is carrying on its activities.

It is the first major Federal structure in Washington authorized, designed, and built under the present administration. Ground was broken August 12, 1935, and the cornerstone was placed by President Roosevelt on April 16, 1936. The building will have a gross floor area of 1,050,000 square feet and a net usable area of 700,000 square feet, and will accommodate approximately 5,000 persons. Important features of the new building are a large auditorium, a general library, exhibition space, a broadcasting studio, a basement garage, a large cafeteria, and an employees' lounge. Indirect lighting, air conditioning, acoustically treated office space, and escalators from the basement to the first two floors will add to the usability of the new building, which, although classic in design, is modern in its practicability. Its completion will materially aid the present serious space situation.

APPROPRIATIONS, DONATIONS, AND REVENUES

APPROPRIATIONS

Appropriations for the National Park Service during the fiscal year 1936 amounted to \$17,722,578. Of this amount the sum of \$15,719,390 was authorized in the Interior Department Appropriation Act, 1936; \$898,000 in the District of Columbia Appropriation Act, 1936; \$143,298 in the Independent Offices Appropriation Act, 1936, for maintenance of the Executive Mansion and grounds; a deficiency sum of \$891,890 for the maintenance and operation of public buildings in the District of Columbia; and a supplement of \$70,000 for Kennesaw Mountain National Battlefield Park. The sum of \$82,000 was transferred to the Service from the War Department for the purchase of additional land for Vicksburg National Cemetery.

Financing of activities under Works Progress Administration allotments was begun as follows:

Works Progress Administration

Administrative expenses of transient camps.....	\$693,951.00
Preliminary survey of Natchez Trace Parkway (150 miles).....	} 1,425,185.00
Grading, drainage structures of the Natchez Trace Parkway (40 miles).....	
Acquisition of site and development of Jefferson National Expansion Memorial.....	¹ 6,750,000.00
Repair or replacement of Federal property damaged or destroyed by the floods of 1936.....	77,240.00
Total.....	8,946,376.00

¹ The sum of \$2,250,000, donated by the city of St. Louis, Mo., also available for this project.

CASH DONATIONS

Cash donations to the National Park Service for the fiscal year ended June 30, 1936, amounted to \$315,281.80. The donations were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditure of Federal appropriations. In the 1935 fiscal year cash donations amounted to \$589,285.69.

Financing of construction activities under Public Works and Emergency Conservation Work allotments was continued during the fiscal year, as follows:

Public Works, 1933-37

Construction of roads and trails.....	\$26,839,415.44
Construction of physical improvements.....	11,716,414.83
Total.....	38,555,830.27

*Emergency Conservation Work, procurements from April 22, 1933, to
June 30, 1936*

National parks-----	\$15,060,436.00
State parks-----	46,491,016.00
Territory of Hawaii-----	1,927,683.00
California-Pacific National Exposition exhibit-----	9,300.00
Acquisition of Lands on Isle Royale for E. C. W-----	705,000.00
Virgin Islands-----	241,638.00
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
	<hr/>
Total-----	66,789,823.00

REVENUES

The revenues received during the fiscal year 1936 amounted to \$1,136,533.68, as compared with revenues receipts of \$907,189.96 in the 1935 fiscal year.

APPROPRIATIONS, 1937 FISCAL YEAR

For the fiscal year 1937 there has been appropriated \$18,411,588. Of this amount, \$16,122,080 (including \$6,500,000 for road and trail construction) was authorized 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 Executive Mansion and grounds; and \$1,238,000 in the First Deficiency Appropriation Act, fiscal year 1936.

PUBLIC WORKS

Greatly needed road and trail construction work, as well as the various other types of physical improvements required in the administration, protection, and improvement of the areas under the jurisdiction of the National Park Service, was continued during the fiscal year 1936 due to the allocation of Public Works funds under title II of the National Industrial Recovery Act. 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 Service in the United States, Hawaii, and Alaska.

The total allocation of Public Works funds for (1) roads and trails projects and (2) physical improvement projects to the end of the 1935 fiscal year, as compared with allocations for the same purposes for the fiscal year 1936, was as follows:

	Fiscal year 1935	Fiscal year 1936
Roads and trails.....	\$25, 558, 303. 95	\$26, 839, 415. 44
Physical improvements.....	10, 899, 611. 32	11, 716, 414. 83
Total.....	36, 457, 915. 27	38, 555, 830. 27

The increase of Public Works allotments for the fiscal year 1936 over the fiscal year 1935 is \$2,097,915. This increase is composed chiefly of the difference between an allocation of \$6,000,000 for construction of the Blue Ridge Parkway and the cancelation of \$4,500,000 previously impounded. Other large increased allocations were \$140,000 for the purchase and improvement of the Painted Desert Inn in Petrified Forest National Monument; \$126,500 for purchase and installation of museum equipment throughout the park system; \$172,000 for the Union Square and Mall developments; and \$65,800 for remodeling the Potomac Park Apartments for use as an office building. Several smaller items make up the balance of the increased allocations.

In addition to the Public Works allotments for construction of roads and trails, \$5,000,000 was authorized in the Emergency Relief Appropriation Act, fiscal year 1935, and \$7,500,000 in the Interior Department Appropriation Act for the fiscal year 1936.

CONCLUSION

This report for the fiscal year 1936 is submitted with a feeling of pride in the achievements of the enlarged National Park Service, and as convincing proof, I believe, that the Service has successfully weathered changing conditions of a most drastic and exacting nature.

Consolidation of all Federal park activities under the National Park Service 3 years ago, together with jurisdiction over National Capital parks and Federal buildings, threw a great burden upon an already undermanned staff. At about the same time, participation began on a large scale in the various emergency programs, and here again the service was handicapped by an altogether too small trained personnel. To complicate matters, these changes and enlargements occurred just as the Service experienced a change in leadership, occasioned by the resignation of former Director Horace M. Albright, who had been in national park work since before the establishment of the Service and who was most helpful in the organization of the Bureau and the formulation of its policies.

Laboring under the handicap of insufficient trained personnel and changing leadership, the Service cheerfully met the enlarged duties suddenly entrusted to it and carried on to the best of its ability. Necessarily the trial-and-error method often had to be substituted for

the tried-and-true method previously used in the smaller-scale administration, and undoubtedly some mistakes occurred, as must happen if real progress is to be made, but any such were incidental to the major gains accomplished.

Now the record of 3 years' efforts under the changed conditions demonstrates the ability of the National Park Service to meet emergencies, to expand so as to carry on unaccustomed activities, and to assume and maintain leadership in the field of conservation of inspirational and recreational resources.

This statement is made with full realization that the record of the past 3 years is due to the loyal support of the administrative force of the National Park Service, often under conditions of acute discouragement and of constant and unusually heavy pressure of work; and to the officials of the Department of the Interior, who with patience and forbearance have upheld the National Park Service during this period of development and stabilization.

To all who have contributed in any way to the support of national-park ideals and to the practical protection of the national parks and monuments, the Service is sincerely grateful. Especially is acknowledgment made of the support of conservationists at crucial moments in national park and monument history, and to cooperating officials of other Federal bureaus who helped to smooth the path of national park administration.

With this cheerful reflection of the work of the past, the National Park Service looks forward with unbounded confidence to the future.

NATIONAL PARK TABLE 1.—Holdings acquired for national park and monument purposes

Parks and monuments	Holdings acquired from July 1, 1935, through June 30, 1936				Total holdings acquired prior to July 1, 1935, in acres
	Holdings acquired by purchase		Total area acquired in acres	Holdings acquired July 1, 1935, in acres	
	Government funds	Area in acres			
Acadia National Park.....			1,452,417	13,956.49	15,408,907
Aztec Ruins National Monument.....			60.00	25.88	25.88
Black Canyon of the Gunnison National Monument.....			2,365.84	105.00	165.00
Blue Ridge Parkway.....					2,365.84
Carlsbad Caverns National Park.....				441.00	441.00
Chaco Canyon National Monument.....			2,560.00	3,832.86	6,392.86
Chickamauga and Chatanooga National Military Park.....			3,000.00		3,000.00
Colonial National Historical Park.....	\$180,859.00	1,885.23	1,900.47	4,250.029	6,150,499
Colorado National Monument.....				649.20	649.20
Crater Lake National Park.....				1.00	1.00
Craters of the Moon National Monument.....				320.00	320.00
Fort Mifflin National Monument.....				17.34	17.34
Federicksburg and Spotsylvania National Military Park.....				2,439.15	2,439.15
General Grant National Park.....	4,900.00	11,512		20.00	31,512
George Washington Birthplace National Monument.....				483.70	483.70
Glacier National Park.....				3,950.21	3,950.21
Grand Canyon National Park.....			905.02	30,843.85	31,748.87
Grand Canyon National Monument.....			3,230.67	506.83	3,737.50
Great Smoky Mountains National Park.....			199.25	1394,088.35	1394,883.30
Hawaii National Park.....	38,825.00		595.70	156,800.00	156,800.00
Hot Springs National Park.....				79.20	79.20
Kings Mountain National Military Park.....			40.09		40.09
Lassen Volcanic National Park.....				40.00	40.00
Mammoth Cave National Park.....	52,720.23	1,577.17	22,900.59	24,837.76	24,837.76
Mesa Verde National Park.....				350.20	350.20
Morristown National Historical Park.....			4.06	933.38	937.44
Ocmulgee National Monument.....				427.79	427.79
Petersburg National Military Park.....			514.88	1,556.10	1,698.46
Petrified Forest National Monument.....			142.36	23,529.32	23,529.32
Pinnacles National Monument.....				1,926.27	2,086.27
Rocky Mountain National Monument.....			160.00	5,096.555	5,214,208
Scotts Bluff National Monument.....			3.316	117.743	162.08
Sequoia National Park.....	4,885.00	114.427		162.08	162.08
Shenandoah National Park.....	81,446.75			3,294.25	3,294.25
Shiloh National Military Park.....	2,200.00	8,136.64	168,382.38	176,519.02	176,519.02
			1,125		1,125

White Sands National Monument									3, 686. 02
Wind Cave National Park									100. 77
Yellowstone National Park									3, 266. 07
Yosemite National Park									30, 547. 48
Zion National Park									1, 561. 30
Yucca House National Monument									9. 00
Total		365, 835. 98	7, 945. 00	11, 925. 354				222, 003. 937	685, 631. 344
									907, 635. 281

1 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 during season 1932-36*

Name of park ¹	1932		1933		1934		1935		1936	
	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles
Crater Lake.....	29,637	-----	19,924	-----	18,521	-----	24,297	-----	30,718	-----
General Grant ²	5,900	-----	6,199	-----	7,992	-----	4,199	-----	3,100	-----
Glacier.....	10,712	11	8,955	10	12,146	18	17,718	40	23,896	50
Grand Canyon.....	32,651	-----	30,104	-----	28,721	-----	35,890	-----	55,721	-----
Lassen Volcanic.....	4,803	3	4,924	9	6,859	7	6,437	8	8,947	10
Mesa Verde.....	4,382	-----	4,262	-----	3,947	-----	4,177	-----	5,008	-----
Mount Rainier.....	44,719	-----	31,903	-----	32,095	-----	37,801	-----	39,187	-----
Sequoia ²	18,304	-----	17,045	-----	17,401	-----	25,304	-----	38,289	-----
Yellowstone.....	52,597	155	38,580	46	44,886	170	54,421	186	86,313	272
Yosemite.....	67,482	129	61,742	118	64,055	124	67,731	122	84,936	192
Zion.....	12,967	-----	12,194	-----	14,352	-----	21,271	-----	28,495	-----
Total.....	284,154	298	235,832	183	250,975	319	299,246	356	404,610	524

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks, because of small road mileage or unimproved condition of roads.

² Permits entrance to General Grant and Sequoia.

NATIONAL PARKS TABLE 3.—*Receipts collected from automobile and motorcycles during seasons 1932-36*

Name of park ¹	1932	1933	1934	1935	1936
Crater Lake.....	\$29,687.00	\$19,924.00	\$18,521.09	\$24,297.00	\$30,718.00
General Grant ²	2,950.00	3,099.50	3,996.00	4,199.00	3,100.00
Glacier.....	11,092.00	8,965.09	12,164.00	17,758.00	23,946.00
Grand Canyon.....	32,764.00	30,104.00	28,721.00	35,890.00	55,721.00
Lassen Volcanic.....	5,778.50	4,928.50	6,862.50	6,441.00	8,952.00
Mesa Verde.....	4,396.00	4,262.00	3,947.00	4,177.00	5,008.00
Mount Rainier.....	44,719.00	31,903.00	32,095.00	37,801.00	39,187.00
Sequoia ²	18,304.00	17,045.00	17,401.00	25,304.00	38,289.00
Yellowstone.....	156,537.00	115,786.00	134,828.00	163,449.00	259,596.00
Yosemite.....	135,831.00	123,602.00	128,234.00	135,584.00	170,064.00
Zion.....	12,976.00	12,194.00	14,352.00	21,271.00	28,495.00
Total.....	455,034.50	371,813.00	401,121.50	476,171.00	663,076.00

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² Permits entrance to General Grant and Sequoia.

NATIONAL PARKS TABLE 4.—Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during fiscal years 1936 and 1937

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Acadia (formerly Lafayette):			
1936	\$46,000.00	\$44,344.48	320.50
1937	46,000.00		
Bryce Canyon:			
1936	12,000.00	12,231.23	
1937	12,000.00		
Carlsbad Caverns National Park:			
1936	64,000.00	62,772.79	173,404.90
1937	64,000.00		
Crater Lake:			
1935-36	5,000.00	5,000.00	
1936	57,600.00	56,595.49	31,131.70
1937	62,600.00		
General Grant:			
1936	15,000.00	14,520.37	3,143.20
1937	15,000.00		
Glacier:			
1936	175,000.00	172,849.94	30,902.06
1937	175,000.00		
Grand Canyon:			
1936	113,500.00	111,708.60	67,029.86
1937	113,500.00		
Grand Teton:			
1936	19,900.00	19,844.89	166.86
1937	19,900.00		
Great Smoky Mountains:			
1936	59,900.00	57,800.66	9,846.83
1937	59,900.00		
Hawaii:			
1936	45,600.00	45,147.34	457.90
1937	45,600.00		
Hot Springs:			
1936	71,200.00	69,261.34	34,991.85
1937	71,200.00		
Lassen Volcanic:			
1936	28,400.00	31,906.84	8,954.00
1937	28,400.00		
Mesa Verde:			
1936	47,250.00	46,379.58	5,238.22
1937	47,250.00		
1937 (deficiency)	10,000.00		
Mount McKinley:			
1936	25,000.00	24,635.39	127.76
1937	25,000.00		
Mount Rainier:			
1936	121,800.00	114,200.91	43,751.73
1937	121,800.00		
National Capital Parks:			
1936	898,000.00	881,483.13	33,122.19
1937	1,074,410.00		
Platt:			
1936	20,600.00	19,966.77	
1937	20,600.00		
Rocky Mountain:			
1936	82,000.00	78,263.84	4,326.60
1937	82,000.00		
Sequoia:			
1936	99,500.00	97,083.51	57,835.16
1937	99,500.00		
Shenandoah:			
1936	39,800.00	23,182.52	311.00
1937	39,800.00		
Wind Cave:			
1936	15,900.00	15,408.29	8,678.81
1937	15,900.00		
Yellowstone:			
1936	394,100.00	381,883.28	329,926.72
1937	391,250.00		
Yosemite:			
1936	286,100.00	266,520.62	249,585.42
1937	284,000.00		
Zion:			
1936	39,800.00	39,149.31	28,638.66
1937	39,800.00		

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during fiscal years 1936 and 1937—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
National Historical Parks and Monuments:			
1936.....	\$92,300.00	\$96,006.51	\$563.90
1937.....	109,400.00		
National Monuments:			
1936.....	111,660.00	105,044.98	1,714.07
1937.....	167,000.00		
National Military Parks, Battlefields, Monuments, and Cemeteries:			
1936.....	239,600.00	226,927.79	2,060.39
1937.....	257,900.00		
Boulder Canyon project:			
1937.....	10,000.00		
National Park Service:			
1936.....	175,380.00	156,596.61	2,186.54
1937.....	189,880.00		
Public Buildings and Grounds:			
1936.....	5,615,000.00	}6,417,061.21	4,270.05
1936 (deficiency).....	891,890.00		
1937.....	6,535,900.00		
1937 (deficiency).....	1,150,000.00		
General expenses, National Park Service:			
1936.....	25,000.00	22,083.46	
1937.....	27,000.00		
Forest protection and fire prevention:			
1935-36.....	75,000.00	67,418.72	
1937.....	90,000.00		
Emergency reconstruction and fighting forest fires:			
1937.....	40,000.00		
Construction of roads and trails:			
1936.....	7,500,000.00	3,540,720.73	
1937.....	6,500,000.00		

NATIONAL PARKS TABLE 5.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Public Works projects, roads and trails:			
1933-37.....	\$25,839,415.44	\$23,026,437.35	
Public Works projects, physical improvements:			
1933-37.....	11,716,414.83	10,866,713.23	
Federal Emergency Relief, 1935:			
Emergency Conservation Work:			
1933-37 (allotments program) ¹	396,819.72	396,819.72	
Works Progress Administration:			
1936-37.....	8,946,376.00	991,370.13	
Commission of Fine Arts:			
1936.....	9,700.00	9,360.73	
1937.....	9,700.00		
Big Dry Wash Battlefield:			
1936.....	500.00		
Perry's Victory Memorial:			
1936.....	4,000.00	2,522.24	\$3,320.80
1937.....	4,000.00		
Mount Rushmore National Memorial Commission:			
1936.....	55,000.00	54,038.31	500.00
1937.....	100,000.00		
Appomattox Court House National Historical Monument:			
1937.....	100,000.00		
Historic Sites and Buildings Survey:			
1937.....	24,000.00		
Investigation and purchase of water rights:			
1937.....	25,000.00		

¹ Available until expended.

NATIONAL PARKS TABLE 6.—*Statement of accounts reappropriated and made available for expenditure in subsequent fiscal years*

Appropriated for fiscal year	Reappropriated for fiscal year	Park	Amount	Purpose
1928	1929	Yosemite.....	\$35,000.00	Hospital building.
1928	1929	Southern Appalachian.....	1,112.87	To remain available; general.
1928	1929	Emergency reconstruction and fighting forest fires.	13,134.54	Do.
1929	1930	Yosemite.....	8,661.78	Construction of water-supply and camp-ground facilities.
1929	1930	Carlsbad Caverns.....	4,950.00	Superintendent's residence.
1929	1930	Southern Appalachian.....	1,662.55	To remain available; general.
1929	1931	Grand Canyon.....	20,000.00	Hospital building.
1930	1931	Acadia.....	2,850.00	Equipment storage building.
1930	1931	Crater Lake.....	1,091.05	Ranger station.
1930	1931	Mesa Verde.....	1,652.18	2 ranger stations.
1930	1931	Yosemite.....	32,662.70	Physical improvements.
1930	1931	National monuments.....	2,500.00	Employees' quarters (2) at Petrified Forest.
1930	1931	Southern Appalachian.....	1,246.80	To remain available; general.
1930	1931	Glacier.....	9,550.00	One-third of cost of constructing a telephone line.
1931	1932	National monuments.....	1,759.23	Water-supply system at Craters of the Moon.
1931	1932	Emergency reconstruction and fighting forest fires.	7,434.15	To remain available; general.
1931	1933	National monuments.....	3,204.50	Water supply at Chaco Canyon.
1932	1933	Carlsbad Caverns.....	13,000.00	Electric system, extension and improvement.
1932	1933	Emergency reconstruction and fighting forest fires.	16,587.00	To remain available; general.
1933	1934	do.....	9,143.93	Do.
1934	1935	do.....	75,000.00	Do.
1935	1936	do.....	64,642.13	Do.
1935	1937	Ackia Battleground National Monument.	15,000.00	Do.

NATIONAL PARKS TABLE 7.—*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 1917¹ to 1937, inclusive*

Year	Department	Appropriation	Revenues
1917	Interior Department.....	\$537,366.67	\$180,652.30
	War Department.....	247,200.00	
1918	Interior Department.....	530,680.00	217,330.55
	War Department.....	217,500.00	
1919	Interior Department.....	963,105.00	196,678.03
	War Department.....	50,000.00	
		50,000.00	
1920		1,013,105.00	196,678.03
1921		907,070.76	316,877.96
1922		1,058,969.16	396,928.27
1923		1,433,220.00	432,964.89
1924		1,446,520.00	513,706.36
1925		1,892,601.00	663,886.32
1926		3,027,657.00	670,920.98
1927		3,258,400.00	826,454.17
1928		3,698,920.00	703,849.60
1929		4,889,685.00	808,255.81
1930		4,754,015.00	849,272.95
1931		7,813,817.18	1,015,740.56
1932		12,113,435.00	940,364.79
1933		12,831,250.00	820,654.19
1933-35		10,640,620.00	628,182.06
1934		53,402,249.00	
1935		10,983,089.00	731,331.80
1936		12,461,513.00	907,189.96
1937		16,686,090.00	
		18,190,490.00	

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, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 8.—*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	\$1,000,000		\$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.....		5,000,000		
Act Dec. 20, 1930; emergency construction.....	1931	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 9.—Forest-fire statistics, calendar year 1935

Classification	Point of origin				Burned area, inside parks (nearest whole area)				Timber destroyed inside parks				Cost of fire suppression (to nearest whole dollar)											
	A	B	C	Total	Inside parks		Outside parks		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	
					On Government land	On private land	Entered park	Contained to outside areas																Acres
Acadia	1			1	1							1	3								2	2	3	
Bryce Canyon								1																
Carlsbad Caverns	25	3		28	28											13	55	787	17	872	79	951	404	
Crater Lake																								
General Grant	25	1		26	26	1		2								4								
Glacier	7	7		14	14	9		5	1							1,446	1,850	8,189	10,415	31,711	1,083	32,794	10,079	
Grand Canyon	12	1		13	13	8		5								6	2	48		74	48	122	75	
Grand Teton	6	9		15	15	2		6													11	11	370	
Great Smoky Mountains	6	9		15	15	2		6	1												21	45	66	419
Hawaii																								
Hot Springs	2	10		12	12	10		2	33												32	32		
Lassen Volcanic	5	4		9	9	4		5													149	149	123	
Mammoth Cave	21	68		89	89	54	47	2	293	86	199	548	5							191	191	850		
Mesa Verde	1			1	1	1		1													2	2		
Mount McKinley																								
Mount Rainier	1	1		2	2	2		1	4												37	37	66	516
Platt																								
Rocky Mountain	2			2	2	2															6	6		
Sequoia	25	8		33	33	28		5	18												263	311	1,156	
Shenandoah	4	4		8	8	4		4	105	2	18	125	26							1	78	79	276	
Wind Cave																								
Yellowstone	49	7		56	56	56		4	103	1	1	105	290							906	2,459	14,523		
Yosemite	34	5		39	39	38		2	9	53	9	62	12							8	103	111	4,867	
Zion	1			1	1	1			9												27	27	56	
Military and historical parks: Chickamauga-Chattanooga	6	1		7	7	6	1		8												9	9	274	

¹ Includes 3,163 man-days on Forest Service fire.

² Includes 620 man-days on outside fires.

NATIONAL PARKS TABLE 9.—Forest-fire statistics, calendar year 1935—Continued

	Classification				Point of origin			Burned area inside parks (nearest whole area)				Timber destroyed inside parks			Cost of fire suppression (to nearest whole dollar)								
	A	B	C	Total	Inside parks			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	
					On Government land	On private land	Entered park																Confined to outside areas
Military and historical parks—Continued.																							
Fredericksburg.....	4			4	3	1																	9
Gettysburg.....	1			1	1																		31
Morrisstown.....	2			2	1	1																	11
Petersburg.....																							11
Shiloh.....	4	1		9	9				53														6
Vicksburg.....	20	4		24	15		8	1	3														23
Monuments:																							
Bandelier.....	1			1	1																		9
Chiricahua.....																							
Colonial.....	4			4		4			1	8	9												4
Death Valley.....																							
Devils Tower.....																							
Lava Beds.....	1	1		2																			97
Muir Woods.....	1			1	1																		
Pinnacles.....	1			1	1				170														144
Oregon Caves.....	1			1	1																		
Scotts Bluff.....	1			1	1																		1
Total.....	246	150	41	437	321	60	10	46	1,861	498	343	2,702	2,229	2,229	4,415	9,653	9,641	10,656	34,365	3,129	37,494	29,326	

NOTE.—Yellowstone, \$352.80 emergency allotment from F. F. F. not included in fire-suppression costs. Glacier, \$355.56 emergency allotment from F. F. F. not included in fire-suppression costs.

NATIONAL PARKS TABLE 9.—*Forest-fire statistics, calendar year 1935*—Continued

	Causes of fires										Classification of fires according to cost of suppression (includes only those fires which burned inside park boundaries)							Total	
	Lightning fires	Camp-fires	Smokers	Debris-burning	Incendiary	Lumbering	Rail-roads	Miscellaneous	Total man-caused	Grand total	\$25 and under	\$26 to \$50	\$51 to \$100	\$101 to \$200	\$201 to \$500	\$501 to \$1,000	\$1,001 to \$2,000		\$2,001 to \$5,000
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Monuments—Continued.																			
Devils Tower																			
Lava Beds				2					2										
Muir Woods								1	1										
Pinnacles								2	2				1						1
Oregon Caves																			
Scotts Bluff		1							1										1
Total	117	32	119	43	90	2	4	30	320	437	323	26	17	12	8	1	1	2	391

NOTE.—C. C. C. labor valued at \$1.50 per day, or \$0.25 per hour, used in above table.

NATIONAL PARKS TABLE 10.—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
Administration	The Mall at 13th St.	307,692	
Archives	Constitution Ave. between 7th and 9th Sts. NW.	496,200	
Army Medical Museum	7th St. and Independence Ave. SW	83,938	
Arlington	Vermont Ave. and H St. NW	575,000	
Atlantic ¹	928-30 F St. NW		38,337
Bureau of Fisheries	6th St. and Independence Ave. SW	39,131	
Barber & Ross ²	11th and G Sts. NW		23,082
Barr ²	910 17th St. NW		26,499
Bond ²	14th St. and New York Ave. NW		18,874
Bragg ²	12th and G Sts. NW		1,490
Capitol Courts, 43-49			1,250
Carpenters ²	10th and K Sts. NW		14,214
Civil Service	7th, 9th, F, and G Sts. NW	246,244	
Columbian ²	416 5th St. NW		11,726
Commerce	Constitution Ave. between 14th and 15th Sts. NW.	1,605,066	
Commercial National Bank	14th and G Sts. NW		2,570
Connecticut Ave. NW., 1108 ²			1,429
Connecting wing	Between new I. C. C. and Labor Buildings	234,100	
Courts	310 6th St. SW		5,373
Daily News	1322 New York Ave. NW		22,000
DeMoll	12th and G Sts. NW		15,243
E Building	6th St. and Maine Ave. SW	231,771	
E St. NW., 801			19,975
E St. NW., 1300		274,373	
E St. NW., 1345 ²			7,544
Executive Office	West Executive Ave.	40,000	
F Building	7th St. and Constitution Ave. NW	266,560	
F St. NW., 918 ²			701
F St. NW., 920 ²			1,230
F St. NW., 1723-25		20,369	
F St. NW., 1724			146,946
Florida Ave. NE., 60			31,800
G St. NW., 1328			4,000
G St. NW., 1712 (Annex)		8,166	
G St. NW., 1712			184,981
Garage	Kansas Ave. and Upshur St. NW		43,723
Do	3d and Canal Sts. SW	48,000	
Garage (White House)	1126 21st St. NW		60,784
Garage	21st St. and Virginia Ave. NW	36,000	
Do	24th and M Sts. NW		53,000
General Accounting	Judiciary Square	196,554	
H St. NW., 1712 ²			4,000
H St. NW., 1825			182,954
Home Owners' Loan Corporation	101 Indiana Ave. NW	121,700	
Hurley-Wright	18th St. and Pennsylvania Ave. NW		87,516
I St. NW., 1004 ²			489
I St. NW., 1624			13,000
Independence Ave. SW., 816		4,239	
Independence Ave. SW., 908		17,408	
Interior	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	
Justice	Constitution Ave. between 9th and 10th Sts. NW.	1,237,000	
K St. NW., 1415 ²			5,374
K St. NW., 1435			15,000
Kellogg ²	1416 F St. NW		4,715
Labor	14th St. and Constitution Ave. NW	447,000	
LaSalle ²	1028 Connecticut Ave. NW		49,416
Lemon	1729 New York Ave. NW		26,620
Lenox	1623 L St. NW		22,000
Lincoln	514 10th St. NW		13,938
Linworth Place SW., 300		50,250	
M Street NW., 2214			9,317
McCrorry ²	826 7th St. NW		10,683
McGill ²	906 G St. NW		19,417
McKinley Park Buildings	20 buildings, American University Park		65,903
Massachusetts Ave. NW., 2000			12,000
Massachusetts Ave. NW., 2020			19,242
Mather ²	916 G St. NW		17,080

Footnotes at end of table.

NATIONAL PARKS TABLE 10.—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
		<i>Square feet</i>	<i>Square feet</i>
Mechanical Shops (Agricultural). Mills ²	13th St. and Constitution Ave. NW	32,058	
Moses ²	17th St. and Pennsylvania Ave. NW		837
Munitions	11th & F Sts. NW		97,378
Navy	Constitution Ave. between 19th and 21st Sts. NW.	851,490	
Ouray ²	Constitution Ave. between 17th and 19th Sts. NW.	949,182	
Pennsylvania Ave. NW., 1653.	801 G St. NW		21,068
Pennsylvania Ave. NW., 1778.			3,288
Post Office (new)			198,507
Post Office (old)	Pennsylvania Ave. between 12th and 13th Sts. NW.	840,000	
Potomac Park Apartment	12th St. and Pennsylvania Ave. NW	377,951	
Premier Apartment	21st and C Sts. NW	108,000	
Printercraft	718 18th St. NW		26,400
Procurement Division	930 H St. NW		27,919
Public Health	8th, 9th, C, and D Sts. SW	886,750	
Research	Constitution Ave. between 19th and 20th Sts. NW.	79,931	
Rizik	19th St. and Constitution Ave. NW	5,200	
Rochambeau	1737 L St. NW		15,983
Security	815 Connecticut Ave. NW		100,000
South	1518 K St. NW		10,632
South Capitol St., 401.	12th, 14th, and C Sts. and Independence Ave. SW.	2,056,430	
Standard Oil ²			55,080
State Department	261 Constitution Ave. NW		24,615
Storage Building and Vault	17th and Pennsylvania Ave. NW	440,250	
Tariff Commission	Missouri Ave. between 4½ and 6th Sts. NW	5,949	
Tempo. No. 2.	7th, 8th, E, and F Sts. NW	140,118	
Tempo. No. 7	19th and D Sts. NW	78,240	
Vermont Ave. NW., 1001 ³	1800 C St. NW	56,359	
Vermont Ave. NW., 1025.			100,414
Vermont Court NW., 1126.			54,696
Walker-Johnson	1734 New York Ave. NW		13,631
Washington	15th St. and New York Ave. NW		187,456
Washington Auditorium	19th St. and New York Ave. NW		26,167
Washington Loan & Trust ²	9th and F Sts. NW		84,000
Wilkins	1514 H St. NW	54,000	15,698
Willard	513-15 14th St. NW		26,543
Winder	17th and F Sts. NW	63,880	
5th St. NW., 420.			4,948
7th St. NW., 425.			7,000
8th St. SW., 215.		5,970	
10th St. NW., 1918.			39,000
12th St. SW., 224.		13,204	
14th St. NW., 509 ²			6,540
15th St. NW., 821.			10,446
21st St. NW., 1503.			5,000
26th St. NW., 501-13.			22,200
26th St. NW., 517.			5,000
Total		16,095,958	2,207,131

¹ Gross area.² 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.³ Protection service only is provided.

NATIONAL PARKS TABLE 11.—Buildings outside the District of Columbia maintained, operated, and protected by the National Park Service

Building	Location	Government-owned gross floor area
		<i>Sq. ft.</i>
Broadway, 45.....	New York City, N. Y.....	142,500
Courthouse.....	Aiken, S. C.....	17,474
Do.....	Galveston, Tex.....	15,000
Do.....	New York City, N. Y.....	655,787
Do.....	Santa Fe, N. Mex.....	47,600
Federal Office.....	Des Moines, Iowa.....	64,200
Immigration Station.....	Baltimore, Md.....	98,000
Old Customhouse.....	Denver, Colo.....	72,560
Old Post Office.....	Parkersburg, W. Va.....	34,900
Do.....	Sacramento, Calif.....	47,600
Sub-Treasury.....	New York City, N. Y.....	72,000
Total.....		1,267,561

NATIONAL PARKS TABLE 12.—Memorials maintained, operated, and protected by the National Park Service

Memorial	Location	Gross floor area
		<i>Sq. ft.</i>
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.....		41,946

NATIONAL PARKS TABLE 13.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service July 1, 1935-June 30, 1936

Item	Unit	Total work accomplished from July 1, 1935, to June 30, 1936			
		New construction			Maintenance—national parks and monuments
		National parks and monuments	State parks	Combined total national parks and State parks	
Foot bridges.....	Number.....	33	454	487	-----
Horse bridges.....	Number.....	11	27	38	12
Vehicle bridges.....	Number.....	19	129	148	12
Buildings:					
Barns.....	Number.....	10	10	20	1
Bath houses.....	Number.....	1	27	28	1
Cabins, overnight.....	Number.....	-----	323	323	-----
Combination buildings.....	Number.....	-----	51	51	-----
Buildings:					
Contact station.....	Number.....	13	20	33	9
Dwellings.....	Number.....	50	57	107	175
Equipment and supply storage houses.....	Number.....	55	261	316	29
Garages.....	Number.....	24	394	418	13
Latrines and toilets.....	Number.....	85	464	549	44
Lodges.....	Number.....	3	17	20	12
Lookout:					
Houses.....	Number.....	3	16	19	6
Towers.....	Number.....	15	12	27	-----
Museums.....	Number.....	2	3	5	9
Shelters:					
Trail-side.....	Number.....	7	131	138	-----
Other.....	Number.....	5	140	145	2
Other buildings.....	Number.....	42	279	321	19
Cribbing, including filling.....	Cubic yard.....	9,362	14,668	24,030	550
Dams:					
Impounding and large diversion.....	Number.....	8	50	58	1
Concrete.....	Cubic yard.....	375	20,864	21,239	-----
Fill:					
Earth.....	Cubic yard.....	5,473	715,549	721,022	-----
Rock.....	Cubic yard.....	220	13,934	14,154	20
Excavation:					
Earth.....	Cubic yard.....	1,110	287,298	288,408	1
Rock.....	Cubic yard.....	100	42,785	42,885	-----
Masonry.....	Cubic yard.....	420	10,503	10,923	-----
Riprap.....	Square yard.....	452	41,746	42,198	-----
Steel.....	Pound.....	8,918	658,611	667,529	-----
Fences.....	Rod.....	27,349	131,493.2	158,842.2	2,242
Guard rails.....	Rod.....	5,565	36,991.9	42,556.9	10
Levees, dikes, and jetties.....	Cubic yard.....	-----	20,688	20,688	-----
Power lines.....	Mile.....	14.7	60.9	75.6	775.9
Disposal:					
Beds.....	Square yard.....	280	79,419	79,699	-----
Tanks and cesspools.....	Number.....	48	240	288	1
Incinerators.....	Number.....	1	83	84	-----
Sewer lines.....	Linear foot.....	19,850	143,209	163,059	6,350
Other sewage and waste disposal.....	Man-day.....	1,217	7,216	8,433	126
Telephone lines.....	Mile.....	244.9	263.7	508.6	1,760
Drinking fountains.....	Number.....	-----	251	251	-----
Open ditches.....	Linear foot.....	1,200	22,438	23,638	-----
Water pipe or tile lines.....	Linear foot.....	95,910	608,727	704,637	13,880
Springs, water holes, small reservoirs.....	Number.....	66	163	229	4
Water-storage facilities (omit last 000).....	Gallon.....	-----	4,269.1	4,269.1	-----
Wells, including pumps and pump houses.....	Number.....	9	152	161	1
Water supply systems, other.....	Man-day.....	2,310	18,453	20,763	129
Camp stoves or fireplaces.....	Number.....	1,524	3,402	4,926	17
Cattle guards.....	Number.....	8	52	60	-----
Corrals.....	Number.....	13	31	44	3
Portals.....	Number.....	6	80	86	-----
Seats.....	Number.....	130	1,838	1,968	1
Signs, markers, and monuments.....	Number.....	4,232	5,339	9,571	2,354
Stone walls.....	Rod.....	2,100	4,045.6	6,145.6	-----
Table and bench combinations.....	Number.....	1,097	7,199	8,296	-----
Tool boxes.....	Number.....	15	401	416	-----
Miscellaneous structural improvements.....	Number.....	206	13,682	13,888	1
Radio stations.....	Number.....	-----	-----	-----	68
Truck trails.....	Miles.....	84.4	351.1	435.5	929.2
Minor roads.....	Miles.....	240.5	-----	240.5	1,306.1

NATIONAL PARKS TABLE 13.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service July 1, 1935—June 30, 1936—Continued

Item	Unit	Total work accomplished from July 1, 1935, to June 30, 1936			Maintenance—national parks and monuments
		New construction			
		National parks and monuments	State parks	Combined national parks and State parks	
Highways.....	Miles.....				1,365.5
Park roads.....	Miles.....	2	565	565.2	
Foot trails.....	Miles.....	152	693.4	845.4	190.6
Horse trails.....	Miles.....	329.5	247.6	577.1	2,090.5
Stream and lake bank protection.....	Square yards.....	157,136	689,686	846,822	9,206
Treatment of gullies—Area treated.....	Acres.....	4,854.2	10,373.5	15,227.7	303.2
Bank sloping.....	Square yards.....	447,787	650,462	1,098,240	74,788
Check dams:					
Permanent.....	Number.....	1,421	7,114	8,535	
Temporary.....	Number.....	2,857	3,254	6,111	1,324
Seeding and sodding.....	Square yards.....	3,233,848	1,363,978	4,597,826	217,855
Tree planting, gully.....	Square yards.....	935,277	303,524	1,238,801	
Ditches, diversion.....	Linear feet.....	17,846	41,761	59,607	3,490
Terracing.....	Miles.....		3.7	3.7	
Sheet erosion planting.....	Acres.....	50	377.5	427.5	
Limestone quarrying.....	Tons.....		155,261	155,261	
Miscellaneous erosion control work.....	Man-days.....		91,204	91,204	
Clearing and cleaning:					
Channels.....	Square yards.....		556,296	556,296	
Reservoir sites.....	Acres.....		1,079.1	1,079.1	
Excavation:					
Earth.....	Cubic yards.....	46,332	1,358,992	1,405,324	
Rock.....	Cubic yards.....	124	29,255	29,379	
Pipe lines and conduits.....	Linear feet.....	22,042		22,042	
Riprap or paving:					
Rock or concrete.....	Square yards.....	9,261	243,090	252,351	
Brush or willows.....	Square yards.....	4,649	2,780	7,429	
Water-control structures:					
Concrete or masonry.....	Cubic yards.....	400	6,755	7,155	1
Wooden.....	Feet b. m.....	11,189	40,025	51,214	3,149
Number of structures.....	Number.....	110	260	370	7
Field planting or seeding (trees).....	Acres.....	260	7,469.6	7,729.6	
Forest stand improvement.....	Acres.....		2,333.5	2,333.5	
Nurseries.....	Man-days.....	7,895	41,820	49,715	283
Tree seed collection:					
Conifers (cones).....	Bushels.....	120	201	321	
Hardwoods.....	Pounds.....	2,559	13,621	16,180	
Fighting forest fires.....	Man-days.....	41,003	70,401	111,404	
Fire breaks.....	Miles.....	26.7	1,122.6	1,149.3	55.3
Fire hazard reduction:					
Roadside.....	Miles.....	327.9	461.2	789.1	
Trailside.....	Miles.....	185	411.3	596.3	
Other.....	Acres.....	17,918.9	41,492.4	59,411.3	
Fire suppression.....	Man-days.....	35,997	30,321	66,318	
Fire prevention.....	Man-days.....	326	3,257	3,583	
Tree and plant disease control.....	Acres.....	12,398.2	56,593	48,991.2	148
Tree insect pest control.....	Acres.....	45,778.3	64,275.5	110,053.8	9,371.4
Beach improvement.....	Acres.....	28.6	621.7	650.3	2
Fine grading, road slopes, etc.....	Square yards.....	1,724,222	5,392,790	7,117,012	10,500
Lake or pond site clearing.....	Acres.....	821	1,399.3	2,220.3	
Landscaping, undifferentiated.....	Acres.....	4,494.7	5,863	10,357.7	95
Moving and planting trees and shrubs.....	Number.....	726,341	1,959,656	2,685,997	520.7
Obliation:					
Roads.....	Miles.....	34.5	124	158.5	
Trails.....	Miles.....	23.5	49.3	72.8	
Borrow pits.....	Man-days.....	19,941	111,055	130,996	
Parking areas and parking overlooks.....	Square yards.....	77,758	986,014	1,063,772	5,310
Public camp ground development.....	Acres.....	497.4	943.8	1,441.2	242.2
Public picnic ground development.....	Acres.....	157.4	1,222.6	1,380	219.8
Razing undesirable structures.....	Number.....	454	1,352	1,806	
Seed collection, flowers, grasses, etc.....	Pounds.....	1,801	14,673	16,474	
Seeding and sodding.....	Acres.....	1,228	3,031.2	4,259.2	4,477.8
Soil preparation (fertilizing, etc.).....	Acres.....	651.6	2,149.3	2,800.9	5.6
Vista or other selective cutting for effect.....	Acres.....	372.6	3,674.6	4,047.2	
Walks, concrete, gravel, cinder, etc.....	Linear feet.....	50,132	76,193	126,325	11,800
Fish-rearing ponds.....	Number.....	67	30	97	2
Food and cover planting.....	Acres.....	82.3	2,354.7	2,437	3
Lake and pond development.....	Man-days.....	3,237	58,694	61,931	

NATIONAL PARKS TABLE 13.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service July 1, 1935–June 30, 1936—Continued

Item	Unit	Total work accomplished from July 1, 1935, to June 30, 1936			
		New construction			Maintenance—national parks and monuments
		National parks and monuments	State parks	Combined total national parks and State parks	
Stocking fish.....	Number.....	4, 189, 400	749, 411	4, 938, 811	-----
Stream development.....	Miles.....	30.9	38.7	69.6	-----
Emergency wildlife feeding.....	Man-days.....	637	-----	637	-----
Other wildlife development.....	Man-days.....	3, 670	16, 413	20, 083	247
Education, guide, and contact station work.....	Man-days.....	43, 148	8, 373	51, 521	-----
Emergency work—Searching for or rescuing persons.....	Man-days.....	348	3, 786	4, 134	-----
Emergency work—Other.....	Man-days.....	12, 734	286, 624	299, 358	-----
Eradication of poisonous weeds or exotic plants.....	Acres.....	2, 584	6, 750.3	9, 334.3	-----
Experimental plots.....	Number.....	42	99	141	-----
Insect pest control.....	Acres.....	57	880	937	-----
Maps: Type, topographic, etc.....	Man-days.....	3, 440	5, 463	8, 903	-----
Relief maps and models.....	Man-days.....	2, 656	1, 316	3, 972	-----
Marking boundaries.....	Miles.....	83	309.5	392.5	-----
Mosquito control.....	Acres.....	-----	2, 123	2, 123	-----
Preparation and transportation of materials.....	Man-days.....	67, 350	466, 610	533, 960	-----
Reconnaissance and investigation—Archeological.....	Man-days.....	17, 893	12, 115	30, 008	-----
Reconnaissance and investigation—Other.....	Man-days.....	2, 582	12, 393	14, 975	-----
Restoration of historic structures.....	Numbers.....	455	57	512	-----
Rodent control.....	Acres.....	-----	2, 141	2, 141	-----
Surveys:					
Grade lines.....	Miles.....	162	718.1	880.1	-----
Ground water.....	Acres.....	97.4	112.6	210	-----
Lineal.....	Miles.....	1, 013.3	2, 641.9	3, 658.2	-----
Topographic.....	Acres.....	16, 038.5	73, 882.8	89, 921.3	-----
Type.....	Acres.....	537, 829	5, 876	543, 705	-----
Other.....	Man-days.....	3, 591	6, 551	10, 142	-----
Tree preservation.....	Man-days.....	27, 162	42, 551	69, 713	454
Unclassifiable.....	Man-days.....	19, 330	593	19, 926	-----

OFFICE OF INDIAN AFFAIRS

(JOHN COLLIER, *Commissioner*)

FOREWORD

An annual report on Indian affairs, were it adequate, would be a report on the whole life of a race. What follows describes governmental activities and only through shadowy implication reveals the forces of life working within the reviving Indian population of more than 230 tribes and bands.

For many decades the Indians were thought of, and they thought of themselves, as a dying race. Numerically they were dying. As battling groups they had lost their fight. As civilizations their day was ended.

Then very gradually but unmistakably the Indians' life-tide seemed to turn. The critical change goes back a decade and a half, or longer. Three years ago, the basis of Indian law was altered. Indian law had presumed the cessation of Indians. The changed law presumed their permanence and their increase. Indian Service, the Indians' mind, the general public's mind, became hopeful of the Indians' future. This future would be realized in terms of numbers increasing, not dwindling; of property-holdings increasing, not continuing to melt away; of cultural values preserved, intensified, and appreciated and sought for by the white world, and no longer treated as being significant only in terms of an outlived or crushed primitive world.

All of these evidences of new birth and new assurance have been forthcoming in the recent years, and never so richly as during the year just closed. The population record alone is an impressive one. Indians are increasing faster than any other group in the United States. Full-blood Indians are increasing at more than one percent a year. This, although the preventable morbidity rate is still excessive.

From 1887 to 1932, the average diminishment of Indian landholdings was 2,000,000 acres a year. Now, an increase is recorded at the rate of hundreds of thousands of acres a year. But the land-supply of fully half the Indians is all but hopelessly insufficient. Their economic level, by and large, is still the lowest in the United States.

The renascent Indian spirit has shown two great evidences. One of these is the universal, eager response of Indians to the opportunity to work, and their faithfulness and technical capacity when em-

ployed. The other is the adoption by more than 180 tribes of the Indian Reorganization Act, and their self-control and enterprise in organizing their common life under the authorities of the act.

There follows a condensed report of the Government's Indian Service activities for the year closed.

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INDIAN ORGANIZATION

The reorganization of Indian tribes has continued, with accelerated pace. The vote by tribes on the Indian Reorganization Act had been largely completed at the end of the fiscal year 1935, and in the year just ended the effort was devoted almost entirely to the building of constitutions and bylaws, and tribal charters. This phase of work under the Indian Reorganization Act is now well advanced, and the year 1936-37 should see an even greater progress.

Last year's report provided a brief history of the downward-spiraling trend of Indian resources and Indian morale from the passage of the General Allotment Act in 1887 to the enactment of the Indian Reorganization Act in June 1934. It might be useful to repeat here these facts:

Résumé of Indian Reorganization Act principles.—The present law prohibits further allotments and the selling of Indian lands except to the tribes; it restores to the tribes the unentered remnants of the so-called surplus lands of those allotted reservations which had been thrown open to white settlement; it authorizes annual appropriations for the purchase of land for landless Indians; provides for

the consolidation of Indian lands, and sets up a process which enables Indians voluntarily to return their individual landholdings to the protection of tribal status, thus reversing the disintegrating policy. Close study of the Indian Reorganization Act reveals that a greater part of the act deals with land, directly or indirectly.

Two other principles of the greatest importance are embodied in the act; namely, the right to the use of credit, by which tribal enterprises may be fostered, and the right to protection in self-government, by which Indian tribal life may be restored and perpetuated.

Organization goes ahead.—On June 30, 1936, 45 tribes had written, voted upon and accepted constitutions and bylaws, and all but three on that date had received official approval by the Secretary of the Interior. These 45 tribes represent an Indian population of 62,852. Five reservations, having a population of about 10,000, voted to reject the constitutions and bylaws written by their councils or constitutional committees. In such instances further elections must be held either on the same constitution or on revised drafts. The rejection of a constitution was usually the result of a local situation peculiar to the reservation, and the action of the tribe did not necessarily indicate dissatisfaction with the instrument voted upon or a reversal of attitude toward the Indian Reorganization Act. In one case the total vote cast was less than 30 percent of the voting population, and therefore another election must be held.

Indian vote is large.—In the annual report of last year, reference was made to the active participation and interest of the Indians in the referenda just then completed, and the fact that 62 percent of all the adult Indians came to the polls and cast their ballots. During the past year interest has not only been maintained but has increased. A few tabulations show that an even larger percentage participated in the elections on the constitutions and bylaws than took part in the referenda. For instance, constitutional elections for the four tribes under the Winnebago Agency in Nebraska were held in February during subzero weather, when roads were blocked by snow and ice; yet, under such conditions there were 338 more votes cast in the four elections on the adoption of constitutions than there were in the election on the act. The percentage of increase was 43 percent.

Constitution carefully drafted to meet local needs.—All of these constitutions and bylaws have some provisions in common; some few of them are near-duplicates of one another. Considering that certain underlying principles were included in each, that representative government was to be established, that certain enumerated powers were to be assumed, that land was to be protected; and considering also that legal phraseology tends to frighten men's thoughts into verbal stiffness, there still is discernible some considerable play of

tribal individuality in these documents. The instruments drafted by the San Carlos Apache Tribe and the Santa Clara Pueblo, to mention but two examples, are exceedingly interesting for the skillful way in which they give expression to local needs. It is of interest to note that in the State of Montana, South Dakota, North Dakota, and Nebraska, only two reservations among those which accepted the act failed to organize under constitutions and bylaws within this first year of active organization work. The voters of these two reservations (Standing Rock and Yankton) rejected the proposed constitutions, and their councils are now studying the problem of future procedure.

Incorporation of tribes begun.—Only one group, the Confederated Salish and Kootenai Tribes of the Flathead Reservation, had been incorporated at the close of the fiscal year, its charter having been ratified on April 25. At several other reservations election dates had been set, and active work was under way on 22 reservations. Incorporation of a tribe means that the tribe is in a position to apply for credit from the revolving loan fund, and that it can set up tribal enterprises to develop resources in land, timber, fisheries, etc. It is a goal toward which all tribes seriously interested in gaining some measure of economic self-sufficiency are striving.

New elections requested, but legislation required.—At the close of the fiscal year 1935, only a few tribes had not voted on the question of accepting or rejecting the application of the Indian Reorganization Act, and a few others fell into the category of those which had voted on the act but without 30 percent of the eligible voters participating. One tribe in this category, the Walker River Indians of Nevada, voted November 17, 1934, with only 20 percent of the eligible voters participating, and of those voting a majority was opposed to the act. A new election was called for June 17, 1936, and the result was a vote of 64 percent of the eligible list, with 62 percent of those voting favoring the act. If we may judge by the number of requests for a second chance to vote which have come from tribes which previously had voted to exclude themselves from the Indian Reorganization Act, it seems safe to assert that the Walker River experience would be repeated many times, if other tribes were allowed to vote again. These other tribes, however, had expressed their wills in elections in which 30 percent or more of the voting population had participated; hence, in accordance with the amendment to the Indian Reorganization Act of June 15, 1935, no further elections can be held on the subject without specific or general legislation on the part of Congress. As time passes, and the Indians gain knowledge and understanding of the benefits afforded by the act, their sentiment is swinging more and more positively toward the program of the administration.

The Alabama and Coushatta Indians of Texas, who had not previously voted, did so on June 17, 1936, at an election in which 84 percent of the eligible voters participated, and almost 100 percent were in favor of the act; to be exact, 123 votes were cast and 122 were in favor of it. A second instance of a tribe which had not previously voted was that of the Oneida Indians of New York, who voted on June 18, 1936, and, following the example of other New York tribes, voted to exclude themselves from the act. Finally, there are 11 small jurisdictions, mostly California rancherias, which either had not voted or upon which less than 30 percent of the members had voted. No requests for reelection came from these groups; consequently, they are accepted as being under the act.

There are now a total of 181 reservations and rancherias under the Indian Reorganization Act, representing a population of 133,000 Indians.

Reorganization Act extended to Alaska.—On May 1, 1936, the President gave his approval to the Alaska Act (Public. No. 538), which will “extend certain provisions of the act approved June 18, 1934 * * * to the territory of Alaska, to provide for the designation of Indian reservations in Alaska, and for other purposes.” This act will extend the organization and credit features of the Reorganization Act to the 30,000 Alaskan natives, who in the past have seen their land rights almost universally disregarded, their fishing rights increasingly invaded, and their economic situation grow each year more desperate.

Oklahoma Act embraces reorganization principles.—Of major importance likewise was the passage of the Oklahoma Indian Welfare Act (Public, No. 816), which was approved June 26, 1936, and which extends to the Oklahoma Indians the right to share in the program of self-government, corporate organization, credit and land purchase. These rights and privileges had been denied them in the legislation of 2 years ago. In addition to sharing in the revolving credit fund and land-purchase funds on an equal footing with other Indians of the United States, a special appropriation of \$2,000,000 was authorized by Congress for loans to cooperative associations and for other credit purposes. The Osage Tribe, wealthiest of all Indian tribes by reason of its tribal oil holdings, held in common, is excluded from the scope of the new law.

These two acts of Congress will make necessary an increased effort on the part of the organization division of the Indian Office. At the end of the year surveys had not yet been completed to indicate how extensive will be the work in these new fields.

Definition of an Indian raises problems.—Section 19 of the Indian Reorganization Act defines the term Indian to “include all persons of Indian descent who are members of any recognized Indian tribe

now under Federal jurisdiction, and all persons who are descendants of such members who were, on June 1, 1934, residing within the present boundaries of any Indian reservation, and shall further include all other persons of one-half or more Indian blood." The first two conditions of Indian status are quite clearly defined, but the third condition, that referring to Indians of one-half degree or more of blood, has made necessary the development of a research procedure the possibilities of which have not yet been fully explored.

Local initiative must be protected.—By the close of the year, the first fruits of tribal organization began to appear in the form of resolutions and ordinances from tribal councils. Many of these legislative acts, as provided for in tribal constitutions, require formal approval by the Secretary of the Interior; also, many new and unsolved questions of law and policy have arisen in connection with such tribal actions. It will be increasingly important, as organization takes effect among the tribes, that the Indian Office shall devise a new practice in Indian administration. The temptation will be great, on occasion, to make decisions in Washington on matters which, when referred to the Office or the Department for decision, should be returned to the point of origin for local action. With the best intentions in the world, the Office can in effect fasten a blight upon local self-government before it is ever an established fact. It will require sleepless vigilance on the part of the Office and of the Indians themselves to prevent any such unwanted anticlimax.

Mention has not yet been made of the need for educational follow-up work among those tribes which have organized themselves. It was not the least important by any means of the necessities which the closing year made apparent, and it will be among one of the first things of importance for some years to come. Administration can do much, but at best it can only make opportunity. The Indians must explore that opportunity and in time develop it; and in this we can offer friendly guidance; no more.

· APPLIED ANTHROPOLOGICAL RESEARCH

The Indian Service has continued to make effective use of the findings of anthropological and other social-science research in working out practical problems in Indian administration.

In January, Dr. Scudder Mekeel, an anthropologist who had done considerable scientific work on contemporary Indian problems, succeeded Dr. Duncan Strong, who had been loaned by the Bureau of American Ethnology until a permanent man could be found to take charge of the Applied Anthropology Unit. Since Dr. Strong was called by his own organization to lead an expedition in Honduras,

the Bureau of American Ethnology has continued to cooperate by loaning, temporarily, Dr. Julian Steward to work with Dr. Mekeel.

A number of anthropological collaborators were sent out to various tribes. Their object has been to gather facts that will help to insure that the constitutions being drawn are based on the actual social organization and institutions of the particular tribe or group, thus giving reasonable assurance that such constitutions will become an integral part of tribal life. Also, collaborators were sent out to observe the workings of constitutions already accepted, so that any political or social conflicts could be noted and rectified early.

A physical anthropologist has been temporarily employed to assist in determination of the degree of blood of certain Indians who have petitioned to come under the Indian Reorganization Act through section 19.

INDIAN ARTS AND CRAFTS BOARD

The Indian Arts and Crafts Board was appointed just after the close of the fiscal year. Its membership consists of: John Collier, Commissioner of Indian Affairs, chairman (acting); Mr. E. K. Burlew, Administrative Assistant to the Secretary of the Interior (acting); Mr. W. W. Beatty, Director of Education, Indian Service; Dr. A. V. Kidder, of the Carnegie Institution of Washington; and Mr. Lorenzo Hubbell, of Oraibi, Ariz. A permanent chairman has not yet been chosen.

Mr. L. C. West has been appointed general manager, and Mr. René d'Harnoncourt as assistant to the general manager.

Briefly, the Board's powers are: (1) To undertake market research to determine the best opportunity for the sale of various products of Indian handiwork or manufacture; (2) to engage in technical research looking toward improvement of Indian products; (3) to engage in experimentation directly or through selected agencies; (4) to correlate and encourage the various governmental and private agencies engaged in similar activities; (5) to assist the management of operating groups in the furtherance of specific projects; (6) to assist appropriate agencies in obtaining loans to aid in the production and sale of Indian products; (7) to create Government trade marks of genuineness and quality for Indian products, and to establish standards for the use thereof; and (8) to license the use of such trade marks. The Board has no power to act as a dealer itself.

INDIAN JUSTICE ADMINISTRATION REORGANIZED

Since 1884, reservation Indians have been subjected to arrest, trial, and imprisonment by Indian Service officials and by judges chosen and removable by the superintendent of the reservation. This system

has been subject to continued criticism by Indians, by members of Congress, and by Indian welfare societies. Several earlier administrations initiated studies designed to reform the administration of justice on the Indian reservations, but none of these studies resulted in any substantial reforms.

Under the new law and order regulations, Indian Service Officials are prohibited from controlling, obstructing, or interfering with the functions of the Indian courts. The appointment and removal of Indian judges on those reservations where courts of Indian offenses are now maintained is made subject to confirmation by the Indians of the reservation. Indian defendants will hereafter have the benefit of formal charges, the power to summon witnesses, the privilege of bail, and the right to trial by jury. The offenses for which punishment may be imposed are specifically enumerated, the maximum of 6 months labor or \$360 fine being imposed for such offenses as assault and battery, abduction, embezzlement, fraud, forgery, misbranding and bribery. These offenses are not now punishable in any State or Federal court when the offense is committed on reservation land and when only tribal Indians are involved.

In addition to this criminal jurisdiction, the Indian courts will, in the future, have authority to handle civil cases between tribal Indians.

The revision of law and order regulations is one step in the program of the present administration to eliminate obsolete regulations and bureaucratic procedures governing the conduct of Indians, and to endow the Indian tribes themselves with increased responsibility and freedom in local self-government. Other Indian Service regulations which have recently been subject to critical revision are those dealing with the inheritance of Indian estates and with the use of Indian grazing lands.

These regulations are subject to modification in the light of local conditions by each tribe organized under the Indian Reorganization Act.

EDUCATION

Integration with community life.—During the past year a strong effort has been made to integrate Indian education more deeply with the actual living experiences and the environment of Indian children. With increased emphasis on community life, the school is becoming more and more the focal point for community interests and activities. No longer are classes held for the school children alone. The basis now is that of a parent-child cooperative program.

The school or community shop is becoming a popular place for the men to repair their tools; men and women come in to the school to sew, to bathe and wash their hair and clothes, for help on home

problems, to attend clinics, and, in some cases, at night to learn to read and write. Nursery schools have been established in a number of the older boarding schools. Child care is part of every older girl's training.

Parents contribute a wealth of information on spinning, weaving, and dyeing materials, in drying foods, and in making pottery, basketry, and leather goods, in conjunction with the general program which is being encouraged in all of the Indian schools and communities. An increased effort is being made to preserve the rich contribution which Indian arts and crafts have to make to the culture of future generations.

A concrete example of community interest is the Red Lake day school, near Leupp, Ariz., where a group of several Indian families, interested in home gardens, built and paid for an irrigation dam, by means of which an ample food supply was provided for their school and community.

This changed emphasis on the interrelationship of school and community life is true not only of the day school but of many of the boarding schools as well. Greater emphasis is being placed on more practical work, such as special agricultural and homemaking courses. At one school, 3-week short courses were provided throughout the year for mothers and girls in outlying communities. School and home gardens have been made by children and teachers. School hothouses and hotbeds provide tomato, cabbage, berry, and flower plants for the homes. Poultry clubs are a part of many homemaking courses. Home furnishing increasingly is taught in terms of the homes from which pupils come. The furniture and furnishings are simple, but of a practical and durable type that can be made and paid for by an energetic homemaker.

A caution must be imposed on those schools which are situated in tribes whose archaic pattern of culture and government still persists, along with archaic moral and economic customs and sanctions and with prestige systems coming down from old time. To shift to the community school the prestige and responsibility now vested in the native institutions might easily, and almost unconsciously, blight the as yet undestroyed ancient values and kill the energies which have served practical and spiritual need for many ages. The all-embracing community school distinctly is not indicated for such complex, self-contained, and traditionally potent small-group situations as are represented by many of the Pueblo tribes. Here, the program must be self-restrained and very tentatively experimental. Meantime, in such situations there is abundant work for the school which only supplements and in no manner supplants the "native" resources.

Exhibits of arts and crafts.—The contemporary arts and crafts of the Indian have been brought before the public during the year through the interest taken by the Interior Department in the Texas Centennial and the Great Lakes Expositions. The exhibits collected for this purpose will become a valuable part of a permanent Indian collection to be used in promoting further arts and crafts activities.

Health education.—In keeping with general educational trends, an attempt is being made to develop health education through all departments and agencies concerned with Indian life. An effort is being made to utilize opportunities in health instruction as they occur in the daily activities of community centers and boarding schools, as well as of clinics, sanatoria, and hospitals. Teachers and Indian assistants are participating increasingly in the educational phases of health supervision. Special training for this purpose was made a part of the summer institute program.

Trades, industrial, and agricultural training.—Improvement is being made in the trade, industrial, and agricultural training courses and types of training for both young people and adults.

Instructors of agriculture have been added to the teaching staffs of several reservation schools, making possible development of training programs organized around the type of agriculture or animal husbandry dominant in the various communities. The programs include development of individual student farm projects on Indian school land and on land owned by the students or their parents.

Trade and industrial training programs are being reorganized particularly at reservation schools and community day schools to stress the acquisition of skills which are bound to be a part of the experience of the students in later life in their own environment.

Indian girls and adults, both men and women, are being encouraged to participate in the training programs arranged in these fields of education to meet local needs.

At the Phoenix Indian School training for adults in operation, maintenance and repair of tractors has been established on an individual training basis under a competent instructor. Adult students are admitted to this school under a reasonable tuition plan when it is shown that they can profit by such training. This school admits students from all parts of the country.

Traveling library and visual education.—A beginning has been made in the establishment of an interjurisdictional traveling library and visual education service in southern Arizona to insure full utilization of library and educational resources. The day schools of one or two jurisdictions are to be used experimentally as centers for the distribution of books, magazines, visual education material, music records, and other library material which will be circulated to adults

as well as students. A specially constructed book and motion-picture truck has been designed to serve these purposes. The service will also bring educational and entertaining sound motion pictures and radio broadcasts to Indian communities. The central library has been established at the Phoenix Indian School, Phoenix, Ariz., under a competent librarian, and the visual education and motion-picture activities will be carried on by a specialist in this field. Other Indian reservation areas throughout the country are being studied with the possibility in view of extending similar services.

Attendance in public schools.—The number of Indian children attending public schools is increasing. In most cases, the Federal Government pays tuition in order to secure adequate education facilities. A multiplicity of factors presents an ever-changing problem in determining what part the Federal Government should assume in support of public schools. Among the more important are: (1) Type and quality of school actually maintained; (2) amount of money needed to maintain a suitable school adapted to the needs of Indian as well as white children; (3) amount and value of nontaxable Indian lands; (4) methods of taxation; (5) amount of State support for education; (6) basis of distribution of State support; (7) maintenance and capital outlay costs; (8) changing legislation affecting school finances; (9) distribution of Indian children; (10) attitude of whites toward Indians; (11) social backgrounds; (12) economic conditions of Indians. In some States funds paid for tuition are used primarily to provide services of special benefit to Indian children. In certain sections of the country, due to adverse economic conditions, it is necessary to furnish lunches, and sometimes clothing, for children in public schools. This service results in increased attendance and a better quality of work. In some areas seriously affected by adverse economic conditions, it has appeared wise for the Indian Service to reassume responsibility for the operation of schools at one time run by local officials.

The problems vary greatly in the different States, from conditions in Oklahoma, where more than 75 percent of the Indian children attend public schools to those in Arizona, where the percentage is very small. In Oklahoma, the number of Indian children is 5 percent of the total scholastic population, and more than 4 percent are enrolled in public schools. In Arizona, the number of Indian children is 11 percent of the total scholastic population, and only 6 percent are enrolled in public schools; the majority of the children are in Government Indian schools.

Traveling mental hygiene clinic.—The special handling of handicapped and problem children has become an increasing challenge to the Indian Service as its personnel has become more sensitive to the

needs of this group. In the Indian's native culture, handicapped children were cared for by the community, with neighbors and relatives sharing in the provisions for their comfort. As this culture has been demoralized or stripped of responsibility by the infringement of a foreign culture and the past oppressions of governmental policy, social controls and community organizations have tended to break down, necessitating an increasing amount of care for handicapped children on the part of the Federal Government.

The problems presented by the mentally defective, physically handicapped, incorrigible, and dependent children in Oklahoma have been found to be so acute that establishment of a special institution has been recommended. To analyze the problems and to see just what classes of children should be cared for, representatives of the Indian Service, in cooperation with Dr. Forrest N. Anderson, director of the Los Angeles Child Guidance Clinic, as psychiatrist, and psychologists from the University of Oklahoma and Northeastern State Teachers College, spent 9 weeks holding clinics in various parts of Oklahoma. School social workers, education field agents, and teachers in boarding schools referred 540 cases to these clinics for various reasons, given approximately as follows: Inability to make normal school progress, 25 percent; truancy, 15 percent; physical and health handicaps, 15 percent (more than twice this number were found to need medical care); general loose type of behavior (restricted to older adolescents, consisting usually in drinking, promiscuous sex relations, loafing, refusal to attend school, and anti-social conduct such as thievery), 20 percent; mental and emotional handicaps, 15 percent; and miscellaneous behavior problems, of which stealing was the most prominent, 10 percent. Half of the cases referred to the clinics were between 14 and 18 years of age. Complete examinations were made of 235, and 75 more were examined partially.

The most important causal factor in all of the cases presented is the demoralization and disintegration of economic and social life. Two-thirds of the children referred to the clinic come from broken homes caused by the death of one or both parents, divorce, separation, or desertion. Emotional instability is present in at least half of the homes studied. The situation is basically an economic one: many Indians in the State live in abject poverty. Other causes of misbehavior include parental indulgence, low degree of mentality, inability of rural schools to secure skilled personnel and modify their programs to meet the specialized needs of such children, and the absence of suitable community life.

After conferring with a large number of field workers and viewing the problems from many angles, the clinic recommended: (1) Estab-

lishment of a special institution, or separate unit in an existing institution, for children above the level ordinarily committed to State homes for feeble-minded, but sufficiently dull to need special training; (2) provision for permanent clinical psychiatric and psychological service; (3) adaptation of boarding-school programs to give older retarded boys and girls the necessary training to make a living and to make good homes; (4) establishment of an opportunity class, or special ungraded class at each boarding school (some are already functioning within the State); (5) provision for better hospitalization at schools not having needed facilities; and (6) provision for home placement.

Social work.—The recognized scope of school social work, introduced into the Indian Service in an effort to reduce institutionalization of Indian children in boarding schools and to assist in their adjustment in home and public school, is expanding as it becomes increasingly obvious that the welfare of the school child cannot be isolated from the general welfare of the group of which he is a part. The school social worker, therefore, finds a fundamental approach to the needs of the school child through participation in the general program of the jurisdiction, concerned as it is with economic rehabilitation and with the organization of Indians for self-maintenance and self-direction as well as with education and family welfare. The jurisdictions, in turn, are finding value in the application of social work principles and techniques to various phases of jurisdiction work, much of which is essentially welfare work.

With the reduction in boarding-school enrollments, provision for the care of dependent Indian children was essential. Children who could not be cared for by friends or relatives have been placed in foster homes through public or private agencies and, in a few instances where no adequate foster-home program could be instituted, some have received care in small dormitories, usually run by missions, from which they attend the local public schools. For 2 years a contract has been in effect with a private agency in the State of Michigan, the Michigan Children's Aid Society, to provide placement and supervision in boarding homes for dependent Indian children for whom suitable care could not otherwise be provided. In California the arrangements are made for individual children in cooperation with the county and the State. The Oregon placement program has been under the supervision of our State superintendent of education, who obtains such assistance as is available from local agencies.

Recently the first contract between a State and the Indian Office for social services was made with the State of Wisconsin. A type of service similar to that mentioned above is now provided for Wisconsin Indian children through the foster-home division of the

State public schools. Child welfare services of the juvenile department of the Wisconsin State Board of Control are extended to Indians throughout the State. State workers and county children's boards are already showing increased interest in discovering the needs of, and planning for, the welfare of Indian children; and efforts are being directed toward improvement of family and community conditions and the provision of recreational outlets in an attempt to reduce delinquency and to promote child welfare.

The United States Children's Bureau, cooperating with the Indian Service, has appointed a special worker to study present child welfare work in the Indian Service and to plan means of extending to Indian children those services available under the Social Security Act and administered by the Children's Bureau; namely, maternal and child health services, child welfare services, and services to crippled children.

During the year three young Indian women—a Cherokee, a Choctaw, and a Chippewa—who had been employed as Indian assistants qualified for classified positions by further social-work training and experience. Two of these became school social workers and one an assistant community worker.

Educational loans.—For some time there has been a growing awareness on the part of those concerned with Indian education of the necessity for trained native leadership if Indian education is to be a reality to the Indian people. One of the major objects before us has been to secure for Indians the technical and professional training necessary for the successful handling of their own affairs. Toward this end Congress appropriated in 1935, \$175,000 under the Indian Reorganization Act, for scholarship loans to Indians, and a gratuity fund of \$15,000 for the payment of tuition and fees in nonsectarian schools. Thirty-five thousand dollars of the total amount appropriated for loans was available for education in high schools and colleges and \$140,000 for training in recognized vocational schools.

Candidates for scholarship loans are recommended by local educational loan committees from each reservation. An effort is made to search out the most able and promising young people for advanced training. Loans are made on a competitive basis, on recommendations made by the reservation loan committees. Preference is given to those students having the higher degree of Indian blood, other qualifications being equal.

While there has been a small educational loan fund available in the past, we have been able for the first time, this year, to meet in anything like adequate measure the demand for the training of native

leadership. As against a total of 204 students in colleges and vocational schools in 1935 it has this year been possible to aid 399 students to attend colleges, universities, and vocational schools. A majority of these young people have held their own in competition with white students, often in spite of inadequate scholastic preparation and the handicap of differences in language and environment. Many have lacked the understanding and backing of their people at home and the understanding and appreciation of those with whom they must live and work. For many of these students, it is a pioneering job, and they have given a good account of themselves.

The great majority of those receiving scholarship loans are hoping to return to work among their own people. This year nine Indian loan students completed training to become teachers, six were trained as nurses, four as teachers of home economics, and one as a social worker. These will be offered opportunity to enter the Indian Service on an apprentice basis. There are 42 different courses being taken by educational loan students from 30 States; the total number having educational loans was 399; the total in college, 258; the total in vocational schools, 141. The distribution by degree of blood was as follows: Full bloods, 104; less than full blood but one-half or more, 173; less than one-half but one-fourth or more, 121.

Indian primers.—It has long been recognized that there was a dearth of textbook material suitable for the specialized Indian education program. Plans have been under way for development and publication of materials dealing with subject matter in a manner applicable to the particular needs of the Indian child. Miss Rose K. Brandt, supervisor of elementary education, has been detailed for a period of time to work exclusively on the preparation and publication of a series of primers for Indian children. The first of these, *Feast Day in Nambe*; *Shaker, Our Monkey*; and *Shaker's Health Book*, have just recently been completed and printed as student projects by the Haskell Institute and Chilocco printing departments. The selections have been written by the Indian children themselves in a class project and have been edited only slightly. The linoleum block illustrations were made by some of the older children at Santa Fe school and give a pictorial description of the subject matter. Other books of the series are in process of completion and additional work in this field, embracing work in mathematics and social science, is contemplated for this coming year.

The Alaska school service.—Mr. Claude M. Hirst was appointed director of education for natives of Alaska and entered on duty in March 1936. He has supervision of the 99 day schools and 2 boarding schools conducted by the Office of Indian Affairs for the Indians and Eskimos.

All schools were in operation during the past year, although a few started late because of the difficulty of securing transportation for new appointees to their isolated posts.

During the past year the Alaska Service was brought under civil-service regulations, and new appointees are now selected from appropriate civil-service registers of eligibles. Community workers, qualified to teach, are being appointed at isolated stations. The day schools in Alaska are extremely isolated, and it is necessary that the teacher (or community worker) serve as physician and nurse, and supervisor of gardens, cooperative stores, reindeer activities, marketing of furs, purchasing supplies, recreation, economic enterprises, and village government. Greater emphasis is being placed upon the development of native arts and crafts as a part of the educational system.

There is urgent need for replacement of shacks which, in many instances, now serve as schools and teachers' quarters. There are about 25 villages with 25 or more children of school age in each, which have never been provided with schools. Appropriations for salary for community workers for two new schools (Minto and Nanavanaglak) have been secured for this coming year.

Mr. Frank Daugherty, teacher at the Point Barrow school, was detailed to make a survey of conditions from Point Barrow east to Demarcation Point, due to reports of an epidemic of mumps and shortage of food and fuel. Marauding wolves have greatly decreased the reindeer herds in this region. The emergency situation was handled locally. This office is cooperating with other Government agencies in helping the natives in their battle against the wolves. Mr. Daugherty was the first Government official to go beyond Flaxman Island since the cutter *Bear* set the boundary mark more than 20 years ago. His report is eagerly awaited.

HEALTH

Increased appropriations for the fiscal year 1936 (\$3,486,085 for 1935; \$4,011,620 for 1936) have made possible real progress in Indian health work. Personnel has been enlarged in the badly understaffed hospitals and field service; new hospitals are being built and others are being remodeled; and the basic task of preventive work is at last being measurably accomplished.

New personnel.—The personnel was increased to 160 full-time and 76 part-time physicians, 378 staff nurses, 105 field nurses, 15 nurses at large, 1 special expert in tuberculosis, 2 special physicians (tuberculosis), 13 full-time dentists and 13 part-time dentists, and 673 other miscellaneous health personnel. There are also employed seven special consultants.

New hospitals.—During the year a new hospital with a capacity of 38 beds was completed and opened to receive patients at Colville, Wash. This institution is modern in construction and equipment and already is doing splendid work. It is fully staffed to serve surgical as well as general cases.

On June 30, 1936, there were under construction 12 hospitals, located as follows:

	<i>Bed capacity</i>
Fort Yuma, Ariz.....	25
Cass Lake, Minn.....	34
Blackfeet, Mont.....	45
Crow Agency, Mont.....	30
Western Shoshone, Nev.....	20
Zuni, N. Mex.....	34
Cherokee, N. C.....	28
Warm Springs, Oreg.....	21
Crow Creek, S. Dak.....	24
Yankton, S. Dak.....	25
Sisseton, S. Dak.....	34
Fort Duchesne, Utah.....	24

Remodeling and enlarging projects were carried on at:

	<i>Additional beds</i>
Taos, N. Mex.....	8
Standing Rock, N. Dak.....	17
Claremore, Okla.....	40
Kiowa, Okla.....	25
Rosebud, S. Dak.....	17
Cheyenne River, S. Dak.....	6

The above-mentioned projects are in varying stages of completion. When all are completed, they will add approximately 325 beds to the present Indian Service hospital capacity.

There has been a vast improvement in both construction and equipment of Indian Service hospitals during the past few years. The newer institutions have been constructed of fire-resisting material and have been fully supplied with modern equipment. Even with these new facilities, the need for hospitalization is far beyond existing or early hoped-for capacity.

Excluding infirmaries of less than 10 beds capacity, there were in operation this year 91 hospitals and sanatoria, with a capacity of 3,743 beds, 109 cribs, and 267 bassinets. Of this number, 15 are sanatoria, with 1,257 beds.

Indian birth and death rates.—During the fiscal year the Indian birth rate, as shown by reports admittedly incomplete, was 24.3 per thousand, and the death rate was 15.1 per thousand. In 1911 the Indian death rate was reported as 35.6 per thousand and the birth rate 36.1 per thousand live births. The present balance of 9.2 addi-

tional to each 1,000 denotes a population increasing, and not vanishing.

Health surveys; anti-tuberculosis vaccination.—A survey begun last year at Pima and Papago in connection with the tuberculosis campaign there has been continued and the follow-up work undertaken. Surveys have been extended to Shoshone, Wyo., and Blackfeet, Mont. At both these reservations there are now special physicians working under the direction of Dr. Joseph D. Aronson, special expert in tuberculosis, in carrying out the tuberculosis program inaugurated a year ago.

During the past year, Dr. Aronson has administered B. C. G. vaccination or given control injections to about 500 tubercular-negative school children on the Papago Reservation. The infants and preschool children will be attended to later. He has applied the tuberculin test to approximately one-half of the population (5,000) on this reservation, and has completed a fairly accurate mortality census.

From April 18 to 25, tuberculin tests were conducted on school children in Hennepin County, Minn., by Dr. Aronson in conjunction with the State health authorities. A total of 1,301 tests were performed in this area.

Dr. Aronson is at present making a preliminary survey of the tuberculosis situation at the Shoshone Indian Agency, Fort Washakie, Wyo.

In addition to the above-mentioned surveys, there was also made a survey at Zuni and at Taos by Dr. William Palmer Lucas, a specialist in child hygiene and nutrition; and a survey in Oklahoma covering the mental condition of children of school age. Two counties in Oklahoma were surveyed for general health conditions, and a dental survey was made in Alaska. Figures from these latter-mentioned studies are not yet available. Cooperative relationships have been entered into with the Oklahoma State Board of Health in the development of a five-county, full-time district health unit. This gives to approximately 25,000 Five Tribes Indians a full-time adequate health service.

Cooperative work has continued with the Public Health Service in a survey of the basillary dysentery infection among the Pueblo Indians of New Mexico. Preliminary reports show among the Pueblo Tribes a high infestation rate, ranging from 14 to 40 percent.

Dental clinics on wheels.—Two additional mobile dental clinics were supplied during the year, which will enable the traveling dentists to whom they have been assigned to accomplish a great deal more work for the Indians under very much improved conditions. To each of these clinics is assigned a young Indian who has had

training to fit him to assist the dentist and to act as driver and mechanic for the automobile.

Trachoma school.—For the past 2 years the Health Division has operated a trachoma school at the old Theodore Roosevelt School site in the Whiteriver Apache jurisdiction. Here a concentrated effort has been made to gather together and treat as many as possible of the trachomatous Apache children of school age. Specially trained physicians and nurses are giving them intensive treatment in order to effect cures in as short a time as possible. Results have been most encouraging. During the first 10 months of the past year there were treated for trachoma in this institution 222 patients, of whom 108 were discharged as cured or improved and 4 unimproved. Of those being treated for other eye conditions, 32 were discharged as cured or improved and 2 unimproved. This undertaking will be continued here at least for the present, and will be extended to other jurisdictions wherever conditions will permit.

Dr. Francis I. Proctor, trachoma consultant to the Indian Service, died July 8, 1936. His death is a great loss to the medical field in general and to the Indian medical work in particular. He was untiring in his efforts to assist in eradicating trachoma from the Indian race.

Preventorium for underweight children.—At Fort Totten, N. Dak., advantage has been taken of the building space made available by the closing of a boarding school to establish a preventorium, in which 50 undernourished children have been placed under observation. Every effort is being made to bring them up to normal physical condition, and frequent examinations are made to detect the possibility of tuberculosis in its very early stages. The success of this institution has been so marked that we shall double the number of children there in the coming year.

Nursing service.—There has been some increase in the number of nurses in the hospital service. Many of the institutions are still much understaffed, however, and the increase of the hospital utilization has made the need for more nurses acute in certain locations.

The school for ward attendants which was opened in the fiscal year 1936 graduated 17 students this June. Girls with this type of training will be of great assistance to the nurses in the understaffed institutions. They will be assigned to the simpler types of nursing duties under the supervision of the graduate nurses, thus enabling the graduate nurses to give more care to the seriously ill patients. Reports on these students have been very encouraging; they have shown interest, initiative, and adaptability. Three of these graduated students have already been assigned to duty and positions will be established to provide employment for the remaining 14. There

have been requests for these students in various sections of the country.

There has been an increase in the employment of Indian girls who are graduate registered nurses. There are now 56 Indians on the nursing staff as compared to 42 last year at this time.

The field nursing program covering control of communicable disease, maternity and infancy hygiene, and health supervision, has been continued. The increase in demand for this type of service shows a constructive attitude and interest in the community health program.

Three field nurses have been assigned to duty on a cooperative basis with the five-county health unit in eastern Oklahoma. This is the first service of this kind provided for the Indians of these counties.

Three nurses were assigned to the special tuberculosis program. Two of these had post-graduate courses at Phipps Institute in order to prepare for this work. One of the staff nurses at the Shoshone Hospital is taking a course in X-ray technique in order to assist in the tuberculosis program being carried out at this reservation.

There has been an increase in the number of trachoma nurses. Several nurses have taken special post-graduate courses in order to qualify better for this work. The special nurses in eye work are teaching the staff nurses eye nursing work, under the direction of the supervisory trachoma nurse, while on detail to the various hospitals. It is hoped that in this way the demand for nurses who have special preparation in trachoma nursing will eventually be met. It was not possible to secure a sufficient number of nurses qualified to do trachoma work from the Civil Service register and we therefore found it necessary to promote a type of in-service training. The majority of the nurses who at this time are assigned to trachoma work have learned this branch of nursing since coming into the Indian Service.

Nursing-school survey.—Arrangements have been made to have a survey made by the National League of Nursing Education concerning the feasibility of establishing a school of nursing at some one of our larger institutions, such as Fort Defiance or the Kiowa Hospital. There are social as well as educational values to be considered. This association is recognized as thoroughly familiar with the standards of nursing service as well as education and has therefore much to contribute to a critical examination of the effectiveness of our work. To bring to the Indian Service the standards recognized as essential by the best authorities in the medical world has an invigorating influence on our planning and development.

Alaska medical service.—In August 1935 Dr. J. F. van Ackeren was detailed by the United States Public Health Service as director of the Alaska Medical Service, with headquarters at Juneau, Alaska. Dr. van Ackeren has familiarized himself with the Alaska work dur-

ing the past year by visiting the six native hospitals and as many as possible of the 23 field-nurse stations.

Miss Elinor D. Gregg, director of nursing for the Office of Indian Affairs, made a trip to Alaska during the fall of 1935 to acquaint herself with the needs of the Alaska Service. Miss Bertha M. Tiber, formerly field nurse at Wainwright, has been appointed supervisor of nurses for Alaska and is planning a better organization of the Alaska nursing service. Appropriation for the salaries of two additional field nurses has been secured for the next year.

Dr. Taylor J. Pyle, formerly traveling dentist in the Alaska service, has been made supervisor of the dental work; and contracts are being made with the local dentists whereby dental service will be rendered to the natives on a fee basis. This plan will save the Government many thousands of dollars in traveling expenses.

The Presbyterian Mission Board has turned over to the Office of Indian Affairs its hospital at Point Barrow, Alaska. An appropriation has been secured for repairs and supplies, and for salaries of two nurses and a physician. Arrangements are under way for the taking over of this hospital by the Indian Office July 1, 1936.

No progress has been made in securing new hospitals for Alaska. Hospitals are particularly needed at Bethel on the Kuskokwim, at Ketchikan, and at Seward. New buildings are urgently needed at Kakanak and Kotzebue; the present buildings are in such a dilapidated condition that it is impossible for a hospital staff to render adequate service.

Cooperation with other organizations.—The cooperation heretofore maintained with the United States Public Health Service, with the usual detail by them of personnel to the Indian Service, has been in effect throughout the fiscal year 1936.

The death of Dr. C. T. Messner, our dental officer (who was detailed from Public Health), was a serious loss to Indian medical work.

Cooperation with other organizations has been continued, and further cooperation with local health organizations is being developed. This refers especially to the five-county cooperative arrangement that is now being worked out with the State health officer of Oklahoma.

EXTENSION AND INDUSTRY

This division works toward better living standards for Indians, by seeking to teach the wise use of their physical resources. Its programs are tied closely to local reservation problems and assets, and they are worked out in cooperation with the Indians.

Indian extension work made progress in 1935, but has not yet fully recovered from the effects of the 1934 drought. The crop year was below normal on most reservations.

All of the figures which follow are for the calendar year 1935, and consequently do not show the losses which will follow from the 1936 drought. These losses, from reports received at the end of the fiscal year, will be tragically severe on the Dakota and eastern Montana reservations, and in eastern Oklahoma.

Cattle.—Arrangements were effected with the New Mexico Rehabilitation Corporation whereby approximately 8,800 head of cattle were turned over to Indians, the greater part of which were distributed on northern reservations which were drought-stricken in 1934.

Many of the drought-relief cattle received from the Federal Surplus Relief Corporation during 1934 were found to be unsuitable for foundation herds, and a decrease of 6 percent in the number of Indians owning dairy cattle, and a decrease of 18 percent in the number of animals owned was recorded due to such losses. The number of Indians owning beef cattle remained practically stationary during the year. The number owned increased approximately 2 percent. These figures should be considered with the fact that 8,482 head were slaughtered during the year and 44,766 head were sold.

	Dairy cattle			Beef cattle		
	1933	1934	1935	1933	1934	1935
Number of Indians owning.....	6,336	9,133	8,556	8,627	13,787	13,812
Total number owned.....	16,406	25,711	20,966	167,313	229,343	233,974
Average value per head.....		\$23.07	\$37.85		\$18.95	\$31.10
Total value.....		\$593,127	\$793,526		\$4,346,307	\$7,276,265
Number of live animals sold.....	252	2,171	1,001	12,284	36,046	44,766
Amount received.....	\$3,603	\$36,008	\$22,229	\$210,609	\$578,070	\$1,365,875
Pounds dressed meat sold.....		3,500	10,151	793,063	547,179	880,947
Amount received.....		\$245	\$1,235	\$52,486	\$44,820	\$86,114

Total income received from cattle: 1933, \$266,698; 1934, \$659,143; 1935, \$1,415,453.

The increased income from beef cattle was due, in part, to improved market conditions.

A strong effort was made to have Indian cattle owners become members of cooperative livestock associations. A total of 53 such organizations were in operation at the close of the year.

Sheep and goats.—The overgrazed condition of the Navajo range demanded additional reduction in the numbers of sheep and goats in that area. 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. The revised

¹ The term "sheep unit" here includes grown sheep, lambs, rams, goats, and kids. Lambs and kids are figured on the basis of two for one grown animal. The term does not here include cattle and horses.

dipping records of the Soil Conservation Service show a still further reduction to 795,789 sheep units at the close of the year. There is need for still further reduction.

In spite of the decrease in the number of sheep in the Southwest, increases were recorded throughout the Service as a whole.

	Sheep			Goats		
	1933	1934	1935	1933	1934	1935
Number of Indians owning.....	7, 527	9, 213	8, 714	5, 842	7, 681	6, 296
Number owned.....	1, 051, 079	901, 765	1, 005, 345	353, 190	215, 566	158, 119
Number of live animals sold.....	94, 226	156, 571	207, 528	2, 654	150, 884	23, 480
Pounds dressed meat sold.....	202, 530	101, 450	85, 693	43, 625	31, 450	47, 685
Amount received from sales of live animals.....	\$306, 652	\$366, 546	\$733, 680	\$3, 872	\$156, 478	\$41, 588
Amount received from sales of dressed meat.....	\$18, 240	\$9, 686	\$11, 036	\$5, 672	\$2, 786	\$4, 059

¹ Includes proceeds from drought purchases of Federal Surplus Relief Corporation.

Amount received from wool and mohair sales: 1933, \$460,635; 1934, \$505,919; 1935, \$549,506.
 Total income from sheep and goats: 1933, \$795,071; 1934, \$1,041,815; 1935, \$1,344,869.

Swine.—The swine project continued to show effects of the 1934 drought. The number of Indians owning swine decreased 16 percent and the number owned decreased 7,980, or about 25 percent, from 1934. Over 60 percent of the swine owned are on Oklahoma reservations.

Horses and mules.—Better bred horses are greatly needed on many reservations. A total of 66 purebred stallions and 2,463 mares were purchased. In some sections there are far too many wild horses which use range that should be put to more productive use. A total of 11,512 horses were sold during the past year. At the close of 1935, a total of 41,543 Indians owned 133,482 horses.

Poultry.—Indian poultry raising continued to show the effects of the 1934 drought. Efforts were directed mainly toward encouraging poultry raisers to supply fresh eggs for family use, and some birds for consumption rather than for commercial activities. Turkeys, however, are grown for the commercial market.

	1933	1934	1935
Number of Indians owning.....	18, 322	19, 638	16, 823
Number poultry owned.....	356, 139	363, 384	341, 603
Number live birds sold.....	61, 932	73, 013	86, 773
Pounds dressed poultry sold.....	55, 161	77, 946	59, 564
Amount received from sales dressed poultry.....	\$10, 356	\$16, 745	\$15, 799
Number birds slaughtered for family use.....	78, 640	90, 291	118, 630
Estimated dozens eggs produced.....		1, 357, 774	1, 397, 485

Navajo sheep-breeding laboratory.—An appropriation of \$60,000 was made for the establishment and \$15,000 for the operation of a sheep-breeding laboratory on the Navajo Reservation. Efforts will

be directed towards building up a breed of sheep adapted to Navajo Reservation climatic conditions, whose wool will be suitable for the making of Navajo rugs, and at the same time salable on the open market. This work was carried forward in cooperation with the Department of Agriculture.

Farming.—While the 1935 season was below normal in most sections, there was considerable recovery from the 1934 drought. The total acreage cultivated by Indians was 583,452.46, an increase of approximately 14 percent over 1934. The acreage planted in various cereal crops showed an increase of 3.36 percent over 1934, while yields increased 84 percent. Cotton yields increased 64 percent, and sugar beets 111 percent over 1934. The acreage of forage crops remained practically stationary, but yields showed an increase of 55 percent. A total of 27,956 families planted 28,624 acres of gardens. Production of various garden products showed a considerable improvement over 1934, examples being potatoes, 20 percent; corn, 107 percent; squash, 55 percent; tomatoes, 78 percent.

Horticultural projects continued to make progress. Yields of tree and vine fruits showed an increase of 168 percent. A total of 6,243 fruit trees was set out on various allotments during the year. Yields of small fruits showed a 53 percent increase, and 18,144 new units were planted.

4-H club work.—This work is valuable not only in giving boys and girls training in better agricultural and homemaking practices but also as a demonstration to the parents of the value of improved practices.

	1932	1933	1934	1935
Total members enrolled.....	3, 871	4, 375	4, 290	5, 138
Total members completing.....	2, 871	3, 195	3, 128	3, 566
Number different members enrolled.....	3, 336	3, 324	3, 581	4, 261
Number different members completing.....	2, 467	2, 398	2, 511	3, 197
Percentage of completions.....	74. 16	73. 02	72. 91	69. 04
Number of clubs.....			294	334

Home extension work.—Home extension projects continued to make progress during the year. Canning projects showed the following results in quarts: Fruits, 501,112; meats, 65,950; vegetables, 435,170; and fish, 45,326. Drying projects showed the following results in pounds: Fruits, 221,974; meats, 558,985; vegetables, 740,969; fish, 156,400. It is estimated that we assisted 7,721 homes in canning projects and 5,754 homes in drying projects. A total of 108,818 pieces of clothing were made and 2,700 homes were helped in clothing activities. A total of 1,633 homes adopted improved nutrition practices.

Farm and home building.—Construction and remodeling of farm and home buildings continued to receive attention. A total of 1,286 new dwellings were constructed at an estimated cost of \$488,295, and 1,800 were remodeled with an estimated resulting increased value of \$226,050. A total of 477 new barns, 136 hog houses, 298 poultry houses, and 119 granaries were constructed. The project on sanitation of home surroundings resulted in the building of 810 toilets.

General extension work.—The following figures summarize general extension work:

Extension workers made 142,711 farm and home visits during the year. A total of 336,314 office and 78,779 telephone calls were received. Workers wrote 72,641 letters; prepared 1,481 circulars, of which 90,614 copies were sent out; and distributed 43,330 bulletins. Exhibits were shown at 1,422 events; 190 meetings were held for local leaders, at which 2,587 were in attendance; 3,383 demonstration meetings held, with an attendance of 41,230; 198 tours conducted, with an attendance of 1,666; 118 achievement days held, with an attendance of 27,417; and 4,325 other extension meetings held, with an attendance of 100,409. Local leaders held 2,540 meetings, with an attendance of 82,120. All meetings held during the year totaled 12,452, with a total attendance of 82,129.

Cooperation with other organizations.—Close cooperation was maintained by extension employees and workers of other divisions. Employees of the Education Division were very helpful in promoting 4-H club work and home extension activities. County and home demonstration agents were also of assistance in forwarding the program of work. The agricultural colleges in the various States, the State relief and rehabilitation corporations, the Department of Agriculture, and the Resettlement Administration also rendered valuable assistance. On Southwest reservations, efforts were directed toward working closely with the Soil Conservation Service.

Revolving credit fund.—Administration of the credit revolving fund authorized by the Indian Reorganization Act was placed upon the Extension Division. The act authorized a fund of \$10,000,000, of which \$2,500,000 was appropriated in the 1936 Budget. Of the appropriated amount, \$50,000 was authorized for administrative expenses. An additional \$2,000,000 was authorized by the Oklahoma Indian Welfare Act of June 26, 1936 (Public, No. 816). A supervisor, 5 district credit agents, 1 administrative assistant, and 4 clerks and stenographers have been appointed. Rules and regulations governing use of the funds were formulated and approved. Economic data have been gathered as to resources of 14 reservations which have come in under the act. Plans for use of the funds include provisions for making loans to corporations, which may be relented to individual Indians and partnerships, cooperatives and credit unions, and which may be used to finance the development and operation of corporate enterprises.

Reimbursable loans.—The appropriation for industrial loan purposes for the fiscal year 1936 was \$150,000, as compared with \$325,000 for the previous year. All but \$548 of this sum was allotted the various jurisdictions. The drastic reduction in funds curtailed industrial development on a number of reservations. In some instances available tribal funds assisted materially in carrying forward programs which otherwise would have been cut down. A total of \$187,844 was allotted to 24 jurisdictions during the year from tribal reimbursable funds. The greater proportion of loans from these two sources was of an industrial nature. According to reports which have been received, only \$12,355 was expended for subsistence loans. Thirty-six young Indian boys and girls obtained educational loans totaling \$6,137.50 from their respective tribal loan funds.

Coming demands.—The attainment of the goal of self-support by the Indians is to an important extent dependent upon a successful extension program. Sound planning, rather than haphazard use of Indian resources and credit, is essential. Results achieved by extension workers in the past have fully demonstrated that the Indians are receptive to the work. The fewness of the extension staff, however, makes it impossible for the Indians to receive the amount of help they seek and need. The growth of their livestock enterprises and the guidance which they need in order to insure sound economic use of the revolving credit fund make it urgent that a more adequate staff be provided. Funds are also sorely needed for demonstration purposes, in order that the Indians may be shown more vividly the value of improved practices and the need for husbanding their resources.

The social side of extension work should also receive more attention than it is possible to give to it at the present time. Home improvement and recreation are some of the important phases of this work which deserve attention.

RELIEF AND REHABILITATION PROGRAM

Rehabilitation.—In February 1936, the President allotted to the Office of Indian Affairs \$2,000,000 of emergency funds (later reduced to \$1,913,204 by the retransfer to the Treasury of \$86,796). According to the terms of the allotment, \$1,396,750 of the total was to be used to finance the rehabilitation of Indians through loans and grants for house and building construction; land improvement; development of water supply; and small self-help projects, such as furniture and handicraft shops, canning kitchens, and sewing projects. The sum of \$33,954 was set up as an administrative fund; and \$482,500 was earmarked for direct relief.

The allotment of the rehabilitation fund enable the Indian Office to commence an enterprise which it had long desired to undertake.

The deplorable condition of thousands of Indian homes has long called for the development of a program to build sound, livable, but minimum-cost houses, suited to the Indian's needs. In addition to these houses, it was desired to construct the outbuildings necessary as adjuncts to small farming or subsistence garden operations. Another great need was for buildings to house self-help endeavors, and for money with which to start and operate self-help projects. The whole program was to be aimed in the direction of a permanent increase of the Indian's capacity to produce and sustain himself.

This goal was continuously observed in the conduct of the program which was undertaken on the strength of the allotment of the rehabilitation fund. With it, was coupled the objective of putting to work as many Indians as possible out of the great number requiring work relief.

Allocations of the fund were made to 68 Indian jurisdictions. In conjunction with the Works Progress Administration, rules and regulations were adopted whereby superintendents had authority to certify Indians as eligible for work relief under the program. A small administrative staff was set up in Washington, and a contract was entered into with the architectural firm of Alfred Fellheimer and Steward Wagner of New York for the development of designs for houses and self-help buildings suited to the needs of the Indian.

It was originally ruled that the entire fund must be expended by June 30, 1936, but this requirement was later relaxed, allowing work on a number of the major projects to be continued after that date, with a resulting increase in the efficiency of the work performed and in the number of relief workers, as distinguished from exempt skilled workers, who could be given employment.

Particular emphasis was placed on the development of a number of communities along the subsistence-homestead plan, which commonly contemplates a fairly compact group of houses and garden tracts, with adjacent small individual farms, or farm-and-garden land cultivated communally. Thus there were developed so-called rehabilitation communities under the Sacramento Agency, in Lake County, Calif., where some 40 new homes were constructed; at the White Earth Reservation in the Consolidated Chippewa jurisdiction, where another 40 houses, together with the necessary barns and outbuildings, were constructed; at Fort Totten Agency, N. Dak., 13 houses; at Burns, Oreg., under the Umatilla Agency, 26 houses; on the Lower Brule Reservation, under Crow Creek Agency, 17 houses; on the Swinomish Reservation, under Tulalip Agency, 18 houses; on the Seger School Reserve, under Cheyenne and Arapaho Agency, 13 houses; and under the jurisdiction of the Five Civilized Tribes in Oklahoma, communities of 30 homes each near McCurtain and Wilburton were completed. A large number of other new houses were

constructed for individual families. A still larger number of Indian homes were repaired, and a large amount of work was done in the construction of buildings to house self-help enterprises.

As of June 30, 1936, a recapitulation of the work thus far performed under the rehabilitation program showed that disbursements and commitments totaled \$779,617. A total of 4,830 individuals had received 595,856 man-hours of employment. It was estimated that upon completion of the program more than 2,000,000 man-hours of employment will have been produced. A total of 604 new houses had been completed or were under construction; 561 new outbuildings had been completed or were under construction; 280 buildings to house self-help enterprises were completed or under way; and some 899 houses had been repaired. In addition to those given direct employment, an estimated total of 4,698 Indian men and 4,799 Indian women had been benefited through self-help projects, and an estimated 6,000 individuals stood to be benefited through the work of house construction and repair.

Relief from other sources.—Aside from this specific program, needy Indians continued to share in other forms of relief. A small amount of money for relief is available each year from regular Indian Service appropriations. A number of W. P. A. projects have been approved on and in the vicinity of Indian reservations. These gave not only the opportunity for Indian employment but were the means of securing such sorely needed physical improvements as buildings, fences, sidewalks, and canals. Indians participate in the distribution, through the States, of surplus commodities, in addition to receiving direct shipments of clothing from stocks surplus to the War Department and other governmental units. A number of Indians have been accepted as resettlement and rehabilitation clients. Some have received help through the National Youth Administration. No source of help is being overlooked.

Social-security program.—During 1936, a beginning was made toward the participation by Indians in the benefits of the social-security program, as conducted by those States having Indian populations. Such benefits include old-age assistance, aid to dependent children, services for crippled children, child-welfare services, and aid to the blind.

CONSTRUCTION

Construction accomplishments during the year included numerous day schools, hospitals, quarters for employees, heating and power plants, water and sewer systems, and irrigation developments. The entire program has been made possible by allotments from the Public Works Administration. Included in the larger and more important structures which have been completed and are now in use are

the Indian addition to the Ah Gwah Ching State Sanitorium, Minnesota; the Salt River Day School, Arizona; Sacaton Day School, Arizona; and the Colville Hospital, Washington. Practically all of the 47 day schools in the Navajo area were completed and placed in operation.

The Central Navajo Agency has also been brought nearly to completion. This project included the construction of an administration building, Indian council house, quarters for employees, heating and power plant, water and sewer system, and numerous other buildings. This development is built entirely of native stone and was designed by a firm of architects who have made an intensive study of the type of architecture most suitable to the Southwest area. More than 90 percent of the labor on this project has been done by Navajo Indians.

Funds have also been made available from the Public Works appropriation for the construction of several large and important hospitals. The largest of these will be a combination 150-bed tuberculosis sanatorium and a 75-bed general hospital at Talihina, Okla. Plans and specifications for these projects are being rushed to completion and it is expected that construction will be started at an early date. Contracts have been let, and construction is progressing on hospitals at Yuma, Calif.; Blackfeet and Crow Agencies, Mont.; Sisseton, Yankton, and Crow Creek Agencies, S. Dak.; and Cass Lake, Minn. Other hospitals are being erected by force account at Zuni, N. Mex.; Warm Springs, Oreg.; and on the Western Shoshone Reservation, Nev. Field studies were completed for the new Sioux sanatorium to be located at Rapid City, S. Dak., and plans for this institution, which will have more than a 100-bed capacity, are rapidly nearing completion.

In the last 12 months approximately \$8,000,000 has been expended by the Indian Service for projects financed from the appropriation for public works.

The construction personnel both in the Washington office and the field offices (located at Albuquerque, N. Mex.; Billings, Mont.; and Muskogee, Okla.) has been increased to take care of the additional work.

(See also the discussion, on p. 185, of the construction work being done under the rehabilitation program; and p. 183 for a description of construction done in connection with our regular extension work.)

COOPERATION WITH SOIL CONSERVATION SERVICE

The work of protecting the foundation of all Indian life—of checking erosion, of reducing the disastrous wastage of the soil, and of rebuilding its vegetative cover and fertility—has been continued and greatly expanded during the year, with the active cooperation

of the Soil Conservation Service of the Department of Agriculture. The results achieved by this cooperative effort have been so startling and convincing that cooperative agreements with the Soil Conservation Service were made for work on the Shoshone Reservation and the Warm Springs Reservation. A survey and planning unit was created by the Soil Conservation Service to study Indian reservations and, on the basis of these studies, to prepare plans and programs for erosion control, soil conservation, and proper land use, to be carried out by the Indian Service. Initially this survey and planning group studied conditions on the Gila River, Pima, Walapai, the Havasupai, the Uintah-Ouray, and the Jicarilla Reservations. Eight additional reservations are to be surveyed and studied by this unit during the coming year. Aerial maps covering 12 reservations were contracted for to aid the work of this Soil Conservation group.

For the Navajo Reservation soil conservation and range management plans for 19 grazing units were started by the integrated Indian Service and soil-conservation administration during the year, and plans for 2 of the grazing districts were completed. In the Pueblo jurisdiction range-management and soil-conservation plans for five pueblos were completed. Laguna and Acoma Pueblos formally agreed to the stock reduction of almost 50 percent prescribed by the range-management plans, and immediately carried out a proportion of the total stock reduction contemplated for the initial year. Both on the Navajo and the Pueblo areas convincing demonstrations showed the Indians that a limited number of ewes on good grass would supply a larger number of lambs and a greater amount of wool than could be obtained from twice the number of ewes maintained without proper management on a depleted range.

On the basis of the results already achieved, it is planned to extend the cooperative work of the Indian Service with the Soil Conservation Service to additional reservations during the fiscal year ahead.

The integrated Indian Service and Soil Conservation Service in the Pueblo and Navajo areas has supplied a new type of administrative procedure suggestive to the whole of Indian Service and to Federal service generally. Each of these jurisdictions represents the consolidation of a number of prior smaller jurisdictions. Much power from the Washington office is delegated to the superintendents and their local staffs in these two areas, and while preserving all requisite technical distinctions, Indian Service and Soil Conservation Service are functionally integrated. A more effective centering of service and of program in very local areas is made possible. A new structure of Indian administration is taking form in these two regions.

INDIAN EMERGENCY CONSERVATION WORK

Indian emergency conservation work meets a twofold need. It has provided employment and it has improved reservation lands. Through this work Indians are becoming trained for self-support on reservations which, through conservation of their resources, may some day become self-sustaining sources of an adequate livelihood.

I. E. C. W. ended its third year on June 30, 1936. Liberalized regulations which gave the Indian Service the supervision of this work on Indian reservations continued. Wholehearted cooperation has been given by the Department to all our efforts, and Director Fechner, through his sympathetic consideration and cordial cooperation, has aided materially in advancing the work.

The sum of \$9,000,000 was allotted for the fiscal year 1936—\$1,000,000 less than for 1935. The decrease somewhat handicapped the I. E. C. W. program, but effective results were achieved nevertheless.

Enrollment and employment.—It is estimated that approximately 30,000 Indian enrollees have been employed since work began in 1933. The total average daily number of men on the pay roll during the last 3 years has been 8,941 and the men have worked a total of 8,985,773 calendar days. Some of the agencies staggered employment.

Indians were given preference for employment in supervisory jobs and enrollees were taken over into them as rapidly as they could be trained. It is difficult to find Indians technically trained as foresters and engineers. However, a large number of group foremen, mechanics, machine operators, camp assistants, and assistant foremen have been Indians. In skilled, "facilitating", and supervisory positions, the average per month up to and including March 31, 1936, shows 589 Indians employed as against 479 whites.

Indian enrollees are permitted to work from camps or from their own homes. They are paid \$30 per month cash allowance, as in white C. C. C. camps, with quarters and food in camp. Where Indians live at home and subsist themselves, they are allowed commutation of \$15 per month for quarters and rations.

The family camp is encouraged. This arrangement is advantageous to the Government and beneficial to the Indians. Family camps permit regular employees of the Service to visit Indian groups frequently and to help them in sanitation and health problems, recreation, and welfare activities.

Health and accidents.—Few work-connected accidents were reported; there was some illness, and there were very few deaths. Special stress is placed upon safety. By arrangement with the Red Cross, first-aid schools were held at seven centers during the past year. Certificates were given to 194 Indians, of whom 113 qualified

as instructors, thus providing personnel for a thoroughgoing first-aid training program.

Production accomplishments.—Varied work projects were undertaken on 74 reservations in 23 States. Work has been carefully integrated with the developmental program for each reservation. Tribal authorities and the technical staff at each agency assisted the superintendent in planning. Water development was stressed. Soil-erosion work was intensified. Every consideration was given to preventing overgrazing. Check dams and other structures were built to prevent the washing away of rich soil. Water is urgently needed in all States lying between the Mississippi River and the Rocky Mountains.

A statement of the major activities undertaken during the period July 1933 to April 30, 1935, follows:

Telephone lines.....	miles..	4, 469
Firebreaks.....	do....	1, 614
Truck trails.....	do....	5, 212
Horse trails.....	do....	1, 622
Fences.....	do....	6, 385
Springs and well development.....	units..	3, 145
Impounding and large diversion dams.....	do....	2, 546
Insect-pest control.....	acres..	652, 058
Rodent control.....	do....	4, 402, 319
Erosion control, check dams.....	units..	61, 774
Bridges:		
Vehicle.....	do....	543
Stock.....	do....	179
Corrals.....	do....	127
Elimination of useless range stock.....	head..	246, 963

In health and morale the Indians benefited. Reservation values have increased. The work undertaken has proved the necessity of establishing long-range programs for reservation activities.

Disbursements analyzed.—Analysis of disbursements from Emergency Conservation funds for the period ending March 31, 1936, shows that pay-roll items (including shelter and subsistence, commutation thereof, and feed and hire of teams) amounted to 71.3 percent of the total funds spent. Purchases of heavy equipment totaled 7.1 percent. Supplies and materials accounted for 13.7 percent. Purchases of equipment were kept to a minimum consistent with efficient work. However, the equipment purchased definitely increased the amount of work accomplished.

Education.—This past year greater stress has been laid on education and recreation. This program, which is developing hopefully, is characteristically decentralized and flexible, resting upon local initiative. Plans have been modified according to the needs of each reservation but are unified and coordinated through office and field

supervision. Training on the job, leisure-time activities, including both athletics and adult education, and special projects, such as the first-aid instructors' training, were the three typical means employed. The nature of the training has been vocational rather than academic. In all respects, results were due in large measure to generous voluntary assistance of regular Indian Service and technical employees and from outside sources.

Opportunities for leadership.—Leadership training has been a major objective. Indian enrollees commencing at minimum pay may, by application and industry, progress through minor positions to higher brackets, such as group foreman or even project manager. The Indians have welcomed this opportunity. Many have shown dependability and real leadership. There has been a gratifying number of promotions, and several from I. E. C. W. were able to obtain employment at higher wages in the Indian Service and elsewhere.

Savings accumulated.—Indians have saved their wages and in many instances have purchased household equipment, clothing, and some livestock. Approximately \$1,500,000 has been deposited during the past 3 years as individual Indian money, and a substantial balance remains available for use by the Indians later on.

Indians at Work.—This semimonthly magazine continues to be popular not only with the Indians and Indian Service personnel but also with schools, organizations, and individual friends of the Indians. Twelve thousand copies are now being sent out each 2 weeks.

INDIAN LANDS AND MINERALS—TRIBAL CLAIMS

New Indian lands.—The purchase of lands under the Navajo-Arizona Boundary Extension Act of June 14, 1934 (48 Stat. L. 960), has been practically completed. A total of 310,146.37 acres has been bought with tribal funds, as authorized by the act, and added to the Navajo Reservation. (This figure includes pending negotiations which will be completed in the very near future.) There are, however, a few isolated white-owned tracts within the reservation which cannot yet be purchased because the vendors demand a price far above the actual worth of their property. Under acts of Congress approximately 21,500 acres of land have been added to the Fort McDermitt Reservation, Nev.; and 80 acres to the Jicarilla Reservation, N. Mex., and authority has been granted the Secretary of the Interior to set aside not to exceed 171,200 acres of land for the Indians of the Walker River Reservation, Nev. Substantial progress is being made in the purchase of lands within the various pueblos with funds awarded them pursuant to the Pueblo Lands Board Act as amended. There are 28 additional tracts that have actually been acquired at a cost of \$12,001.26, and options obtained on many more,

final action on which is delayed pending completion of probate proceedings in the local courts. Lands have been acquired for school, hospital, and other administrative sites involving 18 tracts covering approximately 222 acres. Pursuant to authority contained in section 5 of the Indian Reorganization Act of June 18, 1934 (48 Stat. L. 984), options have been obtained covering 127,681.67 acres for a total cost of \$985,474.79. Of this total, options covering 111,887.37 acres have been accepted by the Department at a cost of \$859,431.71. Title papers have been submitted covering 65,790.04 acres for a total consideration of \$607,076.

In cooperation with the Resettlement Administration, which took over those functions of the land program of the Federal Emergency Relief Administration concerning the so-called submarginal land acquisition activities, a total of 1,302,747 acres has been optioned at a total estimated cost of \$3,762,792. This difference in figures over those contained in last year's annual report is occasioned by the fact that, due to a drastic curtailment in funds for use by the Resettlement Administration, a good many of our projects necessarily were abandoned. At this writing options have been accepted by the Resettlement Administration constituting legal commitment covering 1,196,085 acres at a total cost of \$3,448,976. Purchases have actually been completed covering 573,392 acres of land at a total cost of \$1,509,172.

In furthering the land-acquisition program under the Indian Reorganization Act, a total of \$2,000,000 is available for the fiscal year 1937, one-half of which is expendable and the other half contractual. Allocations of this \$2,000,000 have been made for land purchases within the States of Nevada, California, Idaho, Washington, North Dakota, South Dakota, Montana, Utah, Oklahoma, Michigan, Minnesota, Wisconsin, Mississippi, Florida, and North Carolina.

Lands restored to Indians.—Under section 3 of the Indian Reorganization Act of June 18, 1934 (48 Stat. L. 984), approximately 211,959 acres formerly opened to homestead entry have been returned to a reservation status. Of this area, 192,577.06 acres were restored to the Flathead Reservation; 9,504.51 acres were restored to the Pine Ridge Reservation; 9,277.59 acres were restored to the Grand Portage Reservation; and 600 acres were restored to the Kiowa, Comanche, and Apache Reservations.

Lands leased for Navajos.—During the year an aggregate of 595,184 acres of white-owned lands was leased for the Navajo Indians at an annual rental of \$19,526.16. The lands are leased pending acquisition by purchase or exchange in Arizona under the provisions of the act of June 14, 1934 (48 Stat. L. 960), or the enactment of similar legislation applicable to New Mexico.

Extension of trust periods.—By order of the President, the period of trust on allotments made to Indians of the various tribes in Oklahoma was extended for 10 years. Section 3 of the act of June 15, 1935 (49 Stat. L. 378), extended until December 31, 1936, the trust periods on all Indian lands outside of Oklahoma which would otherwise have expired. The act of February 11, 1936 (Public, No. 435, 74th Cong.), reimposed the trust on certain lands patented to the Pala Band of Mission Indians in California and extended the trust period for 10 years from January 5, 1936.

Fee patents, sales, etc.—A few sales to white persons have been made of allotted lands to meet emergency situations on reservations not under the Indian Reorganization Act. No sales have been made releasing trust or restricted Indian lands for the year ending June 30, 1936. A number of sales to the United States in trust for individual Indian grantees from Indian grantors have been made to meet situations in which such transfers appeared to be mutually beneficial to the Indians in interest. Similar situations have also been met successfully by exchange of properties, as provided for in the Indian Reorganization Act.

Very few patents in fee have been granted to Indians on application, and these only after careful investigation showed that such action was wise in each particular case. A number of cases in which lands were purchased in past years for the Indians with trust funds and held under restricted deeds as taxable under Federal court rulings have been considered and the restrictions removed, especially where city or town lots were involved, so as to save for the Indian owner what could be realized out of the land before tax sales took the entire property. Unfortunately, some properties of this class have already been lost through taxation sales, but the Department has succeeded in obtaining legislation holding, in effect, that all lands heretofore purchased and held by restricted deeds are nontaxable until otherwise directed by Congress (act of June 20, 1936, Public, No. 716, 74th Cong., 2d sess.).

More than 50 cases, involving 16,000 acres or more, have been partitioned among the Indians during this year, and several more such cases are partially completed.

During the past fiscal year 15 patents in fee heretofore issued during the trust period without application by or consent of the Indian allottees have been canceled under authority of the act of February 26, 1927 (44 Stat. 1247), as amended by the act of February 21, 1931 (46 Stat. 1205). This brings the total number of such cancellations of which we have record to 455. Judgments have been rendered by various Federal courts for the recovery of taxes illegally assessed and collected on approximately 30 allotments, for which patents in fee

were issued without application and subsequently canceled by the Department. Suits have been instituted through the Department of Justice to clear title to, and recover possession of, approximately five allotments where allottees or their heirs have sought to dispose of the land without departmental approval.

Permits and business leases.—A number of small areas of allotted lands have been leased for business purposes so as to bring additional income to the Indian owners. A number of permits have been granted for a like purpose for tribal lands, with a noticeable increase in rental fees over those obtained in past years. Tribal councils and business committees of the Indians have been clothed with authority to determine for themselves, subject to departmental approval, when and what areas of tribal lands shall be used for mission and church purposes. One outstanding ruling has been obtained holding that the Indians of the Red Lake jurisdiction in Minnesota have the exclusive rights of fishing in the waters of Upper and Lower Red Lake within the exterior boundaries of the reservation. (See Solicitor's opinion of June 30, 1936, M. 28107.)

Minerals.—The year showed an increase in applications for leases on Indian lands for oil and gas mining purposes, particularly in Oklahoma and on the Blackfeet Reservation in Montana.

Kiowa sales resulted in a total bonus for the Indians of more than \$73,000. A total bonus in excess of \$532,000 was received for leases under the jurisdiction of the Five Civilized Tribes Agency, and more than 93,000 acres were leased during the year.

An exploratory permit was sold covering 19,200 acres on the ceded portion of the Wind River or Shoshone Reservation, Wyo., with provision for certain specific seismographic work. The British American Oil Co. was the successful bidder.

On March 25, 1936, the Secretary of the Interior signed an order revoking the order of September 20, 1929, and all subsequent orders which opened to exploration, location, and lease for mining purposes for minerals other than oil and gas, unallotted Indian lands on reservations to which section 26 of the act of June 30, 1919 (41 Stat. 31), as amended, was applicable. The order does not affect valid locations already made nor existing leases in good standing.

A number of good wells were drilled in the South Burbank unit in the Osage Reservation, Okla. This area was unitized and placed under a blanket lease carrying a 17½-percent flat rate royalty, and it is the belief of experts that the tribe will benefit through an increase in ultimate recovery which will result from the unit operation and development plan. The tribal council was agreeable to the royalty rate, which was later approved by the President, and to the unitization of the area.

A placer gold mining lease was sold embracing approximately 900 acres along the Big Horn River Canyon on the Crow Reservation, Mont. Considerable interest has been manifested in the canyon and a royalty as high as 30 percent has been offered for parts of the sands to be mined.

A decision of importance to the Choctaw and Chickasaw Indians was rendered by the Solicitor during the year, in which it was held that an abandoned railroad right-of-way traversing the Fitts Pool in the Choctaw and Chickasaw area, which had never been used and for which no damages had ever been paid by the railroad company, has reverted to the Choctaw and Chickasaw Nations. The field is rich at certain points where the right-of-way touches it and the tribes should realize a considerable sum from this strip in royalties and bonus.

Litigation.—Approximately 75 cases are now pending in the United States Court of Claims involving Indian tribal claims. Reports were made during the year to the Department of Justice and to the Court of Claims on 19 cases. The court rendered decisions adverse to the Indian tribes in seven cases. In the following two cases the Court of Claims rendered decisions in favor of the tribes:

Case No. L-51, *Seminole Nation v. United States*—Judgment in the sum of \$1,317,087.27.

Case No. H-219, *The Shoshone Tribe of Indians of Wyoming v. United States*—Judgment in the sum of \$793,821.49.

The United States has petitioned the Supreme Court for a writ of certiorari in the *Seminole case* and both sides are petitioning for further action in the *Shoshone case*.

Case No. E-346, relating to lands awarded to the Oregon-Washington Wagon Road Co., went to the Supreme Court of the United States on certiorari. The case was dismissed, but the Court indicated that the Indians had a good moral claim and that Congress should enact further legislation to permit effective judicial determination. The legislation has since been enacted.

Litigation involving the *Jackson Barnett case* is still being carried on in California and other parts of the United States. In Case No. 4556, equity, to determine the Barnett heirs, about 300 persons are claiming a share in this estate. The United States has intervened to protect the full-blood heirs.

Approximately 35 suits have been instituted, upon the recommendation of this Office, to protect the lands of these Indians, and some of the suits have already been brought to a successful conclusion. Sales of lands among the Five Civilized Tribes have been limited or restricted to emergency situations or where the lands were taxable and about to be lost through tax sales.

About 30 Osage suits in partition proceedings in the district court of Osage County, Okla., have been approved in the Department, as required by law. The greater part of the lands involved in these suits were assigned or set aside to Osage Indians who have the right to elect to purchase them in partition proceedings.

Twenty-three reports were prepared on various bills introduced in the second session of the Seventy-fourth Congress relating to Indian tribal and individual claims, and two involving membership rights with different tribes.

The Interior Department Appropriation Act of June 22, 1936, contains an item of \$81,540.49 for payment to individual Sioux Indians for acreages of land which they did not receive as allotments. This appropriation was authorized by the act of June 14, 1935 (49 Stat. L. 340), which also provided for attorney fees not to exceed 10 percent of the amount of each claim.

Land legislation.—The following legislation affecting Indian lands was enacted during the year:

Bill no.	Subject	Act no.	Approval date
S. J. Res. 177....	To define term of certain contracts with Indian tribes.	Pub. Res. 135....	June 26, 1936
S. J. Res. 243....	Distribution of judgment rendered by the Court of Claims in favor of the Indians of the Blackfeet Reservation, Montana.	Pub. Res. 115....	June 20, 1936
S. 1142.....	To reserve certain land in Nevada and Oregon as a grazing reserve for the Fort McDermitt Indians, Nevada.	Public, 419.....	Jan. 17, 1936
S. 1494.....	Amend Chippewa Jurisdictional Act to permit either side to amend pleadings.	Public, 585.....	May 15, 1936
S. 2148.....	Leasing of restricted lands of members of the Five Civilized Tribes, Oklahoma.	Public, 441.....	Feb. 11, 1936
S. 2877.....	Extend trust period on certain lands reserved for the Pala Band of Mission Indians, California.	Public, 435.....	Do.
S. 3227.....	Amend sec. 3 of the act extending the period of restriction on lands of the Five Civilized Tribes, Oklahoma.	Public, 470.....	Mar. 12, 1936
S. 3460.....	Ascertain persons entitled to compensation on account of Private Claim 111, parcel 1, Nambe Pueblo grant.	Private, 558.....	May 15, 1936
S. 3797.....	Amend Klamath Jurisdictional Act.	Public, 592.....	Do.
S. 4152.....	Validate certain conveyances by Kickapoo Indians prior to Feb. 17, 1933.	Private, 722.....	June 29, 1936
S. 4184.....	Amend Delaware jurisdictional bill.	Public, 639.....	June 4, 1936
S. 4298.....	Payment of claims of non-Indian claimants, Pueblo lands.	Public, 640.....	Do.
H. R. 7764.....	Relieve restricted Indians whose lands have been taxed or have been lost through failure to pay taxes.	Public, 716.....	June 20, 1936
H. R. 9997.....	Granting leave of absence to homestead settlers during 1936.	Public, 527.....	Apr. 10, 1936
H. R. 12073.....	Reserve certain land in New Mexico as an addition to the Jicarilla school reserve.	Public, 721.....	June 20, 1936
H. R. 12074.....	Authorize consolidation of Pueblos of Jemez and Pecos.	Public, 693.....	June 19, 1936

PROBATE WORK

Five Civilized Tribes matters expedited.—The personnel of this division has been increased by one associate attorney who helps in the general work of the office and specializes in Five Civilized Tribes matters. Under a revised system whereby unnecessary red tape has been eliminated, these matters now receive prompt attention. Involved therein are proposed transfers of Indian litigation to the

Federal courts. The total number submitted was 387, and of this number, no intervention was had in 240 cases. The probate attorneys were advised to appear and protect all rights of the Indian in 116, and in 31 cases the Government intervened. These cases involve a 20-day time limit, and it is imperative that, in order to cooperate fully with the United States district attorneys and the Department of Justice, these matters be concluded well within the time limit. Under present handling that result is accomplished; furthermore, this Office is told that these matters are now disposed of more quickly and efficiently than at any other time in the history of the Indian Office.

Master docket proves valuable.—The master docket was started on January 8, 1934. It now contains complete data on every case received by the probate division since that date, and has become invaluable in furnishing easily accessible and reliable information on the general conduct of the division's business. It also makes possible the preparation of an absolutely accurate report on the amount and nature of the business transacted. Included in this docket are all cases received from examiners of inheritance, from the Osage Nation and the Five Civilized Tribes.

Educational program helps to prevent litigation.—The educational program on preparation of wills, instituted about a year ago, is now bearing abundant fruit. Contests are avoided and the Indian is now, in most instances, secure in the belief that his exact wishes will be carried into effect.

Notice of decisions now served on interested parties.—The system evolved of notifying all interested parties of the final determination of an estate, and the allowance of 60 days in which to make application for a rehearing, is also bearing fruit. It prevents extended correspondence with Congressmen and Senators over unimportant matters, and makes it unnecessary for heirs to importune the Department in cases long since decided. The 60-day limit on rehearings brings all disputes to a head while they are still fresh in the minds of both the officials and the litigants, and prevents applications in later years when pertinent evidence is difficult to secure.

Applications for rehearing are filed and indexed in the original cases. Heretofore these were counted separately as new cases. As a result, the number of cases disposed of will not come to so large a number as reported in previous years.

The total number of original cases handled during the current year, including Osage, Five Tribes, and the field generally, is 2,310.

More personnel needed.—The division is undermanned, both in Washington and in the field. There is no time available for careful study of reports and conditions. The diligent and efficient examiner

of inheritance cannot report more than 250 cases each year. In some districts there are now pending more than that number, with the increase of the present year to be cared for. A remedy for this situation is being sought by the appointment of additional personnel.

The detailed work of the Washington office staff is so heavy that, with all employees working industriously, much of the routine work is sometimes far behind. It is urgently hoped that this difficulty may be overcome also and the work of the division brought strictly up to date.

FORESTRY AND GRAZING

During the year the name of the Forestry Division was changed to the Division of Forestry and Grazing, to signify more fully the functions of the division.

New grazing regulations.—On December 28, 1935, the Department approved the new general grazing regulations, and on May 18, 1936, the new general forest regulations were approved. The objectives of the general grazing regulations are:

1. The preservation through proper grazing practice of the forest, the forage, the land, and the water resources on Indian reservations, and the building up of these resources where they have deteriorated.
2. The utilization of these resources to give the Indians an opportunity to earn a living through grazing their own livestock.
3. The granting of grazing privileges on surplus range lands not needed by Indians under such safeguards as will yield the highest return consistent with undiminished future use.
4. The protection of the interests of the Indians from the encroachment of unduly aggressive and antisocial individuals.

Permit system now uniformly adopted.—The Blackfeet Indians, who have heretofore leased their lands for grazing purposes, have accepted the grazing-unit permit system, so that all reservations which have grazing privileges for sale have now adopted the permit system.

New forest regulations enforce conservation policy.—The purposes sought in the general forest regulations for the management of Indian forests are:

1. The preservation of Indian forest lands in a perpetually productive state by providing effective protection, preventing clear-cutting of large contiguous areas, and making adequate provision for new forest growth when the mature timber is removed.
2. The regulation of the cut to insure method and order in the harvesting of the tree capital, so as to make possible continuous production and a perpetual forest business.
3. The development of Indian forests by Indians, for the purpose of promoting self-sustaining Indian communities, to the end that the Indians may receive from their own property not only stumpage but also whatever labor the Indians are qualified to perform.

4. The sale of Indian timber in open competitive markets on reservations where the volume produced by the forest annually is more than the amount practicable of development by the Indians; or where fire damage, insect infestation, disease, overmaturity, or other causes require extensive and rapid harvesting of the timber to prevent loss.

5. The preservation of the forest for scenic purposes along public highways, in the vicinity of Indian or white communities, and whatever the recreational or esthetic value of the forest seems to exceed its value for the production of forest products.

6. The management of the forest in such a manner as to retain its beneficial effect in regulating run-off and minimizing erosion.

Timber cutting.—Timber cut under contract amounted to approximately 240,000,000 feet, of which 121,000,000 feet were cut on the Klamath Reservation. Several contracts were completed, and there was a substantial number of applications for the purchase of comparatively large units of Indian timber. The Menominee Indian Mills completed the salvaging of timber damaged by the cyclone of August 1934.

Further decentralization effected.—Decentralization has been accomplished to a certain extent by giving superintendents of Indian reservations authority to approve grazing permits with the concurrence of the regional forester, and to approve timber contracts with a stumpage value up to \$500 and up to \$10,000 with the concurrence of the regional forester.

Recreational planning begun.—Preliminary recreational plans have been initiated on some of the reservations.

There has been a growing appreciation of, and desire for, on the part of self-governing Indians, the conservation and wise use of their forest and grazing resources.

IRRIGATION

Construction.—All construction activities were carried out under allotments of the Public Works Administration, totaling \$3,000,000, for expenditure on a total of 24 projects. With few exceptions these funds were spent in the rehabilitation and improvement of existing projects through extension or betterment of the irrigation canal and lateral systems, provision of urgently needed drainage facilities, construction of additional storage reservoirs, and subjugation of land. Subsequently \$379,465 was impounded: Portions of the funds allocated for F. P. 263, Drainage Colorado River Reservation, Ariz.; F. P. 597, Payment of Indians' share of construction cost of the Bartlett Dam on the Verde River, Ariz. (to be constructed under supervision of the Bureau of Reclamation); and F. P. 605, Irrigation and subjugation for the benefit of the New Mexico Pueblos.

Construction of a number of community and subsistence gardens was provided for through the allocation of a total of \$146,000. Operations under these allocations are and will continue to be handled as a joint Irrigation and Emergency Conservation activity, with the Irrigation Division furnishing the plans and materials and Emergency Conservation the necessary labor. These developments, many of which are in the course of construction, will be of immeasurable value to the Indians. The majority of them are in areas where irrigation has not heretofore been practiced or where no major or formal irrigation project exists. A large number are located in the present drought area. The projects are being designed and constructed in such manner that the operation and maintenance can be handled by the Indians with little or no assistance.

Surveys and investigations.—In addition to the surveys and investigations required in connection with the subsistence gardens, actual field work relating to the proposed construction of the Pine River Dam, Colo., was undertaken with an allotment of \$50,000 from the Public Works Administration, F. P. 601, for surveys, test drilling, and final designs. Miscellaneous surveys of a minor nature were carried on in connection with the present and future construction programs.

Operation and maintenance.—The available funds for operation and maintenance of the various projects amounted to \$1,268,152, of which \$60,000 was appropriated from the general fund of the Treasury for water development, \$744,952 from the same source for irrigation, \$6,500 from tribal funds for irrigation, and \$516,700 from collections from water users under projects where such action is required by existing law and regulations. Activities under this heading were largely routine, consisting of the delivery of water and the repair or replacement of worn-out structures, etc. The limited funds available permitted only the most urgent work to be done.

Walker River suit.—The Federal District Court for the District of Nevada entered a decree in this litigation which was adverse to the interests of the Indians and the United States. The court did not follow the rule of law established in the so-called Winters decision, basing its action partly upon the ground that since the Walker River Reservation was created by Executive order it did not have the same status as the Fort Belknap Reservation which was created by treaty or agreement with the Indians.

Rocky Mountain Power Co. agreement.—After much consideration, numerous conferences, and a great deal of correspondence, agreement was reached with this company under which it is expected that the original license issued it covering the development at project no. 5, Flathead River and Lake, Mont., will be amended so as to provide for

completion of construction in the relatively near future. Tribal interests are exhaustively protected and improvements in the terms of the license are being obtained.

Private litigation at Flathead.—Due to the very unsatisfactory situation facing the project management each year arising from the illegal and excessive diversions by landowners on the Flathead Reservation having private water rights confirmed by the Secretary of the Interior, a decision was reached to institute a suit against certain of them to enjoin such diversions in the future. In the past such diversions have resulted in the loss of considerable quantities of valuable water to the landowners under the project proper.

Coolidge Dam infringement suit.—Under date of June 1, 1936, the Court of Claims in the case of *George Sidney Benckley et al. v. The United States*, dismissed the plaintiff's petition for damages arising from an alleged infringement of their patent by the Government in connection with the construction of the Coolidge Dam, San Carlos project, Arizona.

Crow litigation.—The Federal District Court for Montana continued to keep under advisement the matter of its decision in the Crow injunction suit brought to restrain certain nonproject landowners on the Crow Reservation from illegal diversions of water from the Crow Indian project sources of supply. Fortunately, the available supply was somewhat greater than in previous years so that the situation is not so acute as it has been.

ROADS

An appropriation of \$4,000,000 permitted the Indian Service to continue its road-construction program, begun under the Public Works authority of 1933. With better training of more Indians in the technique of road building, and with the gradual acquisition of sufficient equipment, a greater mileage of improved roads has been achieved. It has also been possible to maintain all reservation roads, including removal of snow, thus permitting operation of school busses during the winter months, as well as medical service to Indians living in outlying districts. The road fund has helped the Indians and the Government greatly, not only as a means of providing much-needed improved roads for school busses, medical assistance, agriculture, and many other necessary activities, but in giving employment to Indians in each community of every reservation. Especially has this fund been of the greatest benefit in assisting Indians in drought-stricken areas. The Hayden-Cartwright Act of June 16, 1933, provided for an appropriation of \$4,000,000 annually hereafter to continue this necessary activity on Indian reservations. With this in mind, surveys and plans are being made to continue road work in the future

as a part of a normal Indian Service program to provide better roads and the employment of Indians, which is a matter of considerable concern to the Government even in normal times.

The Gallup-Shiprock Highway is being maintained as well as possible with the \$20,000 appropriation made annually for this 90-mile reservation section of U. S. Highway No. 666. Due to heavy traffic and weather conditions, this very important highway is rapidly going to pieces. It should be reconstructed to a better standard, but if this cannot be done, at least \$100,000 should be provided annually for maintenance and betterment.

The Indian Service maintains cooperative and amicable relations with the Bureau of Public Roads, other Federal bureaus and agencies, and with the various highway departments and county commissioners, to the mutual benefit of each, particularly of the Indian Service, which has been the recipient of much bridge material and funds on cooperative road projects. Many letters have been received from chambers of commerce and prominent citizens complimenting the Indian Service on its road work.

During the year an improved road-cost system has been set up, and many young Indian men and women have been trained as clerks and cost-accountants in connection with this activity. Approximately 70 percent of every dollar is expended directly or indirectly for labor. The overhead on road work has been kept very low; at the same time professionally trained and experienced road engineers are employed on practically every reservation, thus assuring the best practices in modern road construction. The superintendents and their road engineers are assisted by six specially trained and experienced district road engineers.

Actual construction accomplishments during the fiscal year are shown by the following figures:

Number of miles of road constructed or reconstructed.....	1, 296. 1
Number of miles of road surfaced.....	636. 1
Number of miles of road maintained.....	5, 220. 6
Number of school roads constructed or otherwise improved.....	288
Number of bridges constructed.....	339
Number of bridges repaired.....	234
Number of culverts constructed or installed.....	2, 572
Total number of persons, whites and Indians, employed at one time..	12, 605
Total number of different individual Indians employed.....	14, 201
Total number of Indians employed in skilled positions.....	1, 278
Total number of whites employed in skilled positions.....	480
Total mileage of all improved dirt roads on reservations.....	12, 305. 9
Total mileage of surfaced roads (gravelled, oiled, etc.) on all reservations.....	3, 675. 9
Amount required for annual maintenance of roads and bridges.....	\$947, 798

PERSONNEL ADMINISTRATION

The policy of delegating as much authority as possible to jurisdiction superintendents is being continued and expanded. The practice of bringing in reservation superintendents to the Washington office for periodic visits has proved to be a wise one, and has resulted in a better all-round understanding of personnel administration.

Steps were taken during the year to establish additional local civil-service examining boards for the purpose of filling noneducational positions in all types of activities being undertaken by the Indian Service. Heretofore, local board examinations have been available only for the filling of positions in the Irrigation Division. Careful instructions have been issued to eliminate misassignments of personnel.

During the year a number of conferences were held with representatives of the Civil Service Commission in an effort to have included in examinations for filling Indian Service positions those factors which will insure that persons appointed to positions in this service will have a sympathetic and realistic attitude toward the Indian problem. Some of the recently announced examinations show marked improvement over previous ones.

Some progress has been made in the development of a method which, it is hoped, will ultimately result in the establishment of a procedure to promote the employment of qualified persons in so-called in-service training work. At the present time there is no method by which those who are particularly qualified by education, and who have a practical and understanding point of view on the Indian problem, can be selected from civil-service registers. We hope during the coming fiscal year to take further steps in solving this problem.

A definite effort has been made this year to stop the practice of transferring unsatisfactory employees from one jurisdiction to another, and all jurisdictional superintendents have been informed that as far as possible, personnel problems will have to be handled on the basis of the facts surrounding any particular case. As a result, many personnel problems that were heretofore permitted to continue by the transfer of the individual from one place to another have been solved.

Plans have been worked out and the preliminary work completed on a consolidation of all the personnel records of the Washington office. Beneficial results have already been effected by this work.

Employees.—On July 1, 1936, there were 6,112 "regular" positions in the Indian field service, carrying gross salaries in the amount of \$9,756,500. This does not include the positions set up for the Wash-

ington office (213 regular, and 123 temporary, including public works, emergency conservation, and rehabilitation workers) and for the Alaska service, which numbers approximately 300, nor any of the emergency activities. The increase over the number of positions in effect July 1, 1935, is accounted for by the fact that certain positions in our irrigation work, and positions in our roads activities, have been placed on the regular salary list. In addition, a large number of positions as Indian assistant have been set up to provide opportunities for Indian employment, and the educational force has been increased to take care of the expanded educational program.

EMPLOYMENT OF INDIANS

The total number of Indians for whom employment was obtained for the fiscal year 1936 was 8,140, or 29.6 percent less than in the previous year. Of this number, 4,439 were placed within the Indian Service: 4,299 on emergency projects, and 140 in the regular field service; and 3,701 were placed outside the Service with private employers. In the previous year 3,818 private placements were made by the Employment Division, but of this number 1,517 were placed through reference to the National Reemployment Service. Although the Employment Division this year has referred Indians to the National Reemployment Service, and doubtless many have secured jobs through this Service, no report on the number thus placed is available. Consequently, all 3,701 placements made outside the Service by the Employment Division were made directly by the staff of the Employment Division. This was an increase of 1,635, or 45.5 percent more than the number placed directly by the Employment Division last year. Of the number placed in private employment this year 1,965 were permanent, as compared to 1,508 last year, or an increase of 23.2 percent. Of the total private placements made by the Employment Division, the number of permanent placements increased from 39.4 percent last year to 59 percent this year.

The decrease in the number of "inside the Service" placements reported by the Employment Division is due to the fact that the Indians have become accustomed, through the advice and aid given them in the past few years by the personnel of the Employment Division, to apply in person for jobs without going to the employment office. The number securing "outside the Service" or private jobs has remained rather constant. Most of these jobs are permanent, which seem to indicate a more stable employment situation and a demand for qualified Indians by employers.

The demand for women and girls for household work still continues beyond the available supply, and placements have fallen off in consequence. This situation may be attributed largely to the

better opportunity for employment on the reservations. There have been more jobs for Indian women and girls at agencies, schools, and hospitals, and increased employment of Indian men has meant that fewer women have had to take jobs away from home. Also, there has been an effort on the part of the social workers connected with the Employment Division to raise the standards of domestic employment and to stabilize it; this has meant fewer placements but more continuous employment.

The Kansas City employment office was closed because most of the girls placed were from Oklahoma and wanted work nearer their homes. An Oklahoma Indian girl, who has been employed in the employment office in Phoenix, Ariz., for several years, was transferred to our office in Oklahoma City to take over the placements of Indian women and girls in Oklahoma. An attempt is, therefore, being made to bring this service to the Indians.

The Employment Division has centered its attention largely upon the placement of qualified Indians in the better type of jobs instead of upon mass-recruiting of Indians for any and every type of work. There is developing, therefore, a specialized and individualized placement procedure. This has made possible the accumulation of authentic work records on individuals who have been placed; thus, as this process continues a more efficient service will develop.

APPROPRIATIONS

For expenditure during the fiscal year 1936 the sum of \$30,019,065 was made available by Congress. Of this amount \$28,519,132 was appropriated from the Federal Treasury and \$1,499,933 from funds held in trust by the United States for various Indian tribes. The appropriation from the Treasury included \$4,000,000 for the construction and maintenance of Indian Service roads (an increase of \$2,000,000 over the allotment for the previous year), and \$981,000 for the construction of public schools for the benefit of both white and Indian children. The net increase over the appropriation for 1935 was \$9,362,068, which included \$2,500,000 for the establishment of a revolving loan fund for making loans to Indian-chartered corporations and \$1,000,000 for the acquisition of land for Indian use, in accordance with the provisions of the Indian Reorganization Act of June 18, 1934. Substantial increases were granted for health and educational work as well as for other branches of the Service.

There follows a comparative statement of Indian Service appropriations for the last 4 years and the fiscal year 1937:

TREASURY APPROPRIATIONS

Object	1932	1933	1934	1935	1936	1937
General purposes.....	\$2,587,285.73	\$1,840,054.35	\$1,593,500.00	\$1,806,894	\$2,780,880	\$3,343,401.05
Industrial assistance..	1,605,000.00	1,301,000.00	1,233,881.67	1,060,510	3,740,490	2,288,470.00
Irrigation and water development.....	497,601.00	457,824.00	599,614.00	450,665	1,321,652	1,930,564.00
Education.....	10,185,400.00	9,771,000.00	9,103,230.00	7,990,565	8,795,120	9,395,375.00
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
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
Miscellaneous (roads, annuities, etc.).....	40,020.00	31,020.00	31,020.00	42,020	771,020	736,020.00
Subtotals.....	20,789,606.73	19,065,993.35	17,984,945.67	16,737,064	23,538,132	24,541,190.05
Construction.....	5,570,440.00	1,654,100.00	711,600.00	400,000	981,000	-----
Roads.....	670,000.00	1,420,000.00	270,000.00	2,000,000	4,000,000	3,500,000.00
Total.....	27,030,046.73	22,140,093.35	18,966,545.67	19,157,064	28,519,132	28,041,190.05

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
Industrial assistance..	180,532.21	45,000.00	188,000.00	35,000	151,000	381,000.00
Irrigation and water development.....	49,500.00	59,000.00	46,950.00	6,720	6,500	7,000.00
Education.....	910,000.00	803,000.00	708,600.00	599,550	389,580	332,820.00
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
Miscellaneous (roads, annuities, etc.).....	50,000.00	25,000.00	25,000.00	-----	-----	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
Grand total.....	30,445,092.92	24,355,773.35	21,246,246.67	20,583,979	30,019,065	29,735,410.05

No figures are included in the above statements for allotment from special funds for Indian emergency conservation work, public works, and other activities in the Indian Service associated with the national recovery program.

APPENDIX

INDIAN POPULATION

An Indian, as defined by the Indian Service, includes any person of Indian blood who through wardship, treaty, or inheritance has acquired certain rights. The Census Bureau defines an Indian as a person having Indian blood to such a degree as to be recognized in his community as an Indian. Furthermore, the population enumerated at the Federal agencies is not necessarily domiciled on or near the reservations. It is the population on the agency rolls and includes both reservation and nonreservation Indians. Thus an Indian may be carried on the rolls because of tribal inheritance rights, etc., and may reside anywhere in the United States or in a foreign country. Reports of births and deaths among the absentees are often not received. In many instances certification is made to the State registrars of vital statistics and thus to the Census Bureau, but not to the Indian Service. In a considerable number of cases the addresses of the nonreservation Indians are unknown. For the above reasons the statistics of Indian population as shown in the decennial reports of the Bureau of the Census do not agree with the statistics of the Indian Service.

The total estimated and enumerated number of Indians reported on January 1, 1936, by the Indian agencies was 334,013. This number consists of 238,283 Indians actually enumerated and 95,730 Indians taken from the earlier or special censuses and estimates based on records. The latter number will be considered hereafter as an estimate. (See tabular statement.)

The aggregate estimate and enumerated number of Indians reported by Federal agencies on January 1, 1936, increased by 3,152 over the corresponding figure from January 1, 1935, or 1 percent for the year.

Oklahoma has far more Indians than any other State. If the Five Civilized Tribes, Miami, and Peoria Indians are included, the Indian population is 96,244 or 28.8 percent of the aggregate Indian population. Arizona ranks second with 45,013, or 13.5 percent; followed by New Mexico with 35,570, or 10.6 percent; South Dakota with 27,401, or 8.2 percent; and California with 23,824, or 7.1 percent of the total. The other five States with over 10,000 Indian population are in the order named: Montana, Minnesota, Washington,

Wisconsin, and North Dakota. The first five States represent 68.3 percent of the entire Indian population, while the 10 States with an Indian population of over 10,000 form 88.6 percent of the aggregate Indian population.

It is significant that 87.6 percent of the 238,283 enumerated Indians resided at Federal jurisdictions, while only 29,489 or 12.4 percent resided off the reservations.

Of the enumerated population on January 1, 1936, the most important tribes numerically are the Navajo, Sioux, including the Assiniboin and Chippewa, numbering 44,078, 35,412, and 26,127, respectively; while in 1930 the same tribes were 40,863, 33,168, and 23,647. The increase from April 1, 1930, to January 1, 1936, for the Navajo Tribe being 3,215, or 7.9 percent; for the Chippewa Tribe, 2,480, or 10.5 percent; and the Sioux, including the Assiniboin, 2,244 or 6.8 percent.

As reported by the superintendents of the various agencies the full-blood Indians constituted over 60 percent of the enrolled Indian population while the mixed blood was less than 40 percent. The full-blood Indians in 11 of the States shown in table 2 formed over 50 percent of the enrolled Indian population. Six of these States had full-blood population of over 90 percent and in two other States the full-blood Indian population was over 80 percent. In 7 of the 22 States the full-blood population ranged between 40 and 50 percent. Minnesota has the smallest full-blood enrolled Indian population, and in Iowa, Mississippi, New Mexico, Arizona, and Florida practically all the enrolled population is full-blood. In none of these five States did the mixed Indian blood reach 3 percent of the total enrolled Indian population.

Arizona has more full-blood enrolled Indians than any other State, followed by New Mexico. In these two States the enrolled full-blood Indians constitute 53.9 percent of all the full-blood enrolled Indians in the United States.

The Indian population not actually enumerated (termed an estimate) is 95,730, which is as follows:

California:

Tulare County Indians, and Indians on Rancheria and public-domain allotments, on Apr. 1, 1930, Sacramento Agency-----	1, 735
Other Indians under Sacramento Agency but not enumerated on census rolls, 1930 estimate, Sacramento Agency-----	8, 761
California, Indian census May 16, 1933, not otherwise reported----	4, 483
Michigan, 1927 census-----	1, 192
New York, 1932 estimate-----	4, 523
Oklahoma (Five Civilized Tribes, Bureau of the Census, 1930):	
Cherokee-----	40, 904
Chickasaw-----	4, 685
Choctaw-----	16, 641

Oklahoma (Five Civilized Tribes, Bureau of the Census, 1930)—Contd.		
Creek.....	8,607	
Seminole.....	1,789	
		72,626
Quapaw Agency:		
Miami Reservation, 1935 estimate.....	290	
Peoria Reservation, 1935 estimate.....	400	
Texas, 1936 special report.....	400	
Washington (Taholah Agency), unattached Indians, largely of Cowlitz Tribe, 1936 estimate.....	500	
Wisconsin:		
Rice Lake Band of Chippewas, special census, July 1930.....	221	
Stockbridge Reservation, Keshena Agency, 1910 census.....	599	

The Indian population in the 24 States and the District of Columbia in which there were no Federal agencies in 1930 was 10,456. Doubtless many of these Indians are duplicated in the columns "Residing elsewhere" in table 2. See the 1933 Annual Report of the Secretary of the Interior, page 112, table 1.

TABLE 1.—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
Under 5 years.....	46,680	23,447	23,233	30 to 34 years.....	19,309	10,032	9,277
Under 1 year.....	9,296	4,681	4,615	35 to 44 years.....	33,031	17,285	15,746
5 to 9 years.....	46,736	23,434	23,302	45 to 54 years.....	25,039	13,403	11,636
10 to 14 years.....	39,456	20,028	19,428	55 to 64 years.....	16,787	9,178	7,609
15 to 19 years.....	36,219	18,154	18,065	65 to 74 years.....	10,030	5,257	4,773
20 to 24 years.....	28,843	14,697	14,146	75 and over.....	6,327	3,079	3,248
				Unknown.....	449	229	220

Source: Bureau of the Census Department of Commerce.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1936

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	238,283	124,430	116,853	203,554	104,433	99,121	5,240	2,569	2,671	29,489	14,428
Arizona	45,013	23,242	21,771	43,396	22,333	21,063	309	148	161	1,308	701	607
Colorado River Agency, see California 2	1,193	655	538	379	375	304	29	26	9	485	260	225
Cocopah Reservation (Cocopah) 3	22	12	10	34	22	12						
Colorado River Reservation	743	401	342	586	315	271	23	17	6	134	69	65
Chemehuevi	302	149	153	192	92	99	1	1	1	109	56	53
Mojave	434	248	186	383	221	172	20	16	4	21	11	10
Other tribes	7	4	3	1	1		2	2	1	4	2	2
Fort Mojave Reservation	416	232	184	59	38	21	21	1	3	351	101	160
Mojave	413	231	182	59	38	21	6	3	3	348	190	153
Other tribes	3	1	2				3	3	1	3	3	2
Fort Apache Agency and Reservation (Apache)	2,726	1,432	1,294	2,077	1,409	1,263	10	5	5	39	18	21
Hopi Agency and Reservation (Hopi) 3	3,101	1,621	1,480	3,014	1,575	1,439	8	6	6	79	40	39
Navajo Agency, see New Mexico and Utah	21,844	11,235	10,609	21,810	11,220	10,590	26	13	13	8	2	6
Hopi Reservation (part of) (Navajo)	3,482	1,800	1,682	3,471	1,794	1,677	11	11	5	1,077	5	
Leupp Reservation	2,488	1,110	1,078	2,485	1,108	1,077	3	2	1	5		
Navajo	2,185	1,110	1,075	2,182	1,108	1,074	3	2	1			
Other tribes	3		3				3					
Southern Navajo Reservation, see New Mexico (Navajo)	11,861	6,146	5,715	11,819	6,143	5,706	8	3	5	4		4
Western Navajo Reservation, see Utah 3	4,313	2,179	2,134	4,305	2,175	2,130	4	2	2	4	2	2
Navajo	4,280	2,159	2,121	4,276	2,157	2,119	4	2	2	4	2	2
Paiute	32	20	13	29	18	11						
Paiute Agency, in Utah, and Kaibab Reservation (Paiute)	89	53	36	84	51	33				5	2	3
Phoenix School Jurisdiction and Camp Verde Reservation (Apache)	413	231	182	164	91	73	46	29	17	203	111	92
Pima Agency	6,463	3,146	3,017	5,998	3,030	2,878	119	36	83	196	89	56
Fort McDowell Reservation (Mojave-Apache)	4,718	2,397	2,321	4,585	2,337	2,248	7	7	3	17	11	6
Gila River Reservation	4,150	2,119	2,031	4,024	2,062	1,962	58	14	22	80	46	34
Mariopa		496	239	493	236	237	2	2	2	1	1	
Pima		2,119	2,031	4,024	2,062	1,962	49	14	35	77	43	34
Other tribes		41	31	68	39	29	2	2	2	2	2	
Mariopa Reservation (Papago)	176	72	41	81	31	29	2	2	2	2	2	
Salt River Reservation	1,069	542	527	971	490	472	59	20	39	39	23	16
Pima	1,060	529	521	962	496	465	59	20	39	39	23	16
Other tribes	9	3	6	9	3	6						
San Carlos Agency and Reservation (Apache)	2,944	1,519	1,434	2,847	1,456	1,391	35	18	17	62	36	26
Sells Agency	5,894	3,015	2,879	5,835	2,981	2,854	27	15	12	32	19	13
Gila Bend Reservation (Papago)	228	125	103	228	125	103						

	5,142	2,615	2,527	5,083	2,581	2,502	27	15	12	32	19	13
Papago Reservation.....	5,142	2,615	2,527	5,083	2,581	2,502	27	15	12	32	19	13
Papago.....	5,142	2,609	2,523	5,083	2,581	2,502	17	9	8	32	19	13
Pima.....	10						10	6	4			
San Xavier Reservation (Papago).....	524	275	249	524	275	249						
Truxton Canon Agency	646	344	302	378	205	173	9	6	3	259	133	126
Havasupai Reservation (Havasupai).....	202	114	88	200	112	88	1	1	1	1	1	1
Hualapai Reservation (Walaapai).....	444	230	214	178	93	85	8	5	3	258	132	126
California	8,845	4,515	4,330	7,201	3,728	3,473	46	24	22	1,598	703	855
Carson Agency, in Nevada, and Fort Independence and Indian Ranch Reservations, homese tract, and Bishop scattered bands												
Paute.....	1,569	776	784	1,472	740	732	6	4	2	82	32	50
Other tribes.....	1,334	665	669	1,251	631	620	6	4	2	77	30	47
Colorado River Agency, in Arizona and Fort Yuma Reservation (Yuma)	1,226	111	115	1,221	109	112				5	2	3
Hoopa Valley Agency	822	427	395	727	375	352	11	6	5	84	46	38
Hoopa.....	1,954	965	989	1,511	758	753	9	4	5	434	203	231
Hoopa Valley Reservation.....	1,550	757	793	1,285	635	650	9	4	5	138	118	118
Klamath.....	568	301	267	508	272	236	9	4	5	51	25	26
Rancheria.....	982	456	526	777	363	414				205	93	112
Bear River (Bear River).....	404	208	196	226	123	103				178	85	93
Blue Lake (Blue Lake).....	23	13	10	19	11	8				4	2	2
Crescent City (Smith River).....	48	19	29	33	44	19				25	17	8
Eel River (Miami).....	151	78	73	84	47	37				67	31	36
Smith River (Smith River).....	62	51	51	79	46	33				34	16	18
Mission Agency	113	62	62	84	46	33				67	34	34
Augustine Reservation (Mission).....	2,917	1,542	1,375	2,089	1,155	934	7	3	4	891	384	437
Cabazon Reservation (Mission).....	13	7	6	12	6	6				1		
Cahuilla Reservation (Mission).....	27	17	10	22	12	10				5	5	
Campo Reservation (Mission).....	106	52	54	61	31	30				45	21	24
Captain Grande Reservation (Mission).....	131	67	64	113	56	57	1	1		17	10	7
Cuyapaipe Reservation (Mission).....	108	87	81	156	86	70				12	1	11
Inaja Reservation (Mission).....	3	1	2	1		1				2	1	1
Laguna Reservation (Mission).....	33	16	17	30	13	17				3	3	
La Jolla Reservation (Mission).....	2	3	5	2	2	3				86	41	45
La Posta Reservation (Mission).....	226	123	103	140	82	58				5	1	1
Los Coyotes Reservation (Mission).....	3	1	2	2	1	1				5	11	5
Manzanita Reservation (Mission).....	85	50	35	69	45	24				6	3	5
Mesa Grande Reservation (Mission).....	66	29	37	60	28	32				6	3	3
Mission Creek Reservation (Mission).....	221	123	98	151	89	62	2	1	1	68	33	35
Morongo Reservation (Mission).....	21	10	11	14	7	7				7	3	4
Morongo Reservation (Mission).....	297	160	137	198	118	80				99	42	57
Pala Reservation (Mission).....	208	111	97	153	86	67	1	1		54	24	30
Palm Springs Reservation (Mission).....	69	36	25	48	25	23				2	10	12
Pauma Reservation (Mission).....	49	36	33	47	26	21				22	10	12
Pechanra Reservation (Mission).....	220	110	103	103	57	46				117	53	64
Rinconon Reservation (Mission).....	183	100	83	111	61	50				72	39	33
San Manuel Reservation (Mission).....	41	21	20	26	14	12				15	7	8

1 See estimated statement of other Indians not enumerated, numbering 95,730.
 2 Fort Yuma Agency abolished. Cocopah and Fort Yuma Reservations formerly under Fort Yuma Agency now under Colorado River Agency.
 3 Hopi Indians numbering 423 transferred from Western Navajo Reservation to Hopi Reservation, hence, the marked change in population.
 4 April 1, 1934 population.
 5 Walker River Agency abolished and the reservations formerly under that agency transferred to Carson Agency.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence,
Jan. 1, 1936—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.												
San Pascual Reservation (Mission).....	0	4	5	0	4	5				26	17	0
Santa Rosa Reservation (Mission).....	51	32	19	25	15	10				65	28	37
Santa Ynez Reservation (Mission).....	84	39	45	19	107	88				45	20	25
Santa Ysabel Reservation (Mission).....	241	127	114	195	107	88	1		1	17	9	8
Soboba Reservation (Mission).....	125	63	62	108	54	54						
Soboba Reservation (Mission).....	36	17	19	36	17	19						
Sycuan Reservation (Mission).....	156	112	84	175	102	73	2		2	19	10	9
Torres-Martinez Reservation (Mission).....	1,592	805	787	1,402	700	702	13	7	6	177	98	79
Sacramento Agency												
Fort Bidwell Reservation.....	135	81	54	86	49	37	11	6	5	38	26	12
Paute.....	133	81	52	86	49	37	11	6	5	36	26	10
Other tribes.....	2		2				2			2		2
Fort Bidwell Reserve and Public Domain Allotments.....	430	214	216	335	168	167				95	46	49
Pit River.....	321	161	160	315	159	156				6	2	4
Other tribes.....	109	53	56	20	9	11				89	44	45
Round Valley Reservation												
Maidu.....	839	414	425	808	395	413	2	1	1	1		
Poma.....	149	70	79	141	64	77				6	5	1
Wailaki.....	219	98	121	206	91	115				13	7	6
Wintu.....	123	63	60	119	62	57				4	1	3
Yuki.....	93	45	48	92	44	48				1	1	1
Other tribes.....	66	39	27	62	36	26				4	3	1
Tule River Reservation												
Kern River.....	188	96	92	173	88	85				15	8	7
Yavilmani.....	43	24	19	36	22	14				7	2	5
Other tribes.....	84	42	42	76	36	40				8	6	2
Colorado												
Consolidated Ute Agency, see Utah.												
Southern Ute Reservation (Ute).....	834	433	411	846	413	403	12	5	7	6	5	1
Ute Mountain Reservation (Ute).....	386	199	187	372	191	181	10	5	5	4	3	1
Florida: Seminole Agency and Reservation (Seminole)												
Idaho												
Coeur d'Alene Agency, see Washington												
Coeur d'Alene Reservation.....	4,265	2,087	2,118	3,565	1,759	1,806	175	101	74	465	227	238
Coeur d'Alene Reservation.....	2,161	1,023	1,185	1,757	821	936	115	67	48	289	135	154
Coeur d'Alene.....	623	298	325	436	208	228	14	9	5	173	81	92
Other tribes.....	621	296	325	434	206	228	14	9	5	173	81	92
Other tribes.....	2		2				2			14	6	8
Kootenai Reservation (Kootenai)	118	58	60	104	52	52				102		
Nez Perce Reservation (Nez Perce)	1,420	607	763	1,217	561	656	101	58	43	102	48	54

	1,847	957	890	1,629	840	789	44	26	18	174	91	83
Fort Hall Agency and Reservation, see Utah.												
Bannock.....	346				137	174		6	6	172	31	26
Shoshone.....	1,497	783	714	4	703	645	32	20	12	117	60	57
Other tribes.....						4						
Western Shoshone Agency and Reservation, in Nevada												
Palute.....	197	107	89	179	98	81	16	8	8	2	1	1
Shoshone.....	73	37	36	71	35	36	1	1	1	1	1	1
Iowa: Sac and Fox Sanatorium Jurisdiction and Reservation (Sac and Fox of the Mississippi)												
Kansas.												
Potawatomi Agency.												
Iowa Reservation (Iowa).....	433	215	218	388	195	163	29	10	19	16	10	6
Kickapoo Reservation (Kickapoo).....	1,942	1,000	942	1,544	813	731	197	96	101	201	91	110
Potawatomi Reservation (Potawatomi).....	1,942	1,000	942	1,544	813	731	197	96	101	201	91	110
Sac and Fox Reservation (Sac and Fox of the Missouri).....	508	272	236	480	259	221	3	2	2	25	12	13
Minnesota.												
Consolidated Chippewa Agency.												
Bois Forte Reservation (Chippewa).....	321	163	158	265	140	135	23	13	10	33	10	23
Cass Lake and Winnibigoshish Reservations (Chippewa).....	988	508	480	710	373	337	150	73	77	128	62	66
Fond du Lac Reservation (Chippewa).....	125	57	68	89	41	48	21	9	12	15	7	8
Grand Portage Reservation (Chippewa).....	15,544	7,826	7,718	11,169	5,773	5,396	482	207	225	3,943	1,846	2,097
Leech Lake Reservation (Chippewa).....	12,935	6,485	6,451	9,121	4,709	4,412	400	195	205	3,415	1,581	1,834
White Earth Reservation (Chippewa).....	652	310	342	440	214	226	2	1	1	210	95	115
White Oak Point Reservation (Chippewa).....	529	274	274	474	263	221	14	4	6	41	13	28
Purchased Lands (Chippewa).....	1,302	684	618	727	300	337	12	5	7	563	289	274
Pipestone School Jurisdiction and Purchased Lands												
(Sioux).....	557	281	276	182	78	74	1	1	1	404	203	201
Red Lake Agency and Reservation (Chippewa).												
Mississippi: Choctaw Agency and Purchased Lands												
(Choctaw).....	2,051	1,060	991	1,896	986	940	31	12	19	124	62	62
Montana.												
Blackfeet Agency and Reservation.												
Blackfeet.....	1,841	934	907	1,833	929	904	8	5	3	1,748	805	943
Other tribes.....	15,752	8,021	7,731	13,551	6,974	6,577	453	242	241	1,748	805	943
Crow Agency and Reservation (Crow).												
Flathead Agency and Reservation (Flathead).....	4,418	2,107	2,011	3,560	1,842	1,748	38	19	19	520	246	274
Fort Belknap Agency and Reservation.												
Assinibolin.....	4,102	2,104	1,998	3,555	1,480	1,715	38	19	19	509	245	264
Gros Ventre.....	16											
Other tribes.....	2,127	1,074	1,053	1,895	968	927	28	8	20	204	98	106
Fort Peck Agency and Reservation.												
Assinibolin.....	3,051	1,548	1,503	2,376	1,139	1,111	33	25	8	564	247	317
Rocky Boy's Agency and Reservation.												
Chippewa.....	1,434	741	693	1,302	671	631	33	25	8	35	45	54
Other tribes.....	672	346	326	623	305	314	10	4	4	95	18	17
Tongue River Agency and Reservation.												
Cheyenne.....	758	393	365	675	351	324	19	15	4	64	27	37
Other tribes.....	4											
Tongue River Agency and Reservation.												
Assinibolin.....	2,747	1,375	1,372	2,338	1,186	1,152	139	66	73	270	123	147
Other tribes.....	1,514	770	744	1,285	666	619	70	35	35	159	69	90
Western Shoshone Agency and Reservation, in Nevada												
Palute.....	1,213	605	628	1,053	520	533	70	32	38	110	53	57
Shoshone.....	713	376	337	598	313	285	47	29	18	68	34	34
Other tribes.....	478	246	232	386	197	189	38	21	17	54	28	26
Tongue River Agency and Reservation.												
Cheyenne.....	1,562	800	762	1,482	757	795	57	31	23	12	11	11
Other tribes.....	1,559	797	762	1,479	754	725	57	31	26	23	12	11

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1936—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
Nebraska	4,563	2,370	2,193	3,221	1,664	1,557	342	175	167	1,000	531	469
Winnibago Agency.....	4,563	2,370	2,193	3,221	1,664	1,557	342	175	167	1,000	531	469
Omaha Reservation (Omaha).....	1,677	883	794	1,400	733	667	34	19	15	243	131	112
Ponca Reservation (Ponca).....	1,302	189	203	1,935	97	98	11	4	7	186	88	98
Santee Reservation (Santee).....	1,280	667	613	733	375	358	214	107	107	185	148	148
Winnebago Reservation (Winnebago).....	1,214	631	583	803	459	434	83	45	38	127	111	111
Nevada	5,169	2,549	2,590	4,903	2,434	2,449	182	83	99	24	12	12
Carson School Jurisdiction, see California §.....	4,384	2,177	2,207	4,272	2,129	2,143	107	44	63	5	4	4
Fallon Reservation §.....	420	213	209	405	205	200	12	6	6	2	1	1
Payute.....	416	212	204	402	205	197	12	6	6	2	1	1
Shoshone.....	4	1	3	4	1	3						
Fort McDermitt Reservation (Payute).....	272	125	147	252	120	132	20	5	15			
Mason and Smith Valleys (Scattered Indians) §.....	432	221	211	414	213	201	18	8	10			
Payute.....	423	215	208	405	207	198	18	8	10			
Other tribes.....	9	6	3	9	6	3						
Nye County Scattered Indians §.....	361	183	178	361	183	178						
Payute.....	29	16	13	29	16	13						
Shoshone.....	332	167	165	332	167	165						
Pyramid Lake Reservation.....	564	285	279	564	285	279						
Payute.....	561	285	276	561	285	276						
Other tribes.....	3	3	3	3	3	3						
Summit Lake Reservation (Payute).....	61	33	28	33	33	28						
Walker River Reservation §.....	494	249	245	481	243	238	13	6	7			
Payute.....	448	223	223	435	219	216	13	6	7			
Shoshone.....	46	24	22	46	24	22						
Public Domain.....	1,780	868	912	1,733	846	887	44	19	25	3	3	
Miami.....	1	1	1	1	1	1						
Payute.....	274	190	184	271	118	153	2	1	1	1	1	
Shoshone.....	697	444	483	695	444	481	2	2	2			
Washio.....	578	304	274	556	284	282	40	18	22	2	2	
Payute Agency, in Utah	190	91	99	178	86	92	12	5	5	5	5	7
Moapa River Reservation (Payute).....	154	76	78	145	72	78	7	3	3	3	3	2
Las Vegas Tract (Payute).....	36	15	21	33	14	19	5	2	2	2	2	4
Western Shoshone Agency and Reservation, see Idaho	535	281	254	453	239	214	75	39	36	2	3	3
Shoshone.....	440	226	214	370	191	179	68	34	34	2	2	1
Other tribes.....	95	55	40	83	48	35	7	5	2	2	2	3
Mexico.....	35,570	18,393	17,177	34,988	18,074	16,914	101	47	54	481	272	209
New Mexico	703	364	345	737	353	334	7	6	1	10	8	2
Jicarilla Agency and Reservation (Apache).....	703	364	345	737	353	334	7	6	1	10	8	2
Mescalero Agency and Reservation (Apache).....	751	364	387	737	353	354	4	3	1	2	1	1

	21,967	11,158	40,809	21,960	11,152	40,808	5	5	2	1	1
Navajo Agency, in Arizona											
Eastern Navajo Reservation (Navajo)	8,456	4,231	8,456	4,231	4,225	4,225					
Northern Navajo Reservation (Navajo)	8,560	4,455	8,557	4,455	4,105	4,105	3	3			
Southern Navajo Reservation, in Arizona (Navajo)	4,951	2,472	4,947	2,472	2,469	2,478	2	2			
United Pueblos Agency	42,149	6,543	5,636	11,597	6,218	5,379	83	33	52	262	205
Santa Fe School Division	2,296	1,166	1,130	2,188	1,072	1,072	46	18	67	32	30
Name Pueblo (Pueblo)	127	59	64	2	116	1,072	28	2	4	4	2
Piorris Pueblo (Pueblo)	118	57	61	114	55	59	4	2	4	2	2
Pioques Pueblo (Pueblo)	6	2	6	4	2	2	2	2	2	2	2
San Ildefonso Pueblo (Pueblo)	132	71	61	118	66	52	9	2	7	3	2
San Juan Pueblo (Pueblo)	586	295	291	533	279	274	11	5	22	10	12
Santa Clara Pueblo (Pueblo)	426	219	207	401	203	198	13	6	7	10	2
Taos Pueblo (Pueblo)	772	393	379	750	388	362	9	2	7	3	10
Tesuque Pueblo (Pueblo)	127	66	61	127	66	61	6	6			
Southern Pueblos Division	7,753	4,178	3,575	7,341	3,958	3,958	28	6	22	384	170
Acoma Pueblo (Pueblo)	1,181	613	568	1,123	580	543	38	22	214	214	170
Cochiti Pueblo (Pueblo)	309	167	142	305	165	140	2	2	58	33	25
Isla Pueblo (Pueblo)	1,140	620	520	1,114	601	513	4	2	4	2	2
Jemez Pueblo (Pueblo)	673	361	309	665	356	309	8	8	26	19	7
Laguna Pueblo (Pueblo)	2,332	1,216	1,116	2,043	1,072	971	27	6	8	5	3
Sandia Pueblo (Pueblo)	125	66	59	115	60	55	1	1	10	10	4
San Felipe Pueblo (Pueblo)	623	343	280	616	339	277	1	1	6	4	2
Santa Ana Pueblo (Pueblo)	624	345	39	244	99	89	1	1	7	5	2
Santo Domingo Pueblo (Pueblo)	203	557	386	916	532	383	11	9	3	2	1
Sis Pueblo	2,100	1,169	931	2,068	1,144	924	10	9	21	16	5
Zuni Pueblo	2,092	1,169	923	2,062	1,144	918	10	9	20	16	4
Other tribes	8	6	6	6	6	6	1	1	1	1	1
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee)	3,297	1,737	1,560	2,320	1,236	1,084	2	2	975	499	476
North Dakota	10,739	5,443	5,296	7,015	3,578	3,437	168	87	3,556	1,778	1,778
Fort Berthold Agency and Reservation	1,647	812	833	1,581	776	805	13	9	4	3	27
Arikara	599	280	310	566	274	292	4	1	3	15	15
Gros Ventre	711	349	362	690	338	352	3	3	1	7	8
Mandan	337	174	163	325	164	161	5	5	17	5	2
Fort Totten Agency and Devils Lake Reservation (Sioux)	1,005	511	494	923	472	451	42	21	40	18	22
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	45	28	17	45	28	17					
Standing Rock Agency and Reservation, see South Dakota (Sioux)											
Turtle Mountain Agency and Reservation (Chippewa)	1,705	852	853	1,551	779	772	53	26	101	47	54
Oklahoma											
Cheyenne and Arapaho Agency and Reservation (Cheyenne-Arapaho)	6,337	3,240	3,097	2,915	1,523	1,392	60	31	3,362	1,686	1,676
Kiowa Agency	29,928	11,534	11,394	17,057	8,632	8,425	718	358	5,153	2,544	2,609
Kiowa Reservation	2,818	1,468	1,350	2,496	1,297	1,209	133	71	189	110	79
Kiowa Reservation	6,187	3,002	3,185	6,049	3,118	3,118	29	19	10	52	57
Apache	4,721	2,294	2,427	4,693	2,266	2,397	13	6	45	22	23
Apache	324	169	155	322	167	155	1	1	1	1	1

Walker River Agency abolished and the reservations formerly under the jurisdiction of the United Pueblos Agency. Formerly Santa Fe School, Southern Pueblos and Zuni were separate agencies, now all combined under the jurisdiction of the United Pueblos Agency. January 1, 1935 population.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1936—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.											
Kiowa Agency—Continued.												
Kiowa Reservation—Continued.	2,181	1,065	1,116	2,154	1,054	1,100	3	—	3	24	11	13
Comanche	2,216	1,070	1,146	2,187	1,045	1,142	—	—	—	20	10	10
Wichita Reservation	1,466	708	758	1,386	665	721	16	5	3	64	30	34
Caddo	947	466	481	884	433	451	10	8	2	53	25	28
Delaware	143	67	76	143	67	76	—	—	—	—	—	—
Wichita	376	175	201	359	165	194	6	5	1	11	5	6
Osage Agency and Reservation (Osage).	3,379	1,533	1,846	3,390	1,642	1,748	10	6	4	1,589	778	811
Pawnee Agency	3,600	1,554	2,046	3,433	1,531	1,902	195	97	98	432	206	226
Kaw Reservation (Kaw)	514	267	247	297	157	140	44	21	23	173	89	84
Oakland Reservation (Tonkawa)	49	27	22	38	21	17	4	3	1	7	3	4
Otoe Reservation (Otoe)	742	385	357	570	297	273	68	34	34	104	54	50
Pawnee Reservation (Pawnee)	937	467	470	761	393	368	43	18	25	133	56	77
Ponca Reservation (Ponca)	818	408	410	767	383	384	36	21	15	15	4	11
Quapaw Agency	2,693	1,328	1,365	1,428	726	702	263	126	137	1,002	476	526
Eastern Shawnee Reservation (Shawnee)	269	124	145	168	82	86	27	15	12	74	27	47
Ottawa Reservation (Ottawa)	400	211	189	220	114	106	20	11	9	100	86	74
Quapaw Reservation (Quapaw)	527	253	274	330	161	169	16	9	7	181	83	98
Seneca Reservation (Seneca)	719	358	361	398	198	200	134	63	71	187	97	90
Wandotte Reservation (Wandotte)	778	382	396	312	171	141	66	28	38	400	183	217
Shawnee Agency	4,391	2,356	2,035	2,671	1,395	1,276	88	39	49	1,832	922	910
Iowa Reservation (Iowa)	1,111	52	59	256	137	119	—	—	—	1	—	3
Kickapoo Reservation (Kickapoo)	264	142	122	256	137	119	59	26	33	1,696	864	832
Potawatomi Reservation (Potawatomi)	2,760	1,385	1,375	965	496	470	59	26	33	1,006	41	65
Sac and Fox Reservation (Sac and Fox)	633	335	298	743	396	347	14	5	9	21	12	9
Shawnee Reservation (Shawnee)	4,695	2,300	2,395	3,557	1,789	1,768	307	160	147	831	351	480
Oregon	1,387	678	709	1,076	514	562	57	28	29	260	106	154
Klamath Agency and Reservation	319	155	164	329	163	166	27	14	13	56	28	28
Modoc	145	72	73	115	57	58	17	10	7	3	5	8
Paints	106	55	51	81	45	36	—	—	—	—	—	—
Pit River	145	72	73	115	57	58	17	10	7	27	10	17
Shasta	7	4	3	—	—	—	—	—	—	—	—	—
Salem School Jurisdiction	1,152	600	552	869	466	403	47	30	17	236	104	132
Grande Ronde Reservation	355	190	165	217	125	92	29	18	11	109	47	62
Clackamas	83	39	44	47	24	23	10	6	4	26	9	17
Rogue River	56	33	23	35	20	15	7	5	2	14	8	16
Umpqua	62	28	34	37	18	19	18	19	15	25	10	15
Other tribes	154	90	64	98	63	35	12	7	5	44	20	24

	468	238	388	175	10	5	5	100	50	50
Siletz Reservation.										
Chastacosta.....	30	42	18	14	1	1	1	5	1	4
Galice Creek.....	43	23	20	19	1	1	1	5	3	1
Josuna.....	43	24	15	6				29	14	15
Klamath.....	56	34	22	10				13	7	6
Meguenodon.....	52	26	39	21				13	8	5
Rogue River.....	49	28	21	23	1	1	1	6	4	2
Tututni.....	42	16	39	15				3	1	2
Other tribes.....	151	75	117	56	7	2	5	27	12	15
Fourth Section Allottees (Public Domain)	329	172	294	136	8	7	1	27	7	20
Cherokee.....	18	12	18	6				9	2	7
Klamath.....	55	26	29	22	3	3	3	1	1	1
Kus.....	55	25	30	30	1	1	1	1	1	1
Rogue River.....	71	38	68	30				3	3	3
Tututni.....	18	7	11	4				10	3	7
Umpqua.....	43	25	18	16	3	3	3	3	1	2
Other tribes.....	69	39	30	28	1	1	1	1	1	2
Umatilla Agency and Reservation										
Cayuse.....	1,451	534	617	379	131	61	27	282	114	168
Umatilla.....	374	168	310	145	46	19	20	18	4	14
Walla Walla.....	126	47	79	60	13	5	8	14	3	11
Other tribes.....	633	313	320	145	69	37	32	250	107	143
Other tribes.....	18	6	15	9	3	3	3	3	3	3
Warm Springs Agency and Reservation										
Payson.....	1,005	488	517	420	78	41	37	53	27	26
Payute.....	224	120	164	86	40	23	17	16	5	1
Tenino (Warm Springs).....	483	217	266	204	15	8	7	16	5	11
Wasco.....	221	115	106	88	11	5	6	26	14	12
Other tribes.....	77	36	41	28	5	5	7	5	3	2
South Dakota										
Cherokee River Agency and Reservation (Sioux)	27,401	14,019	13,352	12,225	1,480	503	564	2,629	1,391	1,335
Crow Creek Agency.....	3,431	1,752	2,795	1,471	1,324	101	147	318	150	168
Crow Creek Agency.....	1,572	791	1,276	649	1,027	45	85	166	97	69
Crow Creek Reservation (Sioux).....	965	473	829	408	53	15	38	83	50	33
Lower Brule Reservation (Sioux).....	607	318	289	241	206	77	30	83	47	36
Flandreau School Jurisdiction and Purchased Lands (Sioux)										
Fine Ridge Agency and Reservation (Sioux)	354	193	161	170	71	41	22	19	143	71
Rosebud Agency.....	8,579	4,369	4,210	4,123	3,914	97	54	445	203	242
Rosebud Reservation (Sioux).....	8,609	4,403	4,206	3,974	3,788	233	115	644	314	330
Yankton Reservation (Sioux).....	6,571	3,352	3,189	3,063	3,030	81	39	42	257	117
Sisseton Agency and Lake Traverse or Sisseton Reservation, see North Dakota (Sioux)	2,038	1,021	1,479	771	768	172	76	387	174	213
Utah										
Consolidated Ute Agency, in Colorado, and Public Domain Allotments (Ute)	2,734	1,413	1,898	1,005	893	139	67	697	341	356
Fort Hall Agency, in Idaho, and Washakie Sub-agency (Shoshone)	2,132	1,068	1,817	904	913	99	50	216	114	102
Navajo Agency, in Arizona, and Western Navajo Reservation.....	2,120	1,094	2,000	1,034	966	54	33	66	27	39
Navajo.....	43	25	43	25	18					
Paite.....	135	63	110	51	59	12	9	4		4
Navajo.....	307	161	307	161	146					
Navajo.....	303	158	303	158	145					
Paite.....	4	3	4	3	1					

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence,
Jan. 1, 1936—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.												
Paite Agency, see Arizona and Nevada.	384	192	192									
Goshute Reservation (Goshute)	151	76	75	176	178	178	3	1	2	27	15	12
Kanosh Reservation	23	9	14	21	7	14	2	1	1	13	9	4
Paite			1			1						
Ute	22	9	13	20	7	13				2		2
Koosharem Reservation (Ute)	28	13	15	27	13	14				1		1
Paite Reservation (Paite)	19	12	7	13	9	4				6	3	3
Shivwits Reservation (Paite)	60	44	46	86	44	42				4		4
Skull Valley Reservation (Goshute)	39	19	20	37	18	19	1		1			
Gandy (Homestead) (Paite)	3	2	3	3	3	2						
Cedar City (church property) (Paite)	29	16	13	29	16	13						
Ute and Ouray Agency and Reservation (Ute)	1,251	633	598	1,186	621	565	30	20	10	35	12	23
Washington	13,007	6,456	6,551	9,266	4,653	4,613	189	78	111	3,532	1,725	1,837
Coeur d'Alene Agency, in Idaho, and Kalispel Reservation (Kalispel)	86	46	40	54	46	38	2		2			
Colville Agency	3,954	1,996	1,938	3,220	1,669	1,560	107	46	61	657	290	367
Colville Reservation (Colville)	3,154	1,596	1,558	2,608	1,346	1,262	69	32	37	477	218	259
Spokane Reservation (Spokane)	830	400	430	612	314	298	38	14	24	180	72	108
Taholah Agency	2,509	1,237	1,237	1,491	779	712	23	12	11	995	481	514
Chehalis Reservation (Chehalis)	28	21	7	19	16	3					5	4
Makah Reservation (Makah)	412	223	189	349	194	155	3		3	60	29	31
Nisqually Reservation (Nisqually)	64	38	26	54	34	20				10	4	6
Ozette Reservation (Makah)	1,758	867	891	869	429	440	14	9	5	875	429	446
Quinalt Reservation	105	49	56	59	21	38				46	28	18
Quileute	285	141	144	268	130	138	1	1	1	16	10	6
Quinalt	1,219	613	606	525	267	258	12	7	5	682	339	343
Upper Chinook	123	51	72	6	6	1	1	1		116	45	71
Other tribes	26	13	13	11	6	5				15	7	8
Skokomish Reservation	211	104	107	176	92	84	5	2	3	30	10	20
Challiam	1						1	1				
Skokomish	210	103	107	176	92	84	4	4	3	30	10	20
Squaxin Island Reservation (Squaxin)	31	17	17	22	12	10	1	1		11	4	7
Tulalip Agency	3,507	1,763	1,744	2,089	1,041	1,041	12	3	9	1,415	721	694
Lummi Reservation	324	164	164	324	164	164	267	120	120	63	63	57
Lummi	663	340	323	513	277	266				120	63	57
Sukomish												
Muckleshoot Reservation (Muckleshoot)	107	89	108	188	85	103	3	1	2	6	3	3
Port Madison Reservation (Suquamish)	170	84	86	164	79	75	3	3		13	5	8

Wisconsin Reservation (Puyallup)	328	167	32	17	17	296	146	150
Swinomish reservation	283	149	278	147	5	5	3	2
Other tribes	281	147	276	145	3	5	3	2
Tulalip Reservation and Tulalip unattached Indians	661	341	400	237	2	199	97	102
Snohomish	653	338	452	234	2	199	97	102
Other tribes	5	3	8	3	2	760	397	363
Public Domain (Clallam)	765	400	365	5	2	13	6	7
Public Domain (Nooksak)	233	122	220	116	4	3	1	2
Public Domain (Stagit)	206	113	190	80	2	3	3	2
Yakima Agency and Reservation (Yakima)	2,921	1,379	2,391	1,262	45	85	233	252
Great Lakes Agency ⁸	11,607	5,849	9,449	4,797	388	1,770	877	893
Bad River Reservation (Chippewa)	4,751	2,397	3,846	1,916	44	831	423	408
Lac Courte Oreille Reservation (Chippewa)	1,220	636	749	392	24	456	229	227
Lac du Flambeau Reservation (Chippewa)	1,509	786	1,464	714	29	106	58	48
Red Cliff Reservation (Chippewa)	884	422	462	404	15	113	55	58
Scattered bands (Potawatomi)	613	324	450	243	6	148	77	71
	426	197	403	214	4	8	4	4
Keshena Agency and Menominee Reservation (Menominee)	2,180	1,072	2,078	1,011	19	53	36	47
Tomah School Jurisdiction	4,676	2,344	3,525	1,725	295	856	418	438
Oneida Reservation (Oneida)	3,235	1,631	2,303	1,110	163	95	370	399
Public Domain Allotments (Winnebago)	1,441	713	1,222	615	132	87	48	39
Wyoming	2,261	1,123	2,033	998	61	167	73	94
Shoshone Agency and Wind River or Shoshone Reservation	2,261	1,123	2,033	998	61	167	73	94
Arapaho	1,128	572	1,088	535	16	24	10	14
Shoshone	1,133	566	945	463	45	143	63	80

⁸ Exclusive of Stockbridge Reservation, Keshena Agency, and Rice Lake Band of Chippewas, Great Lakes Agency (see estimated statement).
⁹ The name of the Lac du Flambeau Agency has been changed to the Great Lakes Agency.

TABLE 3.—Indian school population and school enrollment during fiscal year ended June 30, 1936

State and jurisdiction	Indian children, 6 to 18	Enrollment								Definite information not available	Not enrolled in any school	Not eligible for enrollment	Under 6 years and over 18 years in all schools
		Total number	Public	Federal day	Federal reservation boarding	Federal nonreservation boarding	Mission private and State day	Mission private and State boarding	Sanatorium				
Total	103,641	50,328	10,609	2,985	8,509	4,192	1,455	6,543	448	447	13,855	1,460	2,699
Arizona	13,302	655	2,985	2,012	752	287	1,189	99	128	735	4,804	98	344
Colorado River:													
Chemehuevi.....	38	18	22	22	37	8	8			5	2	1	2
Mohave.....	196	200	121	22	12	228	381	26	3	52	44	15	2
Fort Apache.....	813	771	5	506	7	95	24		20		36	11	34
Hopi: Hopi.....	661	659	27	506	7	24							2
Kaibab (under Paiute).....	29	1	26	4									2
Navajo:													
Leupp 1.....	385	430	14	23	336	46	3	8					45
Navajo (formerly under Hopi) 1.....	199	217		161	56		446		3				18
Southern Navajo 1.....	4,422	1,792	231	315	418	382	41	3			2,735		105
Western Navajo 1.....	1,737	459	27	44	344	41		3			1,312		34
Phoenix: Camp Verde.....	1,119	95	73	8	13		94	80	1	14	14	3	4
Pima.....	2,125	1,421	38	870	169	33	141	40	4	384	433	65	63
San Carlos.....	810	1,586	16	300	52		443			15	225		16
Sells.....	1,601	1,234	84	602					105	307			
Truxton Canon:													
Havasupai.....	48	46	23	15	8							2	
Hualapai.....	119	126	26	83	15							1	8
California	4,766	3,690	12	46	523	114	53	12	9	198	294	141	121
Bishop (under Carson) 1.....	449	271	12	43	1					77	45	28	
Fort Yuma 1.....	189	28		3	50								8
Hoopa Valley.....	1,186	1,122	1,001		120		1	1		3	99	63	38
Mission.....	756	570		87	87		47		4	67	67	6	19
Sacramento.....	2,186	2,112	1,826	206	206		4	11		48	72	36	46
Florida: Consolidated Ute	295	215	55	59	15				3	90	165	35	10
Florida: Seminole	182	23	23										6
Idaho	1,056	990	67	67	101	52	101	12	12	46	86		66
Coeur d'Alene:													
Coeur d'Alene 1.....	185	159	84	3	3		70	2		25	2		1
Nez Perce.....	349	333	12	12	31		31	49	5	27	2	14	16
Fort Hall.....	522	498	371	67	52			1	1	16	57	21	49
Iowa: Sac and Fox	128	129	8	102	5		1	1	13	7	7	7	8
Kansas	731	621	549	69	69			2	2	75	57	10	19
Sac and Fox.....	35	31	28	3	5		2	5		1	1	1	2
Potawatomi.....	299	234	234	45	45			1		11	15	5	7

Iowa.....	262	178	172	6	1	1	56	34	3	6
Kickapoo.....	138	132	115	15	1	1	3	7	2	4
Minnesota.....	4,749	4,307	3,245	208	363	47	368	131	14	57
Consolidated Chippewa.....	4,090	3,723	2,970	374	249	41	312	101	11	46
Pipestone.....	67	67	52	14	1	1	56	30	3	11
Red Lake.....	592	517	223	70	114	5	208	208	12	34
Mississippi: Choctaw.....	545	371	369	81	282	5	94	364	134	110
Montana.....	4,832	4,584	3,435	198	191	5	93	65	7	24
Blackfeet.....	1,203	1,138	922	63	94	65	59	25	2	24
Crow.....	664	632	563	21	19	24	1	56	5	24
Flathead.....	999	880	662	25	37	155	9	123	39	25
Fort Belknap.....	439	379	305	16	41	1	12	58	16	7
Fort Peck.....	832	830	742	52	13	1	23	31	26	36
Rocky Boys.....	353	359	116	4	1	2	7	31	1	6
Rocky Mountain.....	442	357	125	76	73	3	66	31	20	12
Tongue River.....	1,437	1,415	1,190	41	165	17	19	3	3	3
Nebraska.....	385	322	322	8	47	8	2	3	3	3
Winnebago.....	526	521	450	24	40	7	17	3	3	3
Omataha.....	396	370	317	2	57	1	2	3	3	3
Santee.....	130	130	101	2	21	1	17	3	3	3
Ponca.....	1,444	1,216	687	12	1	12	124	177	31	33
Nevada.....	1,269	1,013	548	282	216	1	122	137	18	63
Carson (includes Walker River).....	39	20	16	4	1	1	2	39	3	10
Moapa River (under Pahute, Utah).....	196	183	123	32	12	12	13	221	10	10
Western Shoshone.....	9,495	5,144	132	839	360	500	7	4,554	73	216
New Mexico.....	1,772	1,655	1,222	15	90	51	3	11	9	7
Jicarilla.....	235	225	4	1	1	1	3	28	7	18
Mescalero.....	2,975	888	50	123	121	121	2	2,108	21	21
Navajo.....	3,172	1,118	620	160	60	60	2,086	32	32	32
Eastern Navajo.....	631	645	8	147	63	63	40	54	54	54
Navajo.....	1,767	1,598	54	373	116	166	10	232	51	73
United Pueblos.....	543	505	227	21	243	7	49	6	6	11
Santa Fe.....	1,068	698	8	7	529	7	387	9	26	26
Zuni.....	4,305	3,526	1,663	120	83	446	5	773	147	165
North Carolina: Cherokee.....	4,465	439	224	15	1	62	5	27	17	24
Fort Berthold.....	230	219	46	21	44	44	23	40	25	29
Fort Totten.....	1,257	955	131	15	60	28	80	258	46	36
Standing Rock.....	2,353	1,913	760	84	312	7	68	448	59	76
Turtle Mountain.....	38,396	31,688	26,817	476	1,353	7	6,837	593	186	722
Oklahoma.....	793	649	345	59	17	2	46	165	40	61
Cheyenne and Arapaho.....	2,131	1,707	1,142	67	97	5	357	201	134	134
Kiowa.....	1,944	1,687	1,502	12	173	173	200	65	51	68
Osage.....	173	117	109	1	7	1	56	6	1	6
Pawnee.....	276	247	185	1	43	9	47	9	8	27
Favnee.....	266	245	137	37	69	2	22	21	6	22
Ponca.....	243	188	131	13	44	1	51	14	6	10
Otoe.....	18	10	8	1	1	1	4	4	1	1
Tonkawa.....	18	10	8	1	1	1	4	4	1	1

1 1935 data.

	3,508	3,240	2,908	20	90	1	160	61	70	268	127	7
Washington												
Colville.....	907	830	724	---	19	---	78	9	39	40	6	2
Spokane.....	247	225	217	---	---	---	8	---	---	22	8	---
Taholah.....	538	475	430	---	---	1	11	---	20	58	33	15
Tulalip.....	1,049	899	872	20	11	---	7	---	11	139	79	---
Yakima.....	707	811	665	---	60	---	56	30	---	9	5	33
Wisconsin	3,178	2,802	1,341	368	114	338	293	8	325	175	91	124
Keshena 1.....	593	608	64	348	8	9	16	3	6	13	5	34
Great Lakes:												
Lac du Flambeau.....	250	267	58	---	14	20	6	---	22	13	4	39
Red Cliff.....	191	174	54	---	16	98	6	---	8	17	---	6
Crandon.....	87	76	62	4	10	---	4	---	---	45	---	---
Bad River.....	323	304	110	---	18	140	36	---	26	6	---	13
Lac Courte Oreilles.....	306	384	236	---	42	71	35	---	10	16	3	14
St. Croix.....	100	60	54	---	4	---	2	---	40	---	---	---
Tomah.....	820	557	436	5	20	---	91	5	200	66	18	3
Orinda.....	418	372	267	---	2	---	103	---	26	35	16	15
Winnabago.....	699	645	169	187	24	---	265	---	---	66	16	16
Wyoming												
Shoshone.....	361	344	130	---	12	---	25	---	---	33	8	16
Arapaho.....	334	301	39	10	12	---	240	---	---	33	8	---

1 1935 data.

2 1934 data.

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1936

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Arizona:				
Colorado River Agency:				
Mohave.....	22	18	B-5	Day.
Fort Apache Agency:				
Canyon.....	32	20	B-3	Do.
Cibecue.....	62	33	B-5	Do.
Fort Apache (Whiteriver).....	128	96	B-9	Reservation boarding.
Do.....	185	145	B-9	Day.
Theodore Roosevelt.....	294	266	B-9	Reservation boarding.
Hopi Agency:				
Chimopovy.....	68	63	B-6	Day.
Hotevilla-Bacabi.....	129	113	B-9	Do.
Moencopi.....	86	74	B-6	Do.
Oraibi.....	98	90	B-8	Do.
Polacca.....	137	123	B-8	Do.
Toreva (Second Mesa).....	69	63	B-6	Do.
Navajo Agency:				
Chin Lee Area:				
Chin Lee.....	149	142	B-6	Reservation boarding.
Denehotso.....	51	23	B-4	Day.
Lukachukai.....	99	54	B-4	Do.
Rock Point.....	40	19	B-3	Do.
Rough Rock.....	40	21	B-2	Do.
Fort Defiance Area:				
Fort Defiance.....	298	287	B-6	Reservation boarding.
Do.....	1	1	B-6	Day.
Crystal.....	51	33	B-6	Do.
Hunters Point.....	35	23	B-2	Do.
Saw Mill.....	45	24	B-2	Do.
Keams Canyon Area:				
Keams Canyon.....	171	163	B-6	Reservation boarding.
Pinyon.....	28	20	B-2	Day.
Steamboat Canyon.....	60	38	B-3	Do.
Klagetoh Area:				
Cornfields.....	59	46	B-5	Do.
Greasewood.....	55	33	B-3	Do.
Kinlichee.....	62	45	B-3	Do.
Klagetoh.....	52	40	B-2	Do.
Pine Springs.....	56	20	B-6	Do.
Wide Ruins.....	53	34	B-3	Do.
Leupp Area:				
Leupp.....	296	249	B-9	Reservation boarding.
Do.....	19	7	B-7	Day.
Red Lake.....	42	28	B-3	Do.
Seba Dalkai.....	43	23	B-4	Do.
Tuba City Area:				
Kaibeto.....	27	12	B-5	Do.
Kayenta.....	24	9	B-3	Do.
Moenave.....	9	6	B-3	Do.
Navajo Mountain.....	26	11	B-3	Do.
Shonto.....	17	10	B-5	Do.
Tuba City.....	316	279	B-8	Reservation boarding.
Do.....	15	3	B-6	Day.
Phoenix:				
Phoenix.....	521	467	7-12	Nonreservation boarding.
Phoenix Sanatorium.....	97	55	B-8	
Pima Agency:				
Blackwater.....	70	54	B-5	Day.
Casa Blanca.....	112	92	B-5	Do.
Fort McDowell.....	22	18	B-6	Do.
Gila Crossing.....	66	57	B-6	Do.
Maricopa.....	34	24	B-6	Do.
Pima Central (Sacaton).....	280	212	B-10	Do.
Santan.....	118	91	B-5	Do.
Salt River.....	187	165	B-10	Do.
San Carlos Agency:				
San Carlos.....	138	85	B-9	Reservation boarding.
Do.....	325	261	B-9	Day.
Sells Agency:				
Chui Chiuschu.....	30	19	B-4	Do.
Fresnal Canyon.....	13	8	B-4	Do.
Kerwo.....	55	26	B-3	Do.
Poso Redondo.....	43	26	B-4	Do.
Quajote.....	30	18	B-3	Do.
Santa Rosa Ranch.....	30	22	B-6	Do.
Santa Rosa.....	153	103	B-6	Do.
Sells.....	176	120	B-6	Do.
Ventana.....	39	32	B-3	Do.

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Arizona—Continued.				
Truxton Canyon Agency:				
Havasupai.....	23	19	B-6	Day.
Peach Springs.....	26	22	B-5	Do.
Truxton Canyon.....	212	196	B-8	Reservation boarding.
California: Sherman.....	727	695	9-12	Nonreservation boarding.
Colorado:				
Consolidated Ute Agency:				
Towaoc.....	60	52	B-5	Day.
Southern Ute.....	209	197	B-8	Reservation boarding.
Florida:				
Seminole Agency: Seminole.....				
	23	9	B-4	Day.
Idaho:				
Fort Hall Agency:				
Bannock Creek.....	24	22	B-9	Do.
Lincoln Creek.....	20	18	B-10	Do.
Ross Fork Creek.....	28	20	B-9	Do.
Fort Lapwai Sanatorium.....	187	76	B-11	
Iowa:				
Sac & Fox Sanatorium.....				
	53	32	B-7	
Fox.....	28	16	5-8	Do.
Mexquakie.....	68	47	B-4	Do.
Kansas: Haskell.....	673	605	9-12	Nonreservation boarding.
Minnesota:				
Consolidated Chippewa Agency: Pine Point.....				
	77	52	B-8	Day.
Pipestone.....	272	253	B-9	Nonreservation boarding.
Red Lake Agency: Cross Lake.....	111	104	B-7	Day.
Mississippi:				
Choctaw Agency:				
Bogue Chitto.....	51	30	B-5	Do.
Bogue Homo.....	12	8	B-6	Do.
Conehatta.....	63	43	1-7	Do.
Pearl River.....	82	67	1-9	Do.
Red Water.....	60	52	B-9	Do.
Standing Pine.....	34	22	B-6	Do.
Tucker.....	57	37	B-9	Do.
Montana:				
Rocky Boy's Agency:				
Haystack Butte.....	69	39	B-11	Do.
Parker Canyon.....	33	29	B-6	Do.
Rocky Boy.....	23	13	B-3	Do.
Sangrey.....	68	37	B-6	Do.
Sawmill Camp.....	78	37	B-6	Do.
Tongue River Agency:				
Tongue River.....	21	17	B-7	Do.
Do.....	80	73	B-8	Reservation boarding.
Birney.....	44	33	B-6	Day.
Muddy Creek.....	7	6	1-8	Do.
Nevada:				
Carson Agency:				
Carson.....	494	402	B-12	Nonreservation boarding.
Fallon.....	26	22	B-2	Day.
Fort McDermitt.....	29	27	B-6	Do.
Lovelock.....	24	17	B-6	Do.
Nevada.....	77	61	B-8	Co.
Walker River.....	81	65	1-8	Do.
New Mexico:				
Jicarilla Agency:				
Jicarilla Sanatorium.....	48	44	B-6	
Jicarilla-Apache.....	93	84	B-6	Reservation boarding.
Mescalero Agency:				
Mescalero.....	122	93	B-6	Day.
Whitetail-Apache.....	39	29	B-6	Do.
Navajo Agency:				
Crown Point Area:				
Crown Point.....	341	287	B-6	Reservation boarding.
Lake Valley.....	34	15	B-3	Day.
Pueblo Alto.....	31	18	B-3	Do.
Standing Rock.....	34	19	B-3	Do.
Torreón.....	59	33	B-4	Do.
White Horse Lake.....	26	17	B-4	Do.
Shiprock Area:				
Aneth.....	38	19	B-6	Do.
Biclabito.....	40	27	B-3	Do.
Cove.....	36	23	B-3	Do.
Huerfano.....	35	14	B-3	Do.
Redrock.....	72	44	B-1	Do.

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
New Mexico—Continued.				
Navajo Agency—Continued.				
Shiprock Area—Continued.				
San Juan.....	331	280	B-8	Reservation boarding.
Do.....	111	76	1-8	Day.
Tecnospos.....	61	36	B-3	Do.
Toadlena Area:				
Burnhams.....	46	27	B-3	Do.
Nava.....	61	44	B-4	Do.
Sanostee.....	63	53	B-4	Do.
Toadlena.....	223	205	B-6	Reservation boarding.
Do.....	2	2	5	Day.
Tohatchi Area:				
Coyote Canyon.....	27	17	B-3	Do.
Mexican Springs.....	59	36	B-2	Do.
Naschitti.....	70	37	B-2	Do.
Tohatchi.....	152	91	B-6	Do.
Fort Wingate Area:				
Baca.....	43	32	B-3	Do.
Canoncito.....	42	35	B-3	Do.
Chechilgeetho.....	49	21	B-3	Do.
Wingate Vocational High.....	597	469	7-12	Reservation boarding.
Iyanbito.....	30	16	B-5	Day.
Mariano Lake.....	34	19	B-4	Do.
Pinedale.....	25	17	B-3	Do.
United Pueblos Agency:				
Albuquerque.....	785	704	7-12	Nonreservation boarding.
Acoma.....	100	86	B-6	Day.
Chicale.....	33	25	B-6	Do.
Cochiti.....	49	46	B-6	Do.
Encinal.....	16	14	B-5	Do.
Isleta.....	130	108	B-6	Do.
Jemez.....	36	34	1-3	Do.
Jemez Mission.....	31	27	B-3	Do.
Laguna.....	67	58	B-6	Do.
McCartys.....	67	60	B-6	Do.
Mesita.....	21	12	B-6	Do.
Nambe.....	30	29	B-6	Do.
Nutria.....	23	20	B-5	Do.
Paguete.....	80	65	B-6	Do.
Paraje.....	42	35	B-5	Do.
Picuris.....	27	25	B-6	Do.
Sandia.....	16	15	B-6	Do.
San Felipe.....	63	55	B-7	Do.
San Juan.....	91	77	B-6	Do.
San Ildefonso.....	24	22	B-5	Do.
Santa Ana.....	36	34	B-6	Do.
Santa Clara.....	65	60	B-6	Do.
Santa Domingo.....	140	122	B-6	Do.
Santa Fe.....	522	452	7-12	Non reservation boarding.
Seama.....	22	19	B-6	Day.
Sia.....	22	21	B-5	Do.
Taos.....	172	150	B-9	Do.
Tesuque.....	21	19	B-2	Do.
Zuni.....	194	169	1-10	Do.
North Carolina:				
Cherokee Agency:				
Cherokee.....	152	124	1-10	Reservation boarding.
Do.....	195	161	B-10	Day.
Big Cove.....	37	19	B-5	Do.
Birdtown.....	61	41	B-7	Do.
Snowbird.....	23	18	B-5	Do.
Soco.....	102	69	B-6	Do.
North Dakota:				
Bismarck.....	114	109	6-9	Nonreservation boarding.
Fort Berthold Agency:				
Independence.....	46	30	B-10	Day.
Nishu.....	35	21	B-10	Do.
Shell Creek.....	59	43	B-10	Do.
Fort Totten Agency:				
Fort Totten Preventorium.....	121	92	B-10	Reservation boarding.
Fort Totten.....	36	27	B-10	Day.
Standing Rock Agency:				
Little Eagle.....	107	85	B-10	Do.
Turtle Mountain Agency:				
Turtle Mountain Consolidated.....	536	484	B-10	Do.
Dunseith no. 5.....	75	64	B-6	Do.
Roussin.....	91	62	B-4	Do.
Wahpeton.....	398	305	1-11	Nonreservation boarding.

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Oklahoma:				
Cheyenne & Arapaho Agency:				
Cheyenne & Arapaho.....	193	177	1-9	Reservation boarding.
Do.....	15	10	1-9	Day.
Chillico	741	534	7-12	Nonreservation boarding.
Kiowa Agency:				
Fort Sill.....	185	155	B-9	Reservation boarding.
Riverside.....	233	206	B-9	Do.
Pawnee Agency:				
Pawnee.....	214	201	B-8	Do.
Quapaw Agency:				
Seneca.....	254	241	1-9	Do.
Five Civilized Tribes Agency:				
Carter Seminary.....	206	161	B-9	Nonreservation boarding.
Euchee.....	157	123	B-9	Do.
Eufaula.....	159	147	B-9	Do.
Jones Academy.....	207	178	B-9	Do.
Wheelock Academy.....	144	132	B-9	Do.
Sequoyah	392	367	B-12	Do.
Oregon:				
Salem	374	293	1-12	Do.
Warm Springs Agency:				
Burns.....	45	36	B-8	Day.
Warm Springs.....	150	143	B-10	Reservation boarding.
South Dakota:				
Cheyenne River Agency:				
Bridger.....	16	11	B-6	Day.
Cheyenne River.....	223	190	B-10	Reservation boarding.
Do.....	34	26	B-10	Day.
Cherry Creek.....	42	28	B-6	Do.
Green Grass.....	20	11	B-6	Do.
Moreau River.....	24	13	B-6	Do.
Thunder Butte.....	31	21	B-6	Do.
Red Scaffold.....	55	34	B-8	Do.
Flandreau	457	437	10-12	Nonreservation boarding.
Pierre	302	264	1-9	Do.
Fine Ridge Agency:				
Oglala Community High.....	482	357	B-12	Reservation boarding.
Do.....	172	124	B-12	Day.
No. 4.....	18	14	B-6	Do.
No. 5.....	51	29	B-6	Do.
No. 6.....	32	22	B-6	Do.
No. 7.....	31	20	B-6	Do.
No. 9.....	37	20	B-6	Do.
No. 10.....	18	6	B-6	Do.
No. 12.....	17	9	B-6	Do.
No. 13.....	18	8	B-6	Do.
No. 15.....	25	18	B-4	Do.
No. 16.....	43	28	B-4	Do.
No. 22.....	23	11	B-4	Do.
No. 23.....	22	15	B-4	Do.
No. 24.....	62	34	B-4	Do.
No. 25.....	22	12	B-4	Do.
No. 26.....	18	10	B-5	Do.
American Horse.....	113	81	B-8	Do.
Grass Creek.....	16	9	B-4	Do.
Kyle.....	175	122	B-9	Do.
Red Shirt Table.....	31	21	B-6	Do.
Slim Butte.....	32	22	B-6	Do.
Wakpanni Lake.....	11	9	1-6	Do.
Rosebud Agency:				
Blackpipe.....	28	16	B-4	Do.
Greenwood.....	38	29	B-8	Do.
He Dog.....	160	100	B-8	Do.
Little Crow's.....	25	18	B-6	Do.
Milk's Camp.....	31	23	B-5	Do.
Ring Thunder.....	30	21	B-6	Do.
Rosebud.....	231	184	1-11	Reservation boarding.
Agency.....	70	45	1-8	Day.
Soldier Creek.....	31	19	B-6	Do.
Spring Creek.....	32	12	B-6	Do.
Utah:				
Paiute Agency:				
Goshute.....	43	31	B-8	Do.
Kaibab.....	20	13	B-6	Do.
Uintah and Ouray Agency:				
Uintah.....	82	58	B-8	Reservation boarding.
Do.....	79	58	B-9	Day.

TABLE 4.—*Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued*

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Wisconsin:				
Keshena Agency:				
Neopit.....	38	26	B-8	Day.
Great Lakes Agency:				
Lac du Flambeau.....	165	142	1-9	Do.
Wyoming:				
Shoshone Agency:				
Shoshone.....	194	141	B-10	Do.

SCHOOL SUMMARY

Class	Number of schools	Enrollment	Average attendance
Total.....	249	26,248	21,006
Nonreservation boarding.....	19	7,645	6,628
Reservation boarding.....	28	6,396	5,486
Day.....	198	11,822	8,685
Sanatorium.....	4	385	207

OFFICE OF EDUCATION

(Dr. J. W. STUDEBAKER, *Commissioner*)

FOREWORD

Next year the United States Office of Education will be 70 years old. From Henry Barnard's first report of the Commissioner of Education to Congress, we read:

It is obvious that neither constitutional provisions, legislative enactments, nor the existence of the most perfect schoolhouses, will secure the right education of the children of the Nation, without a body of teachers devoted to the work of public instruction, possessing in a sufficient degree, the requisite qualifications of character, attainments, and skill.

The first Commissioner's statement brings renewed appreciation of the view that while equipment and the application of educational methods change, educational principles hold fast throughout the ages.

In the present report of the Commissioner of Education, Commissioner Barnard's statement of principle may well be re-affirmed. The teacher's place in education today is as paramount as it was in 1867.

In "constitutional provisions", "legislative enactments", "most perfect schoolhouses" and other equipment and the application of educational methods, 70 years have brought many changes.

This report presents a review of some of these changes and measures of educational progress that have been noted throughout the Nation during the period from July 1, 1935, to June 30, 1936.

I. GENERAL OUTLOOK IN EDUCATION

1. DEVELOPMENTS DURING THE YEAR

IN PUBLIC SCHOOLS

It is evident that the Nation's public schools are entering upon a new period of development and progress. Reports received from a majority of State departments of education show that fewer States this year than during the two or three preceding years were in need of Federal funds to keep their schools in operation. Funds for current expenses and for capital outlay were increased over those of 1 or 2 years ago in a large number of communities. Teachers' salaries in both rural and urban communities and expenditures for

operation and maintenance of school plants also showed increases, as well as capital outlay which was greatly increased by the use of P. W. A. funds.

In the early years of the depression when school boards were frantically seeking means to reduce expenses, many worth-while activities and services were curtailed or even eliminated. But the following are being gradually restored: Kindergartens, schools and classes for handicapped children, night schools, art, music, home economics, physical education, and health programs.

While enrollments in the lower grades of the elementary schools have been decreasing due to the falling birth rate, enrollments in the secondary schools have been increasing. The increase in the latter type of school is owing in part to larger initial enrollments and in part to retention of high-school pupils for longer periods of time through a smaller number dropping out.

Elementary and secondary school curriculums are reflecting the social changes throughout the country. Objectives are being stated in terms of increased opportunities for social well-being, and of the maximum development of each individual as contrasted with confining curriculum goals to the mere achievements in school subjects.

Both in the field of elementary and secondary education the application of measurement to education has been growing. This growth is due in part to the fact that the use of tests in the classroom or guidance situation is becoming better defined and understood.

The movement to extend educational services to preschool children and adults should be noted. Largely due to the widespread emergency nursery-school program as well as to research in child development, educators and parents are recognizing the values of preschool education. The emergency nursery schools are furnishing a valuable demonstration in the public care of very young children. In time such schools will doubtless become an integral part of the public-school system. Adult education is being promoted along cultural, recreational, and vocational lines.

Turning to school finance, the past fiscal year is one of unusual development. A number of legislatures meeting in 1935 materially revised their State school support plans and the revised plans were in operation for the first time during the school year 1935-36. Among the most important of such revised school-support plans are those of Arizona, Florida, Michigan, Minnesota, Montana, Nevada, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Utah, Vermont, West Virginia, and Wyoming. The most outstanding feature of the new plans is the provision for a relatively larger amount of funds for the public schools from State-wide sources for the year 1935-36 and succeeding

years, than had been provided previously. The movement in itself is one of great significance to the welfare of the public schools.

This movement toward greater State participation in public-school support appears to be, in most instances at least, a State guarantee that public-school facilities can be made available to all youth rather than a definite attempt to equalize school costs among the local school taxing units, since the additional funds are apportioned in large part as flat grants. That is, the local district receives, under the terms of most of the revised plans, a specified amount per pupil, per teacher, or per other unit; in some cases, however, the ability to pay is also a feature of the new plan.

The States have resorted to various revenue sources for the additional funds. State taxes levied especially for public-school revenue were used to a greater extent than ever before. These include severance, liquor, sales, income, and tobacco. However, the additional funds were derived from the State's general fund in some cases.

Other features of State school finance programs which changed during the year include many specific provisions concerning indebtedness, teachers' salaries, support of libraries, and support for institutions of higher learning.

IN THE COLLEGES

The college year has been marked by distinct evidences of recovery. While no complete figures for 1935-36 are available, it seems safe to say, judging by scattered reports, that the enrollments were back nearly to the 1931-32 figure, the income from endowments had increased slightly above its low, and about half the cut in public funds had been restored. The lowest period for the colleges was the year 1933-34. That year all institutions combined suffered, when compared with 1931-32, an 8-percent decrease in enrollments for the regular academic year, a 9-percent decrease in income from endowments, and a 21-percent decrease in income from public funds.

The Federal student-aid program, which provided jobs to about 110,000 young people in college, a cost of more than \$1,500,000 per month, was of unquestioned help not only to the young people but to the colleges. Much useful work which would otherwise have been left undone was done by these students. At the same time the students were given their rightful chance to continue their education, and they did educational work equal to and in many institutions superior to that done by classmates who were doing no work for wages.

The construction of buildings on college campuses came to an almost complete stop 3 years ago. The Public Works Administration has stimulated the movement to build by approving projects at colleges amounting to about \$60,000,000.

The social science courses experienced a rapid increase in demand during the year. In some institutions enrollments in these courses were double what they were but 4 years earlier. Paralleling this development there was a widespread increase in student forums devoted to discussions of current social, economic, and political issues. And not unrelated to this has been the increase in departments and schools organized to train for public service.

Finally, perhaps the most significant development of the year was the distinct rise in the standards of many of the professions. Demands for higher standards of training for teachers were general. The 2-year teacher training course lost ground in favor of the 4-year teacher training course. Many high schools will not accept as teachers anyone without at least a master's degree. Graduate courses in engineering increased rapidly. Special institutes for alumni became more common. Colleges generally have felt the urge to meet the more exacting demands of modern business, scientific, and professional life.

PROVISIONS FOR YOUTH

Significant has been the growth of interest on the part of educators and community leaders in the problems of out-of-school youth. The newer development in education is a growing sense of community responsibility toward youth to the end that the school and other agencies of the community provide programs leading definitely toward establishment of the young person vocationally, socially, and in other ways of normal community living.

The increase in guidance and counselling services of the schools, the development of placement programs, the increased emphasis upon vocational training in the curriculum to prepare for work, and the growth in the number of part-time and evening school classes of both a vocational and general character are indicative of educational provisions attracting many young persons in their attempt to become more fully established.

One of the striking developments of last year has been the number of such surveys completed on State, city, county, and community bases. These surveys have been instrumental in the establishment or extension for out-of-school youth of many educational provisions, such as emergency colleges, university extension classes, group correspondence courses, high-school classes for post-graduates, library reading courses, radio broadcast classes, youth forums, educational clubs, community schools, trade and part-time cooperative classes, art and handicraft classes, training for household service, part-time classes in vocational home-making and vocational agriculture, and commercial training of diversified types. These educational develop-

ments have attracted large numbers of young persons from the out-of-school group.

The passage of the George-Deen Act, to extend vocational education opportunities throughout the United States, represents still another of the newer developments of interest with respect to education for out-of-school youth.

2. PARTICIPATION IN EMERGENCY EDUCATION ACTIVITIES

CIVILIAN CONSERVATION CORPS

The educational program in the Civilian Conservation Corps has made significant and steady progress during the past fiscal year. Objectives of the program have become clearer and more practical, its administration and supervision have been strengthened, and experience in camp work has developed many new and successful practices.

Approximately 75 percent of the enrollees are now voluntarily participating in some form of educational activity. The objectives as now defined are: Elimination of illiteracy; removal of deficiencies in common school subjects; training on the job; general vocational training; avocational training; cultural and general education; health and safety education; character and citizenship training; and assisting enrollees in finding employment.

The essential items in the plan for the educational program adopted November 22, 1933, by the Emergency Conservation Work Administration, provided that the Office of Education would act in an advisory capacity to the War Department in all matters affecting the educational program. A director of C. C. C. camp education was appointed by the United States Commissioner of Education to select and supervise corps area and camp educational advisers, and to recommend to the Secretary of War the outlines of instruction, teaching procedures, and types of teaching materials for use in the camps.

The original plan also provided for the appointment of a corps area educational adviser in each of the nine corps areas to act in an advisory capacity to the corps area commander on educational matters. An assistant corps area adviser was authorized and assigned to each of the nine corps areas in the beginning of the fiscal year.

Until July 1935 corps area educational advisers were called upon to supervise the educational work of all the camps in their corps areas. The authorization of district educational advisers during this year completed the chain of organization and provided for more adequate supervision of the work. District commanders, aided by their district advisers, were able to provide better training for camp advisers and

thus to develop more satisfactory programs. The appointment of these educational officials is probably the greatest forward step since the inception of the program.

The quota of camp advisers varied greatly during the year, due to the fluctuation in the size of the corps, as is shown by the following table:

	July 1935	October 1935	January 1936	April 1936	June 1936
Number of companies.....	2, 270	2, 440	2, 164	2, 121	2, 105
Quota of advisers.....	2, 000	2, 200	2, 000	1, 900	1, 902
Number of advisers on duty.....	1, 336	2, 118	1, 951	1, 834	1, 848

During the year 1,321 advisers were appointed. A study of the personnel records of these men shows that all are college graduates, 74 percent have bachelor degrees, 23 percent master degrees, and 3 percent have doctor degrees. Over half of them have majored in education and the social sciences during their college years. Approximately 60 percent had previous experience in teaching, and 12 percent had administrative school work. About 40 percent had business or industrial experience.

The duties and responsibilities of camp educational advisers have been more clearly defined during the year and may be classified briefly under 12 major headings: Study and investigation; counseling, guidance, and placement; cooperative planning; promotion of new educational activities; administration of the program; teacher and leader training; improving physical equipment; teaching enrollees; maintaining community contacts; promotion of recreational activities; paper work; and miscellaneous (special duties assigned by company commanders).

Committees on education.—In order to obtain the active interest and cooperation of the military and technical personnel, committees on education have been organized in a large number of camps. In several corps areas, these committees were organized in all camps by order of the corps area commander. The committee consists of the company commander, project superintendent, educational adviser, and an outstanding enrollee. Its purpose is to develop the educational program in all its phases during the work hours and in the leisure time of the enrollees.

Counselling and guidance.—The success of a camp educational program depends primarily upon the effectiveness of the camp adviser's work in counselling and guidance. The first duty of the adviser in this respect is to interview enrollees upon their first arrival in the camp. Enrollees having common interests are then organized into groups for work under competent leaders. Those requiring in-

dividual treatment receive personal attention from competent persons.

Elimination of illiteracy.—Analyses of the educational level of enrollees reveal that approximately 2½ percent have been illiterate. Naturally elimination of illiteracy has been considered one of the primary objectives of the program. In October 1935 the Office of Education issued a publication suggesting a number of techniques and materials that had been found to be of value in instructing illiterate enrollees. The Ninth Corps Area educational adviser's office published a text designed specifically for use in the C. C. C. camps. Results achieved in this field are shown in the following table:

	July 1935	October 1935	January 1936	May 1936
Number of illiterates.....	7,369	11,283	10,927	7,852
Number learning to read and write.....	6,521	9,078	9,169	7,017
Percentage.....	88	80	84	89

It is estimated that 35,000 illiterate enrollees have been taught to read and write since the start of the C. C. C.

Educational level of enrollees.—The educational level of enrollees varies considerably in each camp and corps area, but on a country-wide basis, there has been little or no change from month to month in the percentage of enrollees on each level. The proportion for each school grade is given in the following table:

	July 1935	October 1935	January 1936	May 1936
Illiterate.....	2.5	2.5	2.5	2.5
Elementary.....	23.9	28.5	28.4	28.5
High school.....	55.1	52.7	53.0	54.0
College.....	18.4	16.2	16.0	15.0

The following table indicates the enrollment in academic courses for 3 selected months during the year:

Enrollment	October 1935	January 1936	May 1936
Elementary subjects.....	80,016	90,695	77,343
High-school subjects.....	114,728	101,584	83,485
College subjects.....	8,071	7,078	6,020

There are more than 60 major types of work in which the Civilian Conservation Corps is engaged. These major classifications may be broken down into more than 300 jobs for training purposes. The

number of enrollees receiving such planned instruction is shown in the following table:

	July 1935	October 1935	January 1936	April 1936	June 1936
Enrollees receiving job training.....	135,065	188,783	234,706	195,280	215,320

To supplement the vocational instruction gained through job training, courses have been arranged in the camp schools which contain more detailed and advanced vocational material. To help improve the content of these courses, the Office of Education issued to the camps 15 lesson outlines dealing with such subjects as agriculture, auto repair, carpentry, cooking, mechanical drawing, radio servicing, and plane surveying. A Manual for Instructors was also distributed to all companies.

The number of enrollees receiving vocational training is as follows. (The figure for July is estimated.) More than 50 percent of the courses are vocational in nature.

	July 1935	October 1935	January 1936	April 1936	June 1936
Enrollment in vocational courses.....	120,000	162,393	229,146	206,962	215,642

It is estimated that approximately 40 percent of C. C. C. enrollees are from rural communities and in all probability the larger proportion will engage in farming as their life work. Agricultural education was stressed during the spring of 1936. The interest and cooperation of the Department of Agriculture's Extension Service and of the Vocational Division of the Office of Education were secured and suggestions for establishing or improving agricultural courses were sent out to all camps. The formation of practical projects in gardening, poultry raising, dairying, and other agricultural activities was encouraged. As a result, about 50 percent of the companies now offer agricultural courses.

Camp libraries have been expanded to the extent that 350,000 books are circulating monthly and over 150,000 men are regularly engaged in reading. Nearly 10,000 educational films dealing with a wide variety of subjects are being shown to enrollees every month. More than 1,600 camps now publish camp newspapers. Instruction in the duties and responsibilities of citizens is given in a large number of camps, and forum and debating groups have proven popular. A recent survey indicated that more than half the camps have organized an open forum or debating society.

The number of teachers supplied by the Works Progress Administration and the National Youth Administration increased from 1,321 in October 1935 to 2,316 in March 1936, which represents a per company increase of 93 percent. The number of regular school teachers who acted as volunteer unpaid instructors of enrollees increased from 143 in July 1935 to 398 in June 1936. The number of laymen who acted as regular instructors averaged about 1,400 per month. School authorities in a large number of cases have placed their buildings, libraries, gymnasiums, and playgrounds at the service of the enrollees. Colleges and universities have extended needed assistance in the field of higher education.

The basic purpose of the educational program is to return enrollees to their home communities better equipped mentally and morally for their duties as citizens and with a better knowledge of the Government under which they live and of all that that Government means. The C. C. C. officials, therefore, in addition to offering educational opportunities to the enrollees while in camp are making intensive efforts to assist enrollees to find employment upon their return home.

To assist in the work of satisfactorily adjusting enrollees to community conditions and in helping them locate work, advisers in several corps areas have fostered the formation of community guidance and placement councils.

The efforts of C. C. C. officials to help C. C. C. men bridge the gap between camp and employment are undoubtedly winning substantial results. Camp authorities are deeply gratified over a recent report from Director Robert Fechner's office indicating that 145,531 men left the corps during the year of 1935 to accept employment.

WORKS PROGRESS ADMINISTRATION

The Works Progress Administration has sent over 60 projects involving research and experimentation in education and educational psychology to the Office of Education for review and recommendation regarding their technical and practical aspects. These projects involved research in many different areas of education, such as instruction, guidance, failures, buildings, etc., and each involved expenditures ranging from about \$1,000 to over \$50,000. Members of the staff of the Office of Education reviewed these projects and made recommendations.

PUBLIC WORKS ADMINISTRATION

Information concerning public-school building activity, school-district indebtedness, and other phases of school administration has been supplied from time to time upon request of the Public Works Administration. Publications of the Office, particularly those dealing

with school finances and statistics, have been furnished the P. W. A. A number of personal interviews and conferences concerning school buildings and records have been held with P. W. A. staff members throughout the year.

II. THE OFFICE OF EDUCATION DURING 1935-36

1. NEW SERVICES

SPECIAL PROJECTS

Five special projects made possible through Federal relief funds have been administered by the Office of Education during the year. These projects include public forums, educational radio, research in universities, survey of vocational education and guidance of negroes, and local school units. The first two of these projects are herewith reported, while the other three are reported under sections dealing with research.

Public forums.—With the allocation of \$330,000 of Federal relief funds the Office of Education, under the general direction of the Commissioner, has established 10 forum demonstration centers in 10 different States well distributed geographically across the country. The following communities are included in this program: Manchester, N. H.; Schenectady, N. Y.; Monongalia County, Morgantown, W. Va.; Hamilton County, Chattanooga, Tenn.; Wichita, Kans.; Minneapolis, Minn.; Colorado Springs, Colo.; Orange County, Santa Ana, Calif.; Little Rock, Ark.; and Portland, Oreg. The gross population served by these 10 projects is approximately 2,000,000.

The record of the first three centers to get under way, for an initial period of 5 months, is as follows: Manchester, N. H.—91 meetings, 5,856 attendance; Colorado Springs, Colo.—162 meetings, 13,369 attendance; Monongalia County, W. Va.—184 meetings, 7,879 attendance. Approximately 50 unemployed persons were engaged during this period in these 3 projects.

Each project, in addition to organizing and managing neighborhood forum meetings, promoted the reading of important books on public affairs, the extended use of the library, the distribution of pamphlet material, the discussion of public questions on the radio or in the newspapers and in a score of other ways contributed to a community-wide development of adult education. Approximately 40 competent forum leaders will be engaged in the 10 projects during the coming fall and winter period, leading about 5,000 meetings, at which a total attendance of between 350,000 and 500,000 people is anticipated.

In each of the centers the board of education or a group of representative educational authorities constituting a special forum board

functions as the policy-making body. In addition, a citizens' advisory committee has been formed in each center with a membership of 25 or more citizens representing a fair cross section of community organizations. Selection of forum leaders and relief staff has been made by the local administrator with the approval of the policy-making board and the board of advisors. In each case the local project administrator is the superintendent of schools for the recognized local agency of public education. This administrator serves in this capacity without compensation from the Federal Government, but is appointed by the Department of the Interior.

The local agencies of education are responsible for providing supervisory personnel without cost to the project where it is needed to augment the activities of the paid forum leaders.

The response to the public-forum project has been Nation-wide. Hundreds of educators and others in positions of authority have petitioned the Office of Education for such assistance in the development of similar programs. A heavy correspondence has developed as a result of the announcements of these projects indicating a vital interest on the part of thousands of people in adult civic education.

Educational radio.—The experience of the Office of Education with a weekly radio service during the past 3 years led to the establishment, at the end of 1935, of the educational radio project. This project is producing five new experimental weekly educational programs, the first of which went on the air March 1936.

These programs were launched by means of a grant of \$75,000 from emergency funds and through the cooperation of the National Broadcasting Co. and the Columbia Broadcasting System. The grant made possible the assembling of a group of experts from the radio industry, as well as the employment of more than 60 unemployed radio actors, script writers, and technicians. The networks' contributions of thousands of dollars' worth of equipment, facilities, and time brought these programs to listeners in communities from coast to coast.

Primary aims of these services are to discover new methods of educational broadcasting and to pass along the lessons learned to educators all over the country, who have appealed to the Office of Education for some solution of their local problems.

Enthusiastic response of listeners—who have written thousands of letters of commendation in the first 5 months of the project—indicate that what used to pass for educational broadcasting is inadequate and that new techniques of broadcasting will recruit mass listeners for education. Important also is the discovery that effective broadcasting stimulates educational activity and results in greater use of libraries and wider distribution of Government publications.

Tentative conclusions of the first few months of experience with this new art show that (1) the techniques of broadcasting school subjects need more intense investigation, but that (2) radio, properly used, is a most valuable medium for bringing to masses of people messages of culture, of conservation, of government, of health, of safety. Further research on these problems should reveal methods for more successful, valuable, educational broadcasting.

STATE SCHOOL SPECIALIST

A senior specialist in State school systems was added to the Office and assigned to the American School Systems Division the past year. The duties of the new specialist include the initiating and conducting of studies of practices and problems of State school administration and coordinating resources and services of other divisions and specialists of the Office of Education insofar as they have relationships to State school administration. The specialist acts as consultant to State and Territorial superintendents, commissioners, and other school officials in matters of State, Territorial, and local school administration and Federal relations to public schools. He also cooperates with and assists in State studies and surveys of public education, prepares for publication results of surveys and studies relating to State school administration, addresses educational and other organizations on topics concerned with Federal, State, and local administration and support of education.

CONSERVATION EDUCATION

The place of conservation education in the school program, appropriate instructional materials, and means of integrating such materials into the school program through coordination with the established content subjects, through experience units or in other ways, are topics which involve difficult problems for school officers to solve. A new recognition of the importance of the whole broad field of conservation of natural and human resources, its meaning and scope, the necessity of understanding and expressing fundamental school concepts throughout the school program is abroad. The interest of school program makers, supervisors, and teachers has been reflected throughout the year in the form of requests to the Office of Education for definite assistance in formulation of curriculum material. What are the best sources of curriculum materials for conservation teaching? What are prevailing practices throughout the country among school systems in conservation instruction in elementary and secondary schools and in adult programs? are some of the questions received.

During the year the Office has been somewhat unprepared to meet this demand adequately because of limitations of its staff. However,

due to the importance of a better understanding of the far-reaching effects of neglect and exploitation in the past and the belief that only through education can effective steps be taken in bringing about a change of attitude, certain emergency adjustments have been made to meet the immediate needs, at least partially. There have been prepared or are under way bibliographies of instructional materials and methods, information on present practices in school curriculum content, and a preliminary examination of State and other courses of study, with a view to having on file and for dissemination information about present practices in conservation teaching. Under preparation at the present time are outlines and suggestions concerned with instructional material and its use on elementary and secondary levels where the demand just now is most urgent.

NEW LIBRARY DIVISION

Fostered by the American Library Association and endorsed by the Library Association of the District of Columbia, the new Library Division established by act of Congress, this year, brings to fruition plans which have long been considered desirable for the promotion of library service. While the Office of Education since its beginning has been mindful of libraries and their place in the educational scheme, this is a decided stamp of approval given by Congress to a plan for library development by the Office of Education.

The new law provides that the service shall be established for the purpose of "making surveys, studies, investigations, and reports regarding public, school, college, university, and other libraries; fostering coordination of public and school library service; coordinating library service on the national level with other forms of adult education; developing national participation in Federal projects; fostering Nation-wide coordination of research materials among the more scholarly libraries, interstate library cooperation and the development of public, school, and other library service throughout the country."

FEDERAL RADIO EDUCATION COMMITTEE

The development of the so-called American system of broadcasting from its inception to the present day has created many problems and given rise to various difficulties and differing points of view with regard to public uses of this powerful instrumentality of communication. State and local departments of education have experimented to the point where it is estimated that over 200 city-school systems broadcast more or less regularly over local stations.

But with the pressure of private competitive business time on the air, certain differences arose with public educational and nonprofit

agencies which eventually brought extensive hearings by the Federal Communications Commission on the whole subject of educational broadcasting. Commercial stations pointed out that they were already doing a considerable amount of educational and public-service broadcasting and insisted that there was ample time available, especially on the part of local stations, which could be used by educators and public-service agencies, if they could show that they were prepared to broadcast programs which would at least be comparable in public interest to those sponsored commercially.

The Communications Commission advised Congress that in its opinion the present system did provide available free time for educational and public-service broadcasts, and announced that it was creating a national committee with a view to eliminating controversy and misunderstanding and promoting active cooperative relationships between educators and broadcasters. The Commissioner of Education accepted the invitation to become chairman of the committee, which includes 40 representatives of the educational forces, the clergy, labor, nonprofit organizations, and commercial broadcasters.

Prior to the first meeting of the committee, a small representative planning committee met a number of times, took an overview of the major problems involved, formulated certain study projects and incorporated them in an agenda for consideration at the first meeting of the committee as a whole, which was held last February. As a result of the 2-day conference it became evident that a comprehensive study program should be made before definite remedial steps could be taken or even suggested. Three committees were authorized at the meeting to explore possibilities and initiate action before the next meeting of the large committee. The executive committee was organized and in turn appointed a subcommittee to explore the problem of conflicts, while a technical subcommittee was created to define the proposed study projects and develop procedures to be followed in their eventual operation.

Following several meetings of the various committees, a program of some 16 study projects was approved and negotiations begun with several sources of private funds to secure the finances with which to carry them on. After funds are secured a central coordinating agency will be established to administer and coordinate the work of the several studies as they progress.

2. RESEARCH

ORGANIZATION, ADMINISTRATION, AND SUPERVISION

A study made in cooperation with a special committee of the National Society for the Promotion of Engineering Education dealt with the standards and practices of graduate work in engineering

schools. Eighty-two schools of engineering contributed data for the study, which provides the basis for improvement of standards for advanced degrees in the field of engineering. An investigation of the relationship of the State to higher education has been continued as a long-time research project. The statutes of all the States have been examined and extracts from them have been compiled and classified as a basis for a series of studies in this field. A summary publication has been completed, giving for each State a diagrammatic representation of agencies which exercise a controlling influence over institutions of higher education.

A study of junior colleges lists each of the reported junior colleges in the United States, with essential data concerning them. These data include the form of control, the number of teachers, the number of students, the typical expenses required of each student, and reviews the legislation concerning junior colleges in the several States. The regular annual report of land-grant colleges and universities for 1935 was also prepared.

PROGRESSIVE PRACTICES IN RURAL SCHOOLS

A project has been launched to develop a list by States of the smaller rural schools which are known for their progressive or innovating practices and to prepare a series of publications showing the internal organization of such outstanding schools and describing the procedures employed in bringing about improved educational conditions despite the limitations of rural communities. One or more such schools, together with a brief description of the way in which unusual progress was made, have been named by rural-school leaders of most of the States. Further study is now being given to this whole problem with a view to showing practical ways in which rural education may be improved.

RECORDS AND REPORTS

During the past year the Office of Education has directed considerable effort to the cooperative study with the States involving revisions in school records and reports, particularly as related to the State school statistics reported to the United States Office of Education.

The two major objectives in this study are to determine the items of information that should be included in the reports from the States and to formulate basic terminology (with clear definitions) acceptable to the respective States.

SCHOOL HEALTH

In the investigation made of instruction in hygiene, an inquiry was sent to all institutions of higher education listed in the Educational

Directory of the Office of Education. A reply was received from about 65 percent of such institutions. A bulletin entitled "Instruction in Hygiene in Institutions of Higher Education", reports on this study. A study was also made of what the teacher-training institutions are doing in preparing elementary teachers for school health work. Pamphlet No. 67, Training of Elementary Teachers for School Health Work, summarizes this material and includes examples of courses of study offered in some of these institutions. Returns are now being tabulated from questionnaires relative to provision for student-health facilities in institutions of higher education.

FINANCING EDUCATION

In the field of school finance a study of State provisions for equalizing school costs was completed. This study reveals the principal feature of each State school-support system existing in 1933-34. Separate funds are analyzed as to source by States and apportionment methods are described.

A study of educational facilities for children on Federal supervised reservations completed this year shows that a large number of children live on the Government reservations, a majority of whom attend nearby public schools without the payment of tuition; some are obliged to pay tuition in public and private schools, while some others have no school facilities. In a few instances the Federal Government provides schools or pays tuition.

EDUCATION OF EXCEPTIONAL CHILDREN

In the education of exceptional children the year marked the completion of two major projects. The one was Federal Civil Works Administration Project F-90, which was begun in the year 1933-34. When C. W. A. funds were no longer available, the statistical analysis was completed with the assistance of capable workers serving on a voluntary basis. The final report on this is a bulletin entitled "The Deaf and Hard of Hearing in the Occupational World." The purpose of the study was to accumulate data which will be contributory to the better guidance of deaf and hard-of-hearing young people into those occupations for which they are best fitted.

The other major project completed was the preparation of a Guide to Curriculum Adjustment for Mentally Retarded Children. This was the outcome of two special conferences of leaders in the education of retarded children. Contributions to the publication were made by all who participated in the conferences. It is designed especially for those responsible for the education of retarded children in State and local school systems.

NATIVE AND MINORITY GROUPS

The Office has furthered its work in education among native and minority groups in continental United States and its outlying parts through the extension of its advisory service to departments of education in school systems and research organizations in universities; through the preparation and compilation of two additional units in its series of publications on education in outlying parts; and through the initiation and promotion of two projects in coordinated research concerned with language difficulties of bilingual children and their educational results.

Early in the present calendar year a member of the staff in the Special Problems Division responsible for education of native and minority groups spent approximately 2 months visiting schools, conferring and advising with school officials in Hawaii and in the southwestern section of the United States, where bilingualism is a serious problem, especially among children of Spanish-speaking parents. As a result of the survey of schools in Hawaii, a study of education in that Territory, begun the preceding year, was completed and published and is now available. During the visit to the Territorial university in Hawaii and State universities in California and other States, plans were formulated and are now under way for the conduct of coordinated studies concerned with teaching English to bilingual children. The studies are under a specific project known as research in universities and colleges. During the year a study of education in Alaska was prepared for publication. A study and report of the social and economic conditions of the southern Appalachian Mountains and of the educational problems resulting from such conditions was completed during the year. Evidence is presented in the report of the inadequacy and in some areas of the almost total absence of educational opportunities in the southern mountains.

PROGRAMS FOR YOUTH

Activities carried on by the Committee on Youth Problems under the subsidy from the General Education Board were completed during the year and the project officially closed March 31, 1936.

The resulting publications of this committee may be briefly characterized as follows:

BULLETINS

Youth: How Communities Can Help.—Ways in which communities have organized to help meet the problems of unemployed out-of-school youth and a brief description of some of the principal programs evolved in these communities.

Youth: Leisure for Living.—An account of the wide variety of leisure-time activities in which youth engages, with indications of ways in which communities and youth agencies may best join in making the programs more comprehensive and effective.

Youth: Education for Those Out of School.—This description of the programs and activities carried on in the interest of education for youth out of school makes a stimulating challenge not only to the agencies concerned but to the schools as well. The question of what the full responsibility of the schools should be is raised prominently by this bulletin.

Youth: Vocational Guidance for Those Out of School.—In a field of such growing importance as guidance, it is helpful to have this description of vocational guidance programs carried on for out-of-school youth. Various practices used in counseling and job placement are described.

Youth: Finding Jobs.—A description of opportunities which combine earning with learning and an account of the ways in which individuals and communities unite to make and to find jobs for young people.

Youth: Community Surveys.—This bulletin contains (1) an account of the surveys which have been carried on in the past 3 years to ascertain facts about youth, (2) a description of what the techniques involved in making such surveys are, and (3) the results of 13 community surveys which were conducted uniformly in cooperation with the Committee on Youth Problems.

STATISTICAL STUDIES

One of the major functions of the Office of Education, set up in the law under which it was created, is the collection of statistics showing the progress of education. In the United States, where the control and administration of education is a State and local function, the Federal Office of Education acts as the clearing house for statistics and information on a national basis.

In 1935-36 tabulations were completed on the biennial reports for 1933-34 and new information obtained as shown in the following table, in which capital letter "C" stands for data collected and "T" tabulated and "C-T" collected and tabulated within the year.

Subject of study, 1935-36	Type of study		
	Biennial	Periodic	Special
State school systems:			
Personnel and finances.....	T		
Preliminary statistics.....	T		
Revenue receipts by source.....	T		
County school systems:			
Personnel and finances.....	T		
City school systems:			
Personnel and finances.....	T	C-T	
Per capita costs.....		C-T	
School janitor service.....			C
Higher education:			
Personnel and finances.....	T		
Land-grant colleges.....		C-T	
Student health.....			C-T
Instruction in hygiene.....			T
Scholarships.....			C-T
Secondary schools, public:			
Personnel.....	T		
Teaching staff:			
Rural salaries, tenure, and experience.....		T	
Insurance and annuity funds for college.....			C-T
Elementary schools:			
General and special supervisors of instruction.....			C
Nursery schools:			
Personnel.....			C-T

The regular quinquennial study of the status of the personnel employed in the rural schools has been carried on throughout the year. Questionnaires were filled in by about 2,500 rural-school administrators showing the salaries paid to teachers and principals of various classes of rural schools, their training status, their professional experience, etc. The data are now being compiled and prepared for publication.

GUIDANCE

Information on the present status, trends, and problems in guidance and in industrial arts in city-school systems was collected and compiled during the year.

EDUCATIONAL MEASUREMENT

A study of elementary-school graduating examinations was published during the year. A study of the cumulative-record forms used in elementary schools, junior and senior high schools was carried on. For this study the forms used by school systems have been gathered together and the different items analyzed. The study of the status of high-school testing practices was completed. This study gives the actual procedures in using new-type tests, both those constructed in the school and standardized tests.

LEGISLATION

In the field of school legislation two circulars (nos. 145 and 155), each entitled "Legislative Action in 1935 Affecting Education", were prepared, summarizing the principal legislative educational measures enacted into law in the different States. Another, Circular No. 158, entitled, "Legislative Action in 1935 Affecting the Financial Support of Public Education", contains a summary of the characteristic features of legislation in each of the States pertaining to the support of schools, types of taxes levied, changes in the apportionment of school funds, and provisions for the control of public-school expenditures.

PARENT EDUCATION

In the fields of parent education and home-and-school cooperation two studies have been completed and issued: Parent Education Opportunities, Bulletin, 1935, no. 3, describes the parent education activities of the Federal Government, State departments of health and education, public schools, colleges and universities, organizations and institutions having programs in this field which has been developed largely within the past decade. Churches, clinics, social agencies of various kinds, are cooperating in the development of parent education. Significant Programs of High School Parent-Teacher Asso-

ciations, Pamphlet No. 64, discusses the present form and status of high-school parent-teacher associations; programs and service projects, and contains conclusions and recommendations for the consideration of parent-teacher leaders and high-school faculties.

TEACHER TRAINING AND PERSONNEL PROBLEMS

A study of the development of a State program for the certification of teachers conducted during the first half of the year and data concerned certification requirements, and included a bibliography and guiding principles of certification. A selected bibliography on the education of teachers brought up to date volume I of the National Survey of the Education of Teachers, and a comparison was made of salaries of teachers in the land-grant colleges for the years 1928-29, 1929-30, 1930-31, and 1934-35.

Survey of vocational education and guidance of Negroes.—The national survey of vocational education and guidance of Negroes has been conducted by the Office of Education through a grant of \$235,000 from emergency funds. While the primary purpose of the grant was to put to work "white-collar" Negroes who were on relief, the Office of Education has endeavored to make the study contribute to the educational advancement of all Negroes. The survey has filled a long-felt need, and is the outgrowth of many years of interest in the subject on the part of the Office of Education, educational organizations, and individuals.

The study has collected information concerning vocational education and guidance of Negroes with respect to the following items: (1) Vocational offerings in schools of selected communities; (2) vocational offerings by nonschool agencies; (3) evening and continuation schools; (4) training of vocational teachers; (5) vocational teacher-training facilities; (6) prevocational-education programs; (7) vocational-guidance programs; (8) personnel data of students enrolled in vocational courses of the various types of schools and colleges; (9) status of graduates and drop-outs; (10) attitude of students and educational leaders toward the vocational training of the Negro; (11) the conception of students and educational leaders of the Negro's function in American economic life.

The survey, national in scope, has comprised approximately 192 representative urban and rural communities, located in 33 States and the District of Columbia, and including nearly two-thirds of the total Negro population of the United States. A total of 479 persons on relief have been given employment, 205 of whom were male and 274 female. These relief workers had a total of 1,109 dependents. This means that, excluding the 42 nonrelief workers and their dependents, a total of 1,588 persons have benefited directly from the

project. Of the 479 relief workers, 75 had only high-school education, 227 had attended college, 131 had been graduated from college, 34 had done graduate work, and 12 hold the master's degree. Of the nonrelief workers, six hold the Ph. D. degree, or nearly its equivalent, and practically all others hold the master's degree.

The findings of the survey, together with interpretations, conclusions, and recommendations, will be published and made available to school officials, administrators, and other responsible persons interested in vocational education and guidance of Negroes. Also the survey staff is cooperating with a subcommittee of the National Vocational Guidance Association in the production of vocational-guidance manuals for teachers and students, with particular reference to special problems of Negroes.

Local school units.—During the year the Office of Education began a study of the local school-administrative units in 10 States through an allotment of \$844,000 emergency relief funds. The purpose of this project is to determine within each State the possibilities for the organization of more satisfactory schools, attendance areas, and local school-administrative units. It is a most significant research project and is considered particularly timely since more than one-half of the States indicated their interest in having a study made of their local school-administrative units. A number of State departments of education have been carrying on similar studies on a limited basis.

The study of the local school units is well under way in the 10 States, and when completed will reveal existing educational conditions in the present school-district organizations and significant findings, with consequent recommendations pointing to more desirable organizations.

The following States are participating in the project: Arizona, Arkansas, California, Illinois, Kentucky, North Carolina, Ohio, Oklahoma, Pennsylvania, and Tennessee. In each of these States there is a State project director who is a member of the staff of the State department of education and who works in close cooperation with the chief State school officer and with the project staff of the Office of Education. The staff project director, with the assistance of a central staff, directs the activities of workers selected from relief rolls and assigned to the collection and tabulation of the required data and to the preparation of maps and charts needed in the study.

The administrative and supervisory personnel of the 10 States on June 25, 1936, consisted of 10 directors (serving without compensation), 9 associate directors, and 58 assistant directors; and the relief personnel consisted of 1,443 clerical-stenographic workers and draftsmen.

3. STIMULATION AND COORDINATION OF RESEARCH BIBLIOGRAPHIES, THESES COLLECTION, ETC.

Twelve reference bibliographies were compiled during the year. The file of masters' and doctors' theses in education has grown steadily during the year, on June 30, 1936, numbering 2,203 volumes. About 500 of these were sent out on interlibrary loan during the year.

A selected and annotated bibliography has been prepared on problems of education in the Appalachian Highlands. Other bibliographies in progress deal with supervised correspondence study; status and improvement of the county superintendency; improved practices in rural teaching; education of Negroes; etc.

AID TO STUDENTS OF FOREIGN SCHOOL SYSTEMS

The Comparative Education Division helped in 162 studies, which, classified according to purpose, were:

Professional use.....	26
Doctoral dissertations.....	6
Master's theses.....	10
Theses, grade not given.....	9
Reports of term papers.....	30
Study groups.....	2
Purpose not given; plainly from college students.....	31
Purpose not given; probably from college students.....	39
For high-school students.....	9
Total.....	162

In the classification "Professional use" are included requests from members of college and university staffs, State boards of education, local school boards, and secondary- and elementary-school personnel.

Education in some one country was the subject of most of the theses, term papers, and reports. Requests of this nature related to 26 countries and totaled 96 requests.

Letters of introduction.—With the betterment in economic conditions, larger numbers of educators in the United States are traveling abroad. Many of them ask for letters of introduction from the Office of Education. Sixty-three letters of introduction were prepared for 31 persons of the United States who were traveling abroad last year for study purposes.

Research in universities.—The purpose of this project is to conduct cooperative research in a number of universities having organized graduate work. The universities voluntarily provide administrative and general supervisory services. The institutions employ persons taken from relief rolls who have received college and university training sufficient to enable them successfully to perform the professional and skilled work demanded.

A total allotment of \$500,000, later reduced to \$411,695, was made available to the project. Of the final allotment, \$384,695 was made available to participating institutions and \$27,000 was set aside for administrative expenses. The average estimated cost of each study proposed by the Office of Education was \$1,448.

Fifty-eight universities in 32 States, the District of Columbia, and Hawaii have been conducting project studies. These include some of the largest universities in the country.

The number of paid workers employed under the project increased from 64 on April 2 to 448 on July 30. Over 90 percent of the paid workers have been taken from relief rolls. In addition to paid workers, several hundred university professors and other university-staff members have given their services free to the project.

Most of the 23 studies conducted under the project were outlined and proposed to participating institutions by Office of Education specialists. In addition 11 auxiliary studies, closely related to the 23 basic studies, were being conducted. A third group of studies included 15 investigations proposed by participating institutions, and accepted for cooperative conduct by the Office of Education. The Office studies most popular among the universities included: Student mortality in institutions of higher education, conducted in 33 institutions; economic status of college alumni, 28 institutions; relation between certain factors in high-school education and success in college, 22 institutions; and others.

4. POLICY-MAKING IN EDUCATION

RELATIONS WITH STATE DEPARTMENTS OF EDUCATION

An outstanding function of the Office of Education is to cooperate with State departments of education in the initiation and development of progressive educational practices. Handicapped groups are in serious need of special attention everywhere. Through funds made available by the Federal Government for vocational rehabilitation, physically handicapped adults are given the opportunity to achieve economic independence. The education of handicapped children, however, is not so well assured, its maintenance being borne by State or local school systems, with resulting inadequacy of services in many communities.

The Office of Education has sought continuously to establish in the States sound policies of action with reference to these children that will insure their inclusion in the public-school program of the State. It has sought to clarify the relationship of the education of handicapped children to the vocational rehabilitation of handicapped adults, on the one hand, and to the social-welfare services of the

State, on the other hand. In this connection it has emphasized the following principles: (1) That the program for handicapped children in elementary and junior high schools should be administered and supervised by those who have had training and experience in general educational methods of the elementary school as well as in special techniques demanded for handicapped groups; (2) that the vocational rehabilitation of handicapped adults should be administered by persons specially prepared in vocational education and guidance; (3) that these two functions should be distinct but coordinated activities of the State department of education; and (4) that they should both be administered as distinct from any social-welfare functions of the State. In accordance with these principles, the Office has actively advocated the appointment of one or more qualified persons in each State department of education who will have as a sole responsibility the development of a program on a State-wide basis for the education of handicapped or exceptional children.

MEMBERSHIP ON COMMITTEES ON POLICIES AND STANDARDS

Staff members of the Office of Education have served on the following committees having to do with educational policies and standards: Joint Committee on the Emergency in Education; Committee on Special Group Problems of the National Vocational Guidance Association; advisory committee, division of cooperation in education and race relations, State department of education, Raleigh, N. C.; committee to consider special problems of Negroes for American Youth Commission; special committee of the National Education Association to study the economic status of rural teachers; committee of the National Conference of Supervised Correspondence Study; committee to select books for C. C. C. camps; interdepartmental committee to study relationship among health, education, and welfare services of the Government; National Advisory Committee on Education of Negroes; Technical Advisory Committee of the National Survey of Vocational Education and Guidance of Negroes; American Council on Education's Committee on Standards; National Education Association Committee on Social-Economic Goals of America. Assistance has been given the committee on the improvement of teaching in engineering schools of the Society for the Promotion of Engineering Education, and to innumerable other groups.

CONFERENCES

The Second Conference on Comparative Education and the meeting of the National Committee on Inter-American Intellectual Cooperation were policy-making efforts in the special fields under consideration.

Advisory committee on the reporting of local and State school statistics.—In accordance with a resolution of the National Council of State Superintendents and Commissioners of Education in December 1935, requesting that the Office of Education center its efforts on assisting the States in developing more nearly uniform personnel and financial accounting procedures, the Commissioner continued this committee and authorized regional conferences. The committee met in June 1936, with the senior specialist in State school administration and the statistical division staff for the purpose of determining particularly the items of information to be included in the forms used by the States in reporting statistical data to the Office of Education and in attempting to formulate definitions for the report's terminology.

Portland conference.—The Office of Education conducted a 1-day conference in Portland, Oreg., preceding the meeting of the National Education Association. This conference was held in response to numerous requests from State superintendents and commissioners of education of the States in the Midwest, West, and Northwest. Most of these States are spending considerable effort in revising their recording and reporting schemes within the State to conform to the recommendations of the national committee.

School-building problems.—The specialist in school buildings prepared a program for and took part in the Seventh Annual Conference of the National Advisory Council on School Buildings held in St. Louis in February. The members of this advisory council are appointed by the United States Commissioner of Education and it is made up of nine regional councils.

Three regional conferences on school-building problems were held during the year—one at Ann Arbor, Mich., one at Portland, Oreg., and one at Stanford University, Calif. The purpose of these conferences was to acquaint school superintendents, architects, engineers, and others interested in school-building problems with the work planned by the National Advisory Council on school building problems, to invite discussion of the problems presented, and to secure cooperative action in studying such problems.

Office of Education conferences.—During the past spring a series of conferences was called by the Commissioner for the purpose of bringing together groups of outstanding persons in specific educational fields to consider educational services that might well be undertaken by the Office of Education. Conferences were held in the following fields: Adult civic education, conservation, crime prevention and recreation, curriculum, elementary education, guidance, higher education, industrial arts, school buildings, secondary education, and youth problems. These conferences made valuable contributions to the

Office in the way of bringing out suggestions for improved and extended services.

Local school units.—It is known that in areas of low population density, schools during recent years have suffered serious curtailments in length of terms, instructional programs, supervision, etc. In many areas their very existence has been threatened. While these conditions have been aggravated by the depression, the fundamental causes lie deeper. They are inherent in the prevailing system of administering and financing schools through a multiplicity of school districts too small in human and material resources to maintain efficient school facilities within their borders. Results of a conference called in June 1935, by the Commissioner of Education to consider this problem were compiled during the year and the report was made available for the guidance of State and other school authorities. It sets forth the principles involved in the organization of local school units and desirable policies to be followed.

Industrial arts.—A committee of representative persons in the field of industrial-arts education, appointed by the Office to make a study of the place and function of industrial arts in the public-school program, held a 2-day meeting in Washington and submitted a preliminary draft of its report. The final draft is now in preparation for publication as a bulletin.

5. FIELD SERVICE

CONSULTATIVE SERVICE

At the request of the Board of Education of Danville, Va., which was considering the need of a comprehensive survey of the schools of that city, the Office of Education sent a representative to make a preliminary investigation which resulted in recommendation that the superintendent of schools and the school principals carry on a local survey and called on consulting specialists as the needs arose. The board of education has proceeded upon this recommendation.

A member of the staff conducted school-building surveys for a number of the Resettlement projects and prepared reports advising those in charge of the projects as to their school-building programs.

Considerable field work was necessary in connection with the study of local school-administrative units to comply with the requests of the States for guidance and assistance. This is also true of other special projects.

In the field of health education, a representative of the Office prepared detailed memorandum on health and physical education in the United States for the American Consulate General of New Zealand; advised with inspector of public schools, Department of Education of Toronto, Canada; with State director of physical education of Vir-

ginia; with the State Department of Education of New York; with School Health Service of the N. E. A.; with American Council on Education; and with Boy Scouts of America.

Individual staff members have performed the following consultative services: Conferred and advised with school officials in Hawaii and in the southwestern part of the United States concerning the education of native and minority groups; with State education officials in three States (Iowa, Colorado, Virginia) concerning prospective organization of a State program for the education of exceptional children; acted as consultant for the colored State college curriculum reorganization project, Langston, Okla.; as director of colored high-school curriculum revision project, Oklahoma City, Okla.; as adviser to National Association of Teachers in Colored Schools; as educational consultant and trustee of Knoxville College; prepared outline for Commission of Higher Education of Negroes in Maryland, meeting with the committee and with its executive secretary; assistance was rendered a group of school officials in organizing the New England Industrial Arts Association. A member of the staff is included in the personnel of both the State guidance committee and the committee of city directors of guidance of the National Vocational Guidance Association. In connection with credential evaluation, a representative of the Office attended the Twenty-fourth Convention of the American Association of Collegiate Registrars at Detroit, Mich., in April and visited registrars and committees of admission at the universities of Western Ontario, Michigan, Chicago, Ohio, and Northwestern University at Evanston, Ill.

PARTICIPATION IN MEETINGS

Staff members of a division of the Office of Education which has but four professional members reported giving addresses at 41 national, regional, State, or local conferences, and attending 40 different conferences of organized groups during the year. This gives an indication of the literally hundreds of educational meetings participated in by Office representatives. Among such meetings are those of the American Council on Education; National Education Association; National Congress of Parents and Teachers; American Library Association; Progressive Education Association; National Council of Parent Education; Child Study Association of America; and many others.

The Office of Education was represented at the Fifth International Conference on Public Instruction at Geneva, Switzerland; International Conference on Health of College Students at Athens, Greece; and at the Seventh World Conference of the New Education Fellowship, Cheltenham, England.

The Office of Education aided the Department of State in arranging for official delegates to the following listed meetings abroad:

First Inter-Balkan Conference for the Protection of Children, Athens, Greece; Seventh Pan-American Child Congress, Mexico City, Mexico; Tercentenary Celebration of the Royal Hungarian Peter Pazmany University, Budapest; International Congress of Music Education, Prague, Czechoslovakia; Third International Congress of Open Air Schools, Hannover and Bielefeld, Germany; Fifth International Congress on Public Instruction, Geneva, Switzerland; Twenty-eighth Esperanto World Congress, Vienna, Austria; Seventh World Conference of the New Education Fellowship, Cheltenham, England; International Congress of Medical Advisers for Athletics, Berlin, Germany; Ninth International Congress of Linguists, Copenhagen; Third World Congress for Crippled Children, Budapest, Hungary.

COOPERATION WITH PROFESSIONAL AND PUBLIC-SERVICE GROUPS

Cooperation was continued during the year with the National Committee on Research in Secondary Education and with the Committee on Cooperative Study of Secondary School Standards. A member of the Office staff serves as secretary of these two committees.

Throughout the year the Office of Education has been consulted and called into conference on plans for estimating the population of cities from school census and enrollment data, and all records of this nature have been made available to the Bureau of the Census.

Staff members have: Cooperated with Pan American Union in connection with an educational project in Brazil; cooperated with Division of Territories and Island Possessions in respect to (1) consideration of a cooperative project for exchange of teachers between Puerto Rico and continental United States; (2) reviewing manuscript—History of Japan—at the request of the division; (3) miscellaneous advisory and informational service; cooperated with National Negro Student Health Association; assisted in the organization of a department of guidance in the National Association of Teachers in Colored Schools; cooperated with American Library Association in preparing a program of instruction for Negro teacher-librarians; served on committees in connection with the conference of Associated Country Women of the World, held in Washington this year; evaluated plan for department for the handicapped instituted at Teachers College, Columbia University.

In various capacities the Office of Education has cooperated with a long list of other agencies, including the National Congress of Parents and Teachers, the National League of Women Voters, Ameri-

can Red Cross, Social Security Board, the Associated Country Women of the World, National Education Association, National Council of Parent Education, American Association of University Women, American Council on Education, American Vocational Association, United States Sesqui-Centennial Constitution Commission, American Federation of Teachers, American Legion, Association for Childhood Education, Boy Scouts of America, National Catholic Welfare Conference, General Federation of Women's Clubs, National Safety Council, Progressive Education Association, Young Men's Christian Association, universities and colleges, and other groups, both public and private.

6. PUBLIC INFORMATION SERVICE

PUBLICATIONS AND PUBLICITY

Information on education in its various fields has been made available through many additional avenues during the past year. Bulletins and pamphlets presenting results of research and studies, periodicals giving current information and factual data, news releases on educational activities and developments, educational radio broadcasts, and extensive graphical exhibits have made up the mass of educational information which has gone out to the public from the United States Office of Education.

Statistically summarizing, 46 bulletins, 6 pamphlets, 4 leaflets, 7 bibliographies, 1 reading course, and 10 issues of *School Life*, with 1 supplement, made up the 75 different printed publications issued by the Office of Education during the fiscal year. A total of 57 manuscripts containing 6,506 pages were edited and prepared for printing. More than 300 charts, graphs, maps, and other illustrative material were constructed.

March of Education.—A new periodical, *March of Education*, has been added to the publication roll. This is a news letter over the signature of the United States Commissioner of Education. It circulates monthly to school executives and leaders. *March of Education* high spots in brief some of the significant educational happenings of the month. Its circulation over the first 10 months of its publication has been 12,700 each month.

School Life.—This journal has increased in size this year, from a 24-page to a 32-page monthly publication in order to give more adequate service as the official organ of the Office of Education. New regular features developed during the year have included a more extensive news department for public schools, colleges, and other educational groups; an editorial page by the Commissioner; articles growing out of research by the various divisions of the Office; voca-

tional summary for the month; report of C. C. C. educational activities; and other features.

Cooperation with the press.—The Commissioner of Education during the past year assigned a staff member of the editorial division to be especially responsible for cooperation with the press, in order to develop a wider and more effective use of educational information. The response of the press to this service has been most encouraging and has resulted in a very extensive use of news releases pertaining to educational activities, in newspapers and in other publications throughout the country.

Articles published outside the office.—The Commissioner of Education, the assistant commissioner, and staff members, upon request of organizations and periodicals, prepared for publication during the year, a total of 81 articles dealing with various phases of education.

Radio project.—During the past year the chief of the editorial division has been in charge of the Federal educational radio project of the Office of Education. This project as previously described in this report, has been financed through Federal relief funds and it represents a new effort toward disseminating educational information. There have been weekly broadcasts throughout the year of Education-in-the-News programs and scripts for 15 other series of programs have been developed, bringing the number of radio scripts completed to a total of 173.

Educational exhibits.—The Office of Education sponsored more extensive educational exhibits and publication displays at education conventions, conferences, and meetings during the past year than it has perhaps done in any previous year. In this respect the Office cooperated with many major educational associations and organizations, acquainting their members more fully with the services of the Office of Education with other Government publications on educational matters, etc. Through cooperation of the Government Printing Office this year the Office displayed with its own publications, bulletins, pamphlets, and periodicals of an educational nature available from other Government agencies. Special exhibits and samples of publications were displayed at the California International Exposition. A graphical exhibit of educational development in the United States was presented at the Texas Centennial Exposition. A special Negro education exhibit was also sent to the centennial. Office publication displays and exhibits appeared at conventions of the National Education Association, World Conference for the Crippled at Budapest, National Congress of Parents and Teachers, American Association for Adult Education, National Catholic Educational Association, American Library Association, and at various other gatherings of educational groups.

A mass of correspondence.—In the Editorial Division alone 47,736 letters were received during the past year requesting the various publications, and 338,072 printed publications of the Office of Education were distributed through the Superintendent of Documents. This figure does not include distribution of the periodical publications nor of the mass of mimeographed material issued by the Office nor material sent out directly by the Office.

Mailing lists.—The Editorial Division maintains 259 mailing lists. During the year there were 59 new lists set up and 5 discontinued. The total count of these mailing lists is now 143,227, exclusive of those maintained by the Vocational Education Division.

PUBLICATIONS ISSUED OR PREPARED FOR PRINTING DURING THE YEAR

BULLETINS, 1935

- No. 2. Biennial Survey of Education, 1932-34.
 Chapters
 II. Statistics of State school systems.
 III. Statistics of city school systems.
 IV. Statistics of higher education.
 VI.¹ Statistics of private elementary and secondary schools.
 VIII.¹ Review of educational legislation.
- No. 9.¹ Public education in the Philippine Islands.
 No. 10.¹ Public education in Hawaii.
 No. 11.¹ Education in Czechoslovakia.
 No. 12.¹ Availability of education to Negroes in rural communities.
 No. 13.¹ Statistics of the education of Negroes.
 No. 14.¹ Federal student-aid program.
 No. 15. Reorganization of school units.
 No. 16. Elementary-school graduating examinations.
 No. 17. Education for democracy—Public affairs forums.

BULLETINS, 1936

- No. 1. Educational directory, 1936.
 Parts
 I. Principal State and county school officers.
 II.¹ City school officers.
 III.¹ Colleges and universities, including all institutions of higher education.
 IV.¹ Educational associations and directories.
- No. 2. Young children in European countries.
 No. 3. Junior colleges.
 No. 4. State provisions for equalizing the cost of public education.
 No. 5. Bibliography of research studies in education, 1934-35.
 No. 6. Safeguarding democracy through adult civic education.
 No. 7. Instruction in hygiene in institutions of higher education.
 No. 8. Graduate work in engineering in universities and colleges in the United States.

¹ Prepared for the printer before July 1, 1935, but delivered by the Government Printing Office during the fiscal year July 1, 1935-June 30, 1936.

- No. 9. Testing practices of high-school teachers.
 No. 10. Scholarships and fellowships.
 No. 11. A guide to curriculum adjustment for mentally retarded children.
 No. 18. Youth:
 1. How communities can help.
 2. Leisure for living.
 3. Education for those out of school.
 4. Vocational guidance for those out of school.
 5. Finding jobs.
 6. Community surveys.

PAMPHLETS

- No. 64. Significant programs of high-school parent-teacher associations.¹
 No. 65. Aids in book selection for elementary school libraries.
 No. 66. Education of teachers: Selected bibliography, June 1, 1932, to October 1, 1935.
 No. 67. Training of elementary teachers for school health work.
 No. 68. What every teacher should know about the physical condition of her pupils (revised).
 No. 69. Per capita costs in city schools, 1934-35.

LEAFLETS

- No. 23. Osteopathy.
 No. 36. Good references on educational legislation.
 No. 37. Physique of school children.
 No. 46. Educational facilities for children on Federal Government reservations, 1934-35.

BIBLIOGRAPHIES

- No. 33. Visual aids in education: Lantern slides, film strips, stereographs, etc.
 No. 34. Pictures, maps, charts, etc., as classroom aids.
 No. 39. Elementary education: Classification, grading, promotion.
 No. 42. Elementary education: Extracurricular activities.
 No. 44. Parent education: History, objectives, methods, and programs.
 No. 45. Child development: Infancy through adolescence.
 No. 48. The activity program.

MISCELLANEOUS

School Life, 10 issues and index.

The whole child. Reading Course No. 32 (revised).

(See Vocational Education Division Report for vocational publications.)

Biennial Survey of Education.—Three of the eight chapters comprising the Biennial Survey of Education, 1932-34, have been completed. Three others—Statistics of State school systems, of city school systems, and of higher education—are at the Government Printing Office.

EVALUATION OF FOREIGN CREDENTIALS AND TRANSLATIONS

Credential evaluations by the Office of Education for the year totaled 585 distributed over 64 different countries; and in addition

¹ Prepared for the printer before July 1, 1935, but delivered by the Government Printing Office during the fiscal year July 1, 1935-June 30, 1936.

reviews were made of 122 cases that were returned for further consideration. These evaluations are made by the Office at the request of colleges and universities in connection with their admissions.

Translations from 27 languages were made, totaling 174,610 words for the year, for the Office of Education alone and 6,495 words for eight other Government agencies.

LIBRARY SERVICE

More than 5,800 people visited the reading room of the Office of Education library and used 11,419 volumes which were brought from the stacks upon request, besides educational magazines and reference books in the reading room, of which no account was kept.

A special effort has been made to get the collection into shape to move into the new building, by eliminating duplicates among the unbound material, and completing and binding many files that had been accumulating as "incompletes" for a number of years. Much of this work has been done in the section of foreign education. The foreign ministries of education have been generous and helpful, and the library is grateful.

A bird's-eye view of the library's activities is shown in the following data: Books charged, 3,773; books brought to reading room, 11,419; theses loaned, 541; volumes sent to bindery, 752; telephone calls, 2,923; volumes cataloged and classified, 3,000; cards filed in catalog, 22,300.

7. ADMINISTRATION OF THE OFFICE

APPROPRIATIONS

For the fiscal year 1936 Congress appropriated for salaries in the Office of Education, exclusive of those for vocational education and rehabilitation, the sum of \$251,720, an increase of \$20,698 for that item for the fiscal year 1935. This increase provided for the restoration of salary reductions, an increase in the salary of the Commissioner, and for two additional positions—a specialist in State school administration and a stenographer. For the fiscal year 1937 the amount has been increased to \$262,980 and provides for the addition of a specialist in elementary education, a stenographer, two statistical clerks, and an amount of \$1,800 for the office of the Commissioner.

An amount of \$25,000 is appropriated for 1937 for a division of library service, which provides for the following additions to the staff: A chief of the division, two senior specialists, and four stenographers.

For general expenses an amount of \$15,000 was appropriated, and \$46,500 for printing and binding. For 1937 the appropriation for

general expenses was increased to \$20,000 to provide travel expenses for the collection of biennial statistics. The appropriation for printing and binding is in the same amount as for 1936.

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.

THE LAND-GRANT COLLEGES AND UNIVERSITIES

The 69 land-grant colleges and universities are located in every State of the Union and Alaska, Hawaii, and Puerto Rico; there are two in Massachusetts and in each of the 17 Southern States, one for white students and one for Negroes. The Federal endowment raised from the sale of land and land-scrip amounts to \$23,338,351 not including the value of 630,381 acres of unsold land estimated at \$5,124,046. These resources produced a revenue of \$1,315,430 for salaries of faculty members and facilities for instruction, for the year.

In addition to this endowment, annual appropriations (Morrill-Nelson funds) for the same year amounted to \$2,550,000 or \$50,000 to each State and the three Territories mentioned above. For the fiscal year 1935-36 this amount was increased by the passing of the Bankhead-Jones Act (June 29, 1935); section 22 of this act authorizes to be appropriated \$20,000 additional to each State and Hawaii, making a total of \$980,000 for 1935-36, and the sums will be increased by one-half a million dollars annually until 1938-39 when the appropriation will be \$2,480,000 annually, in addition to the Morrill-Nelson appropriations of \$2,550,000.

The Secretary of the Interior is charged with the certification and supervision of these funds, and the duty has been assigned to the Office of Education.

The land-grant institutions enroll 120,761 men and 54,056 women in residence instruction. Increased enrollments in agriculture were marked for the year being the largest in several years. More students than ever before were enrolled in veterinary medicine (1,459). Nearly twice as many students (2,455) were enrolled in forestry as

in the previous year. In home economics the number of girls enrolled has fallen off greatly since the depression, but improvements are being noted. In engineering, 28,755 students were registered representing an increase of 2,667 over the previous year. The depression has not affected the number of degrees granted to any considerable extent.

The total receipts for the year, from all sources reported by the 69 institutions amounted to \$139,946,185; these moneys were derived from student fees (\$19,036,769), endowment income (\$5,990,120), appropriations from Federal Government (\$22,325,384), State governments (\$57,225,632), district governments (\$1,942,433), private gifts (\$3,212,952), sales and services (\$7,826,629), auxiliary enterprises (\$17,686,305), and miscellaneous sources (\$4,699,961). Expenditures for educational and general purposes amounted to \$105,808,525; for noneducational expense, \$4,305,750; for auxiliary enterprises, \$16,786,148; and for capital outlays, \$8,244,990. Staff salaries totaled \$42,342,855 and all other wages \$27,689,608.

About \$424,000,000 represents the money invested in the land-grant institutions, including \$123,000,000 in endowment funds. \$275,000,000 in buildings, \$59,000,000 in grounds and \$100,805,000 in equipment.

III. VOCATIONAL EDUCATION

One of the major responsibilities of the United States Office of Education is administration of the Vocational Education Act of 1917 and the Vocational Rehabilitation Act of 1920. The former act provides for Federal-State cooperation in a program of vocational education in agriculture, trades and industries, and home economics; the latter, for similar cooperation in a program of vocational rehabilitation of persons disabled in industry or otherwise and their placement in wage-earning employment. The responsibility for administration of these acts was formerly vested in the Federal Board for Vocational Education, the functions and personnel of which were transferred to the Office of Education by Executive order in 1933.

This report covers the nineteenth year of Federal-State cooperation in vocational education and the sixteenth year of such cooperation in vocational rehabilitation, and the third year of the administration of these programs through the Office of Education.

In addition to these basic acts a number of supplementary acts have been passed from time to time authorizing appropriations of additional Federal moneys for vocational education and vocational rehabilitation programs. The vocational acts administered by the Office of Education at the present time, therefore, 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.)

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-Ellzey) to provide for the further development of vocational education in the several States and Territories, authorizing for the years 1935-37 additional appropriations for vocational education. (Approved May 21, 1934.) This act continued authorizations of additional appropriations upon expiration of the George-Reed Act of February 5, 1929, which had authorized additional appropriations for the years 1930-34.

An act (Social Security Act) authorizing additional appropriations for 1936 and annually thereafter for cooperation with the States and Hawaii in extending and strengthening their programs of vocational rehabilitation of the physically disabled. (Approved Aug. 14, 1935.)

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 continued authorizations 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 the three fields—vocational agriculture, trades and industries, and home economics—and also in the distributive occupations, and for teacher training in each of these fields.

An act (Randolph-Sheppard) authorizing the operation of stands in Federal buildings by blind persons. (Approved June 30, 1936.)

COMPOSITION OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION

The National Vocational Education Act of 1917 provided for the creation of a Federal agency to be known as the Federal Board for Vocational Education, to cooperate with State boards in the promotion of public programs of vocational education of less than college grade, to be carried on in publicly supported and controlled educational systems. This board consists of four members *ex officio*: the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, and the United States 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.

When the functions of the Board were transferred to the Office of Education in 1933 the Board was made an advisory body, its

members serving without compensation. As at present constituted, the Board is made up of the following members:

Clarence Poe, of North Carolina, for the unexpired term of 3 years from July 17, 1934, succeeding W. Harry King, term expired (representing agricultural interests).

Paul H. Nystrom, of New York, succeeding Lincoln Filene, term expired for a term of 3 years from July 17, 1936 (representing commerce and manufacturing).

Henry Ohl, of Wisconsin, for the unexpired term of 3 years from July 17, 1935, succeeding Perry W. Reeves, term expired (representing labor).

DEVELOPMENT OF NATIONAL POLICY

Mention was made in the last annual report of the fact that Congress was giving consideration to legislation which would provide for a further increase in the Federal grants for vocational education. Such legislation was passed by the Seventy-fourth Congress in May 1936, and approved by the President June 8, 1936. This legislation—the George-Deen Act—provides for the further development of vocational education in the several States and Territories. It authorizes additional appropriations for the year 1937-38 and annually thereafter for vocational education in the fields of agriculture, trades and industries, and home economics, and for teacher training in these three fields. In addition it authorizes for the first time appropriations for vocational training in the distributive occupations as well as appropriations for training teachers in the distributive field; and extends Federal grants for vocational education to the District of Columbia. This act, which becomes operative July 1, 1937, supersedes the George-Ellzey Act, which expires June 30, 1937.

The passage of the George-Deen Act forecasts a new era of development in the field of vocational education. Taking cognizance of the difficulty experienced by many States in maintaining a budget sufficient to insure the uniform development and expansion of their vocational education programs, the act requires the States and Territories to match only 50 percent of the grants provided therein for the 5-year period ending June 30, 1942, this percentage being increased by 10 percent annually thereafter until it reaches 100 percent in the fiscal year 1947.

COOPERATIVE SERVICES TO THE STATES

Attention has already been directed to the fact that the programs of vocational education and vocational rehabilitation carried on under public control and supervision and reimbursed from Federal funds are operated under a Federal-State program of cooperation. Evidence of the effectiveness of these programs is to be found in their growth and development over a period of 19 years, in the case of

vocational education, and over a period of 16 years in the case of vocational rehabilitation.

Enrollment in vocational schools operated under State plans in agriculture, trade and industry, and home economics has increased from 164,123 in 1918 to 1,247,523 in 1935. Similar growth has taken place in the program of vocational rehabilitation. At the end of the first year of this program, June 30, 1921, the number of disabled persons rehabilitated and placed in self-supporting employment totaled 523, and the number on the rolls of the State in process of rehabilitation, 4,792. The number rehabilitated during the year ended June 30, 1935, totaled 9,422, and the number on the rolls in process of rehabilitation, 40,941. In all, 77,261 physically handicapped persons have been rehabilitated and placed in employment during the period, 1921 to 1935. These figures are the more significant when it is understood that rehabilitation must be done on a case and not on a mass basis, and that it takes from 1 to 4 years completely to rehabilitate a disabled man or woman.

Perhaps the most important function exercised by the Office of Education in the field of vocational education and vocational rehabilitation is its cooperative service to the States. In the field of vocational education this service consists of individual and group conferences with State and local administrative staffs; assisting in the development of State and local programs; organizing and conducting annual conferences of State administrators, supervisors, and teacher-training staffs in regional problems in the field of vocational education; assisting in research activities or surveys carried on by individual States in an effort to secure information or data which will aid them in planning, setting up, and operating an effective program of vocational education; teaching services in summer sessions for teacher trainers; and other special and miscellaneous services. Services of a similar nature are rendered also in the field of vocational rehabilitation.

Cooperative services to the States have covered the several fields of vocational education—agricultural, trade, and industry, home economics, and commercial education—and the field of vocational rehabilitation. A brief statement of some of the representative services rendered by members of the staff of the Office of Education in these fields follows:

In the field of vocational agriculture.—Special emphasis has been placed by the members of the Agricultural Education Service of the Office upon the setting up of part-time classes for out-of-school farm youth. To this end conferences have been held in most of the States with teachers and supervisors. As a result, more part-time classes were conducted during the year than ever before.

Particular attention has been directed, also, to the technical curricula in the several teacher-training institutions in agriculture, with the result that some of these institutions are now revising their programs with a view to making the curriculum less specialized and more nearly in line with the need of teachers for broad training in technical agriculture.

Three other services should be mentioned. These are: Assistance to State supervisors of vocational agriculture in developing evening classes for adult farmers in agricultural conservation, assistance to the States in so organizing their vocational-agriculture programs that some of the time of special workers may be allocated to the preparation of subject-matter materials for the use of teachers, and work with State officials in revising State record and report forms.

Cooperative service to the States in the field of vocational agriculture received new impetus during the year by a cooperative arrangement worked out between the Office of Education and the committee on policy and program appointed by the vice president of the American Vocational Association, representing agricultural education. At the invitation of the Commissioner of Education this committee met with staff members of the Agricultural Education Service of the Office in May 1936 for the purpose of formulating and interpreting policies to be used as a guide in building up a more complete and better coordinated program of vocational education in agriculture throughout the United States.

The report of this committee, which will form the basis for further discussion at the next meeting of the American Vocational Association, will be further revised and refined before it is published. It deals with the following problems:

1. Continuing education of teachers in service.
2. Maintaining sound relationships in administration.
3. Maintaining desirable working relationships with adult farm and related organizations.
4. Providing guidance and leadership for National, State, and local units of the Future Farmers of America organization, and for any other similar organizations of young farmers.
5. Increasing the services of the departments of vocational agriculture in the public schools by extending the program of adult education in vocational agriculture (evening school instruction).
6. Making systematic studies of problems in vocational agriculture.
7. Increasing the services of the public school to out-of-school farm youth.
8. Teaching present and prospective farmers techniques, and developing wholesome attitudes toward cooperation.

In the field of trade and industrial education.—Demands for help from the Office of Education in training programs for workers and prospective workers in trade and industry have increased materially

during the year. This has been due, in part at least, to a realization on the part of industrialists, brought about by conditions incident to the economic depression, of the need for trained supervisory and skilled personnel. The Trade and Industrial Education Service of the office has been called upon repeatedly for assistance in surveying and evaluating present programs of vocational education, to determine how well present needs are being met, and what adjustments should be made to improve these programs; and for help in training teachers, leaders, and coordinators in meeting specific problems confronting them in local situations.

Office of Education staff members have rendered considerable assistance to the States during the year in setting up programs of coordination of trade and industrial training under which adult workers are given adjustment training, and young workers are trained for placement in specific jobs. These coordination programs have resulted in a better understanding on the part of employers of the problems involved in training worker personnel and of the help they may receive in solving these problems through the vocational education program.

Local surveys covering the need of trade and industrial training were conducted in Charleston and Huntington, W. Va., in Chattanooga, Tenn., and in a number of other cities and localities. Special assistance in teacher-training activities was rendered by regional agents of the Office in a large number of teacher-training institutions. Successful diversified occupation training programs, under which youth are given part-time school instruction and practical experience through part-time employment in any one of a variety of occupations, were set up with the help of members of the Office of Education staff in several Southern States and elsewhere. A special conference of coordinators for such programs in Mississippi, South Carolina, Florida, and Arkansas was conducted by one staff member. Other activities to which special attention was directed by Office staff members include: Training programs in the field of arts and crafts; training courses for prospective and employed household workers; programs of itinerant instruction for small communities; foreman training conferences; analyses of the trade content of occupations in particular localities, to be used as a guide in setting up courses of study on these occupations; and apprentice training programs.

In the field of home economics education.—Among the services rendered by the Home Economics Education Service of the Office of Education, in addition to its regular advisory and consultative work, are the following: (1) Assisting 9 States in revising or re-adjusting curriculum programs in home economics; (2) making surveys of 8 teacher-training programs as a basis for improving the

preparation of teachers; (3) directing revisions in home economics curricula in 3 colleges; (4) planning and conducting a series of 3 district conferences of supervisors of home economics and representatives of teacher-training institutions for Negroes from 17 States at which the problems involved in the training of home economics teachers for colored schools were considered; (5) assisting with conferences for teachers of special groups, such as the children of foreign-born parents, called for the purpose of planning courses in home economics adapted to the home practices and circumstances of these groups; (6) conducting a conference of leaders in the field of home economics from all over the United States, called for the purpose of determining ways in which the Home Economics Education Service of the Office of Education can render service to general as well as vocational home economics.

In the field of commercial education.—Up to the present time no Federal grants have been available to the States for the reimbursement of vocational classes in any branch of commercial education as such. Under the Smith-Hughes Act, the Federal Board for Vocational Education, now the Vocational Education Division of the Office of Education, was authorized to make studies, investigations, and reports which would be of help to the States in the establishment of vocational schools and classes, and in giving instruction in commerce and commercial pursuits; and to cooperate with the States in the promotion of vocational commercial education classes established in general continuation schools, and in teacher-training classes established for the express purpose of training teachers of retail selling in such continuation schools. The George-Deen Act, which becomes operative July 1, 1937, authorizes Federal appropriations for vocational training in that branch of the commercial field known as the distributive occupations—occupations followed by those engaged in distributing goods produced on farms and in factories.

During the past year the services to the States of the Commercial Education Service of the Office have been confined to such activities as were consigned to it under the terms of the Smith-Hughes Act. More time has been devoted to aiding the States in the establishment of schools and classes for workers in distributive occupations, requests for which were received from State directors of vocational education, than to any other kind of special service. Most of these schools are supported by local taxes. In many instances it has been necessary, in getting these schools started, to enlist the cooperation of local trade associations with school authorities. For example, when it was decided to establish a class for retail meat shop apprentices in the Washburn School, Chicago, the combined support of the local meat cutters' union and local retail meat dealers' associations was enlisted

in the project, with excellent results. Similarly the support of organizations interested in food retailing in Philadelphia has been secured for contemplated classes for workers in food retailing establishments.

Considerable time was given also to assisting secondary schools in adjusting commercial courses and curriculums to conform to present-day conditions and requirements which face those who enter office employment as graduates of such courses. Many high schools have become keenly aware of the fact that comparatively few of their commercial graduates find employment in the kinds of office work for which the commercial courses are supposed to train them. Assistance was given the State of Maryland in an extensive revision of its curriculum for commercial courses in rural secondary schools. The Office also assisted curriculum revision committees in North Carolina in preparing a course of study in commercial subjects. In New Orleans a special commercial school for high-school graduates opened during the year, and is using a curriculum outlined in part by the Office of Education. In addition the Office recommended changes in the commercial courses in New Orleans high schools in general, designed to integrate the courses in these schools and the special commercial school. A former continuation school in Salem, Mass., which was during the year changed into a vocational high school for youth of high-school age, contains a commercial department organized as a vocational commercial preparatory school, conforming to recommendations set up by the Office of Education.

In the field of vocational rehabilitation.—Among the services which are rendered to the States by the Vocational Rehabilitation Service of the Office of Education from year to year are assistance in the following activities:

1. Training new personnel.
2. Organizing the keeping of case records.
3. Expansion of State services.
4. Organization and conduct of studies of special phases of rehabilitation service.
5. Development of cooperative relations with welfare and similar organizations.
6. General promotion of State programs of rehabilitation.
7. Expansion of cooperation by employees of State services.
8. Conduct of State staff conferences.

In addition to these services which were conducted during the year, the Rehabilitation Service of the Office has assisted in surveys of the rehabilitation programs in the States of Maryland, Oklahoma, Ohio, Indiana, Nebraska, and Colorado. These surveys cover such items as basic conditions affecting the program, plan of administration, and case service. Comprehensive reports of the findings from these surveys were prepared and submitted to the rehabilitation offi-

cials in each State covered. These reports were later discussed with the members of the State rehabilitation staffs, recommendations for the improvement of the services suggested by the surveys were discussed, and assistance was given in setting up plans whereby this improvement could be put into effect.

CONTRIBUTION TO RELIEF OF UNEMPLOYMENT

One of the primary purposes of vocational education, particularly during a period of depression, may be said to be the relief of unemployment. This objective is accomplished through the training of youth and adults to an employable status; through adjustment training for new occupations for workers whose occupations have been taken from them through technological changes and in other ways; and by improving the occupational efficiency of workers already employed, in order to enable them to hold their jobs.

A study of the young people who apply for jobs through the public employment agencies in various States shows that very few have ever received training for any kind of work. Not only are they unemployed but in many instances they are temporarily unemployable because they are totally untrained to do any of the jobs for which others are willing to pay. It is especially difficult in times of a surplus of workers for young persons to secure training on the job. Under such conditions the vocational school is the only source of such help for the untrained. Recognizing their special responsibility in this matter, therefore, vocational trade and industrial schools have, during the past several years, gathered in these untrained persons in all-day, part-time, and apprenticeship classes and have trained thousands of them for work. At the same time these schools have, through part time and evening schools, provided training for those already employed to enable them to keep abreast of new developments in their occupations and thus to retain their jobs.

Numerous examples might be cited to show the type of activities that have been carried on in the States in an effort to relieve unemployment through the medium of vocational-training programs.

Alabama reported in 1935 that 34,500 unemployed or otherwise distressed adults would likely be served through instruction programs carried on in cooperation with the State relief administration. An emergency program for homemakers carried on in 400 centers enrolled 8,900 individuals in 639 classes. In Birmingham evening and all-day schools were opened for any who could profit by the work. The schools there worked in close harmony with the local transient bureau and also with representatives of both employers and workers in this program. "All of this work in Birmingham", the report from that State reads, "has been done by vocational

classes subsidized by State and Federal funds allotted under the Smith-Hughes and George-Ellzey Acts.”

Arizona reported that approximately 1,500 unemployed persons would be reached through itinerant classes in placer mining; that vocational agriculture officials there have cooperated with Federal transient camps in sponsoring garden and similar projects; and that the State supervisor of home economics has cooperated in organizing and carrying out emergency programs in homemaking and for nursery schools and in working out menus, recipes, and restricted diets for those on relief, using foods provided by relief agencies.

In Arkansas 112 classes, reimbursed from George-Ellzey funds, with an enrollment of 2,620, were organized, and 13 classes especially for unemployed women.

From Georgia came the report that “between 5,000 and 10,000 unemployed persons will likely be served by the program of vocational agriculture”; that “1,000 otherwise unemployed people have been trained for and placed in wage-earning jobs”; that “3,000 additional persons will be similarly cared for before the end of the year”; that “1,597 persons were given instruction in canning, 93,866 quarts of fruits and vegetables, 52,237 cans of meat, 168,318 pounds of pork having been thus preserved”; that “3,362 persons were given instruction in making 565 year-round gardens, with a total acreage of 672 acres”; that “1,389 persons were instructed in harvesting and storing farm food for the family and livestock”; and that “2,438 tons of food were harvested and stored.”

In Florida “2,500 people will be definitely prepared for and assisted into employment through the division of trade and industrial education.” Miami reports a hotel-training school for training “local citizens who would otherwise be unemployed and without means of support.” Over 800 persons were thus trained and practically all of them were placed.

The record of these few States, selected at random, speaks for itself.

One of the chief causes of unemployment is technological change in processes and equipment, which frequently eliminates individual jobs or even entire trades. To retrain workers thrown out of employment as a result of such changes, is one of the specific purposes of vocational education. Such retraining may sometimes be accomplished by groups. More frequently, however, it must be accomplished on an individual basis. During the past 5 years a great many of the vocational schools of the country have been thrown open to unemployed adults where necessary training has been provided on an opportunity basis so that individuals might come at any time and receive training designed to help them secure and hold a job. During

the past year, indeed during the period of the depression, the Office of Education staff has cooperated with State supervisors and school administrators, relief agencies, the United States Employment Service, and other organizations in setting up training programs for youth and adults, and in finding placement where possible for those completing these courses.

The problem of unemployment as it applies to training in the field of home economics is a particularly difficult one. Those responsible for the vocational homemaking program have, however, done much to alleviate trying conditions brought about by reduced home incomes, and by other conditions incident to the depression. The homemaker has been taught how to use the money available for family expenses to better advantage in the purchase, preparation, and preservation of food; how to purchase, make use of, and remodel clothing; and how to safeguard family health. Members of the Office of Education staff have helped supervisors and teachers in setting up and operating programs of instruction designed to meet the needs of both those on low incomes and those on relief. Instruction to meet the needs, also, of wage-earning girls and women employed in household service who have been out of employment or employed for only part time, has been provided. Special classes in sewing have been set up in a number of centers for women employed in sewing work by the Works Progress Administration. Home economics teachers in rural communities have cooperated with teachers of vocational agriculture in an effort to broaden the scope of live-at-home programs, under which those in small towns or on farms are encouraged to raise and preserve as large a quantity as possible of the farm products, such as fruits, vegetables, and meats necessary to meet the food requirements of the family.

One of the principal objectives of the vocational agriculture program during the past 4 or 5 years has been the development of instruction designed to promote the agricultural adjustment of farmers and farm youth to conditions growing out of the depression, and to aid in rural rehabilitation and resettlement activities.

By reason of its primary objective—the physical restoration of disabled persons and their placement in remunerative employment—the vocational rehabilitation program administered by the Office of Education makes a distinct contribution to the relief of unemployment. Up to February 1, 1936, practically all the States received special grants from the Federal Emergency Relief Administration for the purpose of supplementing their regular programs. Through these grants the States were enabled to render special services to the disabled, which could not be rendered under the provisions of the Federal Rehabilitation Act. For example, these special funds were

used to provide artificial appliances for persons who could not continue in or be reestablished in employment without such appliances. Persons thus fitted for employment were kept off the relief rolls.

NEW PROBLEMS OF THE ALL-DAY AND PART-TIME VOCATIONAL SCHOOL PROGRAM

The later entrance of youth into industrial occupations in the past few years, brought about by legislation or changes in social or industrial conditions, has made it necessary to modify either the period of instruction in trade and industrial classes or the age of entrance into these classes. To this end it has been necessary either to lengthen the period of instruction by 1 year or more, or to raise the minimum age of entrance into vocational trade and industrial classes from 14 years to 15 or even 16 years. This is one of the problems which those responsible for trade and industrial education have had to meet during the year.

There is the other problem in the trade and industrial field, also—that of providing training for older youth, those from 18–25 years of age—and for adults, who while they were at work in a definite occupation were enrolled in part-time and evening classes, but who as unemployed persons may take advantage of day-school classes for training which will keep them abreast of new developments in their former occupations. These older youth and adults would not be interested in attending classes organized to give elementary training to young persons who are still in full-time school. All-day vocational schools have therefore been modifying and developing their programs not only to meet the needs of youth needing preparatory training for work, but to provide special part-time instruction to meet the needs of older youth and adults, already employed or previously employed.

A problem to which vocational agriculture schools have had to give attention is that of training for out-of-school youth, who thrown out of employment in the cities have returned to the farm. These youth are usually not interested in all-day classes, but rather in short intensive courses in specific phases of training which must be given in part-time classes.

Still another group—city youth and adults who having lost their regular jobs have come to the country for the first time to try to make a living in farming—needs instruction in farming. For this group part-time and evening instruction in special branches of agriculture has been made available in localities in which vocational agriculture schools are located.

In setting up classes for the out-of-school youth who are working on home farms or other farms, attention is given to instruction which

will further prepare them for successful farming. In some instances these youth have accumulated a little money in connection with supervised farm-practice projects while attending day-school classes in vocational agriculture and are looking forward to entering farming "on their own." What they need and desire, therefore, is continued training which will enable them to improve their farm management and to advance toward the goal of farm ownership. In addition to setting up training units for these youth those responsible for the program of vocational agriculture have made a definite effort to see that they are placed on farms. To this end they have sought the cooperation of land banks and other financial institutions and farm owners in working out a plan whereby these boys may purchase farms suitable for the agricultural enterprises in which they desire to engage. Such youth are encouraged, after they are settled on farms, to continue their training in evening classes in vocational agriculture in order that they may advance as rapidly as possible in their chosen field. Many of these youth, also, are earning additional money through the supervised farm practices required of them in connection with their vocational agriculture courses.

The principal problem so far as the adult farmer is concerned has been to provide evening-class instruction which would enable him to better adjust his farm-management plans to meet changing conditions.

Certain definite changes have taken place in respect to all-day and part-time classes in the field of commercial education. There has, for instance, been a decrease in enrollment in commercial classes in part-time general continuation schools, resulting from decreased employment in offices and stores, of youth under 18 years of age. Decrease in employment of youth under 18 in stores, for almost every kind of work, has resulted in a corresponding decrease in enrollment in cooperative retail selling classes. Cooperative retail selling classes have been practically closed in many cities. Changes in demand for workers may make continuance of high-school retail selling classes almost impossible, especially in cities where most of the high-school graduates are not mature enough to be satisfactory salespeople or store-service workers.

APPRENTICE TRAINING

Reports from the States show that the promotion of apprentice training is recognized as a major responsibility of State boards for vocational training in developing the Federal-State programs of vocational education.

This form of vocational training was recognized by the Commission on National Aid for Vocational Education, appointed by President Wilson, which in its report in 1914 declared that "vocational educa-

tion is needed to provide a supplement to apprenticeship." The Commission's recommendations on this subject were incorporated into the Smith-Hughes Act, and apprentice training has been a definite part of the vocational-education program ever since it was started in 1917.

During the year members of the Office of Education staff have cooperated with the Federal Committee on Apprentice Training in helping the States set up State advisory committees for apprentice training and in working with interested groups throughout the country in establishing improved standards in the field of apprentice education. Working with such advisory committees, vocational schools are maintaining trade instruction for thousands of apprentices through evening and part-time classes.

Chicago, Milwaukee, Detroit, Seattle, Portland, San Francisco, Denver, San Antonio, Houston, New Orleans, Pittsburgh, New York, Wilmington, Cleveland, and Boston are among the cities in which vocational schools are cooperating with other interested agencies in the promotion of apprentice training. In all cases the courses are organized with the advance and assistance of workers and employers from the special trades and occupations in which the apprentices are employed.

The States of Pennsylvania, New York, Massachusetts, and Connecticut have increased their enrollment in apprentice classes during the past year. In Pennsylvania a full-time coordinator has been employed to have full charge of apprentice programs.

OCCUPATIONAL ADJUSTMENT TRAINING

Occupational adjustment training—training to adjust workers to changes in industrial processes, techniques, and materials, in their trades or occupations—was recognized by Congress when it passed the National Vocational Education Act. Occupational adjustment training, intended as it is for workers already employed, must by its very nature be provided largely in evening classes. The Smith-Hughes Act makes specific provision for such classes.

Increased opportunities for employment following the prolonged period of depression served to emphasize the need for occupational adjustment training for those already employed to enable them to take new jobs which become available in their occupations. It has served to emphasize further the need for training on the part of workers in older age groups who in order to hold their jobs must keep themselves up to date in the new technics. It has been necessary also to train for new jobs workers whose former occupations have been eliminated by reason of technological and other changes.

The vocational schools have made it possible for hundreds of workers to learn to handle new tools and new material and to learn new processes and thus to resume work on their old jobs. Plumbers and boilermakers have learned to do welding; sheet-metal workers, electricians, and steam fitters have been trained to install, operate, and service air-conditioning plants; auto mechanics have learned how to operate and maintain Diesel engines; and electrical workers have been taught to service radio, electric refrigerators, and vacuum cleaners. These are but a few of the examples of adjustment training by which thousands of workers, thrown out of their former jobs through changing conditions, have been fitted for employment in new occupations.

Instruction in home economics in evening classes for adults has centered attention upon adjustments in the practices of homemakers with respect to the expenditure of reduced incomes for food, clothes, home furnishings, and other home necessities; upon the preservation of food, especially that raised in home gardens; and upon measures designed to create better health and sanitation conditions in the home. Such instruction may be said to be occupational adjustment instruction.

For evidence of the scope and effectiveness of instruction in occupational adjustment in agriculture, trade and industry, and home economics, it is necessary only to point to the enrollment of adults in vocational classes operated under State plans in these fields during the year. The total enrollment in such classes was approximately 411,000, of which 110,000 were farmers seeking instruction which would aid them in revising their farm-management practices in line with new developments—scientific and economic—in agriculture; 164,000 were trade and industrial workers, learning the new techniques in their trades; and 136,000 were women, many of them forced by circumstances to practice rigid economies, enrolled to secure instruction which would be an asset to them in their efforts to provide the maximum of satisfaction, comfort, and happiness for their families. These enrollment figures are in contrast to those for the previous year, when 370,000 persons were enrolled in evening schools—101,000 farmers, 140,000 trade and industrial workers, and 129,000 homemakers.

COOPERATION WITH OTHER AGENCIES

It would be impossible for the Office of Education as the Federal administrative agency under the National Vocational Education and National Vocational Rehabilitation Acts, or for State boards for vocational education and vocational rehabilitation to carry on effective

programs in these two fields without cooperating with other agencies more or less concerned with these fields.

Vital as this cooperation is under normal conditions, it is doubly essential under the economic and social conditions which have obtained in the past 6 years. Both Federal and State authorities responsible for the promotion of vocational education and vocational-rehabilitation programs have realized the necessity for a well-planned cooperative effort.

During the past year the Office of Education, continuing a policy adopted with the inception of the vocational-education program in 1917, has worked in close touch with other Government agencies and other public and private agencies whose objectives dovetail with those of the vocational-education program.

The trade and industrial service of the Office has cooperated with the Federal Committee on Apprenticeship Training in promotional work in the field. Two members of the staff of this service have continued to serve as members of this committee. Another member of the service has worked with the United States Air Corps in making an analysis of occupations in the field of communications. The service cooperated with the Department of Labor in preparing and publishing a summary of State laws covering school attendance and employment of minors. Assistance was given the Home Owners' Loan Corporation in organizing a plan of training for groups of its field workers. Various services were rendered by the trade and industrial service also to the Civilian Conservation Corps, the Public Works Administration, the United States Forest Service, the National Youth Administration, and the Tennessee Valley Authority. Other public and private agencies with whom the trade and industrial service has cooperated during the year include: American Municipal Association, American Management Association, a number of industries, and various national labor organizations.

During the year a considerable portion of the time of staff members of the agricultural service of the Office, of State supervisory and teacher-training departments, and of local teachers of vocational agriculture has been devoted to the development of further and closer cooperative working relationships with Federal, State, and local agencies in the field of agriculture, unemployment relief, and emergency education. The service has cooperated with the Farm Credit Administration in carrying to State supervisors and teacher trainers in agricultural education, and in turn to individual farmers, information concerning the activities of that Administration and the services it makes available to farmers in financing their operations. Vocational agriculture teachers have assisted farmers and farm youth enrolled in vocational agriculture classes to get production credit

loans and loans from Federal land banks to refinance their farm mortgages. Farm youth have secured loans in connection with their supervised practice programs. The agricultural service of the Office has also cooperated with teacher trainers employed by the Agricultural Adjustment Administration in the development of teaching information to be used by vocational agriculture teachers in explaining to their classes the purposes and activities of the soil-conservation program. Teachers of agriculture continue to cooperate with camp educational advisers of the Civilian Conservation Corps by assisting them in organizing teaching materials in agriculture to be used in camp classes and by extending the facilities of vocational agriculture departments for inspectional and field trip purposes. Many State supervisors of agricultural education are cooperating with State organizations responsible for the administration of Federal emergency education programs, and in some instances these supervisors have shouldered a considerable share of the responsibility of administering these programs. As explained in the discussion on day-school and part-time classes, the agricultural service is working with land banks and other financial institutions in getting vocational agriculture students placed on farms as renters or as owners.

The home economics education service has cooperated during the year with five Government agencies. It is conducting a study in cooperation with the Home Economics Extension Service of the Department of Agriculture, designed to assist in the development of type programs of vocational home economics education. A series of lessons was prepared by the Office of Education for the educational director of the Home Owners' Loan Corporation, on the household budgets. Help was given the women's work division of the Federal Emergency Relief Administration in planning a program of household employment. Assistance was rendered in various ways also to the Rural Electrification Administration and the Resettlement Administration.

Throughout the year interrelations between agencies vitally concerned with the welfare of disabled persons have been materially strengthened through the cooperation of the vocational rehabilitation service of the Office of Education and the State rehabilitation services. This cooperative effort has extended to such organizations as workmen's compensation bureaus, State employment offices, and crippled children's agencies. The rehabilitation service of the Office has been giving attention also to the establishment of organized working relations between State rehabilitation departments and county or local public agencies.

RESEARCH AND PUBLICATIONS

A continuing program of research has been carried on by all services of the vocational education division of the Office of Education during the year.

The agricultural education service is assisting in a research organized under a committee of the National Association of State Directors of Vocational Education, covering the amount and distribution of time devoted to vocational agriculture in high schools. This service is making a study, also, which has for its objective the evaluation of supervised farm practice in vocational agriculture departments in the Southern States. Two other studies—one on the status and farming record of graduates of vocational agriculture courses, and the other on the place of vocational agriculture in the small high school—have been under way during the year. Other studies on which research is being made by the agricultural education service are: The out-of-school farm youth; placement opportunities for vocational agriculture graduates; and the use of agricultural experiment station data in vocational agriculture classes. The service is cooperating in the University Research project, which provides for the cooperation of colleges and universities in studies and investigations in agricultural education, in which the services of unemployed relief workers are utilized. The research specialist of the agricultural education service is serving as a member of the Committee on Research, Agricultural Section, American Vocational Association. During the year, also, he was called upon to assist graduate students attending summer sessions in several universities with their research problems, through individual and group conferences.

A study of aviation courses in the public schools, started by the trade and industrial service over a year ago, was completed during the year. A second study—training for sheet-metal workers in the aviation industry—is rapidly being completed. Other studies under way in this service are: Vocational needs in the District of Columbia; safety plans in public school shops; apprentice training; household training courses; vocational education for adults; and fireside or handicraft occupations, particularly in New England and the Southern States.

Four studies have been conducted by the home economics service: One on out-of-school rural girls; one on the extensiveness of home economics in public schools in States and Territories; one on the field of home management; and a study, undertaken in cooperation with the home economics extension staff of the Department of Agriculture, on the needs and services available in home economics education in Garrett County, Md. The special agent for studies and investigations of the home economics service has assisted in guiding the program

of a committee on graduate study in the central region States, and has given assistance in research to groups in other regions. She has also advised with graduate students on studies in the field of home economics.

The Commercial Education Service completed during the year a study of cooperative training in retail selling in public high schools. Statistical studies covering changes in commercial occupations have been continued.

In addition to completing surveys of rehabilitation programs in seven States, as indicated under the discussion of "Cooperative Services to the States", the vocational rehabilitation service of the Office completed a study of procedures for such surveys, the results of which were prepared for publication in bulletin form. Results of a second study—factors in the rehabilitation of more than 10,000 persons returned to remunerative employment in 1935—were compiled and put in form for publication.

The principal publications issued by the Vocational Education Division during the year, in addition to the detailed reports of regional conferences of vocational education workers in the three fields—agriculture, trade and industry, and home economics—are as follows:

GENERAL

- Misc. 1766. 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, 1935.
- Misc. 1726. Hobbies. A bibliography.

AGRICULTURAL EDUCATION

- Bulletin No. 183. Business problems in farming. Suggestions to teachers of vocational agriculture for use in conducting agricultural evening classes.
- Bulletin No. 188. Young men in farming. Individual case studies of young men to determine their qualifications, opportunities, and training needs for the vocation of farming.

TRADE AND INDUSTRIAL EDUCATION

- C. L. 1871. Minutes of meeting of Advisory Committee of Nine.
- C. L. 1861. New definitions and interpretations affecting trade and industrial education.
- C. L. 1880. Conditions for training programs within industrial plants.
- C. L. 1896. Use of new forms for annual statistical reports.
- Misc. 1526. State compulsory school attendance standards affecting the employment of minors.
- Summary on apprenticeship in 1935.
- Set of 8 charts on "Occupational Statistics in the United States."

HOME ECONOMICS EDUCATION

- Bulletin No. 181. Space and equipment for homemaking instruction.
- Bulletin No. 182. Consumer buying in the educational program for homemaking.

Bulletin No. 187. Home-economics education courses. A study of practices in teacher-training institutions reimbursed from Federal funds for vocational education.

Misc. 1163. Studies and research in home-economics education reported by colleges and universities. Revised.

Misc. 1173. Subject index to these studies in home-economics education. Revised.

Misc. 1717. An educational program for household employment.

Misc. 1809. Homemaking education programs for adults and out-of-school youth.

Misc. 1810. Illustrations of student-teaching programs in home economics.

VOCATIONAL REHABILITATION

Bulletin No. 184. Procedure for survey of a State program of vocational rehabilitation. A manual of procedure for assembling and interpreting data on the factors involved in the conduct of a State rehabilitation program.

Bulletin No. 120. Vocational rehabilitation in the United States. The evolution, scope, organization, and administration of the program of vocational rehabilitation of disabled persons. Revised.

Misc. 1774. Vocational rehabilitation: Restoration of physically handicapped persons to useful employment.

Statistical tables of cases rehabilitated, fiscal year 1934-35.

APPROPRIATIONS: 1936 AND 1937

Appropriations under the several vocational education and vocational rehabilitation acts for 1936 and 1937, for research and service to aid the States and for administration of the acts, are shown in table 1; totals of appropriations to the States and Territories under these acts in table 2; and allotments to the States and Territories in table 3.

Appropriations for research, service, and administration under the Smith-Hughes Act have been continued in the same amount for 1937 as for 1936. Appropriations under the George-Ellzey Act have been slightly increased for 1937. Appropriations under the Rehabilitation Act as amended by the Social Security Act have been increased for 1937.

TABLE 1.—*Appropriations for research and service to aid the States and for administration: 1936, 1937*

Act	1936	1937
Smith-Hughes Act.....	\$192,000	\$192,000
George-Ellzey Act.....	64,000	73,000
Rehabilitation Act.....	63,500	74,420

Appropriations for allotment to the States and Territories under the Smith-Hughes and George-Ellzey Acts have been continued in the same amounts for 1937 as for 1936. Appropriations to the States under the Rehabilitation Act as amended by the Social Security Act

were increased by \$350,000 for the last 5 months of 1936, and have been approximately doubled for 1937. Additional appropriations for vocational rehabilitation to Hawaii and Puerto Rico have been provided for 1937, and the appropriation to the District of Columbia has been continued in 1937 as for 1936.

TABLE 2.—*Appropriations for allotment to the States and Territories for vocational education and vocational rehabilitation: 1936, 1937*

Act	Appropriation	
	1936	1937
VOCATIONAL EDUCATION		
Smith-Hughes Act		
Total.....	\$7,167,000.00	\$7,167,000.00
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		
Total.....	3,084,603.00	3,084,603.00
Vocational agriculture.....	1,031,019.75	1,031,019.75
Vocational trade and industry.....	1,032,191.60	1,032,191.60
Vocational home economics.....	1,021,391.65	1,021,391.65
Hawaii.....	30,000.00	30,000.00
Puerto Rico.....	105,000.00	105,000.00
VOCATIONAL REHABILITATION		
Vocational Rehabilitation Act.....	1,097,000.00	1,938,000.00
Supplemental Appropriations Act.....	350,000.00	-----
Hawaii.....	-----	5,000.00
Puerto Rico.....	-----	15,000.00
District of Columbia.....	15,000.00	15,000.00

TABLE 3.—Allotments of Federal money to the States and Territories for vocational education and vocational rehabilitation, year ending June 30 1937

State or Territory	Smith-Hughes Act				George-Elzey Act				Vocational Rehabilitation Act 1	
	Total	Vocational agricultural education	Vocational trade, industrial, and home economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational trade and industrial education	Vocational home economics education	1936	1937
Total.....	\$7,157,977.62	\$3,018,853.83	\$3,049,265.27	\$1,089,858.52	\$3,084,603.00	\$1,031,019.75	\$1,032,191.60	\$1,021,991.65	\$1,439,868.52	\$1,885,009.61
Alabama.....	160,268.82	106,018.23	32,611.15	21,639.44	93,135.83	43,759.65	14,181.83	35,194.35	29,168.23	39,730.02
Arizona.....	35,926.19	15,926.19	10,000.00	10,000.00	15,286.94	5,000.00	5,000.00	5,286.94	11,239.24	10,000.00
Arkansas.....	82,028.87	46,425.18	16,776.23	15,184.85	36,530.17	30,530.17	7,981.72	20,440.72	20,440.72	27,842.63
California.....	313,266.41	84,540.06	182,301.17	46,425.18	103,235.99	20,259.34	54,912.31	28,064.34	62,577.43	85,236.67
Colorado.....	61,530.56	28,757.35	92,779.21	10,000.00	26,957.25	9,234.22	8,176.60	17,746.91	15,551.07	15,551.07
Connecticut.....	80,214.52	26,484.45	43,589.77	13,140.30	30,299.37	5,000.00	16,507.46	8,791.91	17,712.07	24,125.69
Delaware.....	30,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	10,000.00	10,000.00	10,000.00
Florida.....	84,783.94	33,488.89	33,290.52	12,066.16	35,131.68	9,108.65	12,914.11	13,108.92	16,183.34	22,043.31
Georgia.....	175,228.08	112,207.67	39,236.98	23,784.03	99,743.24	40,314.07	16,180.15	37,249.02	32,038.97	43,667.48
Idaho.....	37,387.72	17,387.72	10,000.00	10,000.00	16,988.57	4,180.06	3,000.00	3,588.51	11,206.15	10,000.00
Illinois.....	420,534.11	111,199.48	246,933.68	62,388.95	141,551.42	32,625.19	72,011.89	36,914.34	84,208.79	114,654.47
Indiana.....	185,584.34	80,412.77	78,689.02	26,482.55	79,577.66	26,544.44	12,746.59	26,694.23	55,696.36	48,621.96
Iowa.....	146,260.73	83,146.09	42,908.77	20,265.87	75,743.10	31,928.34	16,213.17	27,601.59	37,097.98	37,097.98
Kansas.....	111,527.42	64,167.24	31,978.49	15,331.69	87,634.79	23,089.74	15,166.26	21,301.28	20,733.29	28,240.79
Kentucky.....	157,592.30	101,201.53	35,010.22	21,380.55	67,137.61	38,413.16	15,616.26	33,595.37	28,819.27	39,250.69
Louisiana.....	124,390.87	70,683.15	36,522.14	17,185.58	64,385.30	27,119.04	13,801.93	23,464.33	23,164.79	31,552.72
Maine.....	50,615.30	26,528.15	14,087.15	10,000.00	21,191.88	5,582.94	6,802.52	8,806.42	12,268.73	11,972.28
Maryland.....	92,659.43	62,602.80	42,714.98	13,341.65	35,042.23	7,752.87	15,138.51	12,150.85	24,495.27	24,495.27
Massachusetts.....	225,939.31	23,310.27	167,878.22	34,750.82	57,547.23	5,000.00	44,809.04	7,738.19	46,841.32	63,802.50
Michigan.....	270,137.03	85,855.27	144,684.11	39,597.65	98,133.56	25,544.93	44,087.68	28,500.95	53,374.47	72,701.29
Minnesota.....	148,887.03	72,816.70	55,103.85	20,966.48	71,525.22	29,232.88	18,119.74	24,172.60	28,261.14	38,494.46
Mississippi.....	124,424.02	81,141.81	48,847.09	16,435.12	82,441.92	44,496.42	7,025.68	30,919.82	22,153.23	30,174.88
Missouri.....	209,813.81	98,675.62	81,459.38	29,678.81	96,454.11	36,387.58	27,309.67	32,756.86	40,004.66	54,490.29
Montana.....	39,875.61	19,875.61	10,000.00	10,000.00	18,277.94	6,679.93	5,000.00	6,598.01	11,529.53	20,688.34
Nebraska.....	30,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,269.07	10,000.00
Nevada.....	32,679.49	10,714.23	11,965.26	11,288.16	44,229.32	19,122.97	8,603.35	16,503.00	11,323.80	10,000.00
New Hampshire.....	218,495.63	32,679.49	146,312.71	33,047.63	60,433.69	5,000.00	42,462.14	12,991.55	44,545.56	60,675.45
New Jersey.....	37,642.12	17,642.12	10,000.00	10,000.00	16,035.83	5,179.26	5,000.00	5,866.57	11,204.37	10,000.00
New Mexico.....	679,136.35	115,167.53	461,031.10	102,937.72	190,615.77	23,505.47	128,878.71	38,231.59	138,751.81	188,993.65
New York.....	192,981.96	131,572.98	35,484.35	10,000.00	192,967.34	52,236.85	17,032.86	43,677.63	34,944.33	49,627.62
North Carolina.....	311,632.96	31,632.96	107,495.50	10,000.00	28,473.33	12,971.53	5,000.00	10,501.80	71,937.06	113,263.14
North Dakota.....	371,090.69	119,248.45	197,495.50	54,382.74	433,843.01	33,081.63	61,175.07	39,586.31	26,410.32	33,973.47
Ohio.....	143,352.81	87,756.95	36,002.87	19,392.22	77,600.22	33,435.59	11,898.52	29,132.11	26,410.32	33,973.47
Oregon.....	57,324.88	25,860.11	21,468.77	10,000.00	25,817.85	7,302.69	7,928.52	8,586.66	12,713.60	14,319.87

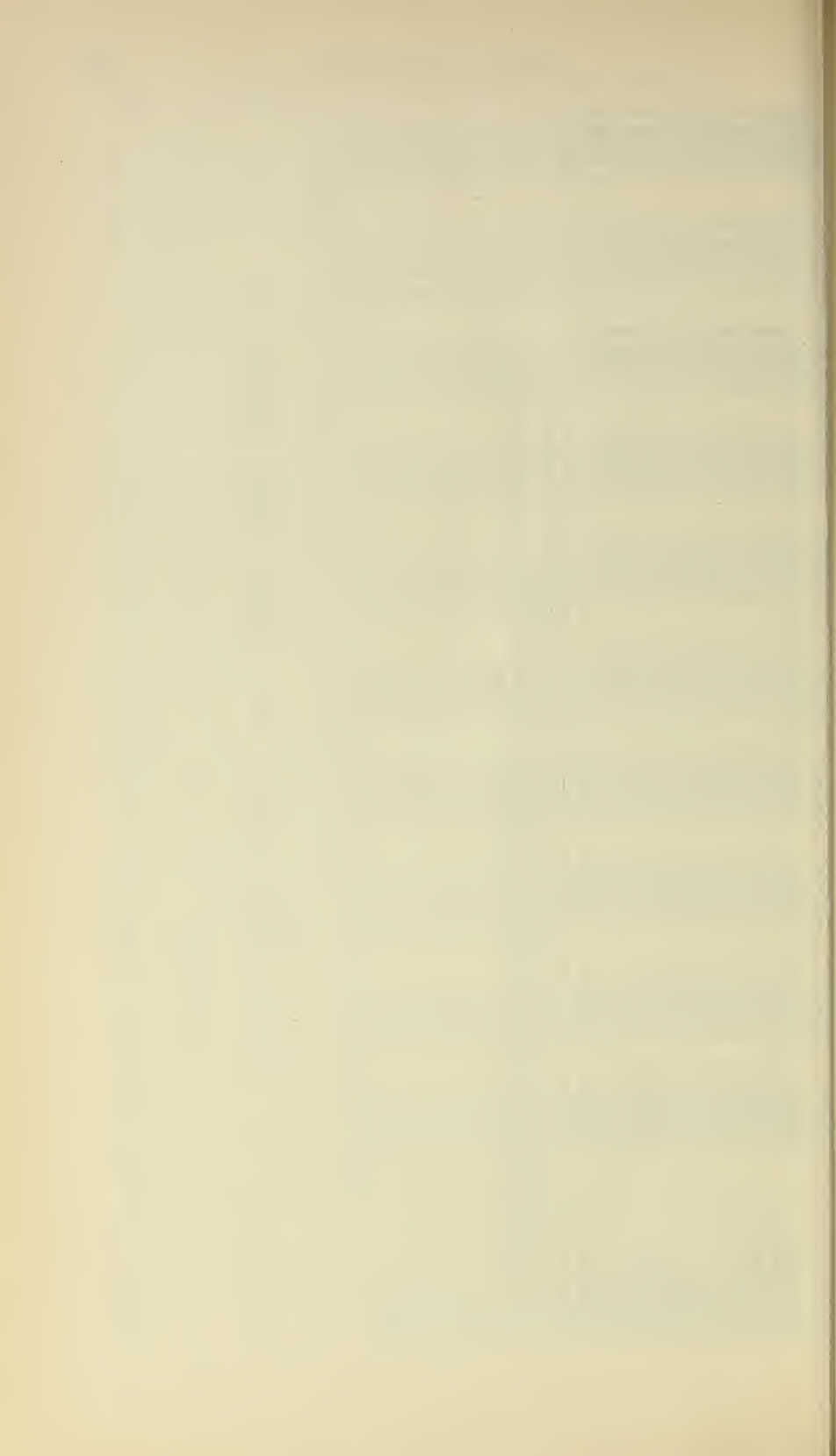
Pennsylvania	537,709.58	172,677.04	286,273.09	78,759.45	180,579.47	27,970.81	95,285.92	57,322.74	106,161.44	144,602.35
Rhode Island	47,842.03	10,000.00	27,842.03	10,000.00	17,286.75	5,000.00	7,286.75	5,000.00	11,955.99	10,321.88
South Carolina	106,714.19	76,236.31	16,289.29	14,218.59	64,159.77	29,922.51	8,929.47	25,307.79	19,165.52	26,105.33
South Dakota	51,323.28	31,323.28	10,000.00	10,000.00	28,138.31	12,740.08	5,000.00	10,398.23	11,971.21	10,402.24
Tennessee	156,555.22	95,875.76	39,282.82	21,396.64	86,726.44	39,684.15	15,214.90	31,827.39	28,840.96	39,284.23
Texas	343,814.26	191,491.24	104,691.95	47,631.06	178,077.40	76,800.99	37,708.02	63,568.39	64,202.86	87,400.62
Utah	35,132.76	13,466.11	11,666.65	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	11,444.87	10,000.00
Vermont	33,424.97	13,424.97	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	5,000.00	10,000.00
Virginia	145,433.63	91,209.99	34,419.18	19,804.46	77,295.40	31,041.94	15,974.93	30,278.53	26,694.83	36,360.99
Washington	89,381.85	37,840.26	38,757.07	12,784.52	36,179.26	14,949.57	13,668.05	12,561.64	17,232.51	23,472.38
West Virginia	104,667.06	68,900.85	21,535.80	14,140.41	51,466.68	14,663.44	13,900.79	22,902.55	19,060.14	25,961.79
Wisconsin	169,327.36	77,210.55	68,083.37	24,633.44	76,743.11	28,766.16	22,347.75	25,631.20	32,395.16	44,125.40
Wyoming	36,006.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,641.75	10,000.00
Alaska	30,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	2,080.00	10,000.00
Hawaii	105,000.00	30,000.00	460,000.00	15,000.00	15,870.52	5,870.52	5,000.00	5,000.00	5,000.00	15,000.00
Puerto Rico										

1 The allotments under the Vocational Rehabilitation Act include allotments under both the organic act and the Social Security Act.

2 The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

3 A special allotment of \$5,000 to Hawaii and the allotment to Puerto Rico are not included in the total under the Rehabilitation Act.

4 Trade and industrial education, \$30,000; home economics education, \$30,000.



GENERAL EDUCATION BOARD

(L. M. DASHIELL, *Treasurer*)

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 education within the United States.

On June 30, 1936, principal fund, belonging without restriction to the Board, amounted to \$34,734,598.42. This fund is invested in stocks and bonds. In addition the sum of \$13,865,481.91 is reserved to pay appropriations to various educational institutions, and the further sum of \$3,495,000 has been referred to the executive committee for appropriation, a total sum reserved of \$17,360,481.91. This fund is invested as follows: Securities, \$14,324,801.45; and cash on deposit, \$3,035,680.46. Lapses and refunds on prior years' appropriations amounted to \$50,000 and \$207.92, respectively. The sum of \$3,918,220.30 was paid during the year ended June 30, 1936.

Appropriations from income during the year aggregated \$3,253,608.31. Lapses on account of prior years' appropriations amounted to \$78,593.54, however, leaving a net increase in income appropriations of \$3,175,014.77.

The income from the above funds, together with income from undisbursed income (and including the sum of \$134.20 received on account of income from the estate of Lucy M. Spelman) amounted during the year to \$2,648,893.75; the balance of income from the previous year as of June 30, 1935, amounted to \$10,260,615.49, which, together with sundry refunds amounting to \$9,211.17, increased the total to \$12,918,720.41.

Disbursements from income during the year were as follows:

Whites:

Colleges of Liberal Arts: General endowment, buildings, and other purposes.....	\$805, 228. 42	
Science of education:		
Schools of education.....	\$30, 705. 21	
Special projects.....	167, 326. 24	
		198, 031. 45
Natural sciences.....		12, 608. 18
Medical sciences: Schools of medicine.....		71, 000. 00

Humanities-----	\$237, 956. 45	
Humanities-----	237, 956. 45	
Public education:		
Fellowships-----	\$41, 899. 33	
Special divisions in State de-		
partments of education-----	80, 192. 53	
Teacher training-----	37, 516. 65	
Library training-----	29, 800. 00	
Studies-----	22, 437. 34	
Other purposes-----	4, 703. 09	
		216, 548. 94
Miscellaneous-----		212, 382. 04
General education-----		714, 663. 87
Child growth and development-----		196, 212. 48
Training of personnel for the advancement of		
knowledge-----		196, 180. 64
		<u>\$2, 860, 812. 47</u>
Negroes:		
Colleges and schools: General endowment,		
buildings, and other purposes-----	600, 831. 08	
Social sciences-----	10, 000. 00	
Medical sciences:		
Schools of medicine-----	\$172, 500. 00	
Special projects-----	2, 475. 00	
		174, 975. 00
Public education:		
Summer schools-----	9, 801. 55	
Anna T. Jeanes foundation---	25, 000. 00	
John F. Slater fund-----	30, 000. 00	
Rural-school agents-----	121, 421. 01	
Fellowships-----	66, 682. 09	
Special divisions in State de-		
partments of education-----	750. 00	
Teacher training-----	1, 250. 00	
Other purposes-----	166. 48	
		255, 071. 13
Miscellaneous-----		1, 753. 11
		<u>1, 042, 630. 32</u>
Surveys and studies-----		18, 365. 87
Miscellaneous projects-----		4, 655. 63
Administration-----		303, 789. 07
		<u>4, 230, 253. 36</u>

This leaves an undisbursed balance of income on June 30, 1936, of \$8,688,467.05, which is invested as follows: Cash on deposit, \$8,221,635.63, and accounts receivable, net, \$466,831.42. It should be noted, however, that against this balance of \$8,688,467.05 there are unpaid appropriations amounting to \$8,122,261.71, leaving unappropriated income amounting to \$566,205.34.

The Anna T. Jeanes fund, the principal and interest of which are to be used for Negro rural schools, amounted, on June 30, 1936, to \$40,919.21. This sum is in cash on deposit. The sum of \$25,000 was appropriated and paid during the year.

The income from this fund during the year was \$1,937.68. Added to the balance from previous year of \$5,304.77, the total available income amounted to \$7,242.45. The sum of \$3,157.96 was paid, and a payment of \$1,750 under prior years' appropriation originally charged to principal, was transferred to income, leaving \$2,334.49, which is accounted for in cash on deposit. Of this balance of \$2,334.49, there were unpaid appropriations of \$1,985.99, leaving \$348.50 available for appropriation.



GENERAL LAND OFFICE

(FRED W. JOHNSON, *Commissioner*)

Due to Executive orders of withdrawal, no. 6910 of November 26, 1934, and no. 6964 of February 5, 1935, and the amendments thereto, there was a marked decrease in the number of acres included in original entries, selections and filings made during the year, when compared with the previous year. The area was 425,834 acres, as against 1,759,078 acres which were included in such appropriations during the preceding year.

The area embraced in final entries, selections and filings made during the year was 1,937,526 acres, an increase of 165,823 acres over the area included in such entries during the preceding year.

Altogether 8,238 patents were issued for 2,216,684 acres, while during the preceding year only 6,102 patents were issued for 1,394,130 acres. This shows an increase of nearly 60 percent over the area patented during the year 1935. In addition, under State grants, 253,903 acres were certified to States, an increase of 30,602 acres over the area so certified during the previous year.

The area which on June 30, 1936, was embraced in unperfected entries upon which final proof of compliance with the law was not due or had not been presented, was 16,862,271 acres, or 2,804,442 acres less than were included in such entries on June 30, 1935. The area which on June 30, 1936, was included in outstanding licenses, leases, and permits issued under the mineral leasing act was 12,322,637 acres, an increase of 1,014,960 acres over the number of acres under such form of appropriation at the close of the preceding fiscal year.

There were furnished during the year 36,898 certified and uncertified copies of entry papers, plats, field notes, patents, etc., for which there were received amounts aggregating \$10,826.75. In addition there were furnished for official use by this and other departments and agencies 60,016 copies of said items. There were furnished altogether 6,468 more copies than were supplied during the preceding year.

Reports were submitted on 69 Senate and House bills, and necessary orders and instructions have been prepared or are in course of preparation in connection with 67 bills, public and private, affecting the public lands which were enacted into law. Reports were made on 26 enrolled bills.

In connection with pending and proposed suits 211 letters were written, which related to initial or interlocutory actions, commented on bills of complaint, and considered reorganization plans of the defendant companies under the Bankruptcy Act. Twelve suits were recommended.

Favorable consideration was given to 75 applications to practice before the Department and charges made in 2 cases against United States commissioners were sustained and the revocation of their respective appointments was recommended.

The number of letters and reports received for consideration or answer from all sources during the year was 139,147, and 73,956 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, approximately 1,553 cases.

Numerous requests were received during the year from other bureaus and departments in connection with their respective operations for the status of public lands, the compilation of maps or diagrams, certified copies of records, the preparation or consideration of proposed orders of withdrawal or restoration, or other information or action. This work frequently involved much research or consideration and it added considerably to the duties of the office.

In land exchanges made for the benefit of other bureaus this office examined abstracts of title covering many thousands of acres in order to determine the sufficiency of title to the lands offered as base. The facts as to such exchanges will be set forth hereinafter in detail.

TAYLOR GRAZING ACT

Grazing districts.—This office, in cooperation with the Division of Grazing, and in accordance with departmental order of March 11, 1935, has prepared the orders which have been issued establishing grazing districts and describing the lands included within the exterior boundaries thereof, together with the diagrams accompanying the orders, showing the exterior boundaries of each grazing district, and other pertinent data. It is estimated that the total area included in all established districts, as of June 30, 1936, was 79,805,186 acres.

Amendment to act.—The act of June 26, 1936, Public, No. 827, amended the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), so as to increase the area subject to inclusion in grazing districts from 80,000,000 to 142,000,000 acres. The amendatory act modifies sections 7, 8, 10, and 15 of the act, and it adds a new section thereto, namely, section 17, which relates to personnel of the Division of Grazing. The

administration of sections 7, 8, 10, and 15 rests largely with the General Land Office.

SEC. 7. *Homestead and other entries.*—Section 7 of the Taylor Grazing Act, as amended, authorizes the Secretary of the Interior, in his discretion, to examine and classify any lands withdrawn or reserved by Executive Order No. 6910, of November 26, 1934, and the amendments thereto, or by Executive Order No. 6964, of February 5, 1935, as amended, or within a grazing district, and to make such lands subject to disposal under any applicable public land law, when such classification shows that the lands are more valuable or suitable for such use than for the use provided for by said act, or that the lands are proper for acquisition in satisfaction of outstanding lieu, exchange, scrip, or land-grant rights. However, no homestead entry may be allowed for more than 320 acres. Classification may be made by the Secretary of the Interior on his own motion, or on application.

A few requests were received under the original section 7 to have lands classified and opened to homestead entry, which requests were referred to the Division of Grazing, as required by Circular No. 1353. No such classifications have yet been made.

SEC. 8. *Exchange of lands.*—The limitation imposed by section 8 of the original act, that exchanges of privately owned lands may be made only when such lands are situated within the boundaries of a grazing district, has been removed by the amended act. Under the act as amended, exchanges may be made of privately owned lands situated outside of grazing districts, as well as of such lands situated within grazing districts. This liberalization of the law will permit private holdings outside of grazing districts to be blocked up in the public interests for grazing use.

The authorization for the exchange of State-owned lands has also been materially modified. Such exchanges may now be made acre for acre as well as on the basis of equal value. Exchanges of State land may not, however, involve the selection of public lands within a grazing district unless the base or offered lands are also within such district, and then only when the selected lands lie in a reasonably compact body, so located as not to interfere with the administration or value of the remaining lands in such district for grazing purposes.

A total of 19 applications for the exchange of privately owned lands were filed during the year, of which 2 were rejected, leaving 17 cases pending. The pending cases are awaiting reports from the Division of Grazing.

At the beginning of the year there were 202 applications pending for the exchange of State lands. Fifty-nine new applications were received and 59 applications were finally rejected. Action on 130 applications was suspended for various reasons. Reports from the

Director of Grazing were requested on 29 applications, and from the Division of Investigation in 26 cases. Additional evidence was required, or other action taken, in 40 cases.

SEC. 10. *Disposition of proceeds.*—The amended law brings all moneys received from the administration thereof, except as provided by sections 9 and 11, under the plan of distribution under which 25 percent thereof, when appropriated by Congress, may be used for the construction, purchase, or maintenance of range improvements and 50 percent will be paid to the States for the benefit of the county or counties in which the lands producing such moneys are situated. This distribution includes the receipts from leases under section 15 of the act, which receipts were not subject to such distribution under the original section 10. Thus, a larger amount of money than was provided for by the original law will become available for range improvements and for the benefit of the counties in which the lands are situated.

SEC. 14. *Public sales.*—Appropriate action was taken during the year on 266 applications for public sales.

SEC. 15. *Grazing leases.*—The restriction imposed by original section 15, under which regulations were approved January 8, 1936, as Circular No. 1375, that isolated tracts outside of grazing districts may only be leased for grazing purposes to owners of lands contiguous to the area sought to be leased, was removed by the amended act, and in its place broad authority is granted to the Secretary of the Interior to lease for grazing purposes any public lands outside of grazing districts, upon such terms and conditions as the Secretary may prescribe. Preference, however, is given to owners, homesteaders, lessees, or other lawful occupants of contiguous lands, to the extent necessary to permit the proper use of the contiguous land. Thus, it can be seen that section 15 has been brought into accord with the fundamental principles governing the allowance of licenses or permits in grazing districts. Furthermore, it was provided by the amendatory legislation that where the area sought to be leased is in the form of an isolated or disconnected tract embracing 760 acres or less, the owner, homesteader, lessee, or other lawful occupants of the contiguous or cornering land is to be given an absolute preference to lease the whole of such tract.

When the amended law was passed, approximately 2,255 applications for grazing lease were pending. Of this number about 1,600 involved lands within contemplated or proposed grazing districts, which applications were awaiting reports from the Director of Grazing. The remaining cases were awaiting reports from the Division of Investigations. When action on these cases is taken, due consideration must be given to the provisions of the amended law, and the regulations issued thereunder.

EMERGENCY CONSERVATION WORK

Among the many diversified projects being carried on by the Civilian Conservation Corps, perhaps none exemplifies better the true conservation nature of the work accomplished than the two camps situated at Gillette, Wyo. These camps are operated under the jurisdiction of the General Land Office.

The work consists in controlling the coal fires that for years without restriction have been destroying the irreplaceable coal deposits of the Federal Government in Campbell County. The smaller fires are being brought under control by digging out the fires and covering the exposed part of the coal vein, while the larger fires are being smothered by the application of a surface of from 10 to 20 feet of finely pulverized earth.

AREAS TO WHICH ACTIVITIES OF THE GENERAL
LAND OFFICE EXTEND

Unappropriated and unreserved public lands.—Because of the withdrawals made by Executive orders of November 26, 1934, and February 5, 1935, no computations of areas of the remaining public lands have been made since June 30, 1934. The area of the unappropriated and unreserved public lands as of said date was approximately 165,695,497 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 and 1936, were 2,169,357 acres in the public land States, and 15,555 acres in Alaska, a total of 2,184,912 acres. However, the net area of the public land was not

decreased to that extent as considerable land was restored to the public domain through the rejection of applications and the cancellation of entries.

CADASTRAL ENGINEERING SERVICE

The Cadastral Engineering Service of the General Land Office is the congressionally constituted agency having jurisdiction over the survey and resurvey of the public lands of the United States proper and Alaska, mineral location surveys, and the preparation of the technical and legal records thereof. The larger part of the cadastral engineering operations during the fiscal year ended June 30, 1936, was carried on under the regular appropriation for surveying public lands. In addition to the regular surveying program, the General Land Office continued to respond in large volume to the call of other governmental agencies charged with the administration and development of public lands under their jurisdiction. Included in the list of such applicants were several of the newer Federal agencies such as the Division of Grazing under the Taylor Grazing Act, and the Resettlement Administration and Agricultural Adjustment Administration of the Department of Agriculture.

During the year 1936 cadastral surveying projects were carried on in 31 States and the Territory of Alaska, under 212 separate groups, 66 of which in 18 States were of resurveys. Accomplishment in much of this work, such as in field engineering investigations and many types of miscellaneous surveys, is not measurable on a quantity basis; however, on that part which can be so measured 15,754 linear miles, embracing 2,341,000 acres, were surveyed or resurveyed. In addition, an extensive cadastral engineering project involving the survey of irregular tracts of farm land for the Agricultural Adjustment Administration in eight Eastern States along and adjacent to the Atlantic seaboard was brought to a close.

Arrearages in office work in practically all districts were brought up and made current. During the year surveys and resurveys in 238 townships were platted and approved, 155 supplemental and segregation plats (exclusive of 22 supplemental plats accompanying survey returns) were constructed, and the work of examining, platting, and approving 143 mineral surveys, embracing 386 locations, at an average office cost of \$20.37 per location, was accomplished, an increase in the number of mineral surveys, of approximately 50 percent over the previous year.

There were accepted and placed on file during the year plats representing 1,328,063 acres of original surveys of public lands and 1,576,706 acres of resurveys, comprising an aggregate area of 2,904,769 acres.

The wall map of the United States has been revised to show current changes since the publication of the 1934 edition. Preparation is being made for the printing of this map. A new map of Alaska has been issued, and the revised map of New Mexico is in the hands of the contractor for printing.

There were sold to the public 6,983 photolithographic copies of township plats, and 7,381 copies were furnished, without cost, to other bureaus and agencies for official use.

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 \$5,074,314.02 and from sales of Indian lands \$120,085.60, an aggregate of \$5,194,399.62, all of which was deposited in the Treasury. The total expenditure from operations was \$1,527,797. The excess of receipts over expenditures was \$3,666,602.62. The receipts were the largest in any year since 1930. They exceed last year's receipts by \$394,237.38.

Receipts under the mineral leasing acts.—Receipts from bonuses, royalties, and rentals under laws providing for the leasing of mineral rights on the public domain (including royalties and rentals from potash deposits and royalties on coal leases in Alaska) aggregated \$4,419,923.30, of which \$4,353,391.12 was received under the act of February 25, 1920 (41 Stat. 437). Under the provision of the said act 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 aggregated \$48,271.34.

Under the provisions of the 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 come.

Distribution of receipts.—Receipts from all sources, aggregating \$5,194,399.62, as shown above, are distributed under the law approximately as follows: Reclamation fund, \$2,489,538.05; to public-land States and certain counties within such States, \$1,950,906.37; general fund, \$633,869.60; and to various Indian tribes, \$120,085.60.

Five percent of the net proceeds from cash sales of public lands is paid to the public-land States within which such sales are 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 fund	State and county funds	Total
Sale of public lands.....	\$22,356.27	\$50,789.82	\$2,549.86	\$75,695.95
Fees and commissions.....	33,552.33	103,239.44		136,791.77
Bonuses, rentals, and royalties from mineral leases. Proceeds of land and timber in Oregon and California railroad grant.....	462,497.39	2,285,313.33	1,632,366.66	4,380,177.38
Proceeds of land and timber in Coos Bay wagon-road grant.....			259,320.81	259,320.81
Power permits.....	43,883.46		14,576.73	58,460.19
Fees from copies of records.....	15,065.00			15,065.00
Royalties and rentals from potash deposits under acts of Oct. 2, 1917, and Feb. 7, 1927.....	12,619.32			12,619.32
Sale of reclamation town sites.....	4,788.44	40,477.23	17,956.64	63,222.31
Receipts from grazing lands, act of June 28, 1934.....		9,718.23		9,718.23
Sale of standing timber, Alaska.....	24,135.67		24,135.67	48,271.34
Miscellaneous (rent of land, royalties on coal leases and fur farms in Alaska, trespasses on public lands, sale of town lots, Alaska, proceeds of Government property, etc.).....	5,270.56			5,270.56
Total.....	9,701.16			9,701.16
Sales and leases of Indian lands.....	633,869.60	2,489,538.05	1,950,906.37	5,074,314.02
Aggregate.....				120,085.60
				5,194,399.62

¹ First and fourth columns contain \$26,786.26 royalties received in Wyoming under act of June 26, 1926.

² It is estimated that this amount will be paid to certain counties in Oregon in lieu of taxes.

³ Twenty-five percent, \$14,576.73, is payable to Coos County.

⁴ Receipts under act of Oct. 2, 1917, amounting to \$15,337.94, are credited to the reclamation fund; receipts under act of Feb. 7, 1927, amounting to \$47,884.37, are distributed as follows: 52½ percent to the reclamation fund, 37½ percent to State funds, and 10 percent to the general fund.

⁵ Half of this amount (25 percent of receipts) is appropriated for range improvement, etc.

⁶ \$21,224.02 of this is Red River oil royalty, of which 37½ percent (\$7,959) is payable to Oklahoma and the balance (\$13,265.02) is credited to the Kiowa, Apache, and Comanche Indians.

REPAYMENTS

Under the repayment laws there were stated 68 accounts, allowing repayment of \$7,235.36, and 17 claims were denied. The claims

allowed included four accounts granting repayment of \$1,034.35, received in connection with sales of Indian reservation lands and repaid from Indian trust funds.

HOMESTEADS

Actions taken.—Actions were taken as follows, in homestead cases: On final homesteads, 7,189; on original homesteads, 8,015; on second homesteads, 516; on applications for leaves of absence and extensions of time, 2,507; and in amendment cases, 367.

In this class of cases reports of special agents were considered in 1,852 cases, of which 1,122 were adverse and 730 favorable.

HOMESTEAD ENTRIES IN NATIONAL FORESTS

Upon recommendation of the Department of Agriculture 888 acres were restored to homestead entry under the act of June 11, 1906 (34 Stat. 233).

MISCELLANEOUS APPEALS IN EX PARTE CASES

Appeals in ex parte cases from actions of the registers, involving applications and entries filed under the homestead, timber and stone, and isolated-tract laws, were considered in 14,219 cases.

CONTESTS, OTHER THAN MINERAL CONTESTS

Approximately 1,350 contest cases other than mineral contests were considered. Approximately 225 hearings were held. At the close of the year about 200 contest cases were pending.

TIMBER AND STONE ENTRIES

Actions were taken in 20 cases on timber and stone entries and 63 cases on timber and stone sworn statements.

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—During the year 1,080 cases were acted upon. For the same period there were delivered to the lessees 52 leases, embracing 35,123.52 acres, granted under section 14 of the leasing act; 5 under section 17, embracing 1,879.18 acres, and 1 under section 20, embracing 30.85 acres.

One lease of 160 acres was sold under section 17 of the act on September 30, 1935, in the Midway Oil Field, California, at a total bonus of \$1,490.

Action looking to the issuance of leases at public auction was suspended from August 21, 1935, the date of the amendatory act (49

Stat. 674), until May 7, 1936, when the regulations thereunder were approved as Circular No. 1386, except where the publication of the notice of sale had been commenced prior to the passage of the act. During the year 6 leases were canceled in entirety.

Oil and gas prospecting permits.—April 23, 1935, the Secretary granted a general extension of time on oil and gas permits to August 1, 1935, and on May 4, 1935, instructions were issued to suspend action on all applications for oil and gas prospecting permits then pending, or thereafter filed, pending legislation to amend the leasing act.

During the year ended June 30, 1936, 1,050 oil and gas permits were granted, embracing approximately 1,546,070.91 acres. Three permits were reinstated. There were 489 assignments acted upon, and 556 actions were taken on applications for extension of time. Over the same period, 490 permits were held for cancelation and 104 were canceled; 359 applications were rejected in entirety and 533 in part. There were 6,325 other actions taken.

Coal.—During the year, there were issued 48 coal prospecting permits covering 41,768.88 acres, 25 leases involving 3,083.86 acres; and 9 licenses for 270 acres. The total number of cases disposed of was 2,598.

Potash, sodium, sulphur, and phosphate.—There were no potash permits or leases issued during the year under the act of February 7, 1927 (44 Stat. 1057), pursuant to departmental orders nos. 799, 817, 854, and 914. However, six potash permits embracing 15,560 acres were issued in the previous year and not reported. One potash permit was extended and 69 were canceled. There were issued 1 sodium lease for 681.72 acres and 20 sodium prospecting permits involving 23,184.17. Twenty sodium permits expired by limitation, one was amended, and five were canceled. No sulphur permits issued during the year. One phosphate lease for 80 acres was issued and one lease was amended. There were 610 cases disposed of during the year involving the above minerals.

One hundred and ten leases, licenses, and permits issued for coal, sodium, etc., involving 84,428.63 acres.

Mineral entries.—There were approved for patent 110 entries.

Mineral applications.—Three hundred and seventy-one mineral applications were disposed of.

Mineral contests.—Exclusive of oil shale, Boulder Dam and Reservoir project, and the San Gabriel Canyon claims, there were 271 mineral contests disposed of.

Oil-shale claims under patent proceedings.—Five mineral entries for 31 claims were approved for patent.

Proceedings against mining locations.—Final action has been taken on all the reports, except two, submitted on mining claims in con-

flict with the right-of-way for reservoir purposes in the San Gabriel Canyon. All cases, except one contests, have been disposed of in the Boulder Dam and Reservoir project. In the Metropolitan Water District appropriate action was taken on 300 field reports.

RIGHTS-OF-WAY

One railroad right-of-way application was approved and 42 stock watering reservoir applications were disposed of. In addition, in other cases, 267 right-of-way applications were approved and 29 canceled. Six hundred and twenty-two other actions were taken.

FEDERAL RECLAMATION PROJECTS

There are 39 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 616 original reclamation homestead entries and 182 assignments of such entries were received, and 240 reclamation entries were approved for patenting.

PRIVATE IRRIGATION PROJECTS

Two private irrigation projects were approved as dependable sources of water supply for desert land entries.

DESERT LAND ACT

Seventy-three entries were approved for patenting under the desert-land act.

CAREY ACT

Carey Act withdrawals and segregations amounting to 114,117.82 acres were considered, on which either final or interlocutory action was taken.

PITTMAN ACT

Forty-three applications 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 19 cases.

SWAMP AND OVERFLOWED LANDS

Under the swamp-land acts, there were approved and patented to the States 1,137.21 acres and claims for 23,030.58 acres were finally rejected. New claims were asserted during the year for 2,575.62 acres.

STATE GRANTS AND SELECTIONS, EXCEPT UNDER
TAYLOR GRAZING ACT

New indemnity school land selections embracing 38,937.04 acres were received during the year, and selections amounting to 154,187.62 acres were approved and title conveyed to the States. Such selections involving 9,380.81 acres were canceled. New selections under quantity grants to States, for specific purposes, embracing 3,664.81 acres, were received, and selections amounting to 99,715.23 acres were approved and title conveyed to the States. Canceled selections involved 80 acres.

Exchange selections were approved and patented to the State of Michigan under the act of July 31, 1912 (37 Stat. 241), embracing 14,673.53 acres.

New selections under the exchange provisions of section 2 of the Arizona Navajo Boundary Act of June 14, 1934 (48 Stat. 960), were received involving 27,033.87 acres.

Applications for patents for granted school sections under the provisions of the act of June 21, 1934 (48 Stat. 1185), were received, embracing approximately 1,753,800 acres.

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections received, together with those on hand, amounted to 85,783.10 acres; 4,265.78 acres were certified or patented in lieu of such grants, and 90 acres of selections were rejected.

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

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

Restoration.—None of the revested Oregon & California Railroad grant lands were restored to homestead entry, and 819.65 acres were reclassified as timber land.

Timber sales.—Sixty-nine sales of timber on the revested Oregon & California Railroad grant lands were made during the past year, involving 4,528.03 acres of land, containing 158,665,000 feet, board measure, of timber, for which the sum of \$247,789.41 was received. Total sales to June 30, 1936, 1,040, involving 124,695.63 acres, containing 2,967,628,980 feet, board measure, of timber for which a total \$6,870,999.49 have been received.

Eight sales of timber on the reconveyed Coos Bay Wagon Road grant lands were made during the past year, involving 680 acres of land, containing 29,580,000 feet, board measure, of timber for which the sum of \$58,196.41 was received. Total sales to June 30, 1936, 111, involving 18,300.78 acres, containing 731,112,000 feet, board measure, of timber, for which a total of \$1,681,361.62 has been received.

Timber rights terminated.—Rights under timber patents were terminated in 139 cases.

ABANDONED MILITARY RESERVATIONS

The sum of \$5,069.29 was realized from the sale of lands in abandoned military reservations and 17 patents for such lands were issued.

ALASKA

Leases of public lands in Alaska for fur farming were approved in 2 cases, 3 assignments of leases were approved, 5 leases were canceled, and 5 applications for lease were rejected.

Five leases of public lands in Alaska for grazing were approved, one assignment of lease was approved, and one lease was rejected.

Purchases of small tracts in Alaska for home sites or headquarters were considered in 24 instances. Further action thereon awaits compliance by the applicants with requirements under the regulations.

Trade and manufacturing site applications in Alaska were considered in 20 cases and one patent was issued.

AVIATION LEASES

Two leases of public lands for public aviation fields were approved, two applications were rejected, and appropriate actions were taken in connection with 39 leases.

COLOR OF TITLE

The sale of improved or cultivated public lands held under color of title for more than 20 years resulted in the issuance of 27 patents, from which the sum of \$4,147.62 was received.

Five patents issued for lands formerly involved in the boundary dispute between the States of Texas and New Mexico, and the sum of \$346.38 was received therefrom.

Five applications were considered under the New Mexico Color of Title Act of February 23, 1932 (47 Stat. 53), and nine Refugio Colony cases were considered under the act of February 3, 1911 (36 Stat. 896).

EXCHANGES OF PRIVATELY OWNED LANDS, EXCEPT UNDER TAYLOR GRAZING ACT

Many acts of Congress provide for the extinguishment of private holdings within national forests, parks, monuments, grazing districts, and Indian reservations, by means of the exchange of Government land for privately owned land. Twenty-five patents were issued and title was accepted to 102,786.94 acres of land for inclusion in national forests. One exchange was consummated whereby private ownership of 2,560 acres of land within the Chaco Canyon National Monument was eliminated. Three patents were issued pursuant to the act of March 3, 1921 (41 Stat. 1225, 1239), which resulted in title to 77,763.53 acres of land being relinquished to the United States. Applications for exchanges in the interest of consolidating Government ownership within grazing districts were considered in 26 cases. Four patents were issued pursuant to the forest lieu selection act. One exchange was consummated under the act providing for the consolidation of the Lincoln National Forest, N. Mex., and title in behalf of the Government was accepted to 6,299.80 acres. Regulations were issued to govern exchanges of public lands in the interest of establishing migratory bird and other wildlife refuges. Thirty patents were issued and title was accepted to 1,769.44 acres of land in exchanges providing for the consolidation of Indian reservations.

INDIAN LANDS AND CLAIMS

During the year extensions of time for the cutting and removing of timber on ceded Chippewa Indian lands in Minnesota were granted on two contracts, and one contract was canceled.

The purchase of ceded Indian lands was considered in 862 cases, resulting in the issuance of 168 patents from which the sum of \$56,632.45 was realized.

Homesteading on ceded Indian lands was considered in 3,594 instances and 296 patents were issued.

Allotments of lands to Indians required 415 actions and 249 trust patents were reissued while 26 original trust patents were issued.

Claims by non-Indians for lands within confirmed Indian pueblos in New Mexico were considered in 750 cases and 712 patents were issued.

PRIVATE-LAND CLAIMS

Action on private-land claims provided for by many acts of Congress passed in the early history of the Government required 259 actions and 44 patents were issued.

SOLDIERS' ADDITIONAL HOMESTEAD RIGHTS

Rights granted in certain cases to Civil War veterans, their widows, and minor children required 382 actions and 7 patents were issued.

TIMBER

One hundred and fifteen letters and reports involving sales of dead, down, or damaged timber were considered. The sum of \$3,872.75 was realized from such sales.

The free use of timber under permit was considered in 89 cases.

TOWN LOTS AND TOWNSITES

Town-site matters were considered in 44 cases with 2 patents issuing, while town-lot sales were considered in 746 instances with 205 patents issuing, from which the sum of \$26,089.42 was realized.

TRESPASS

The amounts accepted in settlement for trespasses on the public lands, together with the number of instances in which trespasses were considered, are as follows: 214 coal trespasses, \$6,759.22; 554 timber trespasses, \$9,332; 17 grazing; 7 gravel; 1 fire; 1 rock; and 1 turpentine trespasses.

MISCELLANEOUS CASES CONSIDERED

Other actions were taken and patents issued as follows: Cemetery applications, 13, with 1 patent issuing; drainage, 67, with 3 patents issuing; military bounty land warrant cases, 22, with 7 patents issuing; park applications, 5, with 2 patents issuing; preemption applications, 15, with 2 patents issuing; quitclaim deeds, 7 issued; riparian ownership, 1, with 1 patent issuing; scrip, 5, with 3 patents issuing; small holding claims, 33, with 3 patents issuing. In the Mud Lake cases, Minnesota, 19 claims for relief under the act of June 26, 1934 (48 Stat. 1440), were approved for sums aggregating \$31,324.89. Four patents were issued under special acts.

WITHDRAWALS AND RESTORATIONS

One new driveway was established and 11 driveways were reduced, resulting in the withdrawal of 320 acres and the release of 17,917 acres from former withdrawals.

The tables which follow give the estimated total areas in outstanding withdrawals and classifications as of June 30, 1936, other than the general withdrawals made by Executive orders of November 26, 1934, and February 5, 1935:

Withdrawals other than mineral withdrawals and classifications

	<i>Total area withdrawn June 30, 1936</i>		<i>Total area withdrawn June 30, 1936</i>
Stock driveways-----	9, 743, 599	Oregon-California and Coos	
Recreational area withdrawals_	284, 111	Bay unrestored timber land_	1, 245, 832
Air-navigation sites-----	32, 085	For forest exchange with New	
Carey Act segregations-----	174, 817	Mexico-----	681, 000
Reclamation withdrawals-----	21, 712, 696	For game and bird refuges---	162, 701
San Carlos irrigation project		For national-forest purposes---	139, 640
(Indian)-----	136, 860	For national parks and monu-	
Fort Hall irrigation project		ments-----	3, 943, 413
(Indian)-----	114, 720	For New Mexico-Arizona In-	
Fort Peck irrigation project,		dian consolidation-----	1, 134, 972
Montana-----	204, 720	For agricultural experiment	
Bonneville Dam, Oregon-Wash-		stations-----	309, 734
ington-----	79, 080	For flood and erosion control_	9, 870
Water-power reserves (non-In-		For State game refuge classifi-	
dian)-----	5, 180, 591	cation-----	44, 000
Reservoir and well sites-----	254, 130	For recreational classification_	42, 348
Public water reserves-----	495, 028	For irrigation-power classifi-	
Los Angeles water supply ¹ ---	866, 365	cation-----	30, 880
Mizpah-Pumpkin Creek grazing		For archaeological classifica-	
district-----	25, 124	tion-----	11, 297
Grazing withdrawals (not in-		Cooperative lookout stations---	767
cluding withdrawals under		For miscellaneous purposes---	1, 644
Taylor Grazing Act)-----	3, 425, 840		
Grazing districts under Taylor			
Grazing Act-----	79, 805, 186	Total-----	130, 293, 050

¹ Includes Owens River-Mono Basin grazing district.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

A summary of the outstanding mineral withdrawals and classifications as of June 30, 1936, is as follows:

	Withdrawn	Classified
	<i>Acres</i>	<i>Acres</i>
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 40,641,782 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.

TABLES

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

Original entries, fiscal year of 1936

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising	767	307, 299	45	19, 032
Enlarged	39	10, 152	3	738
Reclamation	56	6, 656	35	4, 843
Forest	9	676		
Sec. 2289, et al.	338	32, 674	21	1, 586
Total homesteads	1, 209	357, 457	104	26, 199
Deserts	25	2, 964	1	40
State selections	67	37, 261		
Railroad selections	1	440		
Applications and filings	134			
Miscellaneous	114	1, 470	2	3
Total	1, 550	399, 592	107	26, 242
Indian land as above	107	26, 242		
Grand total	1, 657	425, 834		

Final entries, fiscal year of 1936

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising	3, 345	1, 503, 502	147	57, 150
Enlarged	451	117, 127	188	35, 138
Reclamation	181	16, 283	26	2, 277
Forest	44	3, 765		
Commuted	21	1, 743	27	2, 727
Sec. 2289, et al.	1, 179	124, 281	66	8, 093
Total homesteads	5, 221	1, 766, 701	454	105, 385
Deserts	81	11, 355	2	193
Public auction	2	120		
Timber and stone	15	1, 131		
Mineral	103	6, 144	6	4, 106
Miscellaneous	607	19, 265	257	23, 126
Total	6, 029	1, 804, 716	719	132, 810
Indian land as above	719	132, 810		
Grand total	6, 748	1, 937, 526		

Patents and certificates, fiscal year of 1936

	Number	Acres
Homesteads:		
Stock raising.....	3,332	1,590,678
Enlarged.....	540	127,154
Reclamation.....	236	20,904
Forest.....	56	5,219
Sec. 2239, et al.....	1,146	123,182
Total homesteads.....	5,310	1,867,137
Deserts.....	72	14,196
Public auction.....	184	21,781
Timber and stone.....	22	2,121
Mineral.....	108	14,866
Railroad.....	6	4,270
Miscellaneous.....	2,536	292,313
Total patents.....	8,238	2,216,684
Certified to States.....		253,903
Grand total.....		2,470,587

State grants—Areas patented or certified in fiscal year 1936

State	Swamp-land patents	School section indemnity certifications	Quantity grant certifications	Ex-change, act of July 31, 1912	State	Swamp-land patents	School section indemnity certifications	Quantity grant certifications	Ex-change, act of July 31, 1912
Alabama.....			1,625		Montana.....		1,484		
Arizona.....		129,706	2,877		New Mexico.....		19,985	6,010	
California.....	127	341	89,203		Utah.....		1,556		
Florida.....	538				Wyoming.....		1,116		
Iowa.....	220				Total.....	1,137	154,188	99,715	14,932
Louisiana.....	172								
Michigan.....	80			14,932					

Railroad grants—Land approved in fiscal year 1936 for patent or certification

	State	Acres
TO CORPORATIONS		
Atlantic & Pacific (now Santa Fe Pacific).....	New Mexico.....	240
Central Pacific.....	California.....	3,155
Do.....	Nevada.....	871
Total.....		4,266

GEOLOGICAL SURVEY

(WALTER C. MENDENHALL, *Director*)

During the fiscal year 1936 the aggregate expenditures for which the Geological Survey was responsible amounted to about \$4,620,000, as compared with nearly \$5,328,000 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 construction of stream-gaging stations, 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 \$2,285,500 from the \$1,631,000 of the preceding year and before the end of the fiscal year 1936 had provided a little more than \$2,800,000 for the fiscal year 1937.

As a part of our informal service to the public, 5,000 tests of mineral and rock samples were made and over 1,200 chemical analyses were completed.

Between 18,000 and 19,000 square miles of new area was surveyed in the field topographically. This work will yield 139 new contoured topographic maps of areas in 43 States. In addition, by the aid of aerial photography, 31,600 square miles was surveyed for the production of base maps without contours.

Congressional interest in the inadequate rate at which mapping is proceeding was clearly indicated during the second session of the Seventy-fourth Congress. This interest was expressed in the form of Senate Resolution 281, introduced by Senator Hayden, of Arizona, calling upon the Secretary of the Interior to submit to the Seventy-fifth Congress a report and plan for the completion of the mapping of the United States.

With this better fiscal situation, it has been possible to resume, on a more nearly normal scale, the regular services of the Geological Survey; to improve the personnel situation, which was acute 3 years

ago; and again to issue a gratifying volume of Survey products in the form of reports and maps, thus supplying to the Nation the results obtained by the Survey's skilled staff.

Fifty book publications of the Survey's regular series, aggregating nearly 9,000 pages of printed matter, dealing with geology, mineral resources, and water supplies, were issued during the year, and about 700,000 copies of 281 topographic and other maps were printed. A new geologic map of Colorado, long in demand, came from the presses, and substantial progress was made toward the completion of the geologic map of Texas.

There were 50 geologic parties in the field in 35 States. The field investigations on several continuing projects were completed, and it was possible to initiate a number of new investigations, such as systematic studies of the alunite deposits at Marysvale, Utah, of the lead and zinc deposits of the Metaline district, in Washington, and of the granites of the Northeastern States.

Measurements of stream flow were maintained at 3,163 stream-gaging stations. All the States, the District of Columbia, and Hawaii are affected by this work. A report on the droughts of 1930 to 1934 and a series of notable flood studies resulting from cooperation with other Federal agencies were published 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 some 50 reports on this topic, many of them informal, were released for public use.

In the land-classification and mineral-leasing activities of the Survey substantial progress was made, although insufficient personnel and expanding mining activities rendered inadequate our work in safeguarding the Government's interest as owner of great resources in coal, oil and gas, potash, phosphate, and other minerals. The situation will be improved in 1937 as a result of more liberal provision for this work by the Congress. Despite the handicaps, 317,000 acres of public lands were classified as nonoil, nearly 200,000 acres were defined as within "known geologic structures" in accordance with the requirements of the mineral land leasing act of 1920, and technical supervision was given to over 8,000 mineral properties on public lands containing oil and gas, nearly 700 containing coal, and 170 containing other minerals, also to nearly 5,600 oil and gas leases on Indian lands.

An event of particular interest during the year was the retirement of Dr. T. W. Stanton, chief geologist, on September 30, 1935, at the age of 75. Dr. Stanton was appointed to the staff of the Geological Survey in 1889 and hence had spent 46 years in the Government service. His special field had been the paleontology of the Cretaceous

system, but his accurate work on stratigraphy gave special validity to his age determinations and early made him the chief reliance of the geologists of this continent on the relations of the rocks of this system. Dr. Stanton was long in charge of the important section of paleontology and stratigraphy in the geologic branch, and in this position he exercised a valuable influence on the development of our concepts of stratigraphic relationships in the United States and through his chairmanship of the committee on geologic names guided procedure in this difficult field for many years. He became chief geologist on February 1, 1932, and retained this position until his retirement. Dr. G. F. Loughlin, long in charge of the section of metalliferous deposits, succeeded Dr. Stanton as chief geologist and was in turn succeeded as chief of the metalliferous section by Dr. D. F. Hewett.

GENERAL SUMMARY OF THE YEAR'S ACTIVITIES

Geologic work.—Fifty field parties were active during the year, and work was done in 35 States. Most of the Federal field projects financed with funds from the Public Works Administration were completed before the beginning of the fiscal year, but some further studies were made in the gold-bearing areas of the Southeastern States and in the quicksilver field of Arkansas. Work was continued throughout the year on the metal-mining districts of Colorado, Idaho, and New Mexico and the oil and gas region of Kansas, in cooperation with the States, and some further assistance was given to the Arizona Bureau of Mines in its survey of the Tombstone district. Physiographic and geologic studies were made in the Yosemite, Sequoia, and Zion National Parks, in cooperation with the National Park Service. Several major projects begun in 1935 were continued, and toward the end of the year new major projects were begun in the Marysvale district, Utah, the Metaline district, Washington, and some of the leading granite districts of the Northeastern States. Areas of forest lands were geologically examined for the Forest Service, and dam and reservoir sites were examined for the Office of Indian Affairs and the Natural Resources Board. Increasing attention was given to fundamental "borderland" problems involving geology, chemistry, and physics. More than 5,000 tests of mineral and rock samples were made, including 1,225 chemical analyses in connection with the Geological Survey's projects and 1,065 tests for persons not officially connected with the Survey. Many tests were made of bleaching clays, two deposits of which are now being developed commercially, largely as a result of tests made in the Survey's laboratory. Temperature measurements of deep wells were made in nine States, mainly in oil fields.

Explorations in Alaska.—In the field season of 1935 seven field projects were carried on in Alaska, two of which were primarily topographic and five primarily geologic. The usual general survey of recent mining developments and the collection of mineral statistics were continued. Five field projects for the season of 1936 were under way at the end of the fiscal year, and two additional geologic projects were planned to begin early in July. These will be continued throughout the open season.

Topographic mapping.—The area covered by new topographic surveys, re-surveys, and revision amounted to 18,555 square miles, representing 139 topographic maps with contours. The topographic mapping was done in 43 States.

There was also a large increase in the area covered by planimetric maps without contours, resulting from aerial photography, which covered 31,654 square miles in eight States. In addition, aerial photographs were used as bases for topographic mapping in 20 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. The sectional transportation map of the United States being made for the Bureau of Public Roads was continued with increased output. The maps of Florida, in 12 sections; New Hampshire, in 2 sections; Maine, in 6 sections; and Vermont, in 2 sections, were published. These transportation maps on the scale of about 4 miles to 1 inch show transportation routes of all kinds in a variety of colors.

Investigations of water resources.—The water-resources branch collected and made available for publication stream-flow records at 3,163 river-measurement stations on rivers in the 48 States, the District of Columbia, and the Territory of Hawaii, obtaining thus authentic information on the behavior of streams in drought, in flood, and in normal conditions—information which is invaluable for intelligent planning of projects for use or control of the surface water supply. It investigated underground water supplies in 21 States 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. In collaboration with the Mississippi Valley Committee of the Public Works Administration, and with the assistance of special advisory committees of the American Society of Civil Engineers and the American Geophysical Union, studies were made of floods in the United States, with especial reference to their magnitude and frequency, and of the relation of rainfall and run-off in the United States, and the results were published in Water-Supply Papers 771 and 772. The favorable reception of these two reports indicates that they have filled a need for computations of flood data and for interpretations of the relation of rainfall and run-off. The 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. Monthly and annual reports on the production of electricity for public use and the consumption of fuel in generating the electricity were made. Engineers of the branch had general supervision of operation of permits and licenses of the Federal Power Commission in connection with 145 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 started. A report on the thermal springs in the United States and a report on ground-water levels and artesian pressures in the United States up to January 1, 1936, were completed and sent to the printer. About 50 reports giving the results of technical investigations relating to ground water were released. Analyses, partial or complete, were made of 1,481 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 4,917 formal findings of technical fact involving the mineral resources, water power, or storage possibilities of public lands; classified 317,766 acres of public land as nonoil in character; added 46,174 acres to outstanding water-power reserves

and eliminated 10,934 acres therefrom; defined the "known geologic structure" of 13 producing oil and gas fields, amounting to 196,304 acres; completed 1,615 miles of river-utilization surveys and 520 square miles of reservoir surveys in public-land States; supervised operations and activities under 151 power projects licensed by the Federal Power Commission and 317 permits and grants from the Interior Department; supervised on public lands 8,332 oil and gas holdings involving 3,849 productive wells, 694 coal properties, 95 potash properties, 40 sodium properties, 26 sulphur properties, 9 phosphate properties, and 1 oil-shale property; supervised on naval petroleum reserves 23 leaseholds, involving 533 productive oil and gas wells, and on Indian lands 5,583 leaseholds, involving 4,356 oil and gas wells, 36 lead and zinc properties, 109 coal properties, 1 asphalt property, and 1 lime phosphate property; assisted hundreds of oil and gas permittees and operators in preparation of unit plans of development and operation; acted on 279 such plans; and assisted in the formulation of regulations under the act of August 21, 1935.

Publications.—The publications of the year comprised 50 pamphlets in the regular series, covering a total of 8,901 pages; 114 new or revised topographic and other maps; 167 reprinted topographic and other maps; and several pamphlets for administrative use. Among the notable book publications were professional papers on the Gold Hill mining district, Utah, the Montezuma quadrangle, Colorado, the minerals of Franklin and Sterling Hill, N. J., and the pre-Cambrian rocks of the Lake Superior region (with a revised geologic map); bulletins on the San Juan region, Colorado, the Book Cliffs coal field, Utah, the Casto quadrangle, Idaho, the Bellefonte quadrangle, Pennsylvania, the southern Alaska Range, the Salt Valley anticline, Utah, the Monument Valley-Navajo Mountain region, Utah, and the Coastal Plain of South Carolina; and water-supply papers on water utilization in the Snake River Basin, ground water in south-central Tennessee, droughts of 1930-34, floods in the United States, and relations of rainfall and run-off in the United States. Besides the regular publications, 31 brief papers were issued in mimeographed form as memoranda for the press.

The engraving division printed more than 701,000 copies of maps and did repay work amounting to about \$208,000 for more than 75 other Government units and State governments.

NOTE.—Detailed tabular statements are given at the end of the report.

GEOLOGIC BRANCH

SUMMARY

Fifty field parties were actively at work during the year, and work was done in 35 States. Most of the Federal field projects for which funds had been allocated by the Public Works Administration were completed before the beginning of the fiscal year 1936. Small balances, however, remained in the allotments for continuing the mapping of gold-bearing areas in the Southeastern States (project 183), and additional work was done in Georgia and the Carolinas. A brief reexamination of the Arkansas quicksilver field (project 184) was also made. Preliminary reports covering many of the Federal projects have been released as press notices and submitted to State organizations and technical journals for publication.

Work was continued throughout the year on metal-mining districts in Colorado, Idaho, and New Mexico, and in the oil fields of Kansas in cooperation with the States. The geologic map of Colorado, embodying the results of 10 years of cooperative work, was published. Further assistance was rendered to the Arizona Bureau of Mines in a survey of the Tombstone district. Physiographic and geologic studies were made in the Yosemite and Sequoia National Parks, Calif., and in the Zion National Park, Utah, in cooperation with the National Park Service.

Several of the major projects begun in 1935 were continued in 1936, and toward the end of the year new projects were begun in the Marysvale district, Utah, the Metaline district, Washington, and some of the leading granite districts of the Northeastern States. Field work in the Comstock district, Nevada, was nearly completed.

Work for other Federal organizations included the geologic examination of forest lands for the Forest Service and of dam and reservoir sites for the Office of Indian Affairs; also the furnishing of maps and information to the Reconstruction Finance Corporation and the Securities Exchange Commission, the Procurement Division of the Treasury Department, and the Architect of the Capitol.

WORK OF THE YEAR BY STATES

Alabama.—Geologic mapping was continued in the Russellville and other brown iron ore districts in eastern Alabama, including parts of Franklin, Butler, Cleburne, Clay, and Lowndes Counties, and in the manganiferous iron ore area in Cherokee County. A report on the red iron ore formation in northeastern Alabama is well advanced. A press notice giving some results of the investigations for ceramic and bleaching clays in the State was issued, and a more detailed report on clays in Alabama will be included in a report to be published by the Survey on clays in the Southern States. Work on gold in Alabama is mentioned under Southern Appalachians.

Arizona.—A preliminary report on the geology and ore deposits of the Ajo quadrangle was transmitted to the Arizona Bureau of Mines for publication, and a complete report is in preparation for publication by the Survey. Further field examinations were made in the Tucson area in connection with the detailed report in preparation on the geology and mineral resources of the area and in the Tombstone mining district in informal cooperation with the Arizona Bureau of Mines.

Arkansas.—The manuscript of a report on the geology and mineral resources of the western portion of the Arkansas coal field and one on the quicksilver deposits of Arkansas have been completed for Survey publication, and one on the geology of the Arkansas bauxite region was transmitted to the Arkansas Geological Survey. A paper on the stratigraphy of the Arkansas-Oklahoma coal basin has been submitted for publication in the Bulletin of the American Association of Petroleum Geologists. David White's report on fossil plants from the Stanley shale and Jackfork sandstone in southeastern Oklahoma and western Arkansas was completed and submitted for publication as Professional Paper 186-C, and studies were continued on the Morrow formation of Arkansas

and Oklahoma, on the stratigraphy of the Bloyd shale near Fayetteville, and on the manganese carbonate deposits of the Batesville district. A preliminary paper on Radiolaria in the Arkansas novaculite, Caballos novaculite, and Big Fork chert, and a paper on unusual oolites from the Brentwood limestone near Fayetteville were submitted for outside publication.

California.—Studies of the geomorphology of the Sequoia National Park and its environs were made in cooperation with the National Park Service, and an outline of the geologic history of Sequoia National Park and a map of the Pleistocene glaciers in and adjacent to Yosemite National Park were prepared for the Park Service. Geologic studies of the San Andreas rift and of the Death Valley region were continued. Field studies were conducted on the structure, stratigraphy, and oil resources of the lower Tertiary strata in Reef Ridge, in the Coalinga region; on the oil resources and subsurface structure and stratigraphy of the Mountain View and Edison fields, near Bakersfield; on diatom-bearing deposits of the Monterey and Temblor formations in the vicinity of Bakersfield and Coalinga; and on the Monterey shale problem, and additional field data were obtained in the Kettleman Hills oil and gas fields and on the north slope of the San Pedro Hills.

Several reports on the Kettleman Hills oil and gas fields are in preparation, including one on the lithologic descriptions of the subsurface sections, status of wells and zonal correlation, and economic phases; another on the stratigraphy and paleontology of the North Dome; and another on the general geology and oil resources of the Kettleman Hills. A detailed report on mineral resources in the region tributary to the Boulder Dam is in press as Bulletin 871. Papers were submitted to the American Association of Petroleum Geologists on Miocene stratigraphy and paleontology of the Palos Verdes Hills, and the proportion of organic matter converted into oil in the Santa Fe Springs field.

Colorado.—Cooperation was continued with the Geological Survey Board of the State of Colorado and the Colorado Metal Mining Fund in investigations of mining regions of the State. In the San Juan area of southwestern Colorado mapping was continued in the Ouray, Sneffels, and Red Mountain districts and the La Plata Mountain region. Investigations were continued in the Cripple Creek area, the Jamestown district, the Nederland tungsten district, and other areas in the Front Range, and in the Alma and Horseshoe districts in the Mosquito Range. The new geologic map of Colorado, embodying the results of 10 years of cooperative work, was published by the United States Geological Survey. Cooperative reports on ore deposits in the vicinity of the London fault, and on the general geology and mineralization of the Snowmass area, Gunnison County, were completed during the year and will be published as bulletins of the Survey.

A preliminary report on the resurvey of the geology and ore deposits of the La Plata district was submitted to the Colorado Scientific Society for publication. Scientific papers resulting from the cooperative work include Crystallization of Granodiorite Magma (based largely on studies in the Ouray district), Structure of pre-Cambrian Granites in Central Boulder County (American Geophysical Union), Thrusting in Huerfano Park, Colo., and Related Problems of Orogeny in the Sangre de Cristo Mountains (Geological Society of America), and Structure and Mineralization along the London Fault (American Institute of Mining and Metallurgical Engineers). Investigations of dam sites on the Pine River in La Plata County were made for the Office of Indian Affairs. A paper on stratigraphy of the Upper Cretaceous rocks north of the Arkansas River in eastern Colorado will be published in the Survey's

Contributions to General Geology. A report on the Dawson and Laramie formations in the southeastern part of the Denver Basin, Colo., will be published in the Bulletin of the American Association of Petroleum Geologists.

District of Columbia.—A report on gravel and sand in the District of Columbia, resulting from studies made under a Public Works Administration allotment, has been completed and will probably be published as a bulletin of the Survey. A geologic map of the District of Columbia, with descriptive text, is in preparation for Survey publication.

Florida.—A preliminary report on some clays in Florida was issued as a memorandum for the press, and a more detailed report covering investigations will be included in a Survey bulletin on clays in the Southern States. The Tampa and Suwannee limestones are being studied in informal cooperation with the State of Florida. A short paper on additions to the molluscan fauna of the Alum Bluff group will be published by the Florida Geological Survey.

Georgia.—Geologic mapping was done in the Coastal Plain region of Georgia, in informal cooperation with the State, for the purpose of revising the geologic map of the State. A paper giving the general results of a preliminary investigation of the Georgia bleaching clays was published by the Division of Geology of Georgia. Work on the gold deposits of Georgia is mentioned under Southern Appalachians.

Idaho.—In cooperation with the Idaho Bureau of Mines, field work was continued in the Murray, Warren, and Florence mining districts, in the Coeur d'Alene region, and the Boise Basin, and progress was made in the preparation of reports on the Boise Basin, Thunder Mountain, Edwardsburg, Yellow Pine, and Warren mining districts. A party including Survey geologists made an expedition down the gorge of the Salmon River, and a paper on the results of this exploratory trip, entitled "Idaho's river of no return", was submitted to the National Geographic Society. A paper on the geomorphology of south-central Idaho was submitted for publication by the Geological Society of America. A detailed investigation of the geology and mines of the Dickey or Borah Peak quadrangle was begun, and a brief field examination was made in the vicinity of Idaho Falls and Blackfoot for the purpose of reviewing the geology of those areas in connection with the preparation of a report on the geology and mineral resources of the Paradise Valley and Ammon quadrangles.

Illinois.—The complete report on investigation by geologic mapping and geophysical studies of the Cave-in-Rock and Rosiclare districts, southeastern Illinois, is in course of preparation for Survey publication. A preliminary report on the Cave-in-Rock fluorspar reserves was transmitted to the Illinois Geological Survey, and a paper on geologic interpretations of fluorspar reserves in the Illinois-Kentucky field was presented at an industrial conference at Rosiclare. Some progress was made toward bringing to completion the report on the Pottsville flora of the eastern interior basin, mainly in Illinois, a cooperative project with the State, left unfinished by the late David White.

Indiana.—A paper on the flora of the New Albany shale is mentioned under Kentucky. The report on the Pottsville flora of the eastern interior basin is mentioned under Illinois.

Kansas.—Under a cooperative agreement with the Kansas Geological Survey an investigation was made of the limestones of Mississippian age found in deep wells in the eastern and southeastern parts of the State. The report on geologic investigations of the Shoestring oil-bearing sands of Greenwood and Butler Counties was transmitted to the Kansas Geological Survey for publication. Work in the Kansas portion of the lead and zinc area is mentioned under Oklahoma.

Kentucky.—A press memorandum giving some preliminary results of the investigation of bleaching and ceramic clays of Kentucky and western Tennessee was issued. A more detailed report of these investigations will be included in a Survey bulletin on clays of the Southern States. The Calamopityeae and Their Relationships, which will form part 2 of the series on the flora of the New Albany shale, was sent to the printer for publication as Professional Paper 186-E. Samples were collected from Lower and Upper Elkhorn coals from Pike County for the purpose of making a study of the effect of regional metamorphism.

Work on the Pottsville flora and on fluorspar in Kentucky is mentioned under Illinois.

Maryland.—Studies of the geology and mineral resources of Frederick County were continued in cooperation with the Maryland Geological Survey, and a paper on revision of the age of the limestone of Frederick County was presented at a meeting of the Geological Society of America. The new excavations along the Chesapeake-Delaware Canal were intermittently examined as the work progressed. The results of the studies of structural materials, chiefly sand and gravel deposits, of eastern Maryland adjacent to Baltimore, will be published as a Survey bulletin. Three papers were presented for outside publication under the following titles: Are the Maryland Terraces Warped? Structure of the Coastal Plain of Southern Maryland, and Some Fossil Conifers from Maryland and North Dakota.

Minnesota.—Some granite and limestone quarries around St. Cloud and Mankato were examined.

Mississippi.—In the study of the areal and structural geology of the Jackson area, the mapping of the Morton, Pelahatchee, Florence, and Jackson quadrangles and a part of the Raymond quadrangle was completed. Some preliminary results of these studies were published in two papers—Upper Cretaceous and Lower Tertiary History of the Jackson Area (Journal of the Washington Academy of Sciences), and Factors Affecting the Geologic History of the Jackson Area, and Carboniferous Rocks at Jackson (Bulletin of the American Association of Petroleum Geologists). A report on the preliminary investigation of the bleaching clays of Mississippi was submitted to the Mississippi Geological Survey. A detailed report on the clays of Mississippi will be included in a Survey bulletin on clays of the Southern States.

Missouri.—A paper on correlation of the Upper Cambrian sections of Missouri and Texas with the section in the upper Mississippi Valley will be published in the Survey's Contributions to General Geology.

Montana.—Geologic mapping for the purpose of completing geologic studies of the Little Rocky Mountain region and making a study of the oil, gas, and mineral resources of the mountains and adjoining area, including the gold deposits in the vicinity of Landusky, was begun in the later part of the year. Continued field studies were made of the Tertiary and Pleistocene faulting in Granite and Lewis and Clark Counties, of the glacial geology and physiography of western Montana and the Glacier National Park, of gold placers of the Pioneer district in Powell County, and of gold-placer operations in the vicinity of Helena and at Virginia City. Reports are in preparation on the geology and ore deposits of the Libby quadrangle, the Pioneer gold district, faults in southwestern Montana, fossil plants from the Fort Union and associated formations, and glacial geology and physiography of western Montana and the Glacier National Park. A report on the geology and mineral resources of north-central Chouteau, western Hill, and eastern Liberty Counties was completed and will be published as Bulletin 847-F.

Nevada.—The resurvey of the Comstock lode, at Virginia City, begun in 1935, was nearing completion at the end of the fiscal year, and further geologic mapping was carried on in the Hawthorne and Tonopah quadrangles, where a detailed study of the geology and ore deposits is being made. Reports on the underground geology of the Tonopah, Tuscarora, Chief, and Delamar districts have been submitted for publication by the Nevada Bureau of Mines and Geology, and one on the Searchlight district is in preparation. A short paper on sedimentary magnesite in the Boulder Dam region was submitted to the Society of Economic Geologists, and one on the scheelite-leuchtenbergite vein in the Paradise Range to the Mineralogical Society. Work in the Boulder Dam region is mentioned under California.

New Mexico.—Studies of the geology and mineral resources of the Little Hatchet Mountains, begun in 1935, were continued. Field investigations of the Mancos and Mesaverde formations around the southern edge of the San Juan Basin were made in connection with a report on conditions of sedimentation in this area, and a preliminary field survey of the geology of the Potash Mines area was completed. A report on the Magdalena district, nearly completed, will be published by the Survey. A paper on the subject of potash in general, with special emphasis on New Mexico-Texas Permian deposits and development, will be published by the Texas Bureau of Economic Geology, and one on the Permian formations of the Pecos Valley, New Mexico and Texas, was submitted to the American Association of Petroleum Geologists.

New York.—Further field investigations were made of the gas resources and geologic structure of the Greenwood, Hornell, Woodhull, and Wellsville quadrangles, south-central New York, and of gas resources and structure of fields in western New York that produce gas from the Medina sandstone. The report on the structure and gas possibilities of south-central New York was under way. Additional studies were made of the geology of the Millbrook quadrangle, New York-Connecticut, and a field study was made of the stratigraphy and fossil flora of the Genesee shale and Genundewa limestone in western New York.

North Carolina.—Studies of Miocene and Pliocene deposits were continued, and a paper on some deep wells near the Atlantic coast in the Carolinas and Virginia will be published as Professional Paper 186-I in the Survey's series of Contributions to General Geology. Gold investigations in North Carolina are mentioned under Southern Appalachians.

North Dakota.—A preliminary report on the geology and coal resources of the Minot area was issued as a press memorandum. A more detailed report is in preparation as a Survey bulletin. The Survey's Contributions to General Geology will include a paper on American Cretaceous ferns of the genus *Tempskya* (Professional Paper 186-F). Work on Fort Union fossil plants is mentioned under Montana, and work on fossil conifers under Maryland.

Oklahoma.—Work in the tri-State lead and zinc area of northeastern Oklahoma, southeastern Kansas, and southwestern Missouri included detailed areal mapping and considerable underground mapping of individual mines. Field investigations were made of the petroleum possibilities, structure, and stratigraphy of the Black Knob Ridge and adjacent areas and in the Ouachita Mountains. Reports were in progress on the geology, coal resources, and oil and gas possibilities of the Lehigh district (Bulletin 874-B), on the Wilburton-Howe-Heavener coal area, the geology and fuel resources of the Quinton-Scipio district, the fauna of the Moorefield formation, the fauna of the Sycamore limestone, and the flora of the coal fields of eastern Oklahoma. Papers on the correlation of the Bluejacket sandstone and the stratigraphy of the Arkansas-Oklahoma coal

basin have been submitted for publication in the Bulletin of the American Association of Petroleum Geologists.

Oregon.—A bulletin on the metalliferous deposits of the Cascade Range is in preparation for Survey publication.

Pennsylvania.—Reports are in preparation on the geology and mineral resources of the Honeybrook and Phoenixville quadrangles and on the York and Hanover quadrangles, the latter in cooperation with the Pennsylvania Survey. A paper on the study of regional metamorphism in the Lower Kittanning coal beds of western Pennsylvania is also in preparation for Survey publication.

South Carolina.—Studies of the Pliocene and Pleistocene material along the intracoastal canal were made and a paper prepared for publication. The investigation of clays in South Carolina will be incorporated in a bulletin on clays of the Southern States to be issued by the Survey. Gold investigations in South Carolina are mentioned under Southern Appalachians.

South Dakota.—The collection of field data for the revision of the geologic map of South Dakota was completed and the first draft of the map was submitted for editing.

Southern Appalachians.—A report on the gold deposits of the southern Appalachians is in preparation for Survey publication. This includes areas in Virginia, North Carolina, South Carolina, Georgia, and Alabama, field work for which was done under a Public Works Administration allotment (Federal projects 158, 165, 174, 176, and 183). The results of brief field investigations made this year in Franklin and Stanley Counties, N. C.; Lancaster and Chester Counties, S. C.; and the Dahlonega district, northern Georgia, will be included in the report.

Tennessee.—Assistance was rendered to the Tennessee Valley Authority in examination of marble deposits and iron ores of the Norris Basin and inspection of dam sites of southeastern Tennessee. A preliminary report on bleaching and ceramic clays of Tennessee was included in a press notice on clays in Kentucky and Tennessee. Further details will be included in a Survey bulletin on clays in the Southern States.

Texas.—A report on stratigraphic, structural, and paleontologic studies of the Pennsylvanian and Permian rocks of north-central Texas was sent to the Texas Bureau of Economic Geology for publication. A monograph on the Navarro fauna and reports on the brown iron ores of eastern Texas, the Shafter silver district, the Terlingua quicksilver district, and the geology of the southern Guadalupe Mountains were in progress. Papers on stratigraphic relations of the Austin, lower Taylor, and related formations in Texas (Professional Paper 186-G); a redescription of Roemer's Paleozoic types from Texas (Professional Paper 186-M); and new Upper Cretaceous Ostreidae from the Gulf region (Professional Paper 186-A) were submitted for the Survey's Contributions to General Geology. Field work was continued in a study of the stratigraphic geology of the Sierra Diablo. Potash work is mentioned under New Mexico. A description of the clays of the San Antonio area will be included in the report on clays in the Southern States.

Utah.—In the early part of the fiscal year a field study of the coal resources and oil and gas possibilities of the Hanksville-Cainsville district was begun, and in the spring of 1936 this study was extended to include the structure, igneous rocks, mineral resources, and physiography of the adjoining Henry Mountains. Some additional work was done in the Randolph quadrangle for the purpose of bringing up to date a report on the geology and mineral resources of this quadrangle begun some time ago. Reports were in preparation on the geology and structure of southeastern Utah, the geology of the area between the Green and

Colorado Rivers in Grand and San Juan Counties, a geographic and geologic reconnaissance of southwestern Utah, and the Bull Valley iron-ore area. A descriptive text for the back of the topographic map of the Zion National Park was prepared. A paper on the geologic structure of southeastern Utah was submitted to the American Association of Petroleum Geologists for publication and one on new light on the orogenic history of central Utah was published by Science. A report on the Cottonwood-American Fork mining district was completed and has been forwarded for editing and publication.

Vermont.—A study of the metamorphic rocks in eastern Vermont, in cooperation with the Geological Society of America, was under way. Work was begun on the granites in connection with a study of the granites of New England.

Virginia.—Reports are in preparation on zinc deposits of southwestern Virginia and the origin of titanium deposits. A preliminary report on the gold deposits of the Virginia Piedmont was submitted for publication by the State. A paper on mineralization of the Virginia titanium deposits was published by the American Mineralogist, and another on the relation between structure and ore deposition in the Roseland titanium district was published by the National Research Council. Work on gold is mentioned under Southern Appalachians.

Washington.—Field work on the areal geology and mineral deposits of the Metaline quadrangle, Pend Oreille County, was begun late in the fiscal year.

West Virginia.—A field study was made of the coals in the Kanawha, New River, and Pocahontas fields. A report on manganese deposits of eastern West Virginia was published by the West Virginia Geological and Economic Survey.

Wyoming.—Field studies of the petroleum and coal resources of the Isha-wooa-Pitchfork area, in Park and Hot Springs Counties, the geology and mineral resources of the Afton quadrangle, and the physiography and glacial geology of parts of Park County were in progress. Work in the Randolph quadrangle is mentioned under Utah. A report on the structure and stratigraphy of the Black Hills rim is in preparation.

WORK IN CHEMISTRY AND PHYSICS

Borderland problems involving geology, chemistry, and physics have been given increasing attention. Chemical analyses are made to determine the composition of rocks, ores, and minerals, and physical tests involve measurements of temperature, strength, optical behavior, and many other physical properties; but the most valuable results in geology are obtained by correlating all the factors involved in each particular problem. Thus ores are analyzed chemically not only to determine their metal content but to aid the geologist in the interpretation of their origin and concentration; deep-well temperatures are studied to aid in determining the previous history of the strata and to throw light on the physical conditions under which earth processes take place; the atomic structure of minerals is studied to explain their action in affecting natural waters, oil, and ore-forming solutions.

Among materials analyzed in the laboratory during the year were clays from South Carolina and other States, bauxite from Arkansas, phosphate rock from Florida, igneous rocks, mainly from western

mining districts, bentonite from several States, iron ore from Alabama, mercury ore from Texas, garnet from Georgia, arseniosiderite from California, hornblende and ankerite from Georgia, phlogopite from North Carolina, topaz and chloritoid from South Carolina, uraninite from Idaho, and xenotlite from Mexico. Experiments were made to explain the origin of magnesite deposits, and spectrographic tests were made on different minerals, concentrates, and coals.

During the year 5,081 examinations or tests of minerals and rock samples were made, compared with 4,236 in 1935. These included 1,063 specimens tested and identified for persons not officially connected with the Survey, 1,225 chemical analyses made for geologists in aid of general geologic projects, and 678 similar analyses made in connection with studies of methods of analysis and geochemical investigations relating to the formation and alteration of minerals under natural conditions. The remaining 2,115 tests related to core samples, well cuttings, and other samples.

Among the more important items of work in physics were the testing of activable clays in Mississippi and Alabama, two deposits of which are being developed commercially, largely as a result of the tests made in the Survey laboratory. Geothermal surveys of deep wells were made in New York, Pennsylvania, West Virginia, Alabama, Mississippi, Oklahoma, Arkansas, New Mexico, and California. Two wells tested in California had reached depths of more than 9,000 feet and temperatures considerably above the boiling point of water at sea level. The physical properties of serpentine from several localities were studied to explain its origin and uses. Several classes of geologic data were subjected to correlation and elaborate mathematical discussion.

The following papers were completed during the year :

Adsorption and pycnometry (*Journal of the Washington Academy of Sciences*).

Monticellite from San Bernardino County, Calif., and the monticellite series (*American Mineralogist*).

Volcanological boron compounds (*Transactions of the American Geophysical Union*).

Rock temperatures and depths to normal boiling point of water in the United States (*American Association of Petroleum Geologists*).

Tables of temperature, geothermal gradient, and age of a nonradioactive earth (*Bulletin of the Geological Society of America*).

Nephelometric determination of fluorine (*Industrial and Engineering Chemistry*).

Tests of some chemical reagents for lead (*National Research Council*).

Sodium carbonate and sodium sulfate (*American Institute of Mining and Metallurgical Engineers*).

Acid and base—their role in history, geology, health, and industry.

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 the character, distribution, and development of these resources, and laboratory and office studies by which these field observations are analyzed and the results made available to the public through reports, maps, and other media. In addition to the funds regularly appropriated by Congress for this work, a small balance remaining from funds previously granted through the Public Works Administration was utilized in completing the compilation and publication of maps of portions of southeastern Alaska under Federal project 69. The work of the branch, in addition to serving the prime purpose of assisting in the development of the mining industry, 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 four reports and four maps (one a reprint) have been published. In addition 13 manuscript reports, including maps, and 1 separate manuscript map have been completed by the authors and are in various stages of critical review, proof, or preparation for publication. One map is in press. At the end of the year four manuscript reports and four maps were partly completed.

Work of the year.—In addition to the routine duties, seven principal projects involving new field work were carried on during the season of 1935. The field projects included five that were principally geologic and two that were primarily topographic. The geologic projects involved field work in the Alaska Range region, east of the Richardson Highway and north of Slana; the central and southern part of Kodiak Island; and the Tikchik Lake district of southwestern Alaska; a general study of the permanently frozen ground as affecting mining developments in central and western Alaska, especially in the Fairbanks and Nome districts; and a general study of recent mining developments in the larger camps adjacent to the Alaska Railroad, the Yukon River, and Seward Peninsula. The topographic projects included the continuation of surveying and mapping in the Admiralty Island area of southeastern Alaska, west of Juneau, and in the Alaska Range region, especially in the Tok Valley and adjacent parts of the Tanana region.

Two projects not directly involving new field work were the continuation of the compilation of drainage maps of portions of southeastern Alaska from airplane photographs taken by the Navy Department and the annual canvass of the production of mineral commodities.

In order to utilize effectively the short open season, the Geological Survey parties usually begin work in the spring as early as climate and other conditions permit. The beginning of work in the field season of 1936 was somewhat delayed owing to the late passage of the appropriation act carrying funds for this work. However, one party left for the field late in April and most

of the others in May, and at the end of the fiscal year these parties were out of touch by ordinary means of communication, so that it is not practicable to give here more than a summary of the work that it is expected they will accomplish.

Seven field projects have been authorized for the season of 1936, and their completion, with the essential office work, will occupy all the time until the spring of 1937. These projects include four geologic investigations, two topographic mapping projects, and the usual study in the field of mining conditions and mineral production of the Territory. The four geologic projects include a continuation of the investigation of the geologic features and mineral resources of part of the Alaska Range lying near the head of the Copper River and forming part of the watershed between the river and tributaries of the Tanana River; investigations of mining developments and mineral production in the principal placer camps of the upper Yukon, including Eagle, Circle, Fortymile, and adjacent areas; a study of the principal mining camps adjacent to the Alaska Railroad in central Alaska; and investigation of the mineral resources of the Glacier Bay area, including Glacier Bay National Monument, southeastern Alaska. The two topographic field projects include the continuation of surveying and mapping in the Admiralty Island area of southeastern Alaska, west of Juneau, and in the Alaska Range region, especially in the vicinity of the Robertson and Gerstle Rivers.

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 topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

The status of topographic surveys shows that the country as a whole is now 47.1 percent mapped, the year's increment amounting to 0.4 percent. The area covered by topographic base maps without contours, prepared from aerial photographs after field examination, was largely increased.

FIELD SURVEYS

Abbreviations for projects used below: Federal Emergency Administration of Public Works, "P. W."; Tennessee Valley Authority, "T. V. A."; Federal Emergency Relief Administration, State projects, "F. E. R. A." Cooperation with States was continued in about the same amount as in recent years.

Alabama.—Mount Hope 15' quadrangle (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Iuka, Allsboro, Burlson, Gravelly Springs, Barton, Belgreen, Muscle Shoals, Erin, Tusculmbia, Russellville, Haleyville, Rogersville, Town Creek, Mount Roszell, Hillsboro, Danville, Veto, Decatur, Hartsells, Hazelgreen, Talucah, Oleander, Plevna, Gurley, Guntersville, Snead, Blountsville, Larkin, Larkinsville, Albert-

ville, Attalla, Fackler, Hollywood, Portersville, Keener, Long Island, and Valley Head 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Mount Hope 15' quadrangle (T. V. A.).

Arizona.—Payson No. 3 15' quadrangle and Grand Canyon National Monument (P. W.) completed and Payson No. 4 15' quadrangle (P. W.) begun. Summit Valley No. 4 15' quadrangle completed at request of Forest Service.

Arkansas.—Caddo Gap No. 1 and Caddo Gap No. 2 15' quadrangles (P. W.), and North Little Rock No. 4 7½' quadrangle (P. W.), completed.

California.—In cooperation with the county surveyor of Los Angeles County, Mount Emma, Alder Creek, Mount Gleason, and Trail Canyon 6' quadrangles completed; Crystal Lake, North Baldy, Pine Mountain, and Mount Waterman 6' quadrangles begun. In cooperation with the State engineer of California, Sebastopol 15' quadrangle and San Bernardino No. 1 and San Bernardino No. 2 7½' quadrangles completed; Tobias Peak 30' quadrangle continued and San Bernardino No. 4 7½' quadrangle begun. In preparation for geologic mapping Kreyenhagen Hills 7½' quadrangle completed. Burney and Paynes Creek 30' quadrangles (P. W.) completed.

Colorado.—In cooperation with the city of Denver, mapping without contours from aerial photographs begun for East Denver 2c, East Denver 3b, West Denver 1d, and West Denver 4a 7½' quadrangles. Leadville No. 3 15' quadrangle (P. W.) completed; Leadville No. 2 and Buena Vista No. 2 15' quadrangles and Chattanooga mining area (P. W.) begun.

Connecticut.—Montville 7½' quadrangle (P. W.) completed.

Delaware.—Wilmington and vicinity (P. W.) completed.

Florida.—Villa Tasso, Holley, and Point Washington 15' quadrangles (P. W.) completed.

Georgia.—Thomaston 15' quadrangle (P. W.) completed, East Ridge 7½' quadrangle (T. V. A.) begun. Mapping without contours from aerial photographs completed for 7½' quadrangles within Rock Spring, Sugar Valley, Spring Place, Burton, Rabun Gap, Rossville, Trion, Long Island, and Valley Head 15' quadrangles (T. V. A.).

Idaho.—Borah Peak 30' quadrangle (P. W.) completed; Yellow Pine No. 2 and Washington Creek No. 2 15' quadrangles (P. W.) continued, and Logan No. 3 15' quadrangle (P. W.) begun. For the Forest Service, Mackay 30 quadrangle completed. At the request of the Office of Indian Affairs, Pocatello No. 2 15' quadrangle was begun.

Illinois.—Delavan, Keithsburg, and Miles 15' quadrangles completed; Mount Carroll, Shelbyville, Lena, and Stewardson 15' quadrangles continued; Savanna, New Douglas, Tuscola, and Elizabeth 15' quadrangles begun in cooperation with the Department of Registration and Education of Illinois, Geological Survey. Lovington, Arcola, Pontiac, and Watseka 15' quadrangles (P. W.) completed and Ashmore 15' quadrangle (P. W.) begun.

Indiana.—Oolitic 15' quadrangle (P. W.) completed.

Kentucky.—Horse Cave 15' quadrangle (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Paducah, Viola, Mayfield, Benton, Smithland, Murray, Eddyville, Golden Pond, and Blood 15' quadrangles (T. V. A.).

Louisiana.—The Louisiana Board of State Engineers cooperating, mapping without contours from aerial photographs completed for 7½' quadrangles within Santo, Bond, Mamou, Fenton, Simmons, De Quincy, Hecker, Nezpique, Aubrey, Glenmora, Kipling, and Rena 15' quadrangles.

Maine.—St. Croix 15' quadrangle and Acadia National Park (P. W.) completed. Mars Hill 15' quadrangle completed.

Maryland.—Leonardtown 15' quadrangle (P. W.) completed.

Massachusetts.—In cooperation with the Department of Public Works, Division of Waterways, Mount Toby, Williamsburg, Scituate, 7½' Duxbury, Shirley, Pocasset, Cohasset, Abington No. 2, Whitman, Hanover, Nantasket, Greenfield No. 1, and Greenfield No. 4 7½' quadrangles completed. Boston Bay, No. 3, Warwick No. 2, Warwick No. 3, Dedham No. 1, and Dedham No. 2 7½' quadrangles begun. Millbury and Ayer 7½' quadrangles (P. W.) completed.

Michigan.—In cooperation with the State Highway Department of Michigan, mapping without contours for aerial photographs begun for 7½' quadrangles within Rochester, Mount Clemens, Hicky, Armada, Port Huron, Almont, Milford, and Pontiac 15' quadrangles. Ithaca and Cement City 15' quadrangles (P. W.) and Berkey 7½' quadrangles (P. W.) completed, and Swanton No. 2 7½' quadrangles (P. W.) begun.

Minnesota.—Rochester 15' quadrangle (P. W.) completed.

Mississippi.—Edwards 15' quadrangle (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Burnsville, Candler, Iuka, Allsboro, and Burleson 15' quadrangles (T. V. A.).

Missouri.—In cooperation with the Geological Survey and Water Resources of Missouri, Ava, Herman No. 3, Thornfield, Kearney, and Barry 15' quadrangles and Butler 3d 7½' quadrangle completed; Franks, Edgar Springs, Big Piney, Fielden, Richland, Buffalo, Fordland, Long Lane, Protom, and Niangua 15' quadrangles and Knobnoster No. 4 7½' quadrangle continued; Independence No. 1, Springfield No. 3, Knoblick, Bradleyville, Vienna, Middlebrook, Bolivar No. 2, Warsaw No. 3 S½, Hannibal, and Louisiana No. 4 15' quadrangles and Springfield 3b 7½' quadrangle begun; and cultural revision completed for Alton SW., St. Charles SW., and St. Charles SE. 7½' quadrangles. Warsaw 1d, Warsaw 1c, Warsaw 2d, Warsaw 3a, Warsaw 4a, Warsaw 4b, Gravois Mills No. 3, Eldon No. 3, Versailles 3b, and Liberty 7½' quadrangles (P. W.) completed and Warsaw 2c and Warsaw 3b 7½' quadrangles (P. W.) begun. Morrison and Sullivan No. 2 15' quadrangles (F. E. R. A.) completed.

Montana.—Jennings 30' quadrangle (P. W.) completed and Silver Tip 30' quadrangle (P. W.) begun. Dupuyer No. 3 15' quadrangle completed for the Office of Indian Affairs.

Nebraska.—Seward No. 4 15' quadrangle (P. W.) completed.

Nevada.—Gold Creek No. 4 15' quadrangle and Comstock Lode district (P. W.) completed. At the request of the Forest Service, Gold Creek No. 1 15' quadrangle completed and Gold Creek No. 2 15' quadrangle begun.

New Hampshire.—Whitefield (P. W.) and Lovewell Mountain 15' quadrangles completed.

New Jersey.—Weehawken, Ramapo No. 2 and Ramapo No. 3 7½' quadrangles (P. W.) completed.

New Mexico.—Hillsboro Peak No. 1 and Arabela No. 4 15' quadrangles (P. W.) completed. In preparation for geologic mapping Queen No. 3 quadrangle completed.

New York.—Poughkeepsie 15' quadrangle continued, West Point 15' and Tarrytown 1 7½' quadrangles begun, in cooperation with the Department of Public Works of New York. Chenango Forks, 7½' Binghamton, Gansevoort, 7½' Schuylerville, Fort Miller, Corinth, and Weehawken 7½' quadrangles (P. W.) completed.

North Carolina.—Farner 15' quadrangle (P. W.) completed; Blowing Rock 15' quadrangle (P. W.) continued. Mapping without contours from aerial photographs completed for 7½' quadrangles within Robbinsville, Cullasaja, Caesars Head, Democrat, Edneyville, Tigersville, Bushnell, Wayah Bald, Le

Conte, Bryson, Cataloochee, Fines Creek, Waynesville, Halewood, Biltmore Arden, Farner, Hot Springs, Newport, and Limestone 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Haw Knob 15' quadrangle (T. V. A.).

North Dakota.—Dunseith and Kempton No. 2 15' quadrangles (P. W.) completed, McVile 15' quadrangle (P. W.) continued, and Alcide 15' quadrangle (P. W.) begun.

Ohio.—In cooperation with the county commissioners of Lucas County, Whitehouse, Berkey, Grand Rapids, Swanton No. 2, Swanton No. 3, and McClure No. 2 7½' quadrangles completed. Tontogany, Reno by the Lake, Walbridge, and Genoa 7½' quadrangles (P. W.) completed.

Oregon.—Disston 30' quadrangle, Crater Lake National Park, and Squaw Butte ranch (P. W.) completed. At the request of the Forest Service, Crescent 30' quadrangle completed.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, Sheffield, Kinzua, and Mount Jewett 15' quadrangles completed. Loleta, Mattawana, and Slatington 15' quadrangles begun. Allensville, Hawley, Needmore, and Steubenville 15' quadrangles (P. W.) completed.

Rhode Island.—East Providence and Providence No. 1 7½' quadrangles (P. W.) completed.

South Carolina.—Mapping without contours from aerial photographs begun for 7½' quadrangles within Woodford, Spartanburg, Hopkins, Sunter, Edmund, Rimini, Cowpens, St. Matthews, and Ellore 15' quadrangles (F. E. R. A.).

South Dakota.—Oacoma No. 2 15' quadrangle (P. W.) completed.

Tennessee.—Farmer 15' quadrangle (P. W.) completed. Conasauga No. 1 and Conasauga No. 2 7½' quadrangles (T. V. A.) begun. Mapping without contours from aerial photographs completed for 7½' quadrangles within Sequatchie, Pikeville special, Dayton, Apison, Allardt, Spring City, Texas Knobs, Blue Spring, Niota, Conasauga, Vonore, Greenback, Log Mountain, Middlebro, Straw Plains, Sevierville, Tate Springs, English Mountain, Rogersville, Midway, Hot Springs, Fall Branch, McEwen, Bold Spring, Dark Mills, Selmer, Puryear, Hollow Rock, Wildersville, Warrens Bluff, Right, Adamsville, Faxon, Zach, Holladay, Darden, Saffillo, Gillises Mills, Model, Tennessee Ridge, Waverly, Bakerville, Beardstown, Flatwoods, Lutts, Hohenwald, Allens Creek, Iron City, Dickson, Hampshire, Summertown, Pleasant Point, Blood, Fernvale, Lynnville, Minor Hill, Franklin, Groveland, Culleoka, Aspen Hill, Nolensville, Eagleville, Talley, Harms, Bellbuckle, Haley, Elora, Hollow Springs, Tullahoma, Decherd, Smartt, Pelham, Mont Eagle, Altamont, Jasper, Duniap, Lookout Mountain, Mayland, Crossville, Deer Lodge, Roddy, Annadel, Harriman, Huntsville, Oliver Springs, Wheat, Farner, La Follette, Coal Creek, Friendsville, McLean Rock, Corryton, Shooks, Walland, Rutledge, Townsend, Newport, Limestone, and Hazelwood 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Centerville and Haw Knob 15' quadrangles (T. V. A.).

Texas.—Sanford and Longview No. 2 15' quadrangles (P. W.) completed.

Utah.—Elk Ridge and Theodore 30' quadrangles (P. W.) completed.

Vermont.—In cooperation with the State geologist of Vermont, Woodsville 15' quadrangle completed. Lyndonville and Whitefield 15' quadrangles (P. W.) completed.

Virginia.—Charlottesville and Burkes Garden 15' quadrangles, Glen Allen and Midlothian No. 4 7½' quadrangles, and Charlottesville and vicinity completed, and Speedwell and Gerrardstown 15' quadrangles begun in cooperation with the Conservation and Development Commission of Virginia, Geological

Survey. Amherst and Vesuvius 15' quadrangles (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Middlesboro 15' quadrangle (T. V. A.).

Washington.—In cooperation with the Department of Conservation and Development, Marcus 30' quadrangle continued, Yakima No. 3 and Yakima No. 4 15' quadrangles and Kittitas reclamation project begun. Newport 30' quadrangle continued at the request of the Forest Service.

West Virginia.—Cultural revision completed for Steubenville 15' quadrangle (P. W.).

Wisconsin.—Osseo 15' quadrangle (P. W.) completed and Arkansas 15' quadrangle (P. W.) continued.

Wyoming.—Big Piney, La Barge, and Cokeville N½ 30' quadrangles (P. W.) and Grand Teton National Park completed. In preparation for geologic mapping, Cokeville S½ 30' quadrangle begun.

WATER-RESOURCES BRANCH

SUMMARY

The importance of water and of systematic records related to the quality, chemical quality, and availability of both surface and ground waters becomes increasingly 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 drought of 1934, the current drought of 1936, apparently of rivaling intensity, and the dust storms that have continued in large areas of the central West, have impressed on the people the controlling importance of water in 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 and have relied on these basic data for determining action on many projects.

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 work of the water-resources branch thus occupies a position of great importance in the economic affairs of the Nation.

The investigations by the branch are conducted largely in cooperation with Federal bureaus; State, county, municipal, and other gov-

ernmental 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, through advance, transfer, or repay of funds, for the following Federal bureaus:

Department of Agriculture:

- Bureau of Biological Survey.
- Bureau of Plant Industry.
- Soil Conservation Service.
- Weather Bureau.

Department of Commerce: Bureau of Fisheries.

Department of the Interior:

- Office of Indian Affairs.
- Bureau of Mines.
- Bureau of Reclamation.
- Division of Grazing.
- National Park Service.
- Petroleum Conservation Division.

Department of Justice: Bureau of Prisons.

Department of State.

Federal Power Commission.

National Resources Committee.

Resettlement Administration.

Tennessee Valley Authority.

Veterans' Administration.

War Department: Office of Chief of Engineers.

States.—Amounts aggregating \$587,354.80 were made available by States and municipalities for cooperative surface- and ground-water investigations. In addition to the data obtained as a result of this cooperation, it is estimated that other data valued at over \$114,000 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 111 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 145 projects.

WORK OF THE YEAR, BY DIVISIONS

The division of surface water conducts investigations of surface water, which consist of the measurement of the flow of rivers, conducted 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, from which the daily discharge of the rivers is computed. In this work 44 States, the Territory of Hawaii, several Federal bureaus, and several individuals

cooperated in the maintenance of the 3,163 regular gaging stations that were in service at the end of the year. Records for about 114 additional gaging stations were received, ready for publication, from Federal bureaus and from individuals. There were 42,157 regular and miscellaneous discharge measurements made during the year.

The division of ground water investigates the waters that lie below the surface in the zone of saturation (from which the 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 generally published in water-supply papers that include maps showing the ground-water conditions. The investigations relating to the chemical composition of the water are made in cooperation with the division of quality of water. Projects involving large expenditures for wells to develop water supplies are considered each year by the several departments of the United States Government, and the ground-water division is called upon to furnish information and advice on many of these projects. During the fiscal year work was done in 21 States and Hawaii, in cooperation with 13 States or local governmental agencies, the Territory of Hawaii, and other Federal bureaus.

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 such use is affected by the dissolved mineral water. The analysis (partial or complete) of 1,481 samples of water, including some for many of the studies of ground water in the different States and for most of the special investigations on water supplies for specific projects, 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.

The work of the division of power resources comprises the preparation of monthly and annual reports on the production of electricity for public use and the consumption of fuel in generating the electricity reported. The monthly reports also include, through cooperation with the Bureau of Mines, comparative figures of the stocks of bituminous coal and anthracite on hand at electric public utilities, comparison of the monthly consumption of coal, and the number of days' supply of

bituminous coal and anthracite on hand at the current rate of consumption. The annual report for 1935 contains revised figures of the monthly production of electricity and consumption of fuel previously published in the monthly reports, a summary of the annual reports from 1919 to 1935, the average annual rate of consumption of coal and the coal equivalent of oil and gas in generating 1 kilowatt-hour of electricity from 1919 to 1935, and the annual exports and imports of electricity between the United States and Canada and Mexico for certain years. A report on the capacity of water wheels in the United States on January 1 was also prepared. The final report of the monthly and annual production of electricity for public use in 1935 was released April 2, 1936. The annual report on the capacity of water wheels in water-power plants in the United States was released January 31, 1936. The collection, compilation, and publication of the monthly and annual reports of the production of electricity for public use that have been carried on by the Geological Survey since 1919 will be transferred to the Federal Power Commission July 1, 1936.

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 field work is generally conducted by personnel otherwise assigned to the division of surface water. In collaboration with the Mississippi Valley Committee of the Public Works Administration, and with the assistance of special advisory committees of the American Society of Civil Engineers and the American Geophysical Union, studies were made of floods in the United States, with especial reference to their magnitude and frequency, and of the relations of rainfall and run-off in the United States, and the results were published during the year in Water-Supply Papers 711 and 772. The favorable reception of these two reports indicates that they have filled a need. 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 organization of the collection of information on recent outstanding floods.

CONSERVATION BRANCH

The regular work of the conservation branch was severely handicapped during the fiscal year by lack of funds. Many inspections of operations were omitted, and loss in resources and in royalties has

resulted. Up to the end of the year 850 proposed unit plans of development and operation had been submitted by Federal oil and gas permittees for technical review and revision in compliance with departmental requests. This review made necessary the temporary assignment in Washington of field engineers at a sacrifice of field personnel for regular duties. Detail of personnel for Public Works operations in connection with river-utilization surveys, plugging wells, and general rehabilitation has also retarded the normal functions of the branch, but has made it possible to retain a highly trained staff of engineers and scientists, who will resume more nearly normal operations in the fiscal year 1937.

MINERAL-CLASSIFICATION DIVISION

The work of the mineral-classification division was restricted, as in previous years, largely to office procedure, delayed in part by lack of geologic information due to limited field investigations. The mineral-classification activities of the division were further directed to compliance with the assignment of the responsibility for determining the areas subject to logical unitization under plans for unit or cooperative development submitted by holders of Federal oil and gas prospecting permits and leases. The only formal mineral classification completed involved the classification of 317,766 acres in southern Washington County, Utah, as nonoil in character. Coal lands in Valencia County, N. Mex., amounting to 4,962 acres, were restored from coal-land withdrawal. Action was taken on 500 requests for information as to the mineral character of the land, 748 applications for mineral permit, and 147 applications for mineral lease, involving technical action; consideration was given to 1,176 assignments, coal-permit extensions, lease and license authorizations; 105 decisions were prepared for a departmental committee affecting extensions of oil and gas prospecting permits and potash permits; and 731 permits involved in plans for cooperative unit operation and development for oil and gas fields or areas were considered. Technical reports were submitted on 1,167 requests for classification as to oil; 90 right-of-way applications were reviewed as to interference with coal, oil, gas, potash, and other mineral deposits; and reports were made on 143 requests for oil-development status of Government lands. In all, 4,810 cases requiring technical consideration were disposed of in the mineral-classification division during the year.

In addition, definitions of the "known geologic structure" of 13 producing oil and gas fields were prepared and promulgated as follows:

Definitions of "known geologic structure", fiscal year 1936

State	Field	Date promulgated	Area (acres)
Colorado.....	Iles.....	Aug. 5, 1935	1, 710
Montana.....	Cedar Creek (revision).....	Sept. 21, 1935	122, 323
New Mexico.....	Lea (revision).....	Sept. 6, 1935	1, 281
	North Lea.....	do.....	1, 200
	Northwest Lea.....	do.....	1, 560
North Dakota.....	Cedar Creek.....	Sept. 21, 1935	27, 013
Wyoming.....	North Baxter Basin.....	Nov. 14, 1935	7, 031
	South Baxter Basin (revision).....	do.....	15, 463
	Hidden dome (addition).....	Nov. 16, 1935	280
	North Oregon Basin (revision).....	Dec. 9, 1935	4, 632
	South Oregon Basin (revision).....	do.....	7, 415
	East Lance Creek field (revision).....	Mar. 3, 1936	800
	Lance Creek field (revision).....	do.....	5, 593

The area of outstanding definitions of the "known geologic structure" of producing oil and gas fields on June 30, 1936, amounted to 1,154,447 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 1,615 miles of important streams and tributaries were made in 11 public-land States. Surveys of reservoir and dam sites embracing an area of 520 square miles were also completed. Supplemental geologic and geophysical studies of foundation materials and conditions were made at 16 dam sites.

Office activities included action resulting in the addition of 46,174 acres to outstanding water-power reserves in 13 public-land States and the elimination of 10,934 acres from such reserves in 6 States, with a net increase of the total reserved area in 22 States to 6,500,247 acres. The elimination of 40 acres from reservoir-site reserves left a net total of 133,704 acres withdrawn. Two restorations of lands withdrawn under the act of October 2, 1888, were also made. Field supervision of power projects for the Federal Power Commission involved investigations and reports on 11 projects, supervision of construction and operation on 136 projects, and studies of cost accounting on 4 projects. Field supervision of power projects holding permits and grants from the Interior Department involved 317 projects.

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 1935 an aggregate installed

capacity of 4,861,046 horsepower, including 3,370,401 horsepower at hydraulic plants and 1,490,645 horsepower at fuel plants, and an aggregate energy generation of 7,961,000,000 kilowatt-hours, which is an increase of about 15 percent over the production in 1934. Revenues accrued to the Government from these grants aggregated \$221,166 from 1912 to 1935, and \$15,045 additional has been assessed for the calendar year 1936. Accrued charges for unauthorized occupancy of public lands by power projects prior to the issuance of licenses therefor by the Federal Power Commission amount to \$100,536 additional.

MINING AND OIL- AND GAS-LEASING DIVISIONS

The work of the mining and oil- and gas-leasing divisions, consisting of inspectional and regulatory supervision of mineral prospecting and development on public lands, Indian lands, and naval petroleum reserves, increased notably in volume and in difficulty of effective performance during the year.

Public lands.—The number of public-land properties under supervision of the oil- and gas-leasing division increased 13 percent, to a total of 8,332 involving 11,832,767.58 acres in 19 States and Alaska. With the aid of funds allotted in 1933 by the Public Works Administration and a similar allotment in the fiscal year 1936, the supervisory force was maintained intact, though available only in part for regular inspectional and regulatory work, and was enabled to accomplish important conservational and remedial results outlined more fully under the heading "Public Works projects."

The work of the oil- and gas-leasing division has been vastly increased, both in Washington and in the field, by the necessity of 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 of reviewing and revising the engineering and royalty features of such plans after their submission. Six engineers from the field offices were temporarily assigned to the Washington office to assist in the review of unit plans, and three geologists from the geologic branch were given temporary assignments to the mineral-classification division of the conservation branch to assist in delineating the areas appropriately subject to unitization under each plan submitted. The act of August 21, 1935 (49 Stat. 674), amending the mineral leasing law, has required revision of all unit plans submitted for areas that can be logically unitized. At the end of the fiscal year 1936 a total of 800 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 20 have been finally approved by the Secretary of the Interior, 73 have been reviewed and returned to their proponents

for revision and resubmission, 186 have been rejected or withdrawn, and 521 are awaiting technical consideration in the conservation branch. The oil- and gas-leasing division assisted in formulating regulations under the act of August 21, 1935 (49 Stat. 674). These regulations were approved by the Secretary of the Interior on May 7, 1936.

Drilling activity on public lands during the year included the spudding of 226 new wells and the completion of 314 others, 191 of which were productive of oil or gas and 123 barren. The total number of wells under supervision at the end of the year was 7,456 in 17 States and Alaska, including 3,849 capable of producing oil or gas. The production of petroleum, natural gas, and natural gasoline from public land in 1936 was substantially greater than in other recent years, and the revenues accrued therefrom were materially increased.

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 Territory of Alaska Mining Department.

Coal properties under supervision in 14 States and Alaska decreased 64, to 694; potash properties in 8 States decreased 109, to 95; sodium properties in 7 States decreased 5, to 40; sulphur properties in 1 State remained at 26. The number of phosphate properties increased by 1, to 9, and the oil-shale lease remained at 1 in 1 State. The total number of properties under supervision was 865, a decrease of 177. The reduction in coal properties resulted from the Secretary's instructions of January 24, 1934, and that in potash properties from the Secretary's orders 799, 817, 854, and 914. In prospecting for the above-named minerals 12 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 51 awards made to bituminous mines or to operators by the Joseph A. Holmes Safety Association for the calendar year 1935 two were made to departmental lessees, and one was made to one of the two potash mines in operation in America. The use of safety appliances and safety clothing is increasing generally throughout mines on Government lands.

Indian lands.—On behalf of the Office of Indian Affairs technical supervision of mineral development was continued in 1936 on tribal and restricted allotted lands within the limits of numerous Indian reservations. Oil and gas supervision involved 5,583 leaseholds, 4,356 wells, and aggregate royalty and rental accruals of \$2,652,897.70 for Indian beneficiaries in 8 States and in 28 different tribes and included royalty accounting for certain agencies, appraisals of bonus and royalty offers and of 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 36 lead and zinc leaseholds in the Quapaw Reservation, Okla., with aggregate royalty accruals of \$360,727.69, an increase of 74.7 percent from the preceding year; 56 coal leaseholds involving Choctaw, Chickasaw, and Five Tribes lands in Oklahoma, with an aggregate production increased from 465,780.95 tons in 1935 to 568,725.92 tons in 1936, and revenue accruals from royalties, bonuses, and sale of coal lands amounting to \$73,798.97; 1 asphalt lease involving segregated Choctaw and Chickasaw lands in Oklahoma; 1 lime-phosphate lease involving restricted allotted Five Tribes land in Oklahoma; and 53 properties in other States, 18 of which are agency mines. It included also special investigations of 21 properties for minerals other than fuels.

Naval petroleum reserves.—On behalf of the Navy Department supervision was continued during the 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 the California reserves aggregated 3,777,607.53 barrels of petroleum, 2,903,396 M cubic feet of natural gas, and 12,248,006.08 gallons of natural gasoline and had an aggregate royalty value of \$683,256.32. Under a Works Progress Administration allotment of \$9,913, approved September 3, 1935, derricks were repaired, roads were built and repaired, well sites fenced, and fire hazards removed from the California reserves.

PUBLIC WORKS PROJECTS

Under the supervision of the conservation-branch personnel, aggregate expenditures of \$200,902.75 were made during the fiscal year 1936 from funds allotted by the Administrator of Public Works for field investigation in conservation work pertinent to branch functions. On 11 projects \$146,783.76 was expended for river utilization surveys of power and storage resources of important streams in 11 States. On 16 projects \$54,118.99 was expended in 12 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 thereafter 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 2 tracts in Tuscaloosa County and 1 tract in Walker County for adjudication of conflicting mineral and non-mineral filings and 1 tract in Colbert County for minerals. Supervised 1 lease and 1 prospecting permit for oil and gas, and 1 coal lease.

Alaska.—Supervised 1 power project, 128 prospecting permits for oil and gas, and 2 leases, 2 licenses, and 10 prospecting permits for coal.

Arizona.—Supervised 25 power projects; completed 150 miles of river-utilization surveys on the Gila, Little Colorado, and Verde Rivers and tributaries; and surveyed in detail 140 square miles in 8 dam and reservoir sites. Supervised 76 prospecting permits for oil and gas on public land and 1 oil and gas lease on Indian land.

Arkansas.—Investigated oil and gas prospecting operations in southeastern Arkansas and in the western part of the Arkansas Valley in aid of mineral classification, and examined for minerals 1 tract in Franklin County. Supervised 1 power project. Supervised 8 prospecting permits for oil and gas.

California.—Investigated occurrence and use of carbon-dioxide gas in Imperial County. Through the geologic branch examined land in the Castac Creek area, Los Angeles County, for purposes of mineral classification. Supervised 92 power projects; completed 335 miles of river-utilization surveys on the American, Kings, Trinity, Carson, and Yuba Rivers and Cache, Clear, and Putah Creeks; surveyed in detail 70 square miles in 16 dam and reservoir sites; and made detailed surveys of 10 dam sites. Supervised 215 leases and 1,160 prospecting permits for oil and gas on public land and 23 leases on naval petroleum reserves. Supervised 3 coal and 12 sodium permits, 1 sodium lease, and 3 potash leases.

Colorado.—Made an areal and structural reconnaissance of land in Archuleta County for purposes of mineral classification. Supervised 12 power projects; completed 41 miles of river-utilization surveys on the Little Snake and Roaring Fork Rivers and tributaries; and surveyed in detail 4 square miles in 2 dam and reservoir sites. Supervised 30 leases and 632 prospecting permits for oil and gas on public land and 6 oil and gas leases on Indian land. Supervised on public land 85 leases, 15 licenses, 49 permits, and 5 awarded lease applications for coal; 1 sodium lease; and 1 potash permit. Supervised on Indian lands 2 agency coal mines.

Florida.—Investigated oil and gas prospecting operations throughout the State and examined 1 tract each in Glades, Jefferson, and Lake Counties for purposes of mineral classification.

Idaho.—Examined land in the Rainy Creek area, Bonneville County, for purposes of mineral classification. Supervised 33 power projects; completed 120 miles of river-utilization surveys on the Coeur d'Alene, Moyie, and Snake

Rivers; and surveyed in detail 2 dam sites. Supervised 76 prospecting permits for oil and gas; 1 lease and 15 permits for coal; and 2 phosphate leases.

Kansas.—Investigated oil and gas prospecting operations in western Kansas in aid of mineral classification. Supervised 18 prospecting permits for oil and gas.

Louisiana.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised 11 leases and 1 prospecting permit for oil and gas.

Mississippi.—Investigated oil and gas prospecting operations throughout the State and examined 1 tract each in Greene, Jackson, and Pearl Counties. Supervised 1 prospecting permit for oil and gas.

Montana.—Supervised 34 power projects; completed 40 miles of river-utilization surveys on the Flathead River and its North and South Forks; and surveyed in detail 72 square miles in 2 reservoir sites. Geologic and geophysical examinations were also made at these reservoir sites. Supervised 105 leases and 833 prospecting permits for oil and gas on public land and 43 oil and gas leases on Indian land; 97 leases, 37 permits, and 52 licenses for coal; 6 phosphate leases; 1 potash permit; 2 Indian agency coal mines; and 10 coal leases and 2 silver, lead, and gold leases on Indian land.

Nebraska.—Supervised 1 potash prospecting permit.

Nevada.—Supervised 22 power projects; completed 200 miles of river-utilization surveys on the Carson, Humboldt, Little Humboldt, and Marys Rivers and in Pahrnagat Valley; and made detailed surveys of 3 dam and reservoir sites. Supervised 79 prospecting permits for oil and gas, 3 coal permits, 1 phosphate lease, 1 sodium lease, and 7 potash permits.

New Mexico.—Investigated occurrence of carbon-dioxide gas in northeastern and central New Mexico. Examined, for the Indian Service, land in the pueblo of Isleta, Bernalillo County, for the purpose of mineral classification. Initiated an areal stratigraphic and subsurface structural investigation in southeastern New Mexico. Supervised 3 power projects; completed 243 miles of river-utilization surveys on the Pecos and Peñasco Rivers and Rio Chama and tributaries; surveyed 3 washes in the vicinity of Shiprock in connection with erosion studies; and surveyed 28 square miles in 2 dam and reservoir sites. Supervised 149 leases, 4 suspended preference rights, 1,754 prospecting permits for oil and gas on public land, and 7 oil and gas leases on Indian land. Supervised on public land 23 leases and 24 prospecting permits for coal, 12 prospecting permits for sodium, 9 leases and 134 prospecting permits for potash, and 26 sulphur permits. Supervised 1 coal lease on Indian land and 9 Indian agency coal mines.

North Dakota.—Supervised 25 prospecting permits for oil and gas on public land. Supervised 70 leases, 1 permit, and 21 licenses for coal and 1 sodium permit.

Oklahoma.—Investigated oil- and gas-prospecting operations in western Oklahoma, including development in and adjacent to the river bed of the Red River, and examined one tract in Beckham County for purposes of mineral classification. In cooperation with the geologic branch, continued the mapping of the Osage and adjoining Indian lands with special attention to subsurface structure. Supervised 3 power projects, 15 leases and 62 prospecting permits for oil and gas on public land, and 5,495 oil and gas leases on Indian land. Supervised on segregated tribal and restricted allotted Indian lands 32 leases, 17 permits, and 2 temporary mining permits for coal, 1 asphalt lease, 1 lime-phosphate lease, and 1 right-of-way lease; on Quapaw Indian lands, 36 lead and zinc leases.

Oregon.—Supervised 40 power projects; completed 150 miles of river-utilization surveys on the Applegate, Hood, Luckiamute, and Santiam Rivers, the

Middle Fork of the Willamette River, and Cow, Evans, Jump-Off Joe, Little Butte, and Mud Creeks; surveyed in detail 84 square miles in 10 dam and reservoir sites; and made detailed surveys of 3 dam sites. Supervised 122 prospecting permits for oil and gas on public land, 1 lease and 1 permit for coal, 2 sodium permits, and 1 oil-shale lease.

South Dakota.—Supervised 53 prospecting permits for oil and gas on public land and 5 oil and gas leases on Indian land. Supervised 5 leases, 2 permits, and 3 licenses for coal.

Utah.—Supervised 31 power projects; completed 100 miles of river-utilization surveys on the East and West Forks of the Sevier River and tributaries and in the Bear River Valley. Supervised 11 leases and 688 prospecting permits for oil and gas on public land and 1 oil and gas lease on Indian land. Supervised 43 leases, 71 permits, and 2 licenses for coal, 11 sodium permits, and 8 potash permits.

Washington.—Supervised 9 power projects; completed 205 miles of river-utilization surveys on the Cowlitz, Green, Sauk, Skagit, and Toutle Rivers and the East and North Forks of the Lewis River and tributaries; surveyed in detail 50 square miles in 9 dams and reservoir sites; and made detailed surveys of 7 dam sites. Supervised 10 prospecting permits for oil and gas on public land, 1 lease and 17 permits for coal, 1 sodium permit, and 3 silver and gold leases (Indian).

Wisconsin.—Supervised one power project.

Wyoming.—Examined land in Blind Bull-Deadman Creek area, Lincoln County, for purposes of mineral classification and one tract in Carbon County for classification as to sodium. Supervised 10 power projects; completed 44 miles of river-utilization surveys on the Laramie and Bear Rivers and tributaries; and surveyed in detail 30 square miles in 2 dam and reservoir sites. Supervised 431 leases, 1 suspended preference right, 1,632 prospecting permits for oil and gas on public land, and 25 oil and gas leases on Indian land; 56 leases, 66 permits, 25 licenses, and 4 awarded coal leases; and 2 prospecting permits for sodium.

WORK ON PUBLICATIONS

Texts.—The book publications of the year numbered 50, covering 8,901 pages. Besides these publications 31 brief papers in mimeographed form were issued as memoranda for the press. During the year 20,777 pages of manuscript were edited and prepared for printing, 1,237 galley proofs were read, and 5,743 page proofs were revised. Indexes were prepared for 29 publications, covering 5,438 pages. Copy and proof or stencils for 971 pages of multigraph or mimeograph matter were read. In addition to the Survey work the proof reading for the report of the Sixteenth International Geological Congress and the volume on copper resources of the world published by that Congress was completed. The fourth edition of "Suggestions to authors", much revised and enlarged, was published during the year.

Illustrations.—The section of illustrations prepared 1,695 drawings and photographs, transmitted 766 illustrations to accompany 47 reports, received and examined 706 proofs, and examined 71 editions.

Geologic editing and drafting.—The geologic map of Colorado, scale 1:500,000, was completed and published. The geologic map of

Texas in four parts, scale 1:500,000, was engraved and transferred to stone, and color sheets were prepared. The geologic map of South Dakota was received for publication. Illustrations for 37 papers were edited, proofs of 15 maps and sections were read and criticized, and 140 drawings, ranging from large maps with structure sections to text figures, were made to illustrate papers by Survey geologists to be published by State surveys or other non-Federal organizations. Editorial and other assistance was rendered to several State surveys in the preparation for publication of geologic maps of the respective States.

Distribution.—A total of 331 publications, comprising 50 new books and pamphlets, 114 new or revised topographic and other maps, and 167 reprinted topographic and other maps, 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 107,059 books and pamphlets and 697,995 topographic and other maps, a grand total of 805,054. The division distributed 93,708 books and pamphlets, 2,511 geologic folios, and 730,200 maps, a grand total of 826,419, of which 2,271 folios and 587,697 maps were sold. The net proceeds (gross collections less copying fees and amounts refunded) from the sales of publications were \$36,958.88, including \$36,345.03 for topographic and geologic maps and \$613.85 for geologic folios. In addition to this \$7,709.42 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were \$44,668.30.

Engraving and printing.—During the year 84 newly engraved topographic maps, including 7 revised maps, and 30 special maps were printed, making a total of 114 new or revised maps printed and delivered. Of the newly engraved maps 37 were completed under the Public Works allotment. Corrections were engraved on the plates of 153 maps. Reprint editions of 150 engraved topographic maps, 5 special maps, and 12 photolithographed State and other maps were printed and delivered. In addition, 56 new topographic maps had been engraved and were in press June 30, including 32 under Public Works allotment, and the engraving of 112 other new topographic maps was nearly completed, including 72 under Public Works allotment. One new geologic map was printed, the edition amounting to 4,625 copies. Of new and reprinted maps, 282 different editions, amounting to 701,549 copies, were delivered.

A large amount of work was done for more than 75 other units of the Government and State governments, and the charges for it amounted to about \$208,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed. Of topographic maps, geologic maps, and contract and miscellaneous

work of all kinds a grand total of 4,849,142 copies were printed and delivered.

The photographic laboratory made 14,179 negatives (including 6,816 wet plates for photolithographs, 685 wet plates for photographic prints, 14 paper negatives, 1,316 dry plates, 471 lantern slides, and 4,877 field negatives developed), 17,355 prints (including 3,025 maps and diagrams, 13,337 photographs for illustrations and records, and 993 bromide enlargements), 6,507 zinc plates, 325 intaglio etchings, and 9 celluloid prints, and mounted 4,006 prints.

LIBRARY

The volume of work performed by the library during the year has again been abnormally heavy. Of the 11,201 readers who used the library, more than half were not members of the Geological Survey. A register of distinguished readers recently begun shows, among foreign visitors, representatives of the Geological Institute of the South Manchurian Railway, the Union of Soviet Socialist Republics, the Amtorg Trading Corporation, and the Bodleian Library, Oxford University. Members of the staff of many colleges and learned institutions in the United States also visited the library in furtherance of their research projects.

The bibliography of North American geology for 1933-34 was issued in February as Bulletin 869. This volume contains 3,836 entries, as compared with 3,454 in the volume for 1931-32. As an overtime project "A list of references since 1928 on National and State planning in the United States", comprising some 280 items, was prepared in cooperation with a representative of the National Resources Committee and issued as United States Geological Survey Library Bibliographical List No. 5. Bibliographical List No. 2, on the Public Works Administration, was also revised and republished.

Perhaps the most satisfactory feature of the library's work for the year was the authorization for the binding of 2,642 volumes, as compared with only 239 for 1935. Last year the library contained some 20,000 volumes badly in need of immediate binding, and the work done this year represents an excellent start on a much-needed binding program.

The accessions during the year were 19,368 books, pamphlets, and serial parts and 1,221 maps and charts. The total circulation during the year amounted to 40,420 copies.

APPROPRIATIONS AND EXPENDITURES

The appropriations made directly for the work of the Geological Survey for the fiscal year 1936 included 10 items, amounting to \$2,285,560, of which \$57,256.60 remained unobligated on June 30, 1936. In

addition, \$6,500 was allotted from appropriations for the Interior Department for miscellaneous supplies.

Classification of obligations incurred by the United States Geological Survey during the fiscal year ended June 30, 1936

	Salaries	Topographic surveys	Geologic surveys	Alaskan mineral resources	Gaging streams
Salaries of permanent employees.....	\$127,952.09	\$579,991.87	\$373,205.09	\$40,293.00	\$870,555.08
Wages of temporary employees.....		646,073.25	25,160.00	11,244.20	24,779.82
Supplies and materials.....		14,698.59	4,574.37	1,186.75	30,979.67
Dead storage of passenger-carrying vehicles.....			9.00		34.32
Other storage and pasturage of animals.....		2,228.39	389.63		680.52
Communication service.....		1,551.66	153.91	19.09	4,876.01
Travel expenses.....		131,035.40	25,590.76	11,071.57	74,667.51
Hire, maintenance, repair, and operation of passenger-carrying vehicles.....		2,021.69	2,785.60		26,541.18
Transportation of things.....		3,993.71	1,544.50	4,525.07	8,103.01
Hire, maintenance, repair, and operation of freight-carrying vehicles.....		77,206.41	7,446.63	64.75	29,519.68
Printing and binding.....		98,659.94	7,978.04	511.41	8,551.73
Furnishing of heat, light, power, water, and electricity.....		13.09	17.65		148.74
Rents.....		168.73	67.69	615.99	3,069.04
Repairs and alterations.....		6,704.29	2,470.56	150.74	20,487.62
Special and miscellaneous current expenses.....		44.00	33.56	65.68	61.15
Purchase of passenger-carrying vehicles.....		429.29	1,519.08		11,892.92
Purchase of freight-carrying vehicles.....		4,056.28	3,872.92		13,497.10
Purchase of scientific instruments and parts.....		25,448.55	2,252.08	59.00	43,567.75
Other equipment.....		18,822.88	3,365.54	1,238.40	13,695.54
Structures and parts.....					25,523.19
Miscellaneous refunds, adjustments, and transfers.....	69.96	105,032.69	2,726.51	609.33	120,616.06
Total.....	128,022.05	1,718,180.71	465,163.12	71,654.98	1,331,847.64

	Classification of lands	Printing and binding	Preparation of illustrations	Geologic and topographic maps	Mineral leasing	Total
Salaries of permanent employees.....	\$131,457.23		\$17,397.99	\$229,845.84	\$253,593.59	\$2,624,291.78
Wages of temporary employees.....					46,291.56	753,548.83
Supplies and materials.....	925.59		21.60	54,700.44	1,786.22	108,873.23
Dead storage of passenger-carrying vehicles.....						43.32
Other storage and pasturage of animals.....	4.00				37.72	3,340.26
Communication service.....	211.81			6.38	2,341.62	9,160.48
Travel expenses.....	10,250.72		3.00	364.57	16,382.71	269,366.24
Hire, maintenance, repair, and operation of passenger-carrying vehicles.....	2,875.87				11,402.16	45,626.50
Transportation of things.....	711.45			520.65	1,678.77	21,077.16
Hire, maintenance, repair, and operation of freight-carrying vehicles.....	52.40				675.48	114,965.35
Printing and binding.....	502.16	\$110,000	155.97	137.50	2,208.34	228,705.09
Furnishing of heat, light, power, water, and electricity.....					4,135.32	4,314.80
Rents.....	6.00				643.05	4,570.50
Repairs and alterations.....	79.95			9,438.37	1,305.20	40,636.73
Special and miscellaneous current expenses.....					103.63	308.02
Purchase of passenger-carrying vehicles.....	750.91				5,121.69	19,713.89
Purchase of freight-carrying vehicles.....	834.00					22,260.30
Purchase of scientific instruments and parts.....	74.00			215.28	108.83	71,725.49
Other equipment.....	946.92			22,436.00	5,344.16	65,849.44
Structures and parts.....					4,546.92	30,070.11
Miscellaneous refunds, adjustments, and transfers.....	290.19		19.34		4,975.43	234,339.51
Total.....	149,973.20	110,000	17,597.90	317,665.03	362,682.40	4,672,787.03

In addition to the amounts indicated above, cooperating agencies expended directly \$39,540.84 for topographic surveys and \$354,655.48 for stream gaging.

Topographic surveys of the United States, July 1, 1935, to June 30, 1936, and total area surveyed in each State

State	Contour interval (feet)	Mapped in fiscal year (square miles). (For engraved publication unless otherwise stated.) On scale of 1 to —					Total area mapped in fiscal year (square miles)			Total area mapped to June 30, 1936 (square miles)	Percent- age of total State mapped to June 30, 1936	Spirit levels (miles)	Transit traverse (miles)	Trian- gulation stations occu- pied			
		12,000	24,000	31,680	48,000	62,500	125,000	Planimetric map- ping 1	Standard mapping with contours								
		Revi- sion 2	Resur- vey 3	New survey 4													
Alabama.....	20		1 6,376	31,680	48,000	62,500	125,000	6,376				149	373	21,983	42.3	77	52
Arizona.....	50			22	133	387				147				60,542	53.1	90	58
Arkansas.....	10, 20			60	228	365				387				23,631	44.3	24	93
California.....	5, 25, 100		228	60		1,195				51	1,044	514		133,561	84.4	471	122
Colorado.....	25, 50	33		28		228				257	4			56,984	54.8	28	7
Connecticut.....	10			59						59				4,965	100.0	17	
Delaware.....	10			28										2,370	100.0	16	14
District of Columbia.....														70	100.0		
Florida.....	10			2		195								6,144	10.5		
Georgia.....	20		1 172	2		102		772	2					225,202	42.5	70	253
Idaho.....	50, 100			94		684								35,061	41.8	48	
Illinois.....	10, 20			1,101		1,013			88	1,013				39,981	70.6	534	10
Indiana.....	10, 20					195								4,287	11.8	32	132
Iowa.....	20													13,710	24.4	54	6
Kansas.....														64,446	78.4	73	187
Kentucky.....	20		1 1,251			288								27,358	67.4		
Louisiana.....	10, 20			15		182								11,330	23.4	17	
Maine.....	10, 20			625		160			15	182				21,876	66.2	31	71
Maryland.....	20			12		139			82	543				12,327	100.0	3	
Massachusetts.....	10			12		109								8,266	100.0	3	
Michigan.....	5, 10			144		14								14,833	25.6	733	982
Minnesota.....	20			112		14								8,890	10.5	4	140
Mississippi.....	20		1 144			441								7,258	15.5	5	214
Missouri.....	10, 20			14		2,335			112	1,188				50,869	73.3		
Montana.....	10, 20			9		200		506						45,137	30.7	159	9
Nebraska.....	25, 50			368		64								27,631	36.0	87	20
Nevada.....	25, 50			70		368								54,724	49.4	178	
New Hampshire.....	10			305		70								8,302	100.0		
New Jersey.....	10			561		35								8,224	100.0		
New Mexico.....	20, 50			377		2,548								44,980	36.7		
New York.....	10, 20			234		234								49,204	100.0		
North Carolina.....	50			234		234								19,040	36.3	221	22
North Dakota.....	10, 20			5		5								14,382	20.3	120	73
Ohio.....	10, 20			5		5								41,040	100.0	85	379
Oklahoma.....	5			234		234								41,927	68.8	44	28

Summary of outstanding mineral withdrawals and classifications, June 30, 1936,
in acres

State	Coal		Oil		Oil shale		Phosphate		Potash
	With- drawn	Classified as coal land	With- drawn	Classi- fied as oil land	With- drawn	Classi- fied as oil- shale land	With- drawn	Classi- fied as phos- phate land	With- drawn
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	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	1,344,473		2,737,274	2,703,755	277,344	2,937	
Washington.....	691,801	141,414							
Wyoming.....	2,143,991	3,684,235	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	9,411,996

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).

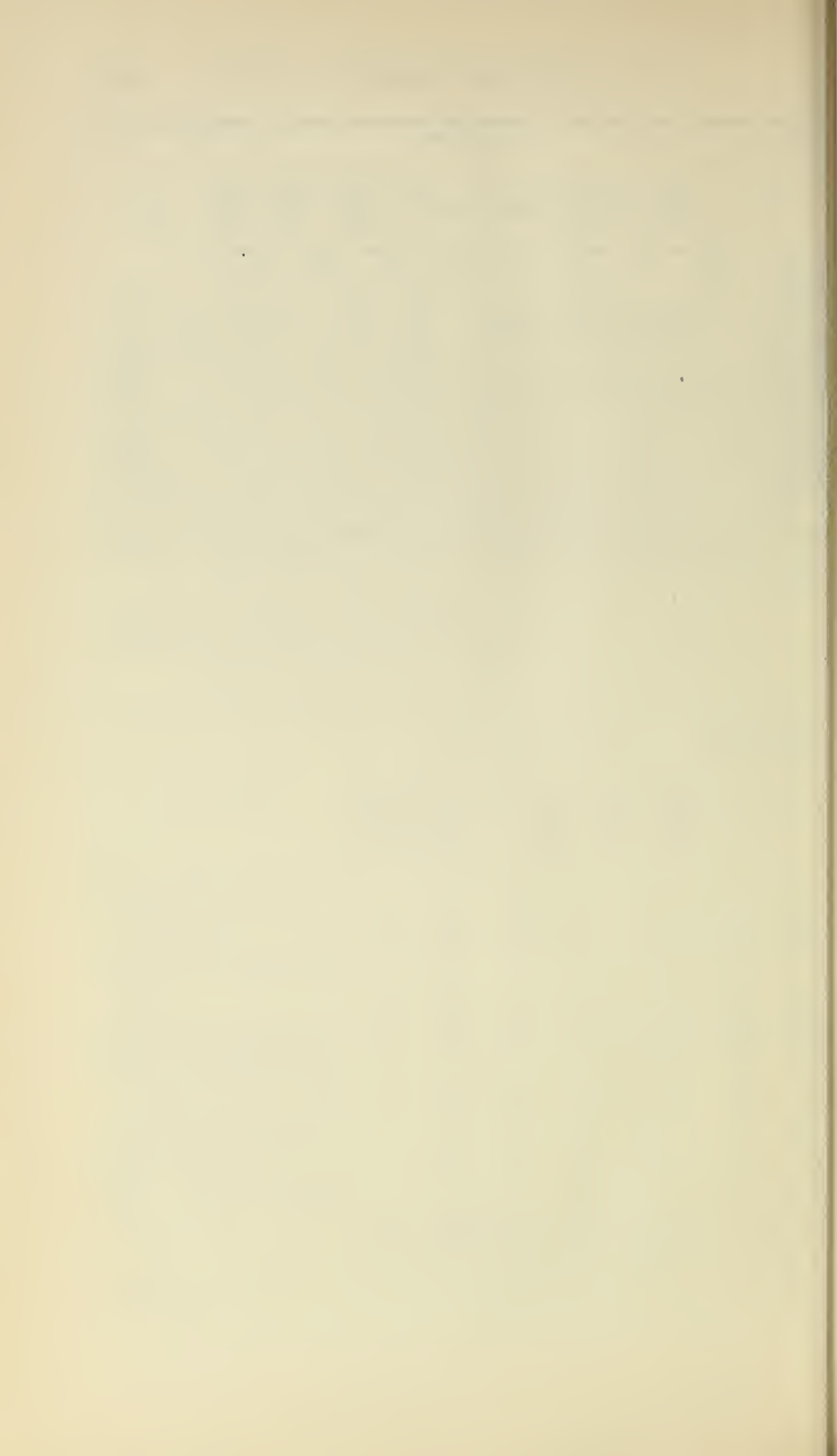
General summary of cases involving land classification

Class of cases	Record for fiscal year 1935-36						Record since receipt of first case	
	Pending July 1, 1935	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1936	Gain or loss during fiscal year	Received	Acted on
General Land Office requests:								
General.....	81	438	519	500	19	+62		
Time extensions.....							2,313	2,313
Oil development.....	14	134	148	143	5	+9	17,523	17,518
Concurrence.....	58	1,139	1,197	1,176	21	+37		
Committee cases—Oil and potash.....	1	117	118	105	13	-12	12,868	12,855
Applications for classification as to mineral:								
Oil.....	176	1,121	1,297	1,167	130	+40	28,541	28,411
Miscellaneous.....	1	2	3	3		+1	935	935
Applications for mineral permits.....	33	724	757	748	9	+24	62,051	62,042
Applications for mineral leases.....	20	336	356	147	209	-189	2,481	2,272
Applications for patent, potassium.....							124	124
Federal Power Commission cases:								
Preliminary permits.....	12	50	62	57	5	+7	398	393
Licenses.....							28	28
Determinations under sec. 24.....	2	54	56	37	19	-17	592	573
Applications for classification as to power resources.....	1	9	10	9	1		551	550
Applications for rights-of-way.....	9	96	105	90	15	-6	7,188	7,173
Irrigation project reports.....	2	3	5	3	2		944	942
Indian Office requests for information.....		1	1				9,549	9,549
Unit or cooperative agreements:								
Cases involved.....	1,454	1,805	1,3,250	731	2,528	-1,074	3,259	731
Total.....	1,864	6,029	7,893	4,917	2,976	-1,112		

¹ 792 units involved.

Mineral production from public lands and revenues accrued therefrom, fiscal year 1936

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.....								
Alabama.....				49,156				\$4,997.92
Arizona.....				2.50				.63
California.....	18,894,251	41,539,464	66,839,619	98		54,215		2,901,746.27
Colorado.....	1,141,737	2,243,987	82,405					
Idaho.....					988.65		50,207	5,016.72
Louisiana.....								
Montana.....	468,305	2,698,750		427,546.81				110,177.06
Nevada.....								160.00
New Mexico.....								
North Dakota.....				453,600.38				27,892.09
Oklahoma.....								
Oregon.....				166				211.00
South Dakota.....				2,028.52				410.81
Utah.....	1,547	27,314	1,442	1,143,939.68				134,144.10
Washington.....				29,472.35				2,947.24
Wyoming.....	8,918,335	15,630,429	27,425,803					
Total.....							50,207	
1935.....	28,269,714	73,033,325	97,864,356	3,434,672.61	334,367	55,307	38,184	4,388,203.93



BUREAU OF MINES

(JOHN W. FINCH, *Director*)

The work of the Bureau of Mines is administered from offices in Washington, but its activities are conducted in mining districts throughout the entire country. Thirteen experiment stations (at Pittsburgh, Pa.; Bartlesville, Okla.; Tuscaloosa, Ala.; New Brunswick, N. J.; Minneapolis, Minn.; Rolla, Mo.; Salt Lake City, Utah; Reno, Nev.; Tucson, Ariz.; Berkeley, Calif.; Seattle, Wash.; Laramie, Wyo.; and Boulder City, Nev.) are equipped to study problems connected with mining, utilization, and conservation of the Nation's mineral resources in their localities, a number of field offices are assigned specialized duties, and the safety instructors move on a flexible schedule, visiting mining establishments on request.

During the fiscal year 1936 the Bureau consisted of the Technologic, Economics and Statistics, Health and Safety, and Administrative Branches.

The Technologic Branch, which conducts research covering all phases of the mining industry at the various field stations, comprised the Mechanical, Mining, Metallurgical, Petroleum and Natural Gas, Experiment Stations, and Explosives Divisions, but on July 1, 1936, was reorganized to include the Coal, Mining, Metallurgical, Petroleum and Natural Gas, Explosives, and Nonmetals Divisions.

The Economics and Statistics Branch prepares special reports on mineral economics and assembles data on the production and consumption of mineral commodities; it is also responsible for the annual publication entitled "Minerals Yearbook." In 1936 it consisted of the Coal Economics, Petroleum Economics, Metals and Nonmetals, Foreign Mineral Service, and Mineral Resources and Economics Divisions. In accordance with reorganization effective July 1, 1936, the Branch in 1937 will comprise the Coal Economics, Petroleum Economics, Mineral Production and Economics, Metal Economics, Nonmetal Economics, and Foreign Minerals Divisions.

With reconstitution of the Health Division, recessed in 1933, the Health and Safety Branch again functioned in two divisions—Health and Safety. This Branch is responsible for safety training, answers emergency calls for aid after disasters at mines or mineral plants, and surveys conditions that may affect the health of workers.

The Office Administration and Information Divisions are the two service groups comprising the Administrative Branch. The first

handles personnel, property records, accounts, and multigraphing, and the second is responsible for the editing and distribution of the Bureau's publications and motion-picture films. The Assistant to the Director of the Bureau acts as chief of the Branch.

SUMMARY

Finances.—The total funds available to the Bureau of Mines for the fiscal year ended June 30, 1936, including direct appropriations, departmental allotments, reappropriated balances, and sums transferred from other departments for service work, were \$2,116,101.51. Of this amount, \$2,097,031.84 was spent, leaving an unexpended balance of \$19,069.67.

On the regular work of the Bureau \$2,039,901.32 was expended. This figure is subject to slight corrections due to unpaid obligations.

In addition, for the helium program, which is purely service work for the Army and Navy and has no part in the regular program of the Bureau, \$18,000 was appropriated directly to the Bureau, and \$20,000 was transferred from the Army and Navy for the purchase at cost of helium produced by the Bureau for the national defense establishment.

Technologic branch.—Eighteen devices for use in mines were approved, and 60 lamps containing a simplified methane indicator developed by the Mechanical Division were used in a number of mines. About 8,000 additional samples of coal and coke were analyzed, and petrographic, carbonization, hydrogenation, and coking tests conducted on special types of coal.

The new metal-mining research section of the Mining Division studied detachable rock-drill bits and drill-steel shop practices. The division also investigated four mine-ventilation problems at the request of mine operators. A survey of the status of mining districts in the Western States was begun and field work was conducted in Arizona, California, and Nevada. Geophysical prospecting to locate underground water supplies was carried on in Nevada.

The Metallurgical Division developed a new method for extracting manganese electrolytically that may make exploitation of this country's low-grade deposits feasible. The division also demonstrated several methods of treating domestic chromite ores and made scientific contributions to the theory of metallic crystals.

During the year the Petroleum and Natural Gas Division was enabled to resume the semiannual surveys of gasoline sold in representative cities, recessed since 1931. A petroleum experiment station was opened at Laramie to replace the field office closed in 1933. A study of back-pressure data on natural-gas wells resulted in the development of a method for gaging delivery capacity that minimizes

waste of gas. Helium supplied by the Amarillo (Tex.) station was used in the National Geographic Society-Army Air Corps stratosphere flight.

Among outstanding accomplishments of the Experiment Stations Division in 1936 were improvements in methods of purifying clay, feldspar, and other low-grade nonmetallics by froth flotation, development of a method for determining minute quantities of benzol in blood and urine, and discovery that silica is an important factor in the caustic embrittlement of steam boilers. The new Tuscaloosa (Ala.) station has put up-to-date testing facilities at the disposal of the South.

The Explosives Division added 25 explosives and 3 new models of a blasting device to the active permissible list, gave advice to a number of Government organizations regarding the use of explosives, and initiated an investigation of the causes and control of mine fires.

Office of Chief Mining Engineer.—This Office has been conducting tests in the experimental mine, Bruceton, Pa., on the bearing strength and plasticity of potash salt from a mine on the Government lease near Carlsbad, N. Mex. In addition, various substances proposed for use in rock-dusting were tested. A study of Diesel locomotives was concluded.

Economics and Statistics Branch.—The Coal Economics Division continued to supply promptly information on anthracite, bituminous coal, coke, fuel briquets, and peat to producers and consumers of these commodities. A special investigation of the packaged-fuel industry was an interesting feature of the year's work. Cooperation with trade organizations promoted economical publication of the Division's reports. Special material was prepared for a number of the emergency administrations.

The Metals and Nonmetals Division inaugurated publication of Mineral Trade Notes, a monthly periodical presenting timely reports on the status of industrial minerals in all countries, many of these being supplied by American consular offices. Flow sheets of world trade in 50 commodities were completed. A study of scrap metals has been made in the light of the effect of the re-use of metals on metal-mine production.

From September on through the balance of the fiscal year, forecast reports of the probable demand for petroleum prepared by the Petroleum Economics Division were established on a monthly basis. A special study of petroleum asphalt was made in cooperation with the Bureau of the Census.

Throughout the year the Foreign Mineral Service Division cooperated with the Metals and Nonmetals Division in making contacts with foreign offices of the Department of State looking toward

establishment of a regular reporting service that would keep the Bureau informed regarding the status of the mineral industry in other countries. In addition, an economic study of the international flow of mineral raw materials was virtually completed.

The Mineral Resources and Economics Division issued prior to June 30, 1936, a series of approximately 50 preliminary reports containing statistical and economic information on virtually all of the important commercial minerals. Special efforts were made to complete the Minerals Yearbook, 1936, at an early date; it was sent to the Government Printing Office on June 17 and issued on August 14, nearly 4 months earlier than the corresponding volume for 1935.

Health and Safety Branch.—The most important work of the reconstituted Health Division was an investigation of dust disease. This included field examination of health conditions at mines in several States and laboratory determinations of particle-size distribution and number concentration of dust.

The Safety Division trained 72,038 members of the mining industry, so that about 963,000 in all have been trained since the Bureau's inception. Moreover, during the year 838 persons earned provisional first-aid instructors' certificates, 188 mineral plants were awarded 100 percent first-aid certificates, 113 men took the advanced rescue course, and 849 officials took the accident-prevention course in bituminous-coal mining. Partly as a result of this work, United States mines have had the lowest accident rates in their history for the past 5 years.

Administrative branch.—The Office Administration Division continued to handle matters of administrative routine. The Bureau personnel comprised 664 permanent and 186 part-time employees. The property of the Bureau, including that at all its field offices, was valued at slightly under \$4,000,000.

The Information Division distributed over 476,000 free copies of Bureau of Mines publications during the year, answered 6,350 letters of inquiry on mineral subjects, edited 450 publications, and prepared several hundred illustrations for reports by the Bureau personnel. Motion-picture films prepared and distributed under the supervision of the Division were shown to a total audience of nearly 6,500,000 persons.

Bureau of Mines Advisory Board.—The annual meeting of the Advisory Board to the Bureau of Mines was held on February 6, 1936. Sixteen of the thirty members, appointed by the Secretary of the Interior and representing management and labor in the principal mineral industries, were present. Approval of accomplishments of the Bureau was generally expressed, with special emphasis on the work in safety and prevention of accidents. The Board also

advocated extension of the study of silicosis and of fundamental research in metallurgy and recommended a survey of coal distribution and of crude oil in storage.

FUTURE NEEDS

The increased appropriations available in 1936, as well as the additional facilities afforded by the opening of several new experiment stations, permitted the resumption of many important Bureau of Mines projects recessed due to lack of funds and the initiation of other studies long planned but hitherto impracticable. As the mining industry recovers from the depression, however, the Bureau feels that it can render worth-while service if funds are provided for conducting the work outlined in the following brief review of principal needs.

In the Technologic Branch the Coal Division, which takes over some of the functions of the former Mechanical Division, should have additional funds for research to develop new uses for coal. Of great advantage in this work would be a laboratory, where tests may be made of the suitability of oil from coal as automotive fuel.

The extensive series of mining and milling papers prepared by the Mining Division, covering several hundred metal and nonmetal mines, mills, and quarries in the United States, Mexico, and Canada, should be kept up to date by resurveys and issuance of supplements to the original reports. Other mineral establishments with efficient practice or with unique problems to solve should also be described in additional circulars. An experimental rock tunnel where mine equipment can be tested under duplicate mine conditions is an outstanding need.

An experiment station large enough to carry tests in nonferrous metallurgy beyond the laboratory stage is urgently needed by the Metallurgical Division. The facilities at Boulder City, Nev., should be increased to permit simultaneous pilot-plant-scale tests of various electrometallurgical processes being developed in the laboratory.

Although adequate chemical laboratories and office space will be afforded by the new building at Bartlesville, Okla., quarters adequate for engineering investigations of the Petroleum and Natural Gas Division are still lacking. The possibility that dirigibles may again be part of the national defense calls attention to the necessity of drilling several additional wells on the helium-bearing gas structure of Texas to assure a supply that will fill the anticipated demand.

The research of the Explosives Division has been largely limited to the field of coal mining in the past. Additional funds should be provided to extend the work to other mineral industries.

The new Nonmetals Division should be enabled to continue its studies on the froth flotation of clays (looking toward the use of domestic materials in ceramics), on the separation of quartz from feldspar, and on the removal of iron from nonmetallic minerals.

In the Office of the Chief Mining Engineer much international scientific good will would be fostered if the exchange of a research fellow with the Safety in Mines Board of Great Britain were resumed; extension of this exchange research system to other foreign countries would help this country to keep abreast of modern mining methods abroad.

The Coal Economics Division of the Economics and Statistics Branch should have funds to conduct annual surveys of the distribution of coal, supply current information on changes in production capacity, study the economics of byproduct recovery, and make statistical analyses of the competitive relations between sources of power.

The industry is asking the Bureau to extend the study of the market demand for petroleum already being conducted by the Petroleum Economics Division to cover gas and fuel oils. It is also asking the Bureau to assemble more detailed information on lubricants. Neither of these requests can be filled unless the personnel of the division is increased by workers capable of assembling and analyzing statistics and gaging market trends.

Both the Metal Economics and Nonmetal Economics Divisions find that the entire time of their personnel is taken up by such routine matters as the preparation of chapters for the Minerals Yearbook and the handling of correspondence. Technical men familiar by field experience with economic problems of the mining industry should be added to both these divisions so that original contributions on subjects of current interest may be part of the annual output of the Branch.

The usefulness of the Foreign Minerals Division depends largely on prompt transmittal of the material it obtains from foreign offices to the American public in such publications as the Minerals Yearbook and Mineral Trade Notes. With this in mind, it becomes obvious that the division staff should be enlarged to the point where it can maintain an even flow of information to the receiving agencies.

In producing useful information on mining under an adequate research program, the overwhelming need of the Mineral Production and Economics Division is a moderate increase in professional personnel. This personnel should hold the dual viewpoint of mining technology and economics and should represent competent judgment in both fields. The present state of mining in the Southeastern United States, in the Pacific Northwest, and in the area between the

middle tier of Rocky Mountain States and the Pacific coast justifies enlargement of the staffs at the Denver, Salt Lake, San Francisco, and Joplin field offices that serve the growing industry in these regions.

The present interest in occupational diseases, especially those associated with the mining industry, calls attention to the facilities possessed by the Bureau's Health and Safety Branch for studying them. Procedure and apparatus already devised by the Health Division could be utilized with a minimum of delay for the investigation of such a live subject as occurrence of dust disease in the entire mining industry if enabling funds were provided.

The personnel of the Safety Division is inadequate to handle the many calls that come for safety training, for conducting safety meetings, for staging and judging first-aid contests, and for rendering emergency assistance after mine accidents. If funds had been available to increase this group of safety men, the Bureau would have trained its millionth miner in first aid during the past fiscal year. Government appropriations could be devoted to few more constructive programs than promotion of safety among the employees of one of our more hazardous industries.

In the fiscal year 1936 Bureau engineers and scientists wrote over 150 papers, many of them representing the results of original research given for the first time, that were printed in technical journals or presented before scientific societies. This wealth of material should have been published and distributed in the form of Bureau of Mines official reports, but lack of funds prevented. In order to disseminate these data promptly it was necessary to adopt the policy stated above. Additional printing funds would make it possible to present to the public a fairer, more complete picture of Bureau of Mines activities in fulfilling the obligations of its enabling act.

TECHNOLOGIC BRANCH

MECHANICAL DIVISION

Electricity in mines.—The Bureau's methane-indicating device for flame safety lamps has been adopted by two manufacturers, and the lamps have been introduced into a number of mines. To visualize the hazards of gas ignition by electric sparks, galleries in which explosions could be produced at will from such ignitions were constructed and demonstrated to more than 1,200 mining men.

Routine inspection and tests in the electrical laboratories led to formal approval of the following mine equipment: 5 coal-cutting machines, 10 coal-loading and conveying machines, 1 storage-battery gathering locomotive, 1 electric flashlight, and 1 gas detector. In addition to the foregoing, about 35 changes in construction of per-

missible equipment were reviewed and extensions of approval granted covering such changes.

Fuel-economy service.—In addition to aiding Federal agencies to purchase and utilize fuel more efficiently by means of power-plant studies, fuel efficiency tests, and advice on the selection of proper fuels and fuel-burning equipment for specific plants, a boiler feed-water conditioning service has been made available to Federal power plants. A survey of water conditions at all high-pressure boiler plants has been made and assistance on treatment given at about 100 plants.

Fuel inspection and coal analysis.—During the year the total number of analyses of coal and coke made and recorded by the Bureau of Mines and available to other Federal and State agencies as an aid in purchasing fuel to the best advantage has been increased by approximately 8,000.

A second coal-sampling truck was purchased and put in commission during the year. Because of these increased facilities and because of the larger appropriation available, 530 samples were collected at 169 mines, compared with 358 samples collected at 90 mines in the fiscal year 1935.

Use of fuels.—An investigation of the possibilities of beneficiating coal by treating it with chemicals has shown that the effects with most coals are very slight unless comparatively large quantities of chemicals are employed.

Based on past studies of action taking place in fuel beds, a report was issued showing the principles that control the rate of combustion under different conditions.

Constitution of coal.—Eight coals were examined microscopically and petrographically in connection with a survey of American coals. In studying the origin and composition of coals stress was laid on the paleobotany of coal-forming plants and the origin of coals from them. The granular opaque matter, one of the characteristic constituents of splint coals, was found to be derived chiefly, though not exclusively, from the wood of conifers.

Coal carbonization.—Carbonization tests at low, medium, and high temperatures were made on six high-volatile coals and one low-volatile coal. Tests on blends of coals showed that the quality of coke from all high-volatile coals tested was improved considerably by blending with 20 percent of low-volatile coal.

From laboratory studies of the fusion of bituminous coal in the process of coking it appears that the quality of the coke obtained from a coal may be predicted approximately from the degree of plasticity and the range of temperature in which the coal is in a plastic or fused condition.

Physical chemistry section.—Equipment for the continuous hydrogenation of coal at the rate of 6 pounds per hour and for the manufacture of the necessary hydrogen was designed and erected in a special building. Methods of analysis of the oils obtained from the hydrogenation of coal for phenols, amines, olefines, aromatics, and other products, were critically reviewed and tested. The limits of error involved were determined, and some improvements were made.

A quantitative critical study of the rate of thermal decomposition of ethane has shown that this is a single monomolecular reaction. This study should form the foundation of a correct theory of the mechanism of the thermal decomposition of hydrocarbons and permit further conversion into valuable motor fuels of refinery gases now wasted.

The calibration laboratory, which calibrates and sometimes repairs instruments used in physical and chemical testing, has been completely renovated and rebuilt.

Miscellaneous analyses.—Small-scale laboratory assay tests to determine the coking qualities of coal and the probable yield of gas, coke, and byproducts were applied to 14 typical coking coals and to different layers of 6 coal beds. A study was made of the agglutinating properties of certain low-volatile coals and low-rank bituminous coals to determine how this property might best be utilized in classifying these coals according to rank.

An investigation of inert materials to be added to coal in determining agglutinating values showed that the tests are so sensitive to slight differences in separate lots of the same material as to require preparation of a standard sample, preferably sand, for distribution to laboratories making this test.

Conclusions.—The increasing encroachment of competing fuels upon coal makes imperative an increased program of research to develop new uses for it and to improve present methods of utilization to overcome the advantages of other fuels. By providing additional funds urgently needed for continuous operation of the new coal-hydrogenation laboratory the Bureau of Mines can make more rapid progress in the study of the extent to which American coals respond to this treatment and obtain data that, as the production of petroleum declines, may form the basis of a new industry utilizing considerable quantities of coal. Sufficient funds should be made available to permit these studies to be made on an adequate scale.

Federal boiler plants may be considered proving grounds where schemes of boiler-water treatment evolved in the laboratory are applied to actual practice and the results under widely varying conditions noted. In addition, direct savings are made possible in the

operation and maintenance of such plants. An increased appropriation to enable this service to be extended to cover all Federal boiler plants should show excellent dividends in reduced operating costs.

MINING DIVISION

Due to increased appropriations for the fiscal year 1936, the Mining Division was able to resume most of its former activities and to revise others to make them more effective. However, because of the difficulty of obtaining personnel of the proper training and experience, the Division was not completely staffed until near the end of the year.

Metal-mining methods.—Two bulletins were published, Concentration of Copper Ores in North America and Stopping Methods and Costs. Each summarized, analyzed, and interpreted data accumulated during the preceding 7 years and made available to the mining industry a concise record of the latest improved practices in the phases of mining covered. Placer Mining in Nevada, a bulletin written by a member of the Mining Division staff, was published by the University of Nevada and the Nevada State Bureau of Mines.

Metal-mining research.—A metal-mining research section was organized, and a comprehensive field survey was made of the use of detachable rock-drill bits in all the important mining centers of the United States; a first progress report was published as an information circular early in 1936 and a second progress report completed in manuscript form. Coordinated with this survey was a study of drill-steel shop practices. When the results of these investigations are finally assembled they will furnish the mining industry with a comprehensive analysis of the data on these subjects that should lead to decided improvements and economies in rock-drilling practice.

In cooperation with the Missouri School of Mines a survey of the use of underground loading with shovel-type mechanical loaders was completed, and manuscript was prepared in part for a bulletin on this subject.

Rock-drilling and steel-shop practice was studied at an Alabama gold mine where the cost of drill steel and sharpening was excessive. As a result of this study the Bureau was able to make recommendations to the operating company that should lower drilling costs appreciably and increase efficiency.

Coal mining.—The coal-mining section, discontinued in 1933 for lack of funds, was reorganized and field work resumed in December 1935. One information circular, Methods of Development and Pillar Extraction in Mining the Pittsburgh Coal Bed in Pennsylvania, West Virginia, and Ohio, was published. Manuscript for a circular on Longwall Mining Methods in Some Mines of the Middle Western States was completed and is ready for publication.

Nonmetal mining.—Parts IV, V, and VI of a treatise on Sand and Gravel Excavation were issued as separate information circulars, and one circular on a clay mine was completed. Six other circulars were written, and several others are nearly ready for publication.

The field staff was reorganized and equipment assembled for seismologic observations of earth and air vibrations caused by quarry blasting.

Mine ventilation.—A bulletin, Engineering Factors in the Ventilation of Metal Mines, and an information circular, Charts for Determining the Performance of Centrifugal Fans, were published. Each fills a long-felt need and is of especial value in view of the increased attention being given mine ventilation as workings go deeper.

Four special investigations were undertaken at the request of mine operators: (1) A study of fires in anthracite mines, their causes, and methods of prevention; (2) ventilation and air-conditioning survey of the Morning mine, Idaho; (3) ventilation requirements for a proposed 6,561-foot vehicular tunnel to divert road traffic around the open pit of the Utah Copper Co. mine at Bingham, Utah; (4) air-conditioning and ventilation of the Magma Copper Co. mine at Superior, Ariz., where rock temperatures of nearly 140° are found in the lowest workings.

Mineral-industry survey.—A mineral-industry survey was begun in response to a widespread demand that the Government undertake a reconnaissance of the status of the various mining districts in the Western States, including their activities, production, and outlook for the future. Field investigations were conducted in the Mojave district of California, one district in Nevada, and two in Arizona.

Geophysical prospecting.—Twelve monthly issues of Geophysical Abstracts were published. Two information circulars were issued—Induction Prospecting for Shallow Ore Deposits and Small Metallic Objects, and Patents on Geophysical Prospecting Issued in the United States, England, Canada, Germany, France, and Russia. Manuscript was completed for a circular, Prospecting for Water in Arid Regions of the Western States.

Resistivity surveys were made on gas and oil geological structures in Ohio, and considerable work was done in locating subterranean water resources in desert regions of Nevada. A number of mineral areas in Nevada were tested by geophysical methods, and a laboratory was established in Reno for the manufacture and repair of needed instruments.

Conclusions.—The study of mining and milling methods and costs in both metal and nonmetal mining should be continued, with special emphasis on resurveying mines and mills covered by earlier circulars. The results of the resurveys should be published as supplements to

the original papers for the purpose of keeping abreast of advances in mining and milling technique. The demand for publications of this type continues unabated.

Research in mining should be undertaken on a larger scale along lines started in the last year, and funds should be provided for an experimental rock tunnel in which fundamental research can be conducted under controlled but accurately simulated mining conditions on such subjects as drill steel, detachable drill bits, and drill rounds, dust prevention by use of various types of apparatus, and wetting agents, noxious gases produced in blasting, ground support, and timber preservation in mine atmospheres.

METALLURGICAL DIVISION

The past year's work of the Metallurgical Division and the results published will be found of scientific and practical value to the Government, industry, and the public. The division's scope has been expanded by addition of the new ore-testing and electrometallurgical sections.

Electrometallurgical section.—A new method for the electrolytic extraction of manganese from its ores has been developed on a laboratory scale. The manganese metal obtained is of 99.85 percent purity.

Studies indicated that ordinary ferrochromium can be made from some of the low-grade ores of this country, and that there is a possibility of producing a higher-grade alloy by means of the electric smelting of chromite in the presence of sulphides of iron and copper.

One development that shows promise for the treatment of alunite is the volatilization of silica in an electric furnace, leaving a high-alumina residue that will be amenable to ordinary aluminum processes. The potash escapes with the silica fume and can be leached therefrom. The preliminary results of these investigations are in the course of publication as a Government report.

Iron and steel section.—The relative desulphurizing power of all blast-furnace slags likely to occur at 1,500° C. has been determined. This information has been published and removes much of the confusion as to the effect of various changes in slag composition.

A definite relation has been found between the porosity and reducibility of iron ores. This permits proper crushing and will result in improved blast-furnace operation and fuel economies.

A comprehensive bulletin on the production of sponge iron by natural gas was completed and forwarded to the printer.

Metallurgical fundamentals section.—The section completed bulletins giving an authoritative digest and thermodynamic correlation of (1) specific heats at low temperatures, including entropy calculations

for 400 metallurgically important materials; and (2) heats of fusion of 280 materials important in smelting. A similar study of the sulphur, sulphurous gases, metallic sulphides, and sulphates so important to nonferrous base-metal metallurgy was virtually completed.

The first technically feasible method for continuous chlorination of chromite ores was also developed.

The results of low-temperature specific-heat investigations of vanadium and its oxides, lead sulphate, and the crystalline modification of silica supplied fundamental contributions to metallurgy and to the use of silica as a metallurgical refractory.

Metallurgy of copper section.—Recovery of sulphur from smelter smoke by direct precipitation of the sulphur dioxide as a dense salt of ammonium derivatives has been shown to be technically feasible.

The use of aqueous solutions of diethylene triamine for absorbing sulphur dioxide from metallurgical waste has been investigated rather intensively on a small scale. The results indicate a metallurgical importance for this method that justifies large-scale tests.

A considerable amount of study has shown the possibility that an organic compound may be developed to overcome the oxidation of certain solutions used for absorbing sulphur dioxide from waste gases.

All phases of this year's work have been described in a progress report to be published as a report of investigations.

Metallurgy of lead and zinc sections.—It has been shown that lead may be metallized from galena directly by blowing air into a fused bath, but the practical application of this reaction will depend upon the development of refractories to withstand the fluxing action of lead compounds, also upon the control of volatilization of lead.

Metallurgy of precious metals section.—Examination of tailings from my plants shows that much gold is lost because it is included in the gangue as small, metallic grains coated with impurities. These impurities, which have been classified, govern the processes best suited to extraction of the gold. Experiments show that surface alterations due to grinding prevent the flotation of minerals.

Other metallurgical problems investigated during the past year are loss of gold in dredging gravel; roasting a manganese-silver ore with salt to render the silver soluble in cyanide; development of emulsions to float refractory oxidized-lead minerals in lead-silver ores when synthetic mixtures are used; and flotation of waste slime carrying scheelite. Two Bureau papers and one journal article on the work of the section were issued.

Ore-dressing section.—The crushing and grinding of ores constituted a major study. A manuscript on ball-mill grinding has been completed and submitted for approval for publication.

The functions and classification of the newly developed wetting or detergent agents as highly selective collectors, frothers, and emulsifiers have been investigated in both sulphide and nonsulphide flotation. A report giving the results of flotation of the potash mineral langbeinite has been prepared as a Bureau publication.

Tests of the flotation of Vermont talc ores were completed; the results obtained await publication.

A 121-page bulletin, *Microscopic Structure and Concentratibility of Iron Ores of the United States*, and a report of investigations, *A Study of the Occurrence and Amenability to Leaching of the Phosphorus Compounds in Some Red Iron Ores of Alabama*, were published during the year.

Ore-testing section.—A rationalized scheme has been set up which has proved to be effective for assisting in the determination of preferred ore-treatment methods for a wide variety of metallic and nonmetallic ores. Thirty types of ore have been investigated in the course of the survey, which is being made to establish the amenability to standard-treatment methods of ores from various districts throughout the United States.

A study of the limitations of the usual analytical methods that have been found unsatisfactory for certain metallurgical products has been followed by an investigation that showed the value of such innovations as spectrographic methods and the use of adsorption indicators. The first annual report covering the work of this section has been prepared for publication.

Special-studies section.—In connection with the new fundamental investigations of the processes of steel making, a preliminary study of the magnetic properties of basic open-hearth furnace slags was made. A report on this work will be published.

The system $\text{SO}_2\text{NH}_4\text{OH}\cdot\text{H}_2\text{O}$ has been studied, and the conditions necessary for dust to settle from a smelter fume have been determined. A paper on this system has been submitted for publication.

The explosive-crushing machine for ores has been developed further, and explosions at steam pressures up to 3,000 pounds per square inch demonstrate that maximum efficiency results from a pressure of about 1,500 pounds.

A paper on nozzle crushing was presented at a technical meeting.

A bulletin on crushing and grinding has been submitted for Bureau publication. It covers the results of many years of research and includes data on milling, steam shattering, and nozzle crushing.

In connection with the study of mineral physics, the coercimeter was developed and is being applied successfully in determining the efficiency of grinding machinery.

Conclusions.—The outstanding accomplishments of the Metallurgical Division during the year were:

(1) The development of a new method for electrolytic extraction of manganese from its ores that promises to make many low-grade domestic deposits economically exploitable.

(2) Demonstration that several methods for treating domestic chromite ores are technically feasible. A chlorination method was developed; pyrometallurgical methods offer other solutions of the problem.

(3) Scientific contributions to the theory of metallic crystals that include evidence of electrical dipoles at metallic surfaces and interfaces.

The new experiment station at Boulder City, Nev., will be barely adequate for pilot-scale testing of electrometallurgical projects contemplated a year ago. The insistent public demand that other problems of this type be investigated requires additional funds for the facilities needed if these requests are to be met.

The lack of a metallurgical experiment station large enough to permit large-scale tests has been deplored for some time. Funds for building, equipping, and maintaining such a station should be provided. A logical location for such a station is Salt Lake City, the center of the nonferrous-metallurgy industry.

PETROLEUM AND NATURAL-GAS DIVISION

Increased facilities for research on petroleum and natural-gas problems pertaining to conservation of these resources have been assured by allotment of Public Works Administration funds, and construction of the long-requested and greatly needed office-laboratory building at the Petroleum Experiment Station, Bartlesville, Okla., is under way. Increased Federal appropriations made possible the opening on July 1, 1936, of a petroleum experiment station on the campus of the University of Wyoming at Laramie to replace the petroleum field office closed in 1933 due to lack of funds. The university erected a building for the use of the Bureau in studying problems relating to petroleum and natural gas.

Production of petroleum and natural gas.—All production-engineering problems within the division have been correlated closely with the intention of presenting a clearer concept of the fluid-energy relations in natural-petroleum reservoirs. To this end, a monograph was published with the assistance of the Natural Gas Department, American Gas Association, giving complete details of a cooperative study of back-pressure data on natural-gas wells. A method for

gaging delivery capacities of gas wells that minimizes waste of gas has been developed, and many other practical applications to production technique have been found. Tests on wells in new high-pressure fields in Kansas, Oklahoma, and Louisiana have increased knowledge regarding pressure and temperature conditions in the reservoir and the control and regulation of combination gas and oil wells with high gas-oil ratios. Bottom-hole samples from these and other fields were tested, and a report on the solubility of natural gas in the reservoir oil from the Crescent (Okla.) pool was published.

Field studies were made of commercial methods of increasing oil recovery through application of data relating to permeability, porosity, saturation, and other characteristics of reservoir rocks and of fluids. An investigation of oil-well cores indicates that appreciable quantities of water occur in oil sands in some areas where the wells do not produce water. This condition is important, not only in estimating reserves but also in applying stimulative methods of oil recovery.

Natural-gas transportation.—A monograph resulting from cooperative work with the natural gas department, American Gas Association, reports the results of several years' study of the flow of natural gas through high-pressure transmission lines. A paper on hydrocarbon hydrates and their relation to pipe-line operation has been presented to the industry.

Engineering field studies.—At the request of the State of Michigan, Bureau engineers augmented their earlier study of the extent and availability of natural-gas reserves of the "stray" sandstone horizon of central Michigan and have completed a report, to be published by the State utilities commission, giving data and estimates as of February 1, 1936.

A report on the performance of wells producing from limestone reservoirs was completed as the result of a detailed study of the Big Spring and other west Texas fields.

Special engineering problems.—The State of Kansas, recognizing that consideration of technical factors giving proper weight to economic and social conditions is the most desirable approach to the problem of disposal of oil-field brines, arranged for an investigation in cooperation with the Bureau. Reports dealing with correct methods of plugging wells, return of brines to subsurface formations, and other aspects of the problem have been published. Not only is the industry being benefited but the detrimental effects of brines upon crops and livestock have been decreased, and potable water sources are being protected against contamination.

The Bureau published a report on the reduction of evaporation losses of gasoline in bulk-storage stations. Increased knowledge on

this subject, which the Bureau has studied for more than 15 years, is important in effecting conservation, reducing fire hazards, and preserving the essential characteristics of gasoline.

Resuming its earlier research on oil-field emulsions, the Bureau has found that by relatively simple rearrangements of well equipment and collecting-system facilities the formation of troublesome emulsions can be reduced markedly.

Chemistry and refining of petroleum.—In order to design automobile engines that will take full advantage of the characteristics of gasoline sold to the public throughout the country, automotive engineers must have reliable information as to these characteristics. To supply the needed data, which have been lacking since the Bureau of Mines semiannual gasoline surveys were discontinued in August 1931, the Cooperative Fuel Research Committee and the Bureau of Mines united in making a survey of gasoline sold during the winter of 1935-36. Another survey is under way.

A report describing the Bureau's method of characterizing crude oils with respect to base was published. Two papers dealing with results of the study of methods for determining "molecular" weights of higher-boiling petroleum fractions were presented, and work on the problem is being continued. A bulletin describing the manufacture of paraffin wax from petroleum, issued during the year, has received favorable comment.

Helium section.—The helium production of the Amarillo plant was reduced to 4,663,000 cubic feet because the demand was limited to the requirements of the several nonrigid ships operated by the Army and Navy and the lease of 1,000,000 cubic feet to a commercial operator of nonrigid airships. Helium produced by the Bureau was used for inflating the balloon in which the second National Geographic Society-Army Air Corps stratosphere flight was made. The Bureau supplied about 16,635 cubic feet of helium to the United States Public Health Service, which is cooperating with certain hospitals in the medical use of helium by mixing it with oxygen in the treatment of asthma and other respiratory diseases.

Conclusions.—The handicap of inadequate office space and chemical laboratories under which the division has labored is being removed by the erection of a new building at the petroleum experiment station, Bartlesville, Okla. An engineering building continues to be a facility greatly needed for proper conduct of research and experiments.

In view of the recommendation by the President's Federal Aviation Commission and the group of technical experts known as the Durand Committee that additional rigid airships be constructed and operated, funds should be provided for drilling two new wells and for repairing

existing gas wells to maintain the supply of helium-bearing natural gas. Funds should also be provided for resumption of research on helium.

EXPERIMENT STATIONS DIVISION

Administrative control and coordination of the work of the Bureau's 13 experiment stations were handled by this division. In addition, the Experiment Stations Division supervised the gas and dust laboratory at the Pittsburgh Experiment Station and the Bureau's research on nonmetallic minerals and coal preparation.

Refractory minerals in the Pacific Northwest.—The Northwest Experiment Station at Seattle, Wash., has found that large deposits of olivine on tidewater in Puget Sound, Wash., are suitable, after preparation, for manufacture into a superior type of refractory brick. A series of useful plastic refractories made with soapstone aggregate has also been developed; one of these, containing chrome cement as a bonding material, gave a concrete that had excellent strength at all temperatures to 2,625° F.

Nonmetallic ores of the Southeastern States.—Considerable progress has been made in development of the froth-flotation process for concentrating low-grade nonmetallic ores which cannot be utilized profitably unless more efficient methods are developed for concentrating them.

Kyanite is a mineral that has come into use in recent years for the manufacture of refractories. Most reserves are extremely low grade. Studies under way at the Southern Experiment Station, Tuscaloosa, Ala., indicate that commercial grades of kyanite and barite may be recovered from low-grade ores by froth flotation.

Seasoning of cement.—The Nonmetallic Minerals Experiment Station, New Brunswick, N. J., has investigated further the effects of steam seasoning of cement on retardation of setting. It now seems possible to grind a clinker to finer size than would have been tolerated in former days without making the cement too quick-setting for control, because steam seasoning is far more powerful in control than is the addition of gypsum.

Boiler-water studies.—The outstanding finding of the year is that the so-called "caustic embrittlement" of boiler steel does not take place unless certain amounts of silica are also dissolved in the caustic boiler water. This discovery explains previously puzzling contradictions in the experimental results of different laboratories investigating this subject.

Properties of western coke.—The first authentic information on the physical and chemical properties of coke produced commercially from various western coals resulted from an investigation made at

the Northwest Experiment Station in cooperation with the College of Mines, University of Washington.

Coal-washing methods.—The Northwest and Southern Experiment Stations are continuing the investigation of coal-preparation methods in order to assist the operators with installations and adjustments of coal-washing plants so as to get a maximum of ash reduction with as little loss of coal as possible.

Analysis of mine gases.—In all, 1,010 samples of gases taken in mines and tunnels and in connection with safety investigations were analyzed.

Analysis of gases and vapors.—The microcolorimetric method for the determination of benzene vapor in air, which was recently developed by the gas section, was adapted to the analysis of blood and urine. A new microcolorimetric method was also developed for the determination of toluene in air and in blood and urine. These methods represent a marked improvement in sensitivity, accuracy, and practical application over those previously available.

Dust investigation.—A microprojector arrangement and procedure were developed for determining particle-size distribution and number concentration of dust in the air of mines and tunnels.

The comparative efficiency of the various available procedures and apparatus for determining dust in the air breathed by workmen has been studied to obtain data that will serve as a basis for correlating the results obtained by the various methods now in use.

Surveys of the exposure of miners to dusts were made in several western metal mines. This work is a service to industry in determining existing conditions that affect the health of miners and affords a basis for recommendations for improvement.

Respiratory protection.—Bureau of Mines approval was granted for three hose masks and four mechanical, filter-type, dust respirators. An approval schedule for supplied-air respirators was prepared and a tentative draft submitted to various interested parties for criticism. A final draft is being prepared.

Stream-pollution investigation.—The stream pollution laboratory has continued to act in an advisory capacity to the various States that are sealing abandoned mines to prevent acid mine drainage. The results show conclusively the value of such procedure, which was developed and recommended by the Bureau.

Inflammability of gases and vapors.—Limits of inflammability, ignition temperature, pressure developed, and explosive violence of many combustible air mixtures were determined, as well as the values below which the oxygen must be maintained to prevent explosions of combustible gases and vapors.

Conclusions.—Results accomplished cover a wide field of activity. Coal, potash, cement, and clay industries have been benefited by investigations made during the past year. Among the most important achievements were: (1) Discovery that silica in boiler water is an important factor, heretofore unrecognized, as a cause of “caustic embrittlement” of steam boilers. (2) Development of a sensitive method for detecting small quantities of benzol in blood and urine. (3) Improvement in methods of purifying clay, feldspar, and other low-grade nonmetallic minerals by use of froth flotation.

Completion of the new laboratory building of the Southern Experiment Station at Tuscaloosa, Ala., provides new facilities and working space for research on the further development of the mineral industries of the South.

Additional funds should be provided for expanding the preliminary work conducted during the past year on the purification of clays by froth flotation, so that these domestic sources of raw material for ceramic products may supplant clays now imported. Similar work should be done on separating quartz from feldspar and the removal of iron from nonmetallic minerals.

The modern equipment for coal-washing and ore-dressing research provided at Tuscaloosa should be utilized in promoting greater efficiency and higher recovery of coal and iron ore from southern deposits.

EXPLOSIVES DIVISION

Testing of explosives.—The chief activity of the sections devoted to the physical and chemical testing of explosives and blasting devices continues to be determination of the permissibility of these explosives and devices for use as prescribed by the Bureau in gassy and dusty mines, particularly coal mines. The work is coupled with control over the quality of explosives on the “permissible” list through field sampling and experimental testing. During the fiscal year just ended 25 explosives were placed upon the active list, which now comprises 175 brand names. In addition, three new models of a blasting device that depends upon the shearing of a frangible disk by conversion of liquid carbon dioxide to the gaseous state were approved.

The effectiveness of the testing and control, coupled with the cooperation of the industries and individuals involved, is shown by contrasting the fatality rate of 1.687 per thousand due to explosives and explosions in coal mining in 1907, before explosives testing was begun by the Government, with a rate of 0.176 in 1935, a reduction of almost 90 percent.

Demonstrations of explosives.—Several educational demonstrations designed to illustrate the dangers of black powder and the

advantages of the proper use of permissibles were staged at the request of mine operators.

Cooperation with Government agencies.—Advice and aid were given to and minor investigations on explosives made for the Tennessee Valley Authority, the Patent Office, the Forest Service, the Federal Emergency Administration of Public Works, the Bureau of Navigation and Steamboat Inspection, and the Industrial Accident Commission of the State of California.

Mine fires.—An extended laboratory investigation of the causes, behavior, and control of mine fires, particularly in the anthracite region, was begun, and data on the atmospheres in burning mines were accumulated by field observation and laboratory analysis.

Conclusions.—The Bureau of Mines, through its Explosives Division, is in a position to render invaluable service to the general public in the protection of life and property; it is also ready to be of particular help to persons in mining and related activities. However, its usefulness has been badly hampered by economy measures. Its research work should be aided and increased and its routine services extended to aid all fields of mining, instead of concentrating upon coal. These objectives can be attained with a relatively small increase in the funds now available to the division.

OFFICE OF THE PRINCIPAL MINERALOGIST

Many people write to the Bureau regarding the identification of minerals or ask for information concerning them. During the last fiscal year about a thousand such letters were answered, almost as many specimens were identified, and more than 500 subjects treated. These letters came from every State in the Union (including 99 from New York, 72 from California, and 53 from North Carolina) as well as from a dozen foreign countries.

Field trips were made to obtain information on the beneficiation of spodumene occurring near Kings Mountain, of anthophyllite and dunite in Avery County, and of clay, mica, and feldspar near Spruce Pine, all in North Carolina; of kyanite at Henrys Knob, S. C.; and of feldspar at Piney River, Va. Other field trips were also made to the Black Hills of South Dakota to collect samples and study the possible need of advice from the Bureau as to certain tin, lithium, and feldspar deposits.

Under a cooperative agreement between the Tennessee Valley Authority, the Harris Clay Co., and the Bureau of Mines, a large clay deposit at Gusher Knob, 7 miles north of Spruce Pine, N. C., was tested, and various nonmetallic minerals in Alabama, North Carolina, Tennessee, and Virginia were investigated.

OFFICE OF CHIEF MINING ENGINEER

Preventing bumps in coal mines.—Study of the cause of disastrous bumps in eastern Kentucky and southwestern Virginia coal mines was continued. The mining method proposed by the chief mining engineer to avoid occurrence of bumps was tried successfully in one mine.

Behavior of coal roof in highly mechanized mines.—The convergence of roof and floor in mines when coal has been extracted rapidly by machine has been investigated in cooperation with two bituminous coal companies to determine the best arrangement for drawing pillars and to provide a safety warning by automatic convergence recorders.

Bearing strength and plasticity of potash salt.—To obtain information on the mining method that will permit maximum extraction of the potash deposit in a mine on the Government lease near Carlsbad, N. Mex., the Bureau has been determining the bearing strength and plasticity of potash salt. This cooperative study has included convergence tests both in the potash mine and the Bureau's experimental mine, where specimens of potash salt were gaged as to plasticity and bearing strength as a pillar in a apparatus designed by the chief of the experimental mine section.

Inflammability of dusts.—Ninety-four samples of coal and other dusts of a mineral nature, including dusts from coal mines, vehicular tunnels, factories, and mills were tested for relative inflammability.

Large-scale dust-explosion tests.—Inflammable dust collected in the exhaust ducts of the Holland vehicular tunnel was studied to determine the maximum amount that could be allowed to collect without danger of propagating a dust explosion through the ducts. Tests of gypsum for rock dusting in coal mines indicated that it had no superiority over limestone under certain conditions and slight superiority under others. Investigations of a wetting agent for coal dust indicated that it, individually, caused no reduction in the explosibility of coal dust treated with it. It was demonstrated that the amount of rock dust required to prevent propagation of a coal-dust explosion varied considerably with configuration of the mine passageways.

International cooperation in mine safety research.—This cooperative work, involving the exchange of research information, has continued to be of much value. The chief mining engineer, who is liaison officer, attended the International Conference of Station Representatives at Dortmund, Germany, September 1935.

Study of Diesel mine locomotives.—An intensive study of Diesel locomotives, which are extensively used in European mines, was made by the chief mining engineer, who visited mining operations in sev-

eral European countries securing information on the subject. He also inspected the official testing stations in these countries with a view to determining a schedule of tests for Diesel locomotives to guard against hazards to safety and health under American mine conditions.

Mine Safety Board.—The Bureau of Mines Mine Safety Board made one recommendatory decision during the year, which related to mine-shaft linings. The Board was also called upon to make recommendations on an explosion disaster and certain other matters.

ECONOMICS AND STATISTICS BRANCH

COAL ECONOMICS DIVISION

Service to coal industry.—The division conducts statistical and economic investigations relating to the bituminous-coal, anthracite, coke, peat, and fuel-briquetting industries. This involves issuance of a series of current weekly and monthly reports, available to producers, distributors, and consumers, that follow short-time movements of supply and demand, as well as detailed annual reports that provide a background for the current service and trace underlying changes in the industry.

Special investigations.—Special publications released during the year include studies of the mechanical cleaning of bituminous coal and of the mechanized mining of bituminous coal and anthracite. The division made a special study (which was published by the National Resources Board) of the effects upon operating efficiency of the British experiment in production control in the coal industry.

The packaged-fuel industry was studied in 1935 for the first time, and the results are published in the Fuel Briquets chapter of Minerals Yearbook, 1936.

International trade in fuels.—The monthly report on the international coal trade included special data on fuel and power in the Netherlands, Spain, Belgium, Italy, and France.

Economics in publication.—The collection of statistical reports through trade agencies, inaugurated several years ago to reduce costs, was followed in the fiscal year 1936. The cooperative arrangement with the National Association of Purchasing Agents for collecting current reports on coal stocks and consumption continues to be very satisfactory. Publication costs were cut by combining reports and condensing tables to make more efficient use of available space. Editions were reduced, and national coal-trade organizations assisted by reprinting extra copies.

Conclusions.—Agencies established under the National Industrial Recovery Act taxed the facilities of the division to supply data on the coal and coke industries. In addition to supplying information to

the National Recovery Administration, the division has answered many requests for information from the Reconstruction Finance Corporation, the Public Works Administration, the Resettlement Administration, the Works Progress Administration, the Tennessee Valley Authority, the Federal Housing Administration, the Federal Securities and Exchange Commission, the National Bituminous Coal Commission, the Department of Justice, and the Federal Power Commission. In all such work the division's service is limited to finding and certifying the facts that may be established by the statistical record or derived immediately therefrom.

The efficiency of the service the division can render would be increased if funds were provided for printing reports in detail and publishing additional data on the coal industry. Producers and consumers of coal should be supplied with the following basic information of national scope:

(1) Annual detailed surveys of the distribution of coal from each producing region to each consuming market, urgently needed to show changes under altered conditions in the industry.

(2) Annual statistics of the domestic fuel market, involving the equivalent of 160,000,000 tons of coal, which would help the coal industry to hold its proper share of the market.

(3) Current information on changes in production capacity, which would show the industry the probable effect of such changes on the market and might discourage unnecessary or unwise expansion.

(4) Economics of byproduct recovery; studies of supply and present and potential demand for the byproducts of coal processing.

(5) Statistical analyses of the competitive relations between coal, fuel oil, natural gas, and hydroelectric power.

METALS AND NONMETALS DIVISION

On July 1, 1935, the Rare Metals and Nonmetals and Common Metals Divisions were combined to form the Metals and Nonmetals Division. The saving in administrative expense enabled the new division to undertake several additional major activities and notwithstanding an increase of almost 100 percent in routine service work, to maintain the normal output of new publications.

Mineral Trade Notes.—In cooperation with the Foreign Mineral Service Division, a monthly publication, *Mineral Trade Notes*, was inaugurated; this embodies notes and comments on the various metal and nonmetallic industrial mineral industries and brings to American readers abstracts of American consular reports and additional information that otherwise might not be made available promptly. As much of the material in each issue is reprinted later in other publications throughout the world, this service reaches far beyond

the commercial firms, libraries, teachers, and publishers that comprise an already large mailing list. The Trade Notes are sent free to bona fide readers on special request only, and hundreds of unsolicited letters have commended the service, testifying to the broad scope of its usefulness.

Marketing advice.—The furnishing of marketing advice on rare metals and nonmetals has been progressively improved. During the year, revised lists of buyers of 150 different mineral products were compiled from the returns of a canvass of 1,900 names. Services to consumers of mineral raw materials and to the increased number of Government agencies having dealings with the mineral industries also were expanded.

Strategic minerals.—To show the position of the United States with respect to strategic materials, flow charts depicting world trade in 50 commodities were completed.

Consumption of tin.—Prompted by urgent requests from consumers, the division undertook to account for the consumption of primary and secondary tin by industries. This study, which covers the calendar year 1935, affords the first accurate and complete information as to plant inventories and the flow of tin scrap and drosses.

Reports.—A somewhat larger number of chapters for Minerals Yearbook, 1936, was prepared by commodity specialists of the division. More comprehensive commodity studies were published as information circulars on alum and aluminum sulphate, asbestos, jade, lime, and the rare earths. A horizontal study of consumption trends for the various white pigments was issued as an information circular. Only the shortage of mimeographing funds prevented publication of a manuscript on world movement of chromite. Due chiefly to the lack of adequate printing and duplicating funds, a large number of papers were presented before engineering and trade groups or published outside the Bureau. The usual general reviews on rare metals and nonmetallic industries were prepared for the January issue of Mining and Metallurgy, and a variety of other papers were published by the American Institute of Mining and Metallurgical Engineers. Through this and other channels the building materials section released a series of papers directing attention to the implications of a revival of building construction. The calculated housing shortage affords a cumulative demand for more than \$3,000,000,000 worth of building materials. Losses by fire and obsolescence, growth of population, and general industrial developments were studied carefully, and by using the various barometers of building activity real progress has been made in forecasting the demand for structural materials of mineral origin.

A primary obligation of the division is to disseminate information on mineral raw materials. Largely through extralateral activities of the Bureau of Mines staff, over 40 papers covering economic aspects of rare metals and industrial minerals were prepared by experts in their respective fields and released by the American Institute of Mining and Metallurgical Engineers.

Scrap metals.—Future production from metal mines may be influenced largely by the reuse of metals. Recent studies of the scrap problem have been focused upon the respective effects of new and old scrap and of home and market scrap upon the demand for new metals. The elements of a historical review of the iron and steel scrap situation were assembled, and a paper entitled "The Importance of Secondary Metals", read by a member of the division staff at the Waste Material Dealers' Convention, was reprinted in several trade journals.

Conclusions.—Future accomplishment is predicated to a large extent upon accumulated knowledge. A system that will make automatic the flow of current factual data into the files of the division was greatly improved, and the division's commodity files now constitute a most complete reservoir of accurate information regarding natural resources, technology, trade, and markets.

PETROLEUM ECONOMICS DIVISION

Forecast service.—The most important accomplishment of the Petroleum Economics Division during 1936 was the placing of the forecast reports on an established basis. A report is issued about the fifteenth of the month forecasting the demand for the coming month and including recommendations for changes in stocks of gasoline and crude oil and for the production of required crude by States. This work was undertaken at the request of representatives of the petroleum industry and State regulatory bodies, and serves as an economic guide to prevent waste of resources and to indicate a proper balance between supply and demand. Forecast Reports 1 and 2 were prepared for July and August 1935 but not published. Report 3 for September was published and issues for each succeeding month have followed regularly. Additional appropriations, made available for the next fiscal year, insure continuance and improvement of the forecast service.

Surveys.—Special information relating to the origin and distribution of petroleum asphalt was collected by the Division during the last half of the fiscal year. Under a cooperative arrangement with the Bureau of the Census, the usual petroleum questionnaires were enlarged to include data on expenditures and employment and information on contract drilling.

Routine work.—The Petroleum Economics Division includes an economics section and a statistics section. The former prepares the monthly forecast reports, makes special studies of motor-fuel consumption, conducts a survey of fuel-oil markets, collects information on foreign trade in petroleum products, and prepares annual economic review of the petroleum, natural-gas, natural-gasoline, carbon-black, and asphalt industries for Minerals Yearbook. The statistics section prepares the current monthly and weekly publications dealing with production of crude oil, natural gasoline, refinery products, interstate movements, and stocks.

Conclusions.—The steady expansion in the scope of the Division's work has responded to requests by the industry and various agencies dealing with petroleum problems for more accurate and current information. Such current services are particularly useful with the growth of State conservation and regulatory laws and the formation of the Interstate Oil Compact Commission.

The Division is planning to extend and improve the services relating to market demand. This work includes more detailed studies of motor-fuel consumption and distribution, including interstate movements of refinery and natural gasoline. A survey of crude-oil stocks is being undertaken, in cooperation with the Petroleum and Natural-Gas Division of the Technologic Branch, to determine available gasoline content and the desirable economic levels of both crude-oil and motor-fuel stocks. Continuation and extension of the study of the market demand for gas and fuel oils are desirable, particularly in view of the relation of these products to the competitive fuel situation. At the request of certain members of the petroleum industry, consideration is being given to obtaining more detailed information relating to lubricants.

FOREIGN MINERAL SERVICE DIVISION

Survey of international flow of mineral commodities.—An economic survey of the international flow of mineral raw materials, inaugurated in July 1935, will be ready for publication in September 1936. The detailed statistical tables cover the production of and trade in 34 minerals that represent the most essential mineral raw materials on which industrial progress depends. Data have been tabulated indicating the foreign trade of the 10 principal industrial countries that consume more than 90 percent of the commodities covered by the survey. Descriptive text, summarizing geographic distribution, principal uses, and economic factors that influence production and international trade in the minerals involved, is being prepared. With a library of monthly and annual foreign-trade statistical pub-

lications for about 60 countries available for original research, the Division is now equipped to provide current trade statistics on mineral commodities covering virtually all foreign countries.

Consular reporting service.—As a procurement agency and liaison office between the Bureau of Mines and the Foreign Service of the Department of State, the Division has established a reporting service among American consular offices that forms the basis of one quarterly and three monthly bulletins on international trade in minerals. In July 1935 a specialist on foreign minerals was assigned to serve in an advisory capacity to American consular offices in Europe. During the fiscal year every American consulate in Italy and Germany was visited by this specialist, and systems of reporting have been installed whereby the Bureau now receives at regular intervals trade reports that are promptly published in Mineral Trade Notes and other monthly commodity bulletins.

Conclusions.—To review and prepare for prompt publication the increasing volume of trade information received from abroad and to coordinate properly the Division's activities with the authors responsible for preparing chapters for Minerals Yearbook, the time element is an important factor. To meet schedules established for the delivery by the Division of statistical information required by Bureau specialists, it is essential that the personnel be increased.

MINERAL RESOURCES AND ECONOMICS DIVISION

In order to meet the demand for early release of statistics, the Mineral Resources Division published a series of current reports and mineral market summaries. The first of the preliminary reviews covering metal production in 1935 was released in December, and by the end of January 1936, detailed summaries of metal production were available for all producing areas. The series of reports on metals was supplemented by summaries for other minerals; by June 30, 1936, approximately 50 reports had been released to the public covering the most recent essential statistical and economic information on virtually all important commercial minerals.

Minerals Yearbook.—The Minerals Yearbook, 1935, was issued in December 1935. The volume included 75 mineral commodity chapters and comprised 1,293 pages, including a comprehensive index. The demand for this annual official review of the mining industry has grown rapidly in recent years and the distribution of the 1935 volume amounted to nearly 10,000 copies. From the date of the first volume of this series—the Minerals Yearbook, 1932–33—to the present, advance orders for copies have exhausted every edition of the publication before they could be delivered by the printer.

Realizing that the Minerals Yearbook would be of still greater value to the public by achieving earlier publication, special effort was made to complete the 1936 volume at the earliest possible date. To this end many visits were made to important mining districts in order to enlist the cooperation of mineral producers as well as to obtain accurate pictures of current conditions that could be included in the annual reviews. These efforts were successful and the complete manuscript for the Minerals Yearbook, 1936, was forwarded to the Government Printing Office on June 17.

Joint conduct of the census of mines and quarries.—In order to avoid duplicate statistical inquiries as well as to achieve economy, the canvass of the mining industry for 1935 was conducted on a cooperative basis by the Bureau of Mines and the Bureau of the Census. Acting with the advice of the Central Statistical Board, questionnaires of the Bureau of Mines and the Bureau of the Census were consolidated into a single schedule and the resources of both agencies were concentrated on a single canvass for each branch of the industry. Results of this joint effort were less confusion to mineral producers, larger resources for the collection of really important information, and a lower total expense of conducting the work than would have been necessary had both agencies proceeded independently.

Employment, health, and safety of the mine labor force.—The division continued its regular studies of accident frequency and employment in the mining industry. Reports were completed and submitted for publication covering coal, metal, and nonmetallic mining. Studies of employment based on man-hours of exposure to accidents were conducted in cooperation with other divisions of the Bureau and with other Federal agencies.

Mineral information needs indicated by the National Resources Board.—In a report to the President the National Resources Board indicated the need for more adequate data in certain fields of mining statistics and economics. During the past year the Mineral Resources Division has cooperated with the Central Statistical Board in examining the recommendations of the National Resources Board with a view to outlining a practical research program that would produce the needed information. At the invitation of the Central Statistical Board representatives of industry participated in the study of the problem. The possibilities of a more adequate program for minerals has been actively pressed and reports were completed outlining the principal objectives in a well rounded program of economic and statistical research on the nonferrous metals. Attention will be given later to other branches of mining.

Within the limits of its own resources the division continued to work toward the development of information that would make data

available on minerals in closer accord with that available for agricultural products and manufactures. No large progress can be made in this direction, however, until more adequate financial provision is made for the work.

HEALTH AND SAFETY BRANCH

HEALTH DIVISION

The health work of the Bureau, recessed on July 1, 1933, was reestablished on July 1, 1935, through an appropriation of \$50,000, one-half of the money being allotted to health field work in the Health and Safety Branch and one-half to laboratory investigations in the Technologic Branch. In February 1936 the gas and dust sections of the Technologic Branch were transferred to the Health and Safety Branch and the Health Division was reconstituted. The division has a personnel of 23 and a combined allotment of \$71,829 for the fiscal year 1937.

Dust investigations.—The Congressional appropriation under which health work was resumed was given largely for dust-disease investigations; therefore most of the Health Division program, both in the field and in the laboratory, has been focused upon dust diseases. One engineer spent several months studying health conditions at mines in Ontario and Quebec, as well as in California, Arizona, and other States, and submitted several reports on ventilation, wash houses, dust prevention, sampling, and air analysis.

In the laboratory much investigative work is under way, and considerable progress has been made. A microprojector arrangement and procedure for determining particle-size distribution and number concentration of dust were developed which eliminate much of the eyestrain of former methods and give results with less effort and with a saving of time. Several new types of apparatus and procedures have been designed for the determination of dust, with the object of developing methods that are more suitable than those now available for control of exposure to dust in the mineral industries.

Publications.—Four papers on dust disease or other respiratory affections were published by the Bureau and four others read before technical gatherings. Studies have been made in the design of up-to-date wash and change houses, and the results will be published during the fiscal year 1936-37. The Bureau of Mines First-Aid Manual is being revised, and this very important assignment probably will be completed before July 1, 1937.

Conclusions.—The work of the Health Division, both in the field and in the laboratory, is so much in demand that allotments for it should be doubled; there is at present much hysteria concerning

occupational diseases (especially dust disease) in mining, and the Bureau of Mines is by all odds the best-equipped organization to study this particular problem.

SAFETY DIVISION

During the fiscal year ended June 30, 1936, the Safety Division had on its staff 24 engineers, 25 safety instructors, 15 clerks, and 6 other employees, a total of 70 persons, with an operating budget of \$257,464. Safety Division employees are headquartered at 14 different cities, chiefly mining centers, and with 43 automobiles or automobile trucks and 2 railroad mine-safety cars in operation the work is kept in close contact with the mining industry.

Safety training.—The personnel of the Safety Division gave the Bureau of Mines full course of first aid or mine rescue to 72,038 persons in the mining and allied industries in 489 communities and in 33 States. Since the Bureau was organized in 1910 the full first-aid or mine rescue course has been given to 963,197 persons: In coal mining, 719,153; in metal mining, 101,930; in the petroleum industry, 71,557; at metallurgical plants, 23,645; in nonmetallic mining, 11,479; at cement plants, 10,584; in tunnel work, 4,393; and in miscellaneous mining activities, 20,456. It is now fairly well agreed that as a result of this work 200 or more lives are saved annually.

Approximately 50 persons are engaged in the field work of the Safety Division; they personally impart information on safety assembled by the Bureau to more than 300,000 persons every year. Although only 2 of the 10 all-steel safety cars are in active use, 43 automobiles traveled 562,467 miles in the fiscal year 1936. Besides giving training, members of the division's personnel were thus enabled to be present at 56 first-aid contests in 18 States, to stage 39 exhibits in 11 States, to attend 657 safety meetings in 34 States, and to advance mine safety in various other ways.

Attendance at mine disasters.—During the year 25 mine explosions in 8 States and 23 mine fires in 14 States were investigated, and at 20 of these Bureau personnel aided in rescue or recovery work or both. Fortunately, during the year there were but two major disasters (a major disaster is one in which five or more lives are lost), and in these the loss of life was but 17, a favorable comparison with the average of 17 major disasters and 497 fatalities annually in the 5 years preceding the formation of the Bureau of Mines. Undoubtedly, much of this sharp reduction in disastrous mine fires and explosions is due to the work done by the Bureau, and especially to its advocacy of rock-dusting. It is generally conceded that the latter practice prevents the occurrence of many explosions every year. In addition, 38 miscellaneous mine accidents in 14 States, including

those from roof falls, explosives, and electricity, were investigated and reported.

Safety recommendations.—Safety conditions were studied in 140 mines or plants in 23 States. Constructive criticism of existing conditions and definite recommendations for improvement were made. As a result of the suggestions made by Bureau men during or after these inspections, hundreds of important alterations were made in operating conditions, equipment, methods, and practices, which served to prevent accidents. Many of these changes have been reported by the Bureau's field men and an almost equal number by letters of appreciation from mining executives.

Publications.—Sixty-nine manuscripts were prepared by members of the Safety Division for publication by the Bureau of Mines or by technical journals or in the proceedings of technical and other organizations; 30 such manuscripts were published, 13 are to be published by the Bureau or some outside organization, and 12 speeches, presented before safety bodies, may be published by these groups. The published papers covered a variety of subjects, such as electric cap lamps, first-aid training, metal-mine accidents, coal-mine accidents, electricity, mine gases and their sampling and analysis, cost of accidents, methods of reducing accidents, safety rules for mine workers, explosions of gas or dust in mines, explosions of dust in tipples, safety organization work, dust disease, mine fires, questions for examinations for mine officials, oxygen breathing apparatus, permissible explosives, accident-prevention contests, respiratory protection, safety on man trips, and many other subjects. The demand for some of these reports far exceeded the supply. One of the most worthwhile uses of these publications is to answer the hundreds of letters of inquiry on mine health and safety subjects, not only from members of the mining industry but from others seeking information.

Miscellaneous activities.—Many other achievements in the safety field during the past year can be credited to the Safety Division of the Bureau; 838 persons in 26 States were qualified to teach first-aid training and were given provisional first-aid instructors' certificates, and 736 such certificates were renewed for provisional instructors who qualified by doing the required amount of first-aid training during the year; 188 certificates of 100-percent first-aid training were issued to mines or plants in 25 States, where every person in the organization had taken the Bureau first-aid course; 113 expert mine rescue men took the full Bureau advanced course in mine rescue and recovery operations and received certificates; 848 officials in 5 States took the Bureau's accident-prevention course in bituminous-coal mining for higher officials and students, 409 of these qualifying for certificates by taking the full instruction; 17 new safety clubs (chapters of the

Joseph A. Holmes Safety Association) were organized, raising the total to 450 in 28 States; and numerous special studies were made of such subjects as rock-dusting, ventilation, electricity, haulage, air-conditioning, wetting methods, detecting gages, testing roofs, and reducing dustiness of air.

Conclusions.—The past 5 years have established the lowest accident rates in the history of mining in the United States; undoubtedly some of the credit for this record is due to the safety work of the Bureau of Mines. Notwithstanding the excellent progress made, especially in recent years, mining continues to have the worst accident record of all the major industries of the United States, both in frequency and in severity; on the other hand, hundreds of progressive mines are conducted with relatively few accidents, indicating that with the proper educational work the industry as a whole can be conducted with no more accidents than other major industries. The Bureau of Mines has better facilities than any other agency in the United States to promulgate safety instruction, but its present field force of about 50 engineers and safety teachers is inadequate to carry on a safety campaign among hundreds of thousands of mineral workers. If the force and funds for the work were doubled there is good reason to believe that within the next 5 years accident occurrence in the United States mines would be reduced at least 50 percent from present figures.

ADMINISTRATIVE BRANCH

INFORMATION DIVISION

The Information Division, which is the outlet through which the results of the Bureau's scientific investigations are made available to the mining industry and to the general public, comprises five sections.

Publications.—During the past fiscal year the publications section supervised the distribution of 126,059 copies of the free editions of printed Bureau publications and approximately 350,000 reports of investigations, information circulars, and monographs. 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 effectively acquainted the public with the results of the Bureau's work.

The section handled more than 61,350 letters requesting publications or information regarding the Bureau's activities and general mining subjects.

Editorial.—During the fiscal year 11 bulletins, 8 technical papers, 1 economic paper, 1 handbook, 69 separate chapters comprising Minerals Yearbook, 1936, 15 chapters comprising Minerals Yearbook Statistical Appendix, 1935, and 4 miscellaneous reports were edited and sent to the printer—a total of 107 printed publications. Moreover, during the year 58 chapters from Minerals Yearbook, 1935, were prepared for publication as reprints, and 6 other publications were reprinted. Owing to lack of printing funds, however, only part of the Bureau's output could be printed at Government expense; consequently, 156 papers were submitted for publication in the technical and trade press.

The section also edited 31 reports of investigations and 73 information circulars, papers that supply promptly to the mining industry and general public results of Bureau investigations usually described in detail in later printed reports or that supply salient facts on the mineral industries in concise form suitable for use in reply to queries. In addition, 2 monographs and 17 miscellaneous reports were edited.

Motion-picture production.—As a means of disseminating information regarding 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 supervision of the Information Division through the cooperation of industrial concerns that bear the entire cost of production.

During the year 2 new film subjects were added, 5 were revised, and 1,059 additional reels obtained for circulation. Through a cooperative arrangement between the National Park Service and the Bureau of Mines, the Bureau obtained the assistance of three of the country's large industrial organizations in the sponsorship of films depicting the Yellowstone National Park, Glacier National Park, Shenandoah National Park, and Big Bend (Tex.) National Park projects.

Library.—The year's accessions to the library comprised 3,728 books and pamphlets, 275 periodicals were received currently, and 4,863 books were loaned for use outside the library.

Graphic section.—In addition to drafting and photographic service the graphic section circulates the Bureau's films. This work is centralized at the Pittsburgh Experiment Station, but there are 16 subdistributing centers 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, 1936, the Bureau had 1,777 sets of films, in-

cluding 3,502 reels, aggregating 2,023,000 feet. During the year the films were shown on 76,607 occasions before an estimated audience of 6,489,000. The attendance was 31 percent higher than in the last fiscal year.

OFFICE ADMINISTRATION DIVISION

The Office Administration Division is charged with handling personnel matters, property records, accounting, multigraphing and mimeographing, and general administrative routine.

Personnel.—On June 30, 1936, there were 664 full-time employees on duty in the Bureau, distributed as shown in the following table:

	Classification and number of employees				Total
	Professional	Subprofes- sional ¹	C. A. F.	Custodial ²	
Washington.....	³ 39	3	145	6	193
Pittsburgh.....	⁴ 94	50	52	52	248
Field.....	⁵ 131	28	43	21	223
Total.....	264	81	240	79	664

¹ Includes instrument makers, safety instructors, laboratory aids, assistants, etc.

² Includes laborers, mechanics, messengers, etc.

³ Engineers, 20; chemists, 3; miscellaneous, 16; total, 39.

⁴ Engineers, 41; chemists, 40; miscellaneous, 13; total, 94.

⁵ Engineers, 66; chemists, 32; miscellaneous, 33; total, 131.

NOTE.—Total: Engineers, 127; chemists, 75; miscellaneous, 62; grand total, 264.

In addition to the foregoing full-time employees, the following employees held appointments on a when-actually-employed basis: 59 consultants, 70 excepted, 7 classified, 19 unclassified; and 28 were employed on field agreements. There were also on the roll 3 persons employed under P. W. A. appointments, making a total of 850 employees.

Property.—The property records of the Bureau, as of June 30, 1936, show accounts as follows:

Automobiles and trucks.....	\$88,560.94
Canvas and leather goods.....	3,835.39
Drafting and engineering instruments.....	10,683.56
Electrical equipment.....	61,688.90
Hardware and tools.....	32,833.36
Laboratory apparatus.....	473,654.99
Household equipment.....	18,998.20
Medical equipment.....	8,180.11
Office furniture and equipment.....	295,471.76
Photographic apparatus.....	29,136.61
Machinery and power-plant equipment.....	1,009,454.05
Land, buildings, and improvements.....	1,523,430.92
Rescue cars and specialized apparatus.....	401,988.93
Total.....	3,957,917.72

This property is located in Washington and at the various experiment stations and field offices of the Bureau.

ACCOUNTS

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 1936, by Bureau divisions.

TABLE 1.—*Bureau of Mines appropriations and expenditures, fiscal years ended June 30, 1911-36*

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	-----	721,207.79	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	\$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	1,260,104.82	1,245,891.36
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.....	1,580,900.00	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.....	2,725,118.00	103,000.00	205,500.00	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	3,684,366.38	⁹ 135,714.93	3,548,671.45	2,216,995.72
1931.....	2,745,060.00	120,680.91	166,500.00	3,134,595.10	¹⁰ 195,534.37	2,939,060.73	2,304,121.45
1932.....	2,278,765.00	137,866.43	194,500.00	3,702,712.18	¹¹ 344,689.43	3,358,022.75	2,186,799.92
1933.....	1,860,325.00	75,100.00	184,000.00	2,398,947.38	¹² 458,335.34	1,940,612.04	1,710,949.42
1934.....	1,574,300.00	50,230.00	17,000.00	1,890,171.98	¹³ 408,674.26	1,481,497.72	1,254,846.72
1935.....	1,293,959.07	50,000.00	126,513.10	1,546,989.94	¹⁴ 32,064.57	1,514,925.37	1,349,686.19
1936.....	1,994,011.00	69,500.00	25,005.00	2,116,101.51	¹⁵ 19,069.67	2,097,031.84	2,039,901.32
Total.....	42,414,749.07	1,815,523.35	15,441,025.11	61,405,498.11	5,766,899.08	55,638,599.03	37,941,712.06
1937.....	2,093,200.00	69,000.00	60,000.00	2,224,200.00	-----	-----	2,153,021.00

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 investigators 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 \$214,713.96 unexpended balance reappropriated.

¹² Includes \$184,056.04 unexpended balance reappropriated.

¹³ Includes \$50,000 unexpended balance reappropriated.

¹⁴ Includes \$25,576.23 unexpended balance reappropriated.

¹⁵ Includes \$2,000 unexpended balance reappropriated.

¹⁶ Estimated.

TABLE 2.—Bureau of Mines expenditures, fiscal year 1936

Branch or division	General expenses	Operating cars and stations and investigations of accidents	Testing fuel	Mineral mining	Oil and gas investigations	Expenses, mining experiment stations	Economics of mineral industries
Office of the Director.....	\$10,600					\$529	
Office of Assistant to the Director.....	9,080					234	
Administrative Branch:							
Office Administration Division.....	29,583	\$30,080		\$144			\$8,200
Information Division.....	5,875	10,459	\$11,260	14,759	\$13,919	7,493	7,691
Total.....	35,458	40,539	11,260	14,903	13,919	7,493	15,891
Office of Chief Mining Engineer.....		49,628					
Technologic Branch:							
Experiment Stations Division.....		104,814	81,210	4,613		94,993	
Explosives Division.....		44,425					
Mechanical Division.....		40,938	92,829				
Metallurgical Division.....				130,337		89,832	
Mining Division.....				130,780			
Petroleum and Natural-gas Division.....					221,061		
Principal Mineralogist.....				6,374			1,825
Total.....		190,177	174,039	272,104	221,061	184,825	1,825
Economics Branch:							
Coal Division.....							68,594
Mineral Statistics Division.....		21,435					96,800
Petroleum Economics Division.....					2,440		32,247
Rare Metals and Nonmetals Division.....							48,807
Foreign Minerals Division.....						357	22,024
Total.....		21,435			2,440	357	268,562
Health and Safety Branch:							
Safety Division.....		273,496					
Health Division.....		56,560					
Total.....		330,056					
Total appropriations.....	55,300	632,000	185,400	288,860	237,866	195,450	286,555
Total expenditures.....	55,138	631,835	185,299	287,007	237,420	193,438	286,278
Total balances.....	252	165	101	1,853	446	2,012	277

TABLE 2.—Bureau of Mines expenditures, fiscal year 1936—Continued

Branch or division	Helium production	Care, etc., buildings and grounds, Pittsburgh	Gas production	Printing and binding	Contingent expenses	Special funds	Total
Office of the Director.....							\$11,129
Office of Assistant to the Director.....							9,314
Administrative Branch:							
Office Administration Division.....		\$5,344		\$15,845	\$11,300		95,152
Information Division.....				1,698			78,498
Total.....		5,344		17,543	11,300		173,650
Office of Chief Mining Engineer.....		1,490					51,118
Technologic Branch:							
Experiment Stations Division.....		80,353		2,993			368,976
Explosives Division.....				354			44,779
Mechanical Division.....				2,175			135,942
Metallurgical Division.....				4,256			224,425
Mining Division.....				3,326			134,106
Petroleum and Natural-gas Division.....	\$45,577		\$10,998	1,074			278,710
Principal Mineralogist.....				5			8,204
Total.....	45,577	80,353	10,998	14,183			1,195,142
Economics Branch:							
Coal Division.....				225			68,819
Mineral Statistics Division.....				24,434			142,669
Petroleum Economics Division.....							34,687
Rare Metals and Nonmetals Division.....							48,897
Foreign Minerals Division.....						\$556	22,937
Total.....				24,659		556	318,009
Health and Safety Branch:							
Safety Division.....				8,615			282,111
Health Division.....							56,560
Total.....				8,615			338,671
Total appropriations.....	47,586	87,690	18,000	65,000	11,300	5,005	2,116,102
Total expenditures.....	45,577	87,187	10,998	65,000	11,300	556	2,097,033
Total balances.....	12,009	503	7,002			14,449	19,069

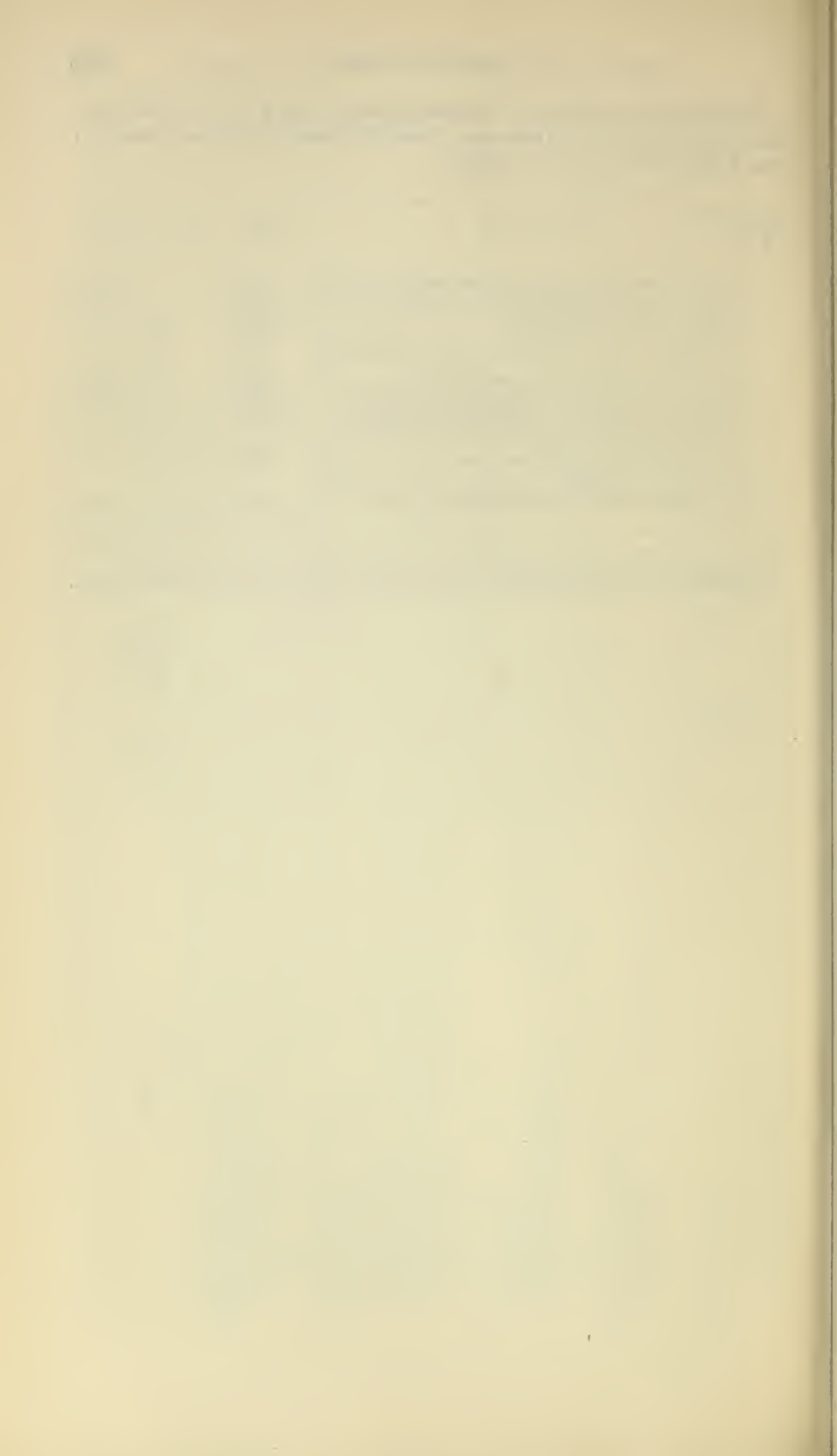
1 Available for expenditure in 1937.

The following table covers expenditures by the Bureau of Mines to June 30, 1936, 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	732.14	199,267.86
9	Locating underground water resources in Nevada.....	4,950	40.59	4,909.41
10	Extension of Petroleum Experiment Station, Bartlesville.....	250,000	7,058.76	242,941.24
11	Fence, electric circuits put underground, roads, etc., at experimental mine, Bruceton.....	43,450	5,088.54	38,361.46
12	Building for mining experiment station, College Park, Md.....	350,000	-----	(¹)
13	5-car garage, Vincennes.....	5,000	-----	(²)
14	Construction of bombproofs, protective partitions, and testing floors, for study of hydrogenation of coal, etc.....	17,000	567.06	16,432.94
	Total.....	1,143,200	13,497.17	774,702.83

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.



ST. ELIZABETHS HOSPITAL

(WILLIAM A. WHITE, M. D., *Superintendent*)

MOVEMENT OF POPULATION

On June 30, 1936, 5,390 patients remained in the hospital as compared with 5,315 on June 30, 1935, an increase of 75.

The total number of patients under treatment during the year was 6,240 as compared with 6,015 for the preceding year, an increase of 225.

The total number of admissions during the year was 925 as compared with 824 the preceding year, an increase of 101.

The total number of discharges for the year was 552 as compared with 396 for the preceding year, an increase of 156.

The total number of deaths for the year was 298 as compared with 304 for the preceding year, a decrease of 6.

The total number of discharges and deaths combined was 850, compared with 700 for the preceding year, an increase of 150, or more than 20 percent.

There were 69 burials in the hospital cemetery as compared with 64 the preceding year, an increase of 5. With the cooperation of the War Department the bodies of 27 service men honorably discharged were buried in the Arlington National Cemetery. The other 202 bodies were buried by private undertakers in cemeteries in Washington and elsewhere throughout the United States.

The daily average patient population was 5,373 as compared with 5,266.5 the preceding year, an increase of 106.5.

Movement of patient population, fiscal year 1936

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1936.....	2,694	785	3,479	1,133	703	1,836	5,315
Admitted during year ended June 30, 1936.....	459	158	617	218	90	308	925
Total number under care and treatment during year ended June 30, 1936.....	3,153	943	4,096	1,351	793	2,144	6,240
Discharged as—							
Not Insane.....	7	1	8	1	0	1	9
Recovered.....	106	14	120	48	29	77	197
Improved.....	90	24	114	62	30	92	206
Unimproved.....	88	9	97	31	12	43	140
Total discharged.....	291	48	339	142	71	213	552

Movement of patient population, fiscal year 1936—Continued

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Died.....	111	57	168	76	54	130	298
Total of patients discharged and died.	402	105	507	218	125	343	850
Number of patients remaining on rolls June 30, 1936.....	2,751	838	3,589	1,133	668	1,801	5,390

ADMINISTRATIVE DEPARTMENT

OFFICE OF THE ASSISTANT TO THE SUPERINTENDENT

Supplies.—The supplies produced on the hospital reservation, including farm and garden products, such as tomatoes, beans, parsley, spinach, squash, corn, turnips, etc., were 283,841 gallons of milk, 125,794 pounds of fresh pork, 13,934 dozen eggs, 3,952 pounds of chicken, 29,021 bunches beets, 31,775 bunches carrots, 12,228 ears of corn, 4,150 bunches endives, 5,375 pounds of grapes, 1,827 bushels kale, 28,679 heads of lettuce, 18,750 bunches of green onions and 741 $\frac{1}{8}$ bushels of dry onions, 948 bushels mustard, 83 bushels pears, 95 bushels green peas, 302 $\frac{1}{2}$ bushels green peppers, 191 $\frac{1}{2}$ bushels polk greens, 716 bushels sweetpotatoes, 812 pumpkins, 18,085 bunches radishes, 1,231 bushels rape, 1,510 bushels spinach, 570 bushels squash, 2,386 bushels Swiss chard, 36 bushels green tomatoes and 941 bushels ripe tomatoes, 2,312 bunches turnips and 411 $\frac{1}{2}$ bushels turnips, and 343 bushels turnip greens.

In addition to that there were made at the hospital 24,731 gallons of ice cream, 1,217 tons of roughage and silage were produced, as well as 2,500 bushels of ear corn.

In the shops there were produced 13,769 pairs of various kinds of shoes and slippers, and in addition 1,404 pairs of shoes were repaired. There were made 126 dozen men's belts, 283 dozen suspenders, 1,137 brushes, 5,730 brooms, 2,197 mattresses, 2,123 pillows, and 6 chair cushions. In the bakery there were turned out 918,105 loaves of bread, 3,264,084 rolls, and 62,522 pounds of pastry. The laundry washed, dried, mangled, and ironed 12,276,099 articles. The power plant manufactured 568,660,000 pounds of steam; the electrical department generated 2,930,540 kilowatts of electricity; there were pumped 383,039,000 gallons of water; and the refrigeration plant produced 7,455 tons of ice and refrigeration.

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, 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.

All the steam, electricity, ice, and refrigeration used on the reservation was manufactured by the hospital.

Dairy and cow barn.—The Holstein-Friesian herd was again tested for tuberculosis. Several cows showed somewhat suspicious reactions; two of them were slaughtered under Federal inspection at Baltimore, Md. No tuberculous lesions were found in either cow; therefore we must consider the herd free from this disease. The herd consisted of 335 cows, bulls, and heifers that were tested, in addition to approximately 50 calves, a total of 385 animals. This is the twenty-second year that there were no reactions from tuberculosis. This is one of the largest accredited herds in the country.

During this period Bang abortion disease seems to have been eliminated from the herd. No reaction has been found for over a year. The herd was retested March 23 and 24, 1936, and the entire herd passed a clean test.

The herd produced 283,841 gallons of milk during the past year, about 7 percent increase over the previous year. This was an average production of approximately 12,000 pounds of milk per animal per year.

The quality of the milk, as indicated by the various bacteria counts, has been highly satisfactory, the average, well below 10,000 colonies per cubic centimeter (average about 6,800) being well within the requirements for certified milk.

The hospital continues to cooperate with the United States Department of Agriculture in the use of pure-bred bulls from its Beltsville (Md.) Experimental Station.

Piggery.—The hospital slaughtered 530 hogs during the year, which furnished 125,794 pounds of dressed pork, about 30,000 pounds less than during the previous year.

During the past year or more, especially since the cafeteria system has been in effect in the hospital for feeding patients, the amount of garbage available for the piggery has been hardly sufficient to maintain the regular output of fresh pork. At the same time, the garbage seems to be of a better quality and there are fewer complaints about over-fat pork.

Whether the closer feeding of garbage was responsible or not, the fact is that the pork production during the past year fell below that of the preceding year approximately 20 percent, and something around 3 percent below the general average for the past 11 years. This drop in production at a time when everything else seems to be normal brings up the question as to the advisability of a change in the policy in feeding. Should grain be used, in connection with the garbage feeding, as a substitute or alternative, or should some sort of mixture be used? Proper investigations are being made and analyses taken of the various items entering into the feed, which we hope to report as a future study.

Farm and garden.—A survey of the records show that the production of vegetables generally has changed considerably during the past 10 years, both in the character of the variety grown and in production. The following crops have been introduced and are being grown regularly, in addition to those produced in 1925: Asparagus, Swiss chard, collards, endive, mustard, mustard-spinach, rape, rhubarb, rutabagas, Hubbard squash, and turnip greens. Others, among which are broccoli, brussels sprouts, and cress, are being tried, but so far with rather indifferent success, although each has found ready demand whenever available. The total tonnage of vegetables delivered during the 2 years of 1925-26 and 1935-36 increased from 197 tons to 267 tons, or an increase of over 35 percent; this, in spite of the fact that cucumbers and cymplings were practically destroyed by the cucumber worm, onions were below normal, as was also cabbage, while parsnips, rhubarb, rutabagas, and salsify were almost total failures.

Poultry Plant.—The records show deliveries of eggs during the last fiscal year approximating 13,934 dozen, an increase of about 40 percent over those of 1925. The deliveries of fowl, 3,952 pounds, compared to 3,098 in 1925, or 30 percent increase. Up to 1930 the flock was made up mostly of White Leghorns with a sprinkling of grades of various sorts. In 1930 Plymouth Barred Rocks were introduced to augment the meat supply. In this way the quality of the fowl delivered has been greatly improved, the output last year being as noted.

Diet.—The hospital continues the study of the diet. Not only are continued efforts being made to serve a greater variety of food to the patients and a larger variety of greens continued throughout the year, but greater efforts are being made to see that the food is being served in a more appetizing manner.

The manner of feeding through the cafeteria system has been extended. The new Men's Receiving Building and Women's Receiving Building—one opened at the beginning of the fiscal year and the

other at the end of the fiscal year—both have cafeteria service for the patients. More than 3,500 patients are now fed by the direct cafeteria system, and approximately 1,000 additional by a modified form of cafeteria system which will best suit the needs of the various patients. The hospital's method of furnishing food by cafeteria is to give the patients a choice of food. The result of this change seems to be appreciated by the patients, who do not hesitate to express their approval of the improvement in the manner in which food is being served, and the advantages may easily be evaluated by an extract from report of the chief dietitian:

It was interesting to note that two of the patients transferred from C Building to the Women's Receiving Building, who had been tube fed for several days previous to this transfer, chose their food and ate their first meal of their own election in their new surroundings.

The economic advantages are reflected in the report of the superintendent of farm wherein he notes that:

* * * since the cafeteria system has been in effect, the amount of garbage available for the piggery has hardly been sufficient to maintain the regular output of fresh pork.

This confirms reports of the dietitians from the various kitchens where the cafeteria system of feeding is in effect that the garbage from such kitchens has been reduced approximately 40 percent.

A class in diet and disease was taught the student nurses by one of the dietitians. This consisted of 15 lectures.

From March to June two of the dietitians taught classes in dietetics which consisted of 15 lecture periods and 30 laboratory periods. There were 24 student nurses in these classes.

Electric refrigerators have been installed in the dining rooms of Q-1, Q-2, P-1, P-2, C, B, and M buildings, replacing worn out wood ice boxes.

Dishwashing machines have recently been put in the dining rooms of I, P, and Q buildings, which will add to the sanitary washing of dishes and utensils.

Ice cream and pasteurizing plant.—A total of 283,841 gallons of milk, or a daily average of 777 gallons, was clarified and pasteurized at 148° F., held for 30 minutes, then cooled as rapidly as possible to 46° F., and then bottled and canned. These bottles and cans had been thoroughly washed, steamed, and inspected before being used.

About 25 gallons of buttermilk were made daily and bottled and canned.

In the ice-cream department a total of 24,731 gallons of ice cream was made, or a daily average of 68 gallons.

Bakery.—The output of bread during the year was 918,105 loaves, with 3,264,000 rolls and 62,000 pounds of pastry.

During the year a new wrapping machine was installed, permitting not only the wrapping of bread as formerly, but also the wrapping of rolls, thus insuring sanitary delivery and handling.

Laundry.—The work in the laundry continues to increase. The number of pieces laundered during the past year was 12,276,099, about 1,000,000 increase over the previous year. There has been no increase among the paid employees, notwithstanding the additional number of pieces laundered.

Two new presses and one sleeve form have been installed on the second floor of the laundry building.

The electrical department has installed four large fans in the press-room, which have relieved the humid condition to a great extent.

It seems that we have reached the limit of the capacity of the present laundry. Several of the machines have been in operation for a number of years and should be replaced. More room is needed for the exchange system, additional elevators for handling clothes, and sanitary conditions for the quartering of the employees and patients who work in this building.

Shoeshop.—During the year the shoeshop manufactured 13,769 pairs of shoes and slippers; repaired 1,404 pairs of shoes; manufactured all kinds of brushes, amounting to 1,137; made 3,396 pairs of suspenders and 1,512 belts.

There is one paid employee in charge of this department, all the other help being patients.

There was a material increase in the quantity of shoes made in order to meet the requirements of the hospital.

Lawns and grounds.—The opening of the new men's and women's receiving buildings completed the quadrangle including the medical and surgical building, R building, and I building. The quadrangle was graded and sown with grass seed; also all of the area around the women's receiving building and the terrace on the north side of the men's receiving building were similarly graded and sodded. Thirty-six evergreen trees, mostly of dwarf habit, were planted in front of the women's receiving building. In front of the passageways leading from the women's receiving building 45 flowering shrubs, 10 Lombardy poplars, and 5 sugar maples were planted; also 5 sugar maples were planted on the opposite side of the quadrangle on the strip of lawn east of I and N buildings.

Fires.—There were 30 fires during the past year, the total property damage amounting to \$278.40. Fire inspections and fire drills were regularly made. During the year inspections were made weekly with officers and privates of the District of Columbia Fire Department, and occasionally with inspectors from the fire marshal's office. On some occasions there were verbal recommendations made which

were adopted as soon afterward as possible. Inspections are made of all fire hydrants, stairways, fire escapes, basements, hose closets, attics, and grounds in general. The fire extinguishers are regularly inspected and repaired when needed. The fire siren is tested monthly, also the fire-alarm system. The fire pumps at the powerhouse are tested weekly, and the triple combination pumper is tested daily and put in service once a week. Tests are made of all fire hose, and fire drills are held monthly. Fire drills are held on the wards and note is made of the time required to get the patients off of the wards.

At the present time the hospital has before it a request from the Federal Fire Council for a statement showing the number of buildings on the reservation, number of patients or employees in each building, preparations that have been made for fire fighting, and other information incident thereto.

Disbursements.—During the year Mr. Homer Smith, who was at the hospital for many years, retired as chief of finance and accounts division of the hospital. After he left the service the finance and accounts division was combined with that of the chief accountant's division. Mr. Struttman, who is the chief accountant at the hospital, was put in charge of the combined work.

The total disbursements of all sorts, which were passed through this office and transmitted to the General Disbursing Office of the Treasury for settlement, amounted to \$3,457,560.

Supplies.—Orders were placed for supplies during the year amounting to \$1,314,224. Of this amount, \$324,000 was covered by formal contracts entered into by the hospital directly with the contracting parties. There were several special contracts under the Emergency Relief and Public Works appropriations, one for installing and testing gravel well, one for elevated steel tank and tower, and others for furniture for new buildings.

Personnel.—The total number of employees on the hospital rolls June 30, 1936, was: Regular, 1,647; P. W. A., 123—a total of 1,770, an increase of 214. The appointments during the year were: Regular, 444; emergency, 228; total, 672. Separations were: Regular, 353; emergency, 105; total, 458, a net increase of 214.

During the year several of the old employees were retired from the service on account of age, including:

E. H. Weisbrod.....	Chief engineer.
Mary O'Malley.....	Clinical director.
Amelia Clyburn.....	Waitress.
Homer Smith.....	Agent-cashier.
Franklin T. Eno.....	Bricklayer.
Richard Moore.....	Chauffeur.
Frank Blinn.....	Charge, psychiatric nurse.

The following were retired on account of disability:

Emory B. Carter.....	Machinist.
Arthur C. Dorsey.....	Stoker-operator.
Robert A. Jenkins.....	Assistant supervisor.
James D. Poe.....	Attendant.
Tillie M. Skinner.....	Do.
Annie McPherson.....	Assistant cook.
Emma J. Thornton.....	Kitchen helper.
Margaret A. Robey.....	Laundress.
Sadie Pilkerton.....	Charge, psychiatric nurse.
Joseph P. Corrigan.....	Attendant.

Administrative promotions (salary rate increases) were granted to 586 employees, effective February 1, 1936. This was the first general salary increase authorized since January 1, 1931. In addition there were 67 promotions and 5 demotions in grade.

Construction.—The women's receiving building, on which progress was noted in a previous report, was practically completed and furnished ready for occupancy the last part of June 1936. This building affords no novelties nor innovations in methods or standards of treatment not available in other buildings on the hospital reservation. It will, it is believed, make possible the accomplishment of a more economical use of physical comforts and mental treatment methods as a result of the increased efficiency in ward service. Included in this building are such special provisions as beauty parlor, laundry, hydrotherapeutic department, occupational, and recreational rooms.

Congress has made an appropriation for one new building to be known as Continuous Treatment Building No. 3. Preliminary plans and specifications for this building are now under way.

The hydrotherapy department, in connection with the sun parlor for Q building, the colored women's receiving service, was put in operation during the year.

Allocations having been made by the Public Works Administration of funds for reconditioning certain buildings, the following work was completed:

Replacement of wooden porches in Allison-C and Allison-D buildings by concrete and brick porches, enclosed, fitted with iron window sashes of a swinging type, permitting proper ventilation. These porches are heated, permitting them to be used as wards, increasing the number of beds, and in some cases to be used for day rooms; and the Allison-D porch to be used as a barber shop.

Several of the porches connected with Oaks-B, D, and E buildings, constructed many years ago of wood and which were more or less of a fire risk, have been replaced by new porches of brick and concrete enclosed in the same manner as noted in the Allison porches, to be used in some cases as wards, day rooms, or dining rooms.

Two new brick porches have been erected for Garfield and Dawes buildings. These buildings were dark and without adequate day-room facilities. The porches increased the day-room advantages and permit a class of patients who had little outdoor exercise opportunities for enjoying fresh air under sanitary conditions.

The porches of the several buildings to which they are attached have added a total of 27,124 square feet of floor area.

Funds allocated by the Emergency Relief Administration permitted the laying of 1,500 feet of 24-inch terra-cotta pipe surrounded by concrete, to be used as a storm-sewer drain from the head of the ravine at the powerhouse to a point below the incinerator, and to be connected with a 24-inch line at that point.

From funds allocated by the Public Works Administration a contract was made to dig a well. It is what is known as a 30-inch gravel well, being 30 inches at the base and 10 inches at the top. The contract called for a flow of 1,250,000 gallons of water per day. The bond for this contract covers this flow for a period of at least 1 year. This well has been completed, and the official test showed a capacity of 1,899,000 gallons of water per day. The water has been tested by the Geological Survey and test showed it to be of an exceptionally good quality. The temperature test of the water on a warm day showed that it registered 56° at the surface.

A new tank is being erected at such a height and capacity that will give sufficient pressure to furnish water to the upper stories of the new buildings just completed. From the old tank water could only be secured by the use of pumps located in each building.

New fire pumps have been constructed and will be installed within a short period.

The woodwork on the porches of the 13 buildings completed about 1903 have been overhauled and the woodwork replaced by brick and concrete, thus making them less susceptible to fire and more permanent in nature.

A concrete road has been built from general kitchen to Howard Hall. On a recent inspection of the hospital by the Federal Fire Council attention was called to the necessity of such a road, so that fire equipment could enter the grounds of the hall should fire break out. Similar criticism was made by a representative of the District Fire Department. This new road will relieve further criticism of this sort and furnish adequate means for not only the hospital but for District fire apparatus to get inside the wall of the Howard Hall service in case of fire.

The concrete road between R and I buildings has been widened and replaced.

Several thousand feet of the old roads have been repaired.

Concrete walks were laid between C and M buildings and between I and N buildings.

New water mains have been installed from R building to the site of the new water tank, from the men's receiving building to the women's receiving building.

Pedestal drinking fountains, with cooler tank, were installed in the basement of Q building, on the lawn between C and M buildings, and the courtyard of the continuous treatment buildings.

All steam fitting and plumbing have been overhauled and many repairs made.

New floors have been laid in the laundry, in several of the wards of the west side service and in other sections of the hospital.

RECREATIONAL, VOCATIONAL, AND OCCUPATIONAL WORK

Occupational therapy.—During the year the occupational therapy department furnished work for 1,005 patients. This work included weaving, sewing, toy making, woodwork, basketry, and general industrial work. In the industrial department there were made 22,500 sheets, 11,100 pillow cases, 24,300 towels, and 12,275 dresses. It has been the practice as far as possible to permit the patients to make their own dresses.

Red Cross.—The American Red Cross continued to maintain a hospital unit during the past fiscal year.

The psychiatric social workers attached to this unit are primarily concerned in case correspondence and contact work. During the year there have been received 4,296 letters and there have been sent out 4,411 communications. Five hundred and six claims of one kind or another have been filed for the patients, and the patients have been helped in presenting their claims in an equal number of cases.

Three thousand seven hundred and ten tickets of all classes were donated to the Red Cross for the use of St. Elizabeths' patients for football, baseball, and theater parties. There have been two boat trips down the river, one chaperoned by the Spanish-American War Veterans and the American Legion and the other by the Motor Corps of the District Chapter of the Red Cross, the American Legion, and the hospital helping with the transportation. The boats were secured through the sources named.

There have been 10 band concerts on the green during the past year. There have been 167 parties and entertainments and 92 athletic events.

The superintendent of the hospital having instituted a practice of delivering letters of welcome to each patient as admitted to the institution, said letters explaining the nature of the institution and in what way the hospital can cooperate with the patient in helping to

restore his health, the field director of the Red Cross acted as a representative of the superintendent in helping to put such communications in the hands of the patients shortly after they were received in the hospital.

It is recommended by the field director of the Red Cross that the building at present used for that purpose be either made over and enlarged or, as an alternative plan, to add wings to the Hitchcock Hall for the use of Red Cross work, or that funds be furnished for the erection of a new building, including a recreational center for both men and women. Whether this is to be done by the Red Cross or congressional appropriation would have to be determined.

MEDICAL DEPARTMENT

Library.—The library at St. Elizabeths Hospital is divided into two parts, primarily that noted as the medical library and that noted as the patients' library. The total number of volumes in the combined library is about 32,000. About 125 books have been added to the medical library during the year. There were 1,200 books added to the patients' library. Through the kindness of Mr. Alvah Godding, a very valuable addition was made to this library—approximately 1,000 books, including standard fiction, poetry, and drama. There are about 3,500 books in constant circulation, approximately 200 books being drawn daily.

Social service department.—The work of this department included training of students from the hospital training school and from the social-service school. There were four students from the National Catholic School of Social Service and one, a priest, Father Humensky, from the school of social work, Catholic University of America. He was here the full 2 months of September and October, and then, as he and the director of the school were interested in learning what a priest could do for the patients, he continued coming to the hospital several days a week until the end of the school year.

The letter the superintendent sent to each patient, as discussed under the Red Cross, which the field director of that organization delivered to a certain class of patients, was delivered to District patients by the chief of the social service department.

The social service report from July 1, 1935, to June 30, 1936, showed the following:

Number of out-patients on rolls July 1, 1935-----	149
Number of out-patients on rolls June 30, 1936-----	85
Average number on rolls per month-----	130
Number of patients discharged from the rolls-----	152
Number of out-patients under care during the year-----	284
Average carried during 1 month (in and out patients)-----	193
New patients (out on visit)-----	116

Training school.—There were 18 students in the graduating class of the 3-year course of the training school. Sixteen took the District of Columbia Board in October; 14 passed, 1 student failing in two subjects and 1 failing in one subject. The hospital received honors for having the highest school average. Of the 14 nurses who passed the Board, 10 are on duty in the hospital, 2 are in the Veterans' Administration, 1 is married, and 1 is doing private duty.

From July 1, 1935, to June 30, 1936, 107 affiliating students have finished their course and an additional 38 were admitted June 1, 1936, making 145 enrolled during the year. Approximately 60 postgraduate students have completed a course during this period, and there are 32 post-graduate students now in the hospital, making 92 enrolled during the year.

The hospital now receives affiliate students from four local hospitals, from the Parrish Memorial Hospital, Portsmouth, Va.; Riverside Hospital, Newport News, Va.; and the Munroe Hospital, Ocala, Fla. The St. Elizabeths students affiliate at Emergency Hospital for surgery, at Sibley Hospital for surgery and obstetrics, at Children's Hospital, Washington, D. C., and Bellevue Hospital, New York City, for pediatrics, and with the Instructive Visiting Nurse Society.

Forty-nine attendants have completed the course during the year. There are at present 98 attendants in the class.

Medical and surgical wards.—The activities of this service have increased over the previous year.

There were admitted to the wards 1,500 patients and to the clinics 17,001 patients. The clinic patients made 40,056 visits. There were 216 surgical operations.

The physiotherapy department has been more and more utilized, with benefit to the patients.

During the year past an attending otolaryngologist was appointed to fill the vacancy created in that department by the resignation of Dr. Billard. There has been a considerable amount of indicated surgery, such as cases of chronic mastoiditis, as well as a few cases of acute mastoiditis, and conditions relating to the nose and pharynx.

The attending ophthalmologist resigned because of change of residence to another city. His vacancy was filled by the appointment of a local ophthalmologist which did not turn out as successfully as desired and was, therefore, terminated. At the present time there is a vacancy.

The radiographic and radiotherapeutic clinics have been functioning satisfactorily during the year. The radiotherapeutic apparatus, which gave so much trouble for a time, was finally properly repaired and has functioned steadily throughout the year without the slightest

difficulty. One hundred and seventy-eight patients have received X-ray therapy during the year, about 25 percent of these being cases of malignancy in some form.

The antitubercular clinic has treated a considerably increased number of patients during the past year. This is partly due to the actual number of such patients to be treated and partly to some new departures in the method of treatment.

The urological clinic has been attended regularly by the visiting urologist during the year and some of his work has proven quite interesting, although just as interesting is the fact that very few active cases of venereal disease are seen.

The gynecological clinic has continued weekly, although the day of the clinic was changed to accommodate other activities in the institution.

Men's services.—The last three remaining wards in the men's receiving building were opened. The number of patients on the men's receiving service has materially increased. Admissions during the year were 447. Treatments in the hydro room were 68,823.

Due to the fact that the men's receiving building is caring for more acute cases than formerly, the various other services, such as Richardson Group, do not have as many acute cases on the wards, but they continue to have many serious behavior problems and many acutely disturbed patients. A great deal of personal attention has been devoted to the caring for the acutely disturbed patients and endeavoring to assist them in improvement and, it is believed, that a considerable degree of success has been attained.

It is still necessary to devote a considerable amount of attention to inducing patients to write to their relatives, and it is often necessary to write special memoranda to the supervisors of the service requesting that the individual patients write to their relatives. This practice is followed in every case where a relative makes a specific request in a letter to the hospital that a reply be sent by the patient, and almost 100 percent success is obtained in following this system.

In the Richardson Group the hydrotherapy room showed 23,733 treatments.

During the year the chief and radical change in administration of the Howard Hall service was the removal of the supervisor's office from the Howard Hall building to the West Lodge building. The supervisor now uses the office which for a long time was used as a physician's office and later as a visitors' room. The former nurses' office was connected with the small hall in the front of the building by cutting out a large archway and this whole space is now being used as a visitors' room. The nurses' office was moved back to the

room formerly used as the dining room and a 3-bed dormitory was converted into a doctor's office.

Nearly all of the patients in West Lodge 1 now eat in the West Lodge basement cafeteria, a few trays being served on the wards. The patients in the whole of the West Lodge building are under the general supervision of the charge nurse located on ward West Lodge 1.

The moving of the supervisor's office from the Howard Hall building to the West Lodge building has solved a problem which for several years seemed to defy solution—a reception or visitors' room for the Howard Hall proper. At the present time relatives of the patients are received in a nice visiting room adjoining the supervisor's office, and the proximity of the supervisor's office to the admission ward, West Lodge 1, is an added convenience.

The occupational index which was introduced on the various services of clinical division number 1 during the previous year has continued to be very useful and has enabled this division to supply the various industrial departments, such as the laundry, shoe shop, sewing room, and power-house, with the necessary number of patients. As during the past year, the charge of each ward was requested to furnish a list of patients, giving name and case number, whether employed or idle, if employed the type of work done, and some general remarks concerning the patient's behavior and habits. Such lists were gone over with the various physicians in charge and thus there were assigned a number of idle patients to various occupations.

The completion of the porches connecting the Garfield wards, white ash and gray ash, will provide spacious sitting rooms for patients who formerly congregated in the hallways and will release extra beds in these wards.

The cafeteria service in West Lodge is satisfactorily functioning. Generally speaking, marked improvement has been accomplished in the care of the colored male patients, both from the standpoint of the patients' physical comfort and the medical attention given to them.

Women's services.—During the year the retirement of Dr. Mary O'Malley, who was clinical director in charge of the women's services, left a vacancy which has been temporarily filled by having Dr. S. A. Silk supervise professional and administrative work of the Women's division in addition to division number 1. His work in the women's division has been mainly directed toward the improvement in classification and distribution of patients, and the opening of the new women's receiving building.

Preliminary to opening the new women's receiving building the admission service was divided into two services—C-service and P-

service. With the opening of the women's receiving building the women's department will have four services, namely, the women's receiving service, C-service, P-service, and Q-service, the Q-service consisting altogether of colored patients. The new women's receiving building, or new admission building, was opened on June 22, 1936. It has many improvements over any of the other buildings opened. It is not only provided with an admission suite, large and small dormitories, single rooms, special-treatment rooms, cafeteria service for all patients, occupational therapy room, hydrotherapy department, continuous flow tubs, recreational room, but in addition, beauty parlor, and rooms especially set aside for individual laundry work by the patients.

Laboratory.—The work of the laboratory continued along the same lines.

During the past year a considerable amount of effort has been expended in looking up the literature of the physiology of the brain and in reading up on the chemical and physiological ramifications involved.

Over 100 patients with neurologic conditions of unusual or difficult type have been thoroughly studied during the past year.

Electro-encephalographic technique has been introduced and gradually improved.

Psychological office.—During the year admission examinations and notes on the white and Indian women's service were made on 181 cases. Psychological examinations, 211 cases. Special examinations and conferences, 76. Psychotherapeutic interviews, 28. Lectures, 104.

Dr. Kendig is engaged in a study of the psychological material which has accumulated over a period of 15 years in the hospital, in the hope of learning something of the mental functions in dementia precox. It will be recalled that Binet believed that each type of mental illness was marked by a certain type of mental function, and that psychology could identify these types as an aid in early diagnosis. There have been a few sporadic attempts at research along these lines, and it is hoped to do a better job than has so far been done.

Dr. Hunt, a research fellow in psychology from Cornell, has been at the hospital since February engaged on a problem in mental functioning in depressed patients. He left on June 13.

Educational.—The hospital continues to cooperate with the various educational institutions around Washington.

The teaching work with the George Washington medical students was continued through the year as during the preceding year, with

Dr. Lind acceptably substituting for Dr. Lewis in giving a course of lectures to the first year medical students on medical psychology. The arrangement for the second, third, and fourth year medical students was unchanged with the exception that last fall Dr. Lind gave the fourth-year students a course of lectures on the psychoneuroses that had previously been given by Dr. Lewis. In addition, Dr. Lind has continued to have a group of fourth-year students during the year. Dr. Silk, Dr. Duval, and Dr. Twombly also assisted with these students.

Dr. Hall has given two courses of clinical lectures and demonstrations to the University of Maryland students in abnormal psychology. The spring course was composed of 9 lectures and was attended by some 30 students, and the summer course composed of five sessions has about 75 students, most of them school teachers.

Dr. Karpman gave a course of lectures to the students of the Howard University medical school.

The superintendent continues his lectures to the George Washington medical students.

REVISION OF LAWS FOR THE ADMISSION OF PATIENTS TO SAINT ELIZABETHS HOSPITAL

A bill has been introduced in Congress, upon the recommendation of the District Commissioners, to change the method of admissions to St. Elizabeths Hospital. The hospital cooperated with representatives of the District upon the form of the proposed bill.

STAFF CHANGES JULY 1, 1935, TO JUNE 30, 1936

The following appointments were made during the year:

Internes: Clara L. Hoyer, William F. Murphy, Arnold H. Ungerman, Daniel J. Sullivan, William Y. Baker, Moorman P. Prosser, William H. Vicary, Zigmund M. Lebensohn, Samuel R. Berenberg, Herbert A. Wiggers, Genevieve M. Stewart.

Visiting oto-laryngologist: David Davis.

Visiting urologist: Alan J. Chenery.

Visiting ophthalmologist: Ronald A. Cox.

The following resignations took effect during the year:

Internes: Sidney Berman, Walther H. Thiele, Eugene J. Alexander, Stephen E. Kramer, Jr., Samuel R. Berenberg, Alfred R. Abrams, and Durward G. Hall.

Clinical director: Mary O'Malley.

Director of laboratories: Nolan D. C. Lewis.

Visiting ophthalmologists: Francis C. Skilling and Ronald A. Cox.

Dr. William M. Kenna, senior medical officer, died during the year.

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The Influence of Psychiatric Thinking on General Medicine. Mental Hygiene, Vol. XX, No. 2, April 1936. Pp. 189-204.

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Modern Housing of Mental Patients. (With Monie Sanger.) Published in The Modern Hospital, Vol. 45, No. 1, July 1935. Pp. 42-47.

Karpman, Benjamin, senior medical officer:

Imitation of Life. Psychoanalytic Review, Vol. XXIII, No. 2, April 1936. Pp. 149-172.

Fong, Theodore C., senior medical officer:

The Treatment of Neurosyphilis. The Military Surgeon, Vol. 78, No. 6, June 1936. Pp. 449-456.

The Diathermy Treatment of Dementia Paralytica. Medical Record, May 6, 1936. Pp. 286-288.

Abrams, Alfred L., junior medical officer:

Epidemic Poliomyelitis in Washington. Medical Annals of the District of Columbia, Vol. V, No. 5, May 1936. Pp. 126-130.

Richmond, Winifred V., psychologist:

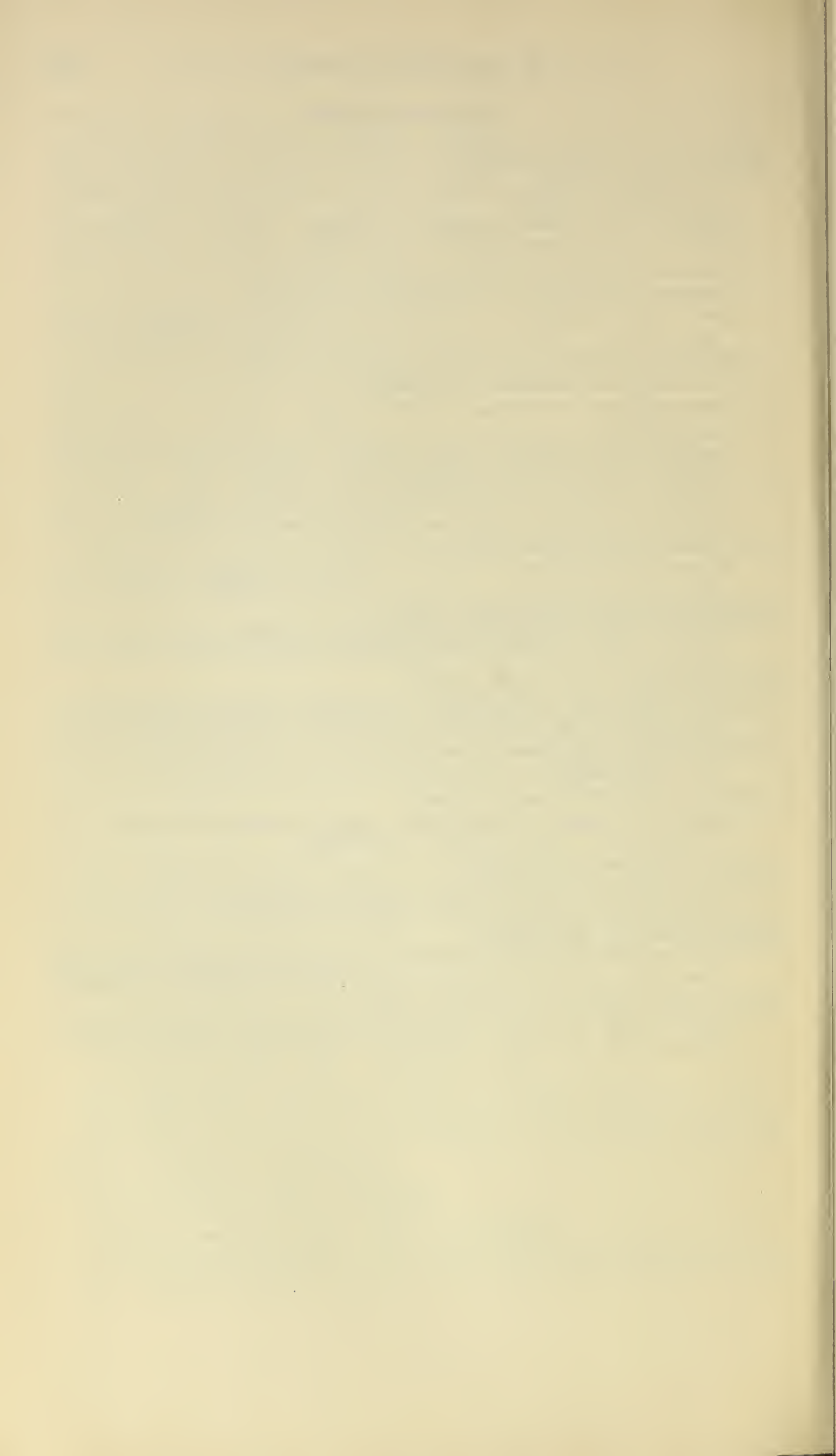
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Ashby, Winifred M., bacteriologist:

The Preservation of Entigenic Specificity in Sheep Corpuscles. Journal of Laboratory and Clinical Medicine, Vol. 21, No. 9, June 1936. Pp. 943-948.

Sanger, Monie, assistant to the superintendent:

Modern Housing of Mental Patients. (With William A. White.) Modern Hospital, Vol. 45, July 1935. Pp. 42-47.



HOWARD UNIVERSITY

(MORDECAI W. JOHNSON, *President*)

GENERAL TRENDS

1. *Increased enrollment.*—Forty-one States and 13 foreign countries sent 1,970 students to Howard University during the school year 1935-36, and 245 graduates were sent out from the graduate school, the college of liberal arts, the school of engineering and architecture, the school of music, the colleges of medicine, dentistry and pharmacy, and the school of law. Enrollment continued on the increase, showing a gain of 63 for the year and a gain of 344 or 21 percent since 1933-34, when the number of students reached the bottom of the depression trough.

2. *Advancing center of graduate education.*—The graduate school again showed increased enrollment, bringing students from 38 colleges and universities in 30 States and 5 foreign countries; medicine and law received freshman classes with 85 percent and 83 percent of their students, respectively, of graduate status; religion graduated its last class of college students and advanced to a wholly graduate enrollment. Twenty-one and five-tenths percent of the entire enrollment of the university was of graduate caliber.

3. *Major service to the South.*—Eighty-two and two-tenths percent of all graduate enrollment and 75 percent of all the enrollment came from the South, the States of the Negro's majority residence and greatest educational need.

4. *Following up the graduates.*—The university now has 9,782 graduates at work in 43 States and 24 foreign countries. Names and addresses are classified by class, by school, by city, by State. The registrar of the university with the help of National Youth Administration funds, is making a study of the economic status of these graduates, for report and review by the United States Office of Education.

5. *Progress in number and salaries of full-time teachers.*—The full-time teaching staff of the university showed an increase of 40 percent over the full-time staff of 10 years ago and was in charge of 83 percent of all instruction. The faculties of medicine, law, and religion, however, were still in need of increased full-time personnel to meet the minimum requirements of instruction and the liberal arts college faculty anticipated the need of additions to personnel

in 1937-38 to meet the rise in enrollment and the increase of graduate work. The teaching staff had but slightly passed the halfway mark in maturity, however, there being a manifest need for 30 mature teachers in the professorial rank. The salaries of teachers had passed the minimum agreed upon 10-year-program figures and were approximating the agreed upon average, except in the professorial rank, where 10 teachers were still below the minimum and the average annual salary was far from the agreed upon figure. In numbers and in salary, the university was still heavily disadvantaged at the most important point in its work, namely, the mature teaching staff in the professorial rank.

6. *Increased scholarly activity and publication.*—The *Journal of Negro Education* finished its fifth year of service with increased prestige. The teachers were more active than ever before in learned societies and published during the year 9 books and monographs and 138 scholarly articles, many of them representing creative contributions to knowledge. Their eagerness for improved abilities continued to be one of the most inspiring elements of the university life, 18 members, or 11 percent of the staff, being away on leave of absence or on fellowships for further study.

7. *New educational ventures succeed.*—The school of engineering and architecture passed successfully through its second year of independence, with increased enrollment, and with all of its graduates employed.

The dental college successfully carried through its second year of work in the preparation of oral hygienists. The graduates uniformly met the requirements for licensure in every State wherein they underwent examination, but the percentage of employment was low. The trustees inaugurated on the graduate level courses for the preparation of professional social workers. Twenty-four students were enrolled and were served by eight teachers.

8. *Medicine receives \$100,000 grant and takes forward steps in clinical teaching.*—The college of medicine received a grant of \$100,000 from the General Education Board to provide able temporary leadership in the departments of medicine and surgery, pending the training and placement of permanent personnel. Facilities for the clinical teaching of medicine were greatly improved by the establishment of a tuberculosis clinic at the Freedmen's Hospital by the Health Department of the District of Columbia and the extension of facilities for the study of contagious diseases at the Gallinger Hospital. The General Education Board continued to provide fellowships for the further training of teaching personnel.

9. *School of law moves to main campus.*—The school of law moved from its downtown location to adequate and very promising quarters

on the university campus and experienced an unprecedented increase in the number and quality of its first-year class.

10. *Two new buildings about ready and two more on the way.*—The chemistry building, made possible by the appropriation of \$626,300 by the Public Works Administration, was completed. The equipment and furniture were being installed, and it was estimated to be ready for occupancy in September 1936. The appropriation for the new university library had been restored from impoundment, and specifications were being revised and printed for proposals. The new heat, light, and power plant, made possible by an appropriation of \$555,577 by the Public Works Administration, was nearly completed and was undergoing trials in the production of heat and power. The architect's contract for the new men's dormitories, to be erected from a Public Works appropriation of \$525,000, had been drawn and was waiting the approval of the Secretary of the Interior.

11. *Increased income and expenditures.*—While the total income of the university during the year showed a decrease of \$52,467.69, the income for current purposes showed an increase of \$36,905.89. Expenditures were carefully budgeted, but with the most thoughtful economy expenditures exceeded income by \$1,364.98. There was an increase in the amount and percentage of current funds used for resident instruction and the general library, a reduction in the percentage of funds spent for general administration and for athletics. In the matter of resident instruction and the general library the percentages approximated those planned in the 10-year program.

12. *Increased scholarship and student aid.*—Seven and one-half percent of all student fees were again devoted to scholarship and student aid. The university funds, with the help of the National Youth Administration, were able to provide urgently needed aid for a 25-percent increase in the number of students helped in the undergraduate and graduate schools and approximately 100-percent increase in the number of students given help in the professional schools.

13. *General appraisal of advance in a perspective of 10 years.*—The improvement which has taken place at Howard University during the past 10-year period as the result of the planned cooperative support of Government and private philanthropy has been the most constructive and inspiring event in the current education of the Negro people. This has been true because appropriations and gifts have been made with the obvious purpose of establishing a first-class institution in both personnel and equipment. While the work has been forwarded in the matter of capital buildings during the last 3 or 4 years, it has not received the needed increase of support in current funds for personnel, books, and maintenance. Urgent need now appears in these items of support.

14. *Outstanding needs.*—The outstanding needs of the university are (1) 30 mature teachers in the professorial rank; (2) increased scholarship funds for undergraduate students and substantial increases in the number and size of fellowships for graduate students; (3) \$300,000 to double the gravely deficient book collection; and (4) increased funds for maintenance to check the depreciation of the plant which has set in as a result of the limited funds available during the depression.

STUDENTS

1. *Enrollment for the year 1935-6.*—The total enrollment of Howard University (see the table following) for the year 1935-36 was 1,970, of whom 1,072 were men and 898 were women, as compared with the total of 1,907 for 1934-35, of whom 1,008 were men and 899 were women. A net gain of 63 students, or 3.3 percent, is shown, as compared with a net gain of 281 students, or 17.3 percent, in 1934-35, and a net loss of 267, or 14 percent, in 1933-34.

2. *Geographical distribution.*—Ninety-five and two-tenths percent of the enrollment during the school year 1935-36 came from the continental United States, while 4.8 percent came from without the borders of the United States, as compared with 94.9 percent and 5.1 percent, respectively, during 1934-35. The percentage of candidates for degrees coming from the District of Columbia during 1935-36 was 28.7 percent, as compared with 27.2 percent for the year 1934-35.

Summary of students enrolled in Howard University for the years 1935-36 and 1934-35

Divisions of the university	Net enrollments						Total gain	Total loss
	1935-36			1934-35				
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts.....	1,174	548	626	1,156	547	609	18	-----
School of engineering and architecture.....	52	52	0	27	27	0	25	-----
School of music.....	55	20	35	60	24	36	-----	5
Graduate school.....	236	134	102	225	76	149	11	-----
Total.....	1,517	754	763	1,468	674	794	54	5
Professional schools:								
Theological college.....	8	7	1	11	10	1	-----	3
Graduate school of theology.....	19	18	1	13	13	0	6	-----
Law school.....	62	56	6	44	43	1	18	-----
School of medicine:								
College of medicine.....	142	135	7	168	161	7	-----	26
College of dentistry.....	38	37	1	35	34	1	3	-----
College of pharmacy.....	26	21	5	26	23	3	-----	
Total.....	295	274	21	297	284	13	27	29
Total in regular courses.....	1,812	1,028	784	1,765	958	807	81	34
Special students in music, law, dentistry, religion.....	158	44	114	142	50	92	16	-----
Grand total (net).....	1,970	1,072	898	1,907	1,008	899	63	-----

Forty-one States sent 1,717 candidates for degrees in 1935-36, as compared with 39 States sending 1,675 candidates for degrees in 1934-35. The gain of 42 candidates is shown to have been shared by 21 States. The distribution of the regular enrollment of candidates for degrees, by divisions, is as follows: From the North, 415 students, as follows: New England, 60; the Middle Atlantic States, 245; the East North Central States, 72; the West North Central States, 38. From the South 1,294 students, as follows: From the South Atlantic States, 1,105; from the East South Central States, 98; from the West South Central States, 91. From the West, 8 students, as follows: From the Mountain States, 2; from the Pacific States, 6.

3. *Students of advanced standing.*—Eighty students from fifty-seven institutions entered the college of liberal arts, the school of engineering and architecture, and the school of music with advanced standing. Seventy-nine of the one hundred and twenty students entering the professional schools for the first time during the year 1935-36, or 66 percent, were equipped with 4 years or more of college training. Of the 1,970 students in the entire institution, 424, or 21.5 percent, were persons holding one or more academic degrees.

4. *Scholarship and student aid.*—The trustees of Howard University continued to set aside 7½ percent of all student fees as a special scholarship fund for needy students. They also made provisions for increased work opportunities for students, and continued the use of the installment system of fee payments. The National Youth Administration awarded aid averaging \$15 per month to 9.6 percent of the full-time student body. Through these several means 407 students in the undergraduate colleges received some assistance during the course of the academic year, as well as approximately 62 students in the graduate school and 122 students in the professional schools. Scholarships and student aid were awarded to students in the order of their scholastic standing. Support was thereby given to all other measures stimulating earnest scholarly work.

The committee on scholarships and student aid for the undergraduate colleges reports that for the year 1935-36 it acted upon 1,500 applicants, as compared with 1,400 the year before. Ninety-eight percent of these applicants were judged by the committee to be in actual need of financial aid. The resources of the university together with the assistance from the National Youth Administration, furnished aid for only 39 percent of the total number of applicants. The amount of scholarship and work aid available to the university is far below the present need.

GRADUATES

1. *Number and distribution.*—The following table exhibits the number of graduates from each division of the university during 1935-36, as compared with 1934-35. The table shows that there was a total of 245 students graduated during the year, representing a decrease of 30, as compared with the group of graduates in 1934-35. The percentage of male graduates was 47 in 1935-36, as compared with 53.7 in 1934-35, while the corresponding percentages of women graduates were 53 and 46.3, respectively.

2. *Honorary degrees.*—Three honorary degrees were conferred at commencement in June 1936. William Stuart Nelson, president of Shaw University, Raleigh, N. C., and president-elect of Dillard University, New Orleans, La., was awarded the degree of doctor of laws; Edward H. Morris, attorney, of Chicago, Ill., was awarded the degree of doctor of laws; and Richard Hausber Bowling, minister, First Baptist Church, Norfolk, Va., was awarded the degree of doctor of divinity.

3. *Number and distribution of graduates.*—The total number of graduates of Howard University is now 9,782. Of this number the registrar has 6,500 correct addresses in 43 States, the District of Columbia, and 15 foreign countries. These addresses are classified alphabetically, by States, by cities, by sex, by schools, and by classes. In cooperation with the United States Office of Education, the registrar of the university is now making a careful study of the economic status of these graduates.

Summary of students graduated by Howard University for the years 1935-36 and 1934-35

Division of the university	Graduates						Gain	Loss
	1935-36			1934-35				
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts.....	132	38	94	144	55	89	-----	12
School of engineering and architecture.....	6	6	0	0	0	0	----- 6	-----
School of music.....	3	2	1	5	1	4	-----	2
Graduate school.....	45	20	25	38	13	25	----- 7	-----
Total.....	186	66	120	187	69	118	----- 13	----- 14
Professional schools:								
Theological college.....	4	3	1	2	2	0	----- 2	-----
Graduate school of theology.....	3	3	0	4	4	0	-----	1
Law school.....	4	4	0	10	10	0	-----	6
School of medicine:								
College of medicine.....	35	33	2	55	53	2	-----	20
College of dentistry:								
4-year course.....	5	5	0	2	2	0	----- 3	-----
Dental hygiene.....	6	0	6	8	0	8	-----	2
College of pharmacy.....	2	1	1	7	7	0	-----	5
Total.....	59	49	10	88	78	10	----- 5	----- 34
Grand total (net).....	245	115	130	275	147	128	-----	30

TEACHING STAFF

1. *Number and distribution of teachers.*—There were 264 members of the teaching staff during the school year 1935–36, of whom 133 were full-time and 131 were on part-time, representing together a full-time equivalent of 160 teachers, as compared with a total of 241 members of the teaching staff during the year 1934–35, of whom 134 were on full time and 107 were on part time, representing together a full-time equivalent of 156 teachers. This represents a loss of 1 full-time teacher and a gain of 24 part-time teachers—a net full-time equivalent gain of 4 teachers.

2. *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 the students to teachers in each division of the university. The status of our progress in relation to these objectives continues to be favorable, but 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 in the years from 1931–32 to 1933–34 the university reduced its staff by 44 members, 30 of whom were full-time teachers. In the 2 years 1933–34 to 1935–36 enrollment has increased by 344 students, from 1,626 to 1,970, with commensurate increase in the teaching load. During this 2-year period, however, the university has been able to make no net additions to the full-time staff, and such part-time additions as are the equivalent of only six full-time teachers. 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 to meet the added graduate load of 242 students. Six teachers are now bearing loads of from 16 to 19 hours and there are 50 classes above 30 in numbers. This college will be urgently in need of additions in 1937–38 to meet an enrollment further increasing toward normal.

In engineering and architecture the ratio of teachers to students is favorable, but the nature of the subject matter is such that 5 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 there is urgent need of additional teachers, particularly now in general medicine, obstetrics, pediatrics, venereal diseases, psychiatry, and tuberculosis. The Rockefeller

Foundation and the General Education Board, already so greatly helpful in the matter of preclinical teachers, have appropriated \$100,000 to provide the temporary leadership of highly competent men in medicine and surgery, while the university selects, trains, and places the additional personnel needed.

The faculties of dentistry and pharmacy are adequate in number and are prepared to teach a much larger enrollment. Law has a full-time faculty of minimum adequacy, but needs at least one additional full-time teacher. The very nature of subject matter in religion requires an increase of from three to five full-time teachers.

3. *Full-time teachers.*—One of the major problems confronting the university has been to overcome the heavy preponderance of part-time teachers in many branches of knowledge, who do their university teaching as a supplement to active vocation elsewhere. Improvement in this respect has been markedly steady and gratifying. In 1925-26, with an enrollment of 2,213 students, the university had only 79 full-time teachers. In 1935-36 the university had 133 full-time teachers, and they were offering 83 percent of all instruction. While it is desirable to retain many part-time instructors for specialized services, it is necessary further to increase the number and preponderant weight of full-time personnel in medicine, law, and religion.

4. *Maturity of the staff.*—Of the 160 (full-time equivalent) teachers on the staff this year 32.8, or 20 percent, were professors; 24, or 15 percent, were associate professors; 27, or 16 percent, were assistant professors; 61, or 38 percent, were in the rank of instructor and below. On the basis of the 10-year program of development, our present staff should have a distribution as follows: 64 professors, or approximately double the present number; 16 associate professors; 32 assistant professors; and 48 instructors. The full professorial staff is still seriously undermanned. The disparity in maturity is not as great as the figures would show, however, for with the help of the Julius Rosenwald Fund, the Rockefeller Foundation, and the General Education Board the university has given opportunity for further training to more than 100 members of the staff, for periods of from 1 to 3 years in the best universities of America and Europe. Several of these teachers, now mature and very able, are in the associate and assistant professorial rank, awaiting advancement which has been long delayed for lack of adequate funds.

5. *Salaries of teachers.*—In the 10-year program of development for Howard University the minimum, average, and maximum salary scales for the teaching personnel were definitely fixed. The salary situation for full-time teachers at Howard University at June 30, 1936, was as follows: The average instructional salary had reached \$1,916 which is \$184 below the average of \$2,100 agreed upon in

the 10-year program. The average salary for full-time assistant professors had reached the level of \$2,684 which is \$152 below the average of \$2,800 agreed upon in the 10-year program. The average associate professor's salary had reached the sum of \$3,446 or \$54 below the average salary agreed upon. Fully 10 full-time professors, however, were still receiving less than the minimum salary of \$4,000 agreed upon in the program and the average professor's salary was \$4,078 or \$808 below the average of \$5,000 agreed upon in the program.

Here we place our finger upon the strategic center of further improvement. All able men in the field of education are agreed that competence in 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 (*a*) to advance the salaries of the men in its professorial rank, (*b*) to bring into that rank, by advancement, the worthy teachers who are prepared to do its work, and (*c*) to supplement their numbers 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 steadily forward year by year.

GRADUATE SCHOOL

1. *Summary of general trends.*—The graduate school, in its second year as a separate school of the university, experienced an increase of 16 in enrollment, an increase in the number of students giving full time to their studies, and an increase of 7 in graduate degrees awarded. While the school drew its enrollment from 38 institutions and 30 States and 5 foreign countries, 90 percent came from institutions for Negro youth and 82.2 percent from 17 Southern States—the place of greatest educational disadvantage on the graduate level and with the greatest need. Instruction was offered in 17 departmental faculties, including for the first time social work and bacteriology. Three-fifths of the students showed a preference, however, for education and the social sciences. The biological and physical sciences and mathematics were elected by approximately one-seventh of the students and drew one-fifth of the degrees awarded. In all departments offering graduate instruction the ratio of teachers to students was approximately such as to make possible thoughtful, individual attention to the student. There was also a good proportion of able teachers with ample preparation and experience. Twelve of the departments produced scholarly publications during the year, much of which represented independent contributions to knowledge. Nearly all of the departments, however, were handicapped by the inadequate salaries of the mature teachers, by grave deficiencies in

the university book collection, and by the shortage of funds for research.

2. *Enrollment.*—The total enrollment of the graduate students for the year was 242, as compared with 226 and 164 for the 2 preceding years, respectively, representing a net increase of 58 over the enrollment before the graduate school was independently organized, and an increase of 48 over the prior peak enrollment of graduate students in 1931–32.

3. *Scholarship and student aid.*—Applications sent to the graduate school indicated that nearly all prospective full-time students were in need of financial aid. The university undertook to meet this need as far as possible with the help of the National Youth Administration. Aid was given to the total value of \$11,280. The number of students helped was 50 and 63 during the 2 semesters, respectively. The margin of unhelped need was very great.

4. *Social work.*—In accord with the vote of the trustees, a department of social work was organized in the graduate school, under the direction of the head of the department of sociology. Twenty-four students enrolled for the course, under the instruction of eight teachers. Two of the teachers were from the faculty of the school of medicine.

5. *Graduate degrees conferred.*—Forty-five graduate degrees were conferred upon 20 men and 25 women, as compared with 38 degrees for the previous year. Thirty-two graduates received the degree of master of arts, and 13 the degree of master of science.

6. *Solid foundations for the future.*—The steady growth in enrollment has demonstrated that graduate work at Howard University is developing to meet a real and growing need. This need is based upon the obvious lack of graduate educational opportunity for Negro citizens in the States of their majority residence, while the development of elementary, high-school, and college educational facilities is steadily increasing and making urgent demands for teachers of graduate training. It is a matter of major interest to those States and to the entire Nation that there shall grow up here with the help of the Federal Government an institution which offers this work on a sound and thoroughly competent basis to young men and women selected for their great promise and who are provided with the means to study.

If this sound foundation is to be assured, the university must have substantially increased funds for the following purposes: (1) For improvement of the salaries of mature teachers and for an increased number of them; (2) for a doubling of its book collection within 5 years; (3) for scholarships and fellowships; and (4) for at least that minimum of research which is necessary to maintain a living mind in the members of the staff.

THE COLLEGE OF LIBERAL ARTS

1. *Proposed new plan of study.*—During the year a committee, after careful planning over a period of more than 1 year, presented to the faculty a report embracing a new plan of study for the college.

2. *Students.*—The student registration during the current year was 1,175, of whom 548 were men and 626 women. These were distributed by departments as follows: Art, 115; botany, 88; chemistry, 249; commerce and finance, 170; economics, 101; education, 617; English, 803; freshman orientation, 84; German, 216; history, 534; home economics, 201; Latin, 32; mathematics, 178; military science and tactics, 284; philosophy, 77; physical education for men, 165; physical education for women, 307; physics, 114; political science, 194; psychology, 327; romance languages, 245; sociology, 135; and zoology, 162.

3. *Graduates.*—During the academic year 132 degrees were conferred, as follows: 33 bachelors of arts, 18 bachelors of science, 4 bachelors of science in commerce, 50 bachelors of arts in education, 17 bachelors of science in education, 9 bachelors of science in home economics, and 1 bachelor of science in art.

4. *Faculty.*—There were 91 members of the faculty of the college of liberal arts during the academic year 1935-36. Of these, 32 were professors, 15 associate professors, 15 assistant professors, 32 instructors, and 7 assistants. Thirty-five have the degree of doctor of philosophy. It is gratifying to note an increase in the scholarly activities of the faculty. A list of their publications during the year 1935-36 covers 11 typewritten pages.

5. *Special lecture series in the social sciences.*—During the year the division of social sciences sponsored at the university a series of six lectures on the general subject of "The Crisis of Modern Imperialism in Africa and the Far East." Alert and educated natives of Asia and Africa, as well as distinguished persons from American universities and from public life, were included among the speakers.

6. *The drama and the debate.*—A worthy development during the year 1935-36 was the setting up of a little theater in the north basement of Douglass Hall. Through initiative and industry on the part of the director and players, maximum use was made of very uninviting equipment. Several plays were presented on five different occasions.

During the year nine public debates were held between the students of Howard University and those of eight other colleges in various sections of the country.

7. *New building facilities.*—The faculties and students this year enjoyed the first full year's use of the new classroom building, Douglass Hall. In its ample space and equipment for classes, for teachers, administrative officers, and for small assemblies, and in its rest and

comradeship rooms for teachers and students, the building proved a superior blessing.

8. *Needs*.—Among the needs of the college are the following: Repair and remodeling of Thirkield Hall to serve adequately the needs of the departments of botany, physics, and zoology; a home-economics practice cottage; additional teachers in education, German, physical education for women, political science, and Romance languages; and staff assistants in political science and chemistry.

MILITARY SCIENCE AND TACTICS

1. *Rating*.—For the third successive year the Howard University R. O. T. C. bears in the rating of "excellent" as a result of formal inspection during the spring of 1936 by Maj. Charles D. Carl, acting assistant adjutant general, Third Corps Area. The following extracts are from the report of inspection under date of June 17, 1936:

This R. O. T. C. unit has attained the War Department objective.

The earnestness and enthusiasm displayed by the members of this unit deserves special mention. Both in the classroom and on the drill field, their attitude is extremely commendable, and contributes greatly to the excellent results being attained.

General rating of the unit, "excellent." By command of Major General Bowely.

2. *Enrollment and teaching staff*.—The enrollment in military science and tactics during the year 1935-36 was 291 the first semester, 276 the second semester, or an average of 283—and an increase of 15 over the average of 268 last year. This enrollment was divided as follows: First semester, basic students, 245; advanced students, 46; second semester, basic students, 228; advanced students, 48. These students were taught by a staff of four members.

3. *Commissions awarded*.—Twenty students were awarded commissions as second lieutenant in the Reserve Corps of the United States Army.

SCHOOL OF ENGINEERING AND ARCHITECTURE

1. *Trends*.—The vigorous activity of the Federal Government on engineering and architectural projects and the concurrent employment of an increasing number of Negroes on projects of this character have strengthened all factors which tend to encourage the type of education offered by the school of engineering and architecture. The school has had a larger enrollment this year than at any time during the history of the university's work in this field.

2. *Enrollment*.—Thirty-nine students enrolled the first semester of the year 1935-36 in engineering and architecture and 48 registered for the second semester. Of this number, 27 were freshmen. The

enrollment at the beginning of the second semester represented an increase of 90 percent over the enrollment for the second semester of 1934-35, and exceeded by 15 percent the highest enrollment at any time during the 25 years in which the university has offered instruction in engineering and architecture.

3. *Graduates.*—Six students earned degrees in engineering and architecture in June 1936 as follows: B. S. in architecture, one; B. S. in civil engineering, two; B. S. in electrical engineering, two; and B. S. in mechanical engineering, one. All of the graduates secured immediate employment. This school now has 64 graduates in the field, as follows: Architecture, 12; civil engineering, 3; electrical engineering, 25; mechanical engineering, 24. The school maintains a bureau of technical information which serves to place its graduates and to promote the employment of Negro technical talent throughout the Nation.

4. *Teaching staff.*—The faculty consisted of eight members: One associate professor, three assistant professors, and four instructors, all of whom were full-time teachers. This staff offered 40 courses of instruction during each of the 2 semesters.

5. *Rating and inspection of school.*—The Engineers Council for Professional Development, the accepted agency for the accrediting of colleges of engineering, is now making an inspection of Howard University school of engineering and architecture.

6. *Needs.*—In his annual report the dean of the school summarizes the needs of the school as follows: (1) More space for teaching purposes, to be provided by transfer of the art department now housed in the building; (2) two additional teachers—an instructor in architecture and an instructor in engineering; (3) many items of scientific equipment in all divisions of the work.

SCHOOL OF MUSIC

1. *The work of the school of music.*—The school of music at Howard University offers degree courses in piano, public-school music, organ, and violin and maintains a junior department for the purpose of developing a large group of students with sound basic training in music. It also offers courses in the history and appreciation of music and other instruction in the several departments to students in the college of liberal arts and in other divisions of the university.

2. *Number and distribution of students.*—The school enrolled during the year 197 students, as compared with 187 students in the year 1934-35 and 140 students in 1933-34.

3. *Faculty.*—There were 12 members of the faculty of the school of music for the year. Eight of these were rendering full-time

service and four were rendering part-time service. Two were professors, two assistant professors, six instructors, and two part-time assistants.

4. *Graduates.*—Three students were graduated at commencement. Two of these received the degree of bachelor of school music and one received the degree of bachelor of music with organ as a major.

5. *Needs.*—This school needs a teacher of history and appreciation of music for service primarily to the undergraduate students in the college of liberal arts. It also needs two parlor grand pianos, five upright pianos, one practice organ, one double bass, and one viola.

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 lines of 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, a Government institution, built upon grounds leased in perpetuity to the Government by the university, provides clinical facilities for the university medical unit.

COLLEGE OF MEDICINE

1. *Outstanding events of the year.*—The outstanding events of the year 1935-36 are as follows: (1) A grant of \$100,000 by the Rockefeller Foundation to be used over a period of the next 5 years for the development of the departments of medicine and of surgery; (2) the establishment of a tuberculosis clinic at the Freedmen's Hospital by the Department of Health of the District of Columbia with the understanding that this clinic shall be available to Howard University medical students for teaching purposes; (3) the extension of clinical teaching of acute contagious diseases to Howard University medical students at the Gallinger Hospital under supervision of Dr. Alonzo DeG. Smith, associate professor of pediatrics; (4) a grant of \$3,910.75 by the Wisconsin Alumni Research Foundation to finance a study of acute rickets under direction of Dr. Alonzo DeG. Smith.

2. *Students.*—There was a total enrollment of 142 students in the college of medicine during the school year 1935-36, as compared with 168 during the previous year. There were 222 applicants for admission. Of these 142 presented minimum premedical qualifications, 54 were issued permits to register, and 39 actually entered the freshman class. Of these new entrants 33, or 85 percent, had 4 years or more of previous college training.

3. *Instruction.*—During the year instruction has been furnished to students from the following schools and colleges of the university and from the Freedmen's Hospital: Medicine, 143; dentistry, 38; dental hygiene, 9; pharmacy, 26; liberal arts, 53; nurses, 38; grand total 308.

4. *Graduates.*—The degree of doctor of medicine was conferred upon 35 graduates at the June commencement. All secured internships in hospitals approved by the council of medical education and hospitals of the American Medical Association. Fifty-five Howard medical graduates were examined by 16 different State boards in the United States and Possessions during the year. Fifty passed, and five failed. The percentage of failures was 9.1 as compared with 11.1 the previous year.

5. *Officers of instruction.*—There were 113 officers of instruction in the college of medicine during the year, of whom 19 were rendering full-time service and 94 were rendering part-time service, together being estimated as the equivalent of 32.62 full-time teachers. We report with deep regret the loss of three of the faculty by death. The college of medicine was represented by members of the faculty at the following scientific meetings during the year: (1) The Federation of American Societies for Experimental Biology, (2) the American Association of Anatomists, (3) the American Association of Physical Anthropologists, (4) the American Association for the Advancement of Science, (5) the Association of Pathologists and Bacteriologists, and (6) the Eldridge Reeves Johnson Foundation for Medical Physics.

6. *Interschool and hospital relations.*—The year 1934-35 marked the first year for residencies in Freedmen's Hospital. This year, 1935-36, one resident in pediatrics and one in obstetrics-gynecology were appointed to the Freedmen's Hospital, by the Surgeon-in-Chief, effective October 1, 1935. For the coming year, beginning July, the Department of the Interior has approved the appointment of one resident in medicine and one in surgery. As a result of the grant made by the Rockefeller Foundation, the university has found it possible to make available a stipend of \$500 to both these new residents. The introduction of residents into the Freedmen's Hospital will greatly improve the medical care of patients and in time will make possible certain needed improvements in clinical teaching.

7. *Needs.*—(1) Additional teaching personnel. Although the pre-clinical staff of the college of medicine is still incomplete at several important points, the principal problem to be solved in the immediate future is the development of the clinical staff. In the preclinical

departments, additions to the staff are urgently necessary in the departments of anatomy, pharmacology, biochemistry, and in the division of public health. In the clinical departments, only the beginning has been made in medicine and in surgery. We are greatly in need of additional teachers in all the major clinical departments. Additional teachers are particularly needed in general medicine, obstetrics, pediatrics, venereal diseases, psychiatry, and tuberculosis. (2) The clinical material for teaching, in the Freedmen's Hospital, is still inadequate in amount in some services, and in variety in all services. Facilities are still lacking for efficient teaching of clinical neurology and psychiatry. (3) With reference to physical equipment the following needs are urgent: (a) Larger and better equipped animal quarters, (b) the expansion of the lecture room in pathology, (c) the remodeling of the west pathological laboratory, (d) the equipment of the rest rooms for women and for men, and (e) additional staff space in the medical library.

COLLEGE OF DENTISTRY

1. *General trends.*—The dean of dentistry reports the best year since the beginning of his administration 5 years ago. There was increased enrollment of students. There was increased quality and scope of clinical cases. There was marked increase in the quality of student scholarship. Faculty members worked together with high esprit de corps. A vigorous movement toward further graduate preparation appeared among the faculty. Dental alumni manifested eager interest in the work. The class of 1926 returned for reunion and pledged an annual scholarship.

2. *The enrollment.*—The enrollment in the college of dentistry for the year was 47, as compared with 44 in 1934–35 and 41 in 1933–34. Nineteen of these were new students including 9 dental hygienists.

3. *Improvement in scholarship.*—It is the opinion of the faculty that the students as a whole have achieved more and have done a better grade of work than any student group in a period of 7 years. This was especially true of juniors and seniors whose work is largely clinical and is graded on the basis of quantity as well as quality.

4. *Graduates.*—Five graduating students were awarded the degree of doctor of dental surgery at the June commencement. Six students were awarded certificates in oral hygiene. A very encouraging thing for our graduates is the increasing number of internship awards open to those who have excelled in scholarship, character, and promise. The following have been annually available: The William A. Forsyth postgraduate internship, the Murry and Leonie Guggenheim postgraduate internship, and the Freedmen's Hospital internship. Other internship opportunities are available also from time to time.

5. *Oral hygiene.*—The department of oral hygiene has completed its second year. The graduates in this department uniformly met the requirements for licensure in the District of Columbia and the various States, but the percentage of employment was low. With a view to heightening the employment percentage, the college of dentistry has established a placement bureau.

6. *Faculty.*—There were 14 members of the faculty during the year, distributed as follows: 2 associate professors, 2 assistant professors, 9 instructors, and 1 assistant.

7. *The needs of the dental college.*—The dental college is in urgent need of further improvement. A small Public Works Administration appropriation is available toward this purpose and the work will proceed during the summer. The college further needs 22 new dental units and an octoclave sterilizer to supplement and partly to replace badly outworn and inadequate equipment.

COLLEGE OF PHARMACY

1. *Organization and general trends.*—The college of pharmacy began the year 1935-36 for the first time with the full 4-year curriculum in operation as adopted by the American Association of Colleges of Pharmacy, leading to the degree of bachelor of science in pharmacy.

2. *Registration.*—Twenty-six students registered for classes at the beginning of last year, 10 of whom were freshmen. Four of the entering classes were granted tuition scholarships. A number of qualified applicants were unable to enter because of financial need.

3. *Graduates.*—There were three graduates from the college of pharmacy who received the degree of bachelor of science in pharmacy. One of these was a graduate from the 3-year course who returned for the 4-year course and the bachelor of science degree. Several of our graduates have specialized in the purely professional practice of pharmacy in Virginia, West Virginia, Missouri, and Kansas. Reports indicate they are meeting with success.

4. *Faculty.*—We greatly regret to report the death of one member of the staff. The faculty for the coming year will be one vice dean, who is also professor of pharmacy; one professor of pharmacognosy department, two instructors in pharmacy, full time, and one instructor in pharmacy, part-time.

5. *Equipment and library.*—The scientific equipment of this college is now considered by the dean to be adequate and favorably comparable to that of other small colleges. Improvements and additions are being made annually as needs require.

The library of pharmacy is now combined with that of medicine. About 50 books have been added this year.

SCHOOL OF LAW

1. *Trends.*—The school has moved from its old and distressingly inadequate quarters on Fifth Street NW., to a much better building on the main campus of the university. Its enrollment has increased in numbers and in quality. Its library facilities are still growing, but too slowly. Its faculty meets the minimum requirements of the American Association of Law Schools, but has insufficient full-time members.

2. *Enrollment.*—The total enrollment of the school for 1935-36 was 62 as compared with 44 in 1934-35 and 37 in 1933-34. The present enrollment represents 23 States as compared with 17 States represented in 1934-35. It represents 29 undergraduate institutions as compared with 11 for 1934-35. Of the total enrollment 42 were new students, 35 of whom, or 83 percent, held the bachelor's degree or above. A majority of these entering students, moreover, were honor students in their respective colleges. One was a member of Phi Beta Kappa.

3. *Graduates.*—Four graduates received the degree of bachelor of laws degree in June 1936.

4. *Faculty.*—During 1935-36 the faculty consisted of six part-time teachers and four full-time teachers. There is urgent need of an additional full-time teacher of proven ability to place the school of law on a sound, full-time basis.

During the year the school had also six special lecturers.

5. *Library.*—During the year the Harvard University School of Law donated 238 miscellaneous volumes many of which are rare, some dating back as early as 1684. There were many other donors during the year who together made contributions of 913 volumes. Following is a detailed statement of the books now in the library:

Books as of June 30, 1936.....	15,796
Books purchased, 1935-36.....	359
Books by gifts, 1935-36.....	913
Books by binding, 1935-36.....	29
Books lost and exchanged (lost 8).....	18
Books as of June 30, 1936.....	17,079
Periodicals received by purchase.....	30
Periodicals received by gift.....	30
Circulation of books, 1935-36.....	2,043

6. *Needs.*—The outstanding needs of this division of the university are: (1) Additional full-time faculty members (at least one more for 1937-38), and (2) increased funds for the binding, rebinding, and purchase of books and legal periodicals.

SCHOOL OF RELIGION

1. *Support.*—The school of religion received no support from Federal funds. Its work is maintained wholly by income from endowment and gifts from private sources.

2. *General trends.*—During the year 1935-36 the school of religion completed its passage through the period of transition by graduating the last members of the theological college.

3. *Enrollment.*—During the year 1936-37 the enrollment of the school for the first time will be composed altogether of students who have received the bachelor's degree or its equivalent from reputable institutions. This marks the completion of the first basic step in placing the school of religion on an entirely graduate basis.

4. *Faculty.*—The faculty suffered the loss of Dr. William Gordon, who for 14 years taught homiletics in the school of religion, and died June 5, 1936. He was highly respected and loved, and his loss will be difficult to sustain. One associate professor was on leave of absence during the year. There were three full-time teachers on the faculty and eight part-time teachers, representing a full-time equivalent of 6.20 percent.

Two members of the faculty published books during the year.

5. *Extension work.*—The eleventh annual ministers institute, held at Kinston, N. C., was one of the most helpful and constructive conferences in the history of the extension work of the school of religion.

As in years previous, the school of religion gave religious instruction to a group of Washington churches under the leadership of Dr. John Bentley. Many of the students served as assistant pastors and leaders in the churches of the District of Columbia and vicinity, and practically all Sunday speakers for the Maryland normal schools were supplied by the school of religion.

The thirteenth annual convocation of the school of religion was held in November. Men of national repute served as leaders and the convocation was well attended.

6. *Graduates.*—Seven students were graduated on June 5, 1936, three receiving the degree of bachelor of divinity and four the bachelor of theology degree.

UNIVERSITY LIBRARY

1. *Book and periodical collection.*—The total collection of books in the university is 99,005. During 1935-36 we accessioned 6,972 in the main library and a total of 8,270 in the entire university. The number of periodicals now received totals 592, representing 365 by the main library, 60 by law, and 167 by medicine. The total book collection at Howard University is greatly inadequate for an insti-

tution of this size and the rate of acquisition is too slow. The staff made a careful study of the adequacy of our book collection during the current year. This study shows that the library rates very low on holdings of books listed in various standard book lists and bibliographies. For example, we possess approximately 40 percent of the titles on the Charles B. Shaw list of selected books for an undergraduate college library and 58 percent of the selected titles of general cultural books in the Helen E. Haines bibliographies, from only one-tenth to one-third of the titles of works in the various classics in English literature, and only 8½ percent of the titles in Mudge's Standard List of Reference Books. The university needs a minimum of 200,000 books at a cost of \$300,000. It is hoped that a special book grant may be secured for a period of 5 years, so as to overcome this grave defect in our equipment.

2. *The University libraries.*—The total collections outside the main library now number 35,057 as follows: Medicine, 10,145; law, 17,076; religion, 1,443; engineering and architecture, 1,823; liberal arts departments, 4,570 (comprising: botany, 697; chemistry, 2,038; mathematics, 753; and physics, 1,082). A better coordination of these resources is much needed.

3. *The Moorland Foundation.*—This collection now numbers 9,992 items. One thousand three hundred and thirty-nine items were acquired during the year by purchase and by gift.

4. *Important needs.*—(1) Immediate erection of the long-delayed library building, (2) \$300,000 for book and periodical collection, (3) an enlarged staff, and (4) professional classification and salary scale for the staff.

BUILDINGS AND GROUNDS

1. *Two divisions of work.*—Work on the buildings and grounds of the university went forward during the year under two major divisions: (1) The regular university department of operation and maintenance, and (2) building construction work under the direction of the Public Works Administration, with a contract for each project.

2. *Special survey for improved organization service.*—To supplement internal surveys made by the superintendent of buildings and grounds and to further improvement in organization and work the trustees of the university secured the services of Mr. R. R. Linn of Muskegon, Mich., a specialist in the maintenance of buildings and grounds, to make a detailed survey of the organization and work of this department, with recommendations. The report has been received and clearly will be of great value to the university.

3. *Buildings under construction.*—The following table shows the list of building projects in process during the year ending June 30, 1936. These buildings were going forward under the funds and direction of the Public Works Administration.

Building projects in process, year ending June 30, 1936

No.	Description of project	Date authorized	Total appropriations
2	Construction and equipment of a chemistry building.....	May 4, 1929	\$626,300.00
5	Construction and equipment of a library building.....	Feb. 14, 1931	800,000.00
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 at June 30, 1936, was as follows:

Project no. 2.—Chemistry building. Building completed. Equipment and furniture being installed. Estimated to be ready for occupancy in September 1936.

Project no. 5.—Library building appropriation restored from impoundment, February 7, 1936. Plans and specifications being revised and printed for proposals.

Project no. 8.—Heat, light, and power plant—project nearly completed. The first trial run was begun on April 2, 1936. Chief engineer and staff had been secured, and trial period was still in process.

Project no. 9.—Men's dormitories. The appropriation impounded early in the year 1936 was released by the Bureau of the Budget on June 11, 1936. Architect's contract was presented for approval of the Secretary of the Interior on June 13, 1936, and was awaiting his approval. Plans and specifications to be ready within 120 days from the date of the signature of the contract.

Needs.—By reason of the shortage of funds during the depression period, the interior painting of the buildings of the university and other important items of general repair are far behind schedule and in a distressing state. This department needs a minimum increase of \$50,000 in funds available for this purpose during the school year 1937-38.

FINANCES

The total assets of the university at June 30, 1936, were \$7,963,170.93, 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 \$1,095,974.38 represents assets in the physical plant extension fund, made possible through private gifts from the General Education Board and the Julius Rosenwald Fund; \$910,012.36 represents en-

dowment; \$5,780,583.59 represents plant fund assets (an increase of \$683,183.90 since the last report), exclusive of the unexpended balances of Government appropriations for buildings, as indicated above. The remaining \$176,600.60 represents assets of the current fund.

The total income for the year 1935-36 was \$1,691,351.30, including current and capital funds. This represents a gross decrease of \$52,467.69 under the total income for 1934-35. The total income for current purposes, however, was \$1,024,118.60, or an increase of \$36,905.89 over the income for current purposes for 1934-35.

The total expenditures for all purposes, current and capital, were \$1,709,992.63, representing an increase of \$17,276.37 over the total expenditures for 1934-35. The total expenditures for 1935-36 were \$1,025,483.50, representing an increase of \$72,097.15 over the year 1934-35, and an excess of expenditures over the income by \$1,364.90.

While the peak expenditures of long appropriated Government funds for buildings temporarily throw a heavier percentage weight on the side of the Government in the total expenditures, the percentage of Government funds for current support is less than during the previous year.

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

(W. A. WARFIELD, *Surgeon-in-Chief*)

Many difficult problems were encountered last year, arising principally from a shortage of personnel, particularly in the nursing department where the situation became so acute during the winter that it was necessary to close 1 ward of 28 beds in order to maintain a fair standard of nursing. The professional service rendered the patients and the results obtained were on the whole satisfactory.

PATIENTS

At the beginning of the year, there were 233 patients remaining from the preceding fiscal year. There were 4,830 admitted into the hospital during the year, making a total of 5,063 indoor patients under care. Of those remaining, 22 were pay patients, 74 indigent residents of the States, and 129 indigent residents of the District of Columbia. Of those admitted into the hospital, including births, 687 were pay patients, 1,600 were indigent residents of the States, and 2,540 were indigent residents of the District of Columbia.

There were discharged during the year, including births, 3,930 of whom 2,356 had recovered, 1,975 improved, 189 unimproved, and 307 died, leaving 234 in the hospital July 1, 1936, of which number 24 were pay patients, 79 indigent residents of the States, and 131 indigent residents of the District of Columbia.

Of the deaths, 26 were coroner's cases, 64 died within 48 hours after admission, and 34.1 percent were autopsied at the hospital. The mortality rate from all causes was 5.7 percent.

There were 2,035 surgical operations performed, of which 1,132 were major and 903 minor.

In the dental department 1,960 received care and treatment.

In the outpatient department 23,742 received treatment, of which number 8,816 were new cases. There were 6,537 emergencies. This department was greatly overcrowded and many persons could not be given the attention needed because of a lack of personnel.

NEEDS

As stated in the last annual report, the outstanding and most urgent need of the hospital is a larger personnel. It must be admitted that the care of the sick should be divided into three main

groups: (1) Physical equipment, to include housing apparatus, machinery; (2) sustenance, such as food, heat, medication; (3) service, which embodies personnel. Hospitals are classified according to their preparation to meet requirements along these lines, and the sick can be properly cared for only in proportion as the institution is equipped to meet their needs. The first two elements, physical equipment and sustenance, have been met fairly adequately; but the increase in personnel has in no degree kept pace with the steady growth of the hospital.

Our most glaring deficiency is in the nursing department where 16 additional graduates must be employed if the patients are to receive the best that medical science has to offer, and at the same time reduce the hours of duty for the nurses to a daily basis of 8 in accordance with standard requirements. For this, \$20,160 will be required.

Two social service workers should be provided without further delay. This part of the hospital service cannot function properly without these additional employees. The primary purpose of the hospital social service department is to further the medical social case study and treatment on an individual basis. It is recognized that the two workers now employed cannot carry on this important service in the manner desired, owing to the large number of applicants requiring attention. Three thousand six hundred dollars will cover this deficiency. An additional clerk should be employed in this department. It is only necessary to call attention to the 35,187 patients treated in the outdoor clinics during last year to emphasize the urgency for an additional clerk at \$1,440.

One additional orderly, at \$1,080, is required for the new clinic building. It has been an uphill struggle to keep this building of 40 rooms clean with one employee, whose time must be divided between serving physicians, directing patients to the various clinics, and keeping all rooms in a proper state of cleanliness.

Adequate appropriation for the foregoing personnel must be provided as a minimum requirement, or the hospital will be forced to continue operation, as heretofore, on a skeleton basis, and this at a time when the demand for service is most insistent.

COLUMBIA INSTITUTION FOR THE DEAF

(PERCIVAL HALL, *President*)

During the fiscal year July 1, 1935, through June 30, 1936, there were under instruction in the advanced department of the institution, known as Gallaudet College, 85 men and 60 women, a total of 145, representing 37 States, the District of Columbia, and Canada. This is an increase of eight as compared with the preceding year.

In the primary and grammar department, known as the Kendall School, there were under instruction 37 boys and 32 girls, a total of 69. This is a decrease of three as compared with the preceding year. Of the total in this department 67 were admitted as beneficiaries of the District of Columbia.

There were admitted to the institution 41 males and 27 females; discharged 36 males and 25 females.

HEALTH

Although a serious case of infection and three attacks of appendicitis requiring operation occurred during the year, all were successfully treated and general health was excellent. Modern preventive and protective methods are employed by our institution physician in medical care of the students and pupils.

COURSES OF INSTRUCTION

An additional course in educational psychology was added to the curriculum of the advanced department.

NEEDS OF THE INSTITUTION

A study of future building expansion has been made. This should include the following: New building to house library, printing office, laboratories, and recitation rooms; additions to the powerhouse, laboratory, and gymnasium; three complete units for housing and instructing the pupils of the Kendall School; and an additional cottage for permanent employes.

No additional buildings have been constructed for 18 years and the facilities for laboratory instruction are not modern. Dormitory space is badly crowded for both pupils and older students and the most pressing need at the present time is for relief in this respect.

The scale of salaries should be revised again in the near future to put them on the plane with those of similar workers elsewhere.

RESEARCH WORK

From time to time small grants of money have been arranged for to carry on research work in the institution. It is probably the finest field for this type of work in the world as the institution is located in Washington and covers a range of ages of students and pupils from 6 to 26. As the only institution in the world for the advanced instruction of deaf persons it is looked on as a center of information for other schools. Continuous research work should be carried on by regular employees. As a beginning one research worker with an assistant should be provided for in the near future.

RECEIPTS AND EXPENDITURES

The total receipts for the current operations for the fiscal year ending June 30, 1936, were \$181,253.36; total expenditures, \$178,716.63.

PRESENTATION DAY

On commencement day the degree of master of arts in the normal department was awarded to 8 graduates of other colleges and universities; 12 degrees of bachelor of arts and 11 degrees of bachelor of science were granted to the deaf graduates of advanced department. The honorary degrees of master of arts were conferred upon two well known teachers of the deaf, Miss Edith Mansford Fitzgerald and Miss Helen Bradshaw Fay.

THE ALASKA RAILROAD

(O. F. OHLSON, *General Manager*)

Gross operating revenues for 1936 were \$1,868,526.13, an increase of \$349,570.61, or 26.76 percent over the comparable figure for 1935. Operating expenses were \$1,888,934.30, an increase of \$331,371.12, or 21.27 percent, due to increased train service, also because of expanding the program of improvements and rehabilitation, consisting of ditching, bank widening, grade raising, ballasting, replacing wooden culverts with concrete pipe, placing rock to protect roadbed against erosion from rivers and streams, and making line changes to eliminate snowsheds.

The operating deficit amounted to only \$17,443.89, a reduction of \$56,230.77, or 76.3230 percent. The deficit figure includes an expenditure of \$27,121.81 made during 1936 for investigation of mineral and other resources, which amount, if deducted, would produce an operating profit of \$9,677.92, a most satisfactory improvement.

Passenger earnings in 1936 increased \$66,431.71, or 38.04 percent. Freight earnings for the year increased \$249,039.83, or 21.84 percent.

The rail-line revenue passengers in 1936 increased 19,771, as compared with last year, which was in part due to the increased tourist travel and in part to local travel between Anchorage and Palmer. Rail-line freight tonnage handled increased 41,796 tons, divided 19,145 tons to coal shipments and 22,651 tons to miscellaneous merchandise. The increase in freight tonnage is attributable to the result of improved business conditions.

The pay roll for 1936 amounted to \$1,572,454.25, an increase of \$233,628.98 over the previous year. Increased employment, necessitated by the greater volume of traffic handled, accounted for the greater part of the increase in pay roll, while a substantial part was due to the restoration of pay-roll deductions.

The more important additions and betterments consisted of placing 61,455 cubic yards of ballasting in main and branch tracks; placing of 6,359 cubic yards of riprap; relocating main line at mile 71.2 by constructing 1,700 feet of trestle which was filled with 101,662 cubic yards of gravel and 29,310 cubic yards of rock; replacing wooden bridges at Bird Creek and Kern Creek with 80-foot steel girders and cresoted pile trestles; construction of a new passenger and freight depot at Palmer; construction at Curry of an

18-room addition to the Curry Hotel, to be completed in July 1936; construction of a car-repair shed at Anchorage; extension to face of Seward Dock; construction of a new section house at Berg; construction of a warehouse at Holy Cross, to be completed in August 1936; construction of a 400-ton barge for river service; and the reconstruction of telegraph and telephone line for 30.8 miles.

Practically all of the mining camps adjacent to The Alaska Railroad, from Seward to Fairbanks and Yukon River points, were very active. These camps include the Moose Pass-Hope gold placer and lode, Girdwood gold placer and lode, Willow Creek gold lode, Nelchina gold placer, Yentna gold placer, Valdez Creek gold placer and lode, Broad Pass gold lode, Kantishna gold-silver-lead placer and lode, Bonnifield gold placer, Hot Springs gold placer, Fairbanks gold placer and lode, Livengood gold placer, Circle gold placer, Ruby gold placer, Innoko-Iditarod gold placer, and many other small scattered districts. The greater part of the increase in activity is in gold mining, and is due to the mechanization of old low-grade properties rather than to new discoveries.

Some of the outstanding new developments of the year were: The installation of a gold dredge in the Moose Pass-Hope district; the successful installation and operation of a gold-gravel washing plant in the Yentna district, which will stimulate the further use of similar types of equipment where special operating conditions exist; the continued development of a low-grade gold-lode property in the Broad Pass district, which, if successfully terminated, will invigorate the entire railroad area; the continued development of new gold dredging ground in the Fairbanks district; and the installation of a new gold dredge in the Circle district.

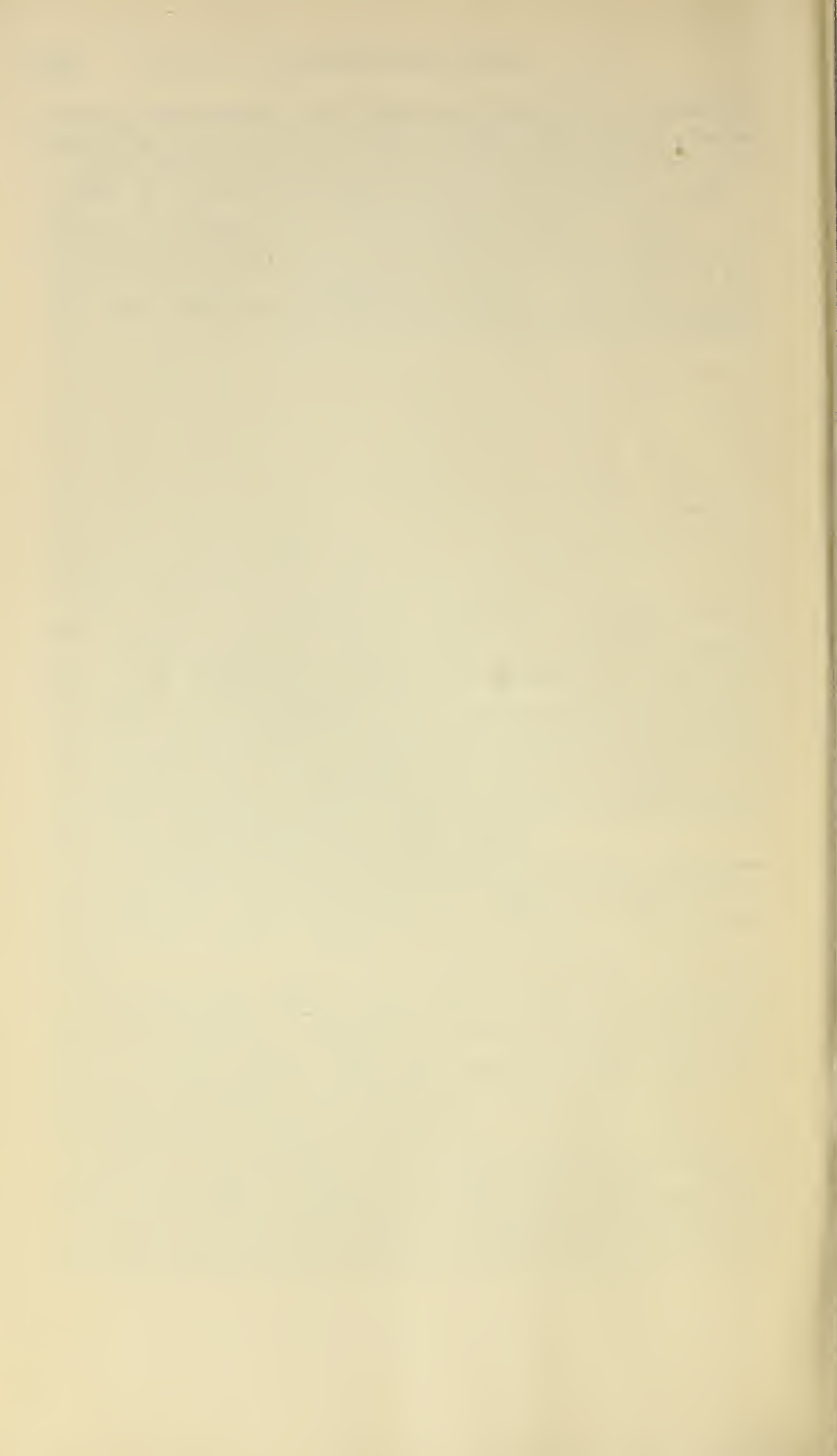
Coal was mined throughout the year in the Matanuska bituminous and Healy River lignite-coal fields. In addition to supplying fuel to all railroad points, 6,736.66 tons were shipped to nearby coastal towns.

The colonization project in the Matanuska Valley, which was started during May 1935, caused a heavy movement of passengers, construction material, and supplies to Palmer during the 1936 fiscal year. A traffic normal to what may be expected from a community of its size will rapidly be realized as the construction and development stages of the project are completed.

Outside of a reduction in revenues, as a result of completion of construction work at Palmer, it is expected that freight revenues in 1937 will closely approximate this year's totals. Passenger traffic is expected to increase, but with the present hotel facilities in the rail belt, including Mount McKinley National Park, being far from

adequate in comfortably providing for the present travel, the expansion of the tourist traffic presents a serious problem, and it is of vital importance that modern facilities be provided for the future.

The application of the Annual Leave Act of March 14, 1936, to the employees of The Alaska Railroad will substantially increase the operating expenses of 1937, but with a gradual improvement of the roadbed and the replacement of temporary structures with permanent structures, a further reduction in maintenance and operating costs may be expected in the near future.



THE PERRY'S VICTORY MEMORIAL COMMISSION

(WEBSTER P. HUNTINGTON, *President*)

This report of the Perry's Victory Memorial Commission, created by act of Congress March 3, 1919, is its seventeenth and final annual report, not including a special report filed April 6, 1933. The act of Congress entitled "An act to provide for the creation of the Perry's Victory and International Peace Memorial Monument, on Put-in-Bay, South Bass Island, in the State of Ohio, and for other purposes", approved June 2, 1936, transferred control and administration of the memorial to the National Park Service under direction of the Secretary of the Interior, effective by proclamation of the President July 6, 1936. By the terms of this act the former Memorial Commission was terminated but its membership reconstituted as a board advisory to the Secretary of the Interior in the future administration of the Perry's Victory and International Peace Memorial.

Previous annual reports have set forth in detail all financial transactions of the former Commission, as required by law to be filed with the Secretary of the Interior on the first Monday of December of each year. The present report is therefore a summary of the sixteenth annual report for the year ended December 1, 1935, and a statement of receipts and expenses for the fiscal year ended June 30, 1936, with additional information as to operation of the memorial during the season of 1936, as compared with recent previous seasons.

Receipts for the memorial for the fiscal year ended June 30, 1936, were \$3,320.80, and expenses the same amount, such expenses, however, including disbursements of \$336.80 on account of previous indebtedness from operation.

Receipts from operation for the year ended December 1, 1935, as shown by the Commission's sixteenth annual report, were \$3,128.80, and expenses \$2,489.25, the cash balance December 1, 1935, being \$699.95. Receipts indicated an increase of approximately 18 percent over the previous year, and expenses a decrease of \$573.45.

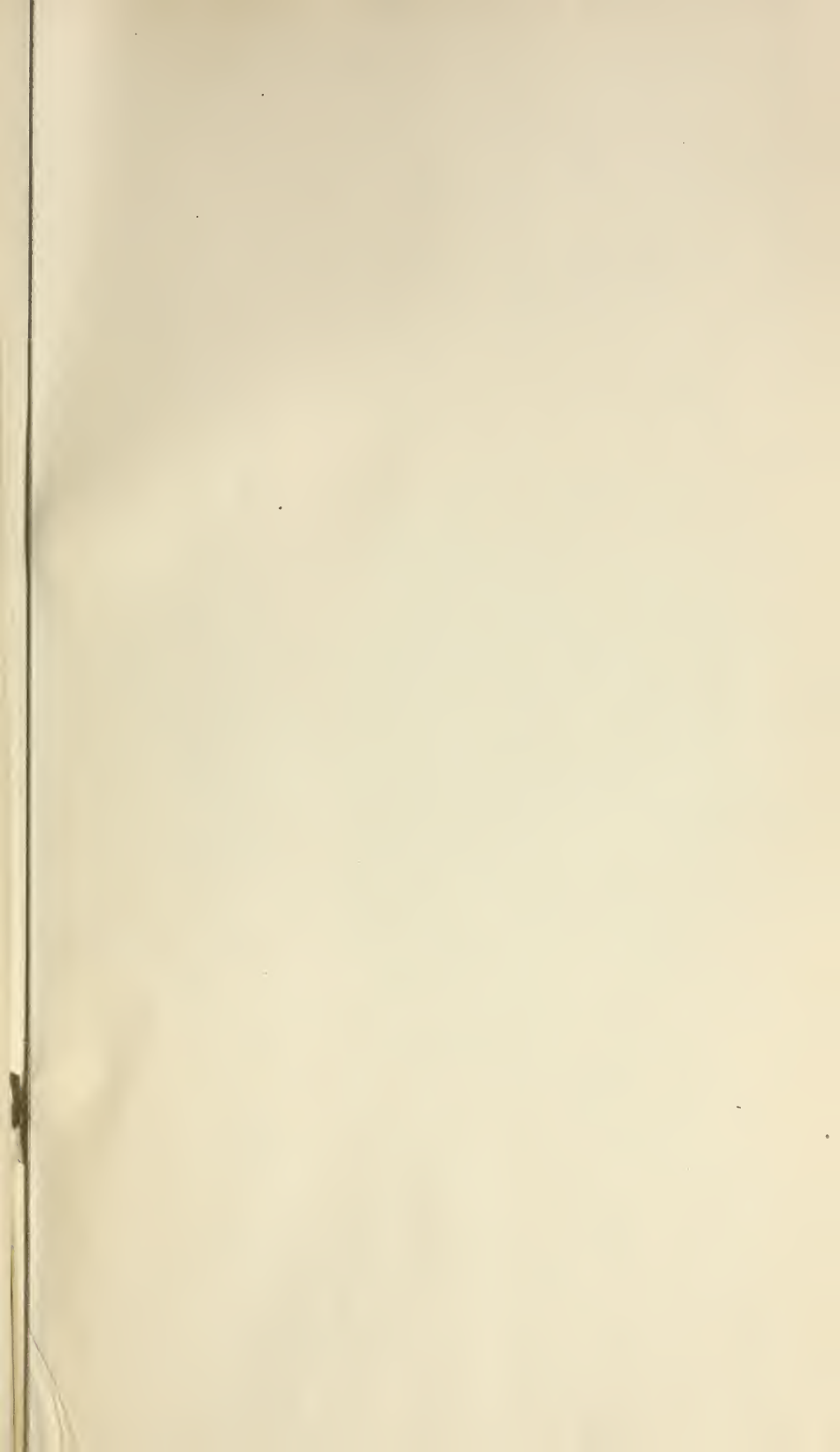
Based on the increase in receipts to August 24, 1936, as compared with the same period in 1935, the total increase for 1936 will be not less than 25 percent. This would indicate an increase of approximately 45 percent over the season of 1933, the most unprosperous

in the history of the memorial since it was opened to the public in 1915.

Concerning funds received by the Commission from the grant, in 1934, of \$25,025 by the Federal Emergency Administration of Public Works, of which \$4,465 was rescinded, there remains an unexpended and unappropriated balance of \$353.11.

In its annual report for the year ended December 1, 1935, the Commission appealed for cooperation of the Department of the Interior to discharge its indebtedness continuing on account of the rescindment of the allotments above referred to and to meet other indebtedness necessarily incurred in operating the memorial during 5 years of general business depression. The total indebtedness thus indicated is \$7,305.50. To emphasize the justice of relief in this amount by the Government, the Commission sets forth the fact that upon transfer of the memorial to control of the Secretary of the Interior and National Park Service by the act of Congress approved June 2, 1936, the Government came into possession of assets totaling \$37,829.56, derived by the Commission, in its 16 years of administration of the memorial, in large part from sources other than its revenues from operation and representing chiefly absolutely necessary improvements. The Commission now respectfully renews its request contained in the report aforesaid, that payment of the debt of \$7,605.50 shall be regarded by the Government as an obligation meriting discharge by act of Congress or otherwise.







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