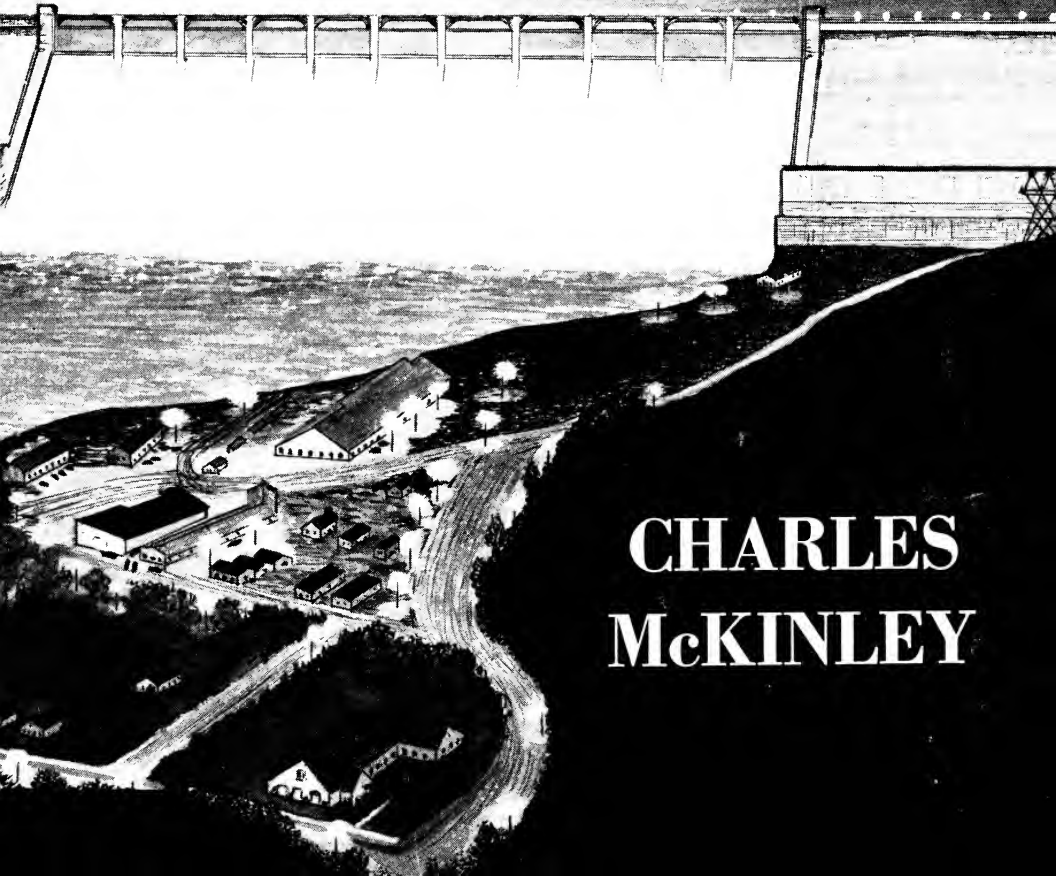


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IN THE
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*Federal Management of Natural Resources
in the Columbia River Valley*

BY CHARLES MCKINLEY

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TO NELLIE

Preface

THIS IS A STUDY in public administration and public policy. It is concerned with those federal field services that manage and develop natural resources in the Pacific Northwest. For the past fifteen years there has been widespread interest in the region drained by the Columbia River concerning the possible establishment of a valley authority. There has been continuous and acrimonious debate over the need and desirability of copying the Tennessee Valley Authority model for the planning, control, and management of the land, water, and related resources now under the jurisdiction of several separate federal bureaus and departments. That debate became particularly vigorous near the close of the Second World War when President Roosevelt advocated the early enactment of valley-authority legislation to carry out developmental programs in the Missouri and Columbia River watersheds. This proposal was quickly expressed in bills introduced by Senators Murray of Montana and Mitchell of Washington.

The Mitchell Bill, introduced in February, 1945, first spelled out the detailed basis for a federal valley authority-program for the Columbia Valley region. Its publication was greeted within the Pacific Northwest with paeans of praise from public ownership advocates, most of the leaders of the Washington and Oregon state granges, and many other citizens concerned with a comprehensive and integrated plan for developing the region's water resources and for placing on a sustained yield or on a conservation basis the management of the land and mineral wealth over which the agents of the national government exercise financial, administrative, or legal responsibility. Anguished cries of even greater volume and intensity came from other regional residents and organizations, private utility officials, chambers of commerce, the National Reclamation Association, and many other business groups, who protested and denounced all valley-authority legislation for the Columbia. The protagonists of change charged that existing federal agencies within the region had failed to make the most of the resource potentialities for its people and for the nation, had supported piecemeal and duplicating plans and programs, and had engaged in enervating jealous conflict. The opponents of the authority idea countered with praise for the plans and achievements of the galaxy of bureaus entrusted with the development and management tasks and with charges of federal "dictatorship" and "communistic" objectives lurking behind the authority facade.

The heat and din of verbal battle brought forth little information about the precise program activities of the existing federal resource agencies operating in the Pacific Northwest, about the extent of interagency conflicts or duplication, about the adequacy of plans for development or for correction of neglected and depleted resources, or about the need or possibility of alternative modifications of federal administrative organization. It seemed useful, therefore, for someone to take a hard and careful look at the pattern of federal administrative structure and activity concerned with resources management in the Columbia Valley. The writer has immodestly undertaken this task. He has used his vacations and other spare hours since June, 1945, to explore the work and the administrative arrangements of the principal federal field establishments engaged in these tasks.¹ While he was examining these matters, events arising from the termination of the war and from the 1946 shift in party control of Congress altered a number of the programs and the administrative organization and relationships of several of the agencies being studied. Reëxamination of facts and conclusions noted in the first period of study thus became necessary to keep pace with the kaleidoscope of governmental change. Final termination of research came in May, 1948, and completion of the manuscript three months later. But the delay in publication has necessarily blurred the current accuracy of some of the factual description of agency activities, structures, and relationships. More important, some new developments of real consequence have occurred which in a few instances modify or complicate conclusions or suggestions voiced in the text. To retravel the whole area of this fluid administrative situation to produce a completely revised story is impracticable; even if it were done it would not greatly affect the nature of the problems delineated by the study or the basic alternatives available for dealing with them. It has seemed better to add a postscript chapter and a few postdated notes in which to summarize briefly some of the more significant developments that have transpired since the late spring of 1948.

The most obscure but significant factors to be discovered and assessed in this study of federal agencies are obviously their essential interrelations, actual or potential. These are of key importance to any valid judgments of the need for changes in structure, relationship, or function. Consequently the center of attention in our analysis has been (1) the existing pattern of working relationships between the several federal services and (2) the kind of relations intrinsically most conducive to best resource management. It early became evident that these matters could not be

¹ Through the generosity of the Rockefeller Foundation and of Reed College he also used the spring term of 1946 on this enterprise. In addition, the Rockefeller Foundation defrayed travel and some other incidental costs of the study. For this help the author makes grateful acknowledgment.

realistically understood without knowing some of the structural arrangements determined either by the Washington offices of the bureaus and departments or by the Congress. It was necessary therefore to examine in Washington the reasons for certain structural features of the national administrative mechanism and the fundamental revisions of departmental or agency responsibilities (for which the Congress would usually be responsible) that might be necessary to permit better articulation and integration of resource management activity within the Columbia River region.

It was also necessary to spend some time in direct contact with the work and staff of the TVA so as to refine insight and amplify knowledge beyond that available from printed material emitted about that controversial agency.

In relating the experience of the Pacific Northwest Regional Planning Commission, as told in chapter xiv, and the more recent history of the effort at intradepartmental coordination undertaken by the Department of the Interior (chapter xiii), the author had the advantage of having occupied a "ring-side seat" from which to view many of the activities described. He had served as consultant to the regional planning commission during most of its decade of life, and had occupied a similar status with the field coordinating committee of the Department of the Interior in the first year of its development. These and other close contacts, official and unofficial, over a considerable span of years, with a number of federal agencies, in Washington and in the field, had naturally yielded a number of notions about the complexities of federal resource functions and their administration. The writer thus early became convinced that improvements in administrative structure, methods, and relationships were both needed and possible. He was also persuaded that it would not be easy to simplify the complex administrative problems posed by the multiplicity and importance of the tasks to be performed. The search for a responsibly ordered design seemed unlikely to disclose any single panacea which would melt away all the intricacies of diverse administrative units performing a wide variety of duties. Would a valley authority afford the best means of simplifying and integrating federal operations within a large homogeneous region like the Pacific Northwest? Or, are there more suitable realignments and extensions of the established executive pattern which might produce more orderliness, comprehensiveness, and consistency in regional field administration of resources while gearing the work within the region more equitably and precisely into the entire national administrative pattern? These have been the queries, and this the point of view with which the inquiry has been pursued whose results are presented in the pages which follow.

For the assembly of the facts and the problems they suggest, it has been

necessary to rely chiefly on information not available in library collections. The principal sources of data have been the experiences and knowledge of the officers, chiefly those in the field service, who perform the federal jobs. Without exception they have been most helpful in their responses. They have allowed the perusal of internal reports and administrative memoranda; they have answered patiently and with remarkable frankness the hundreds of questions raised. Many of them will not agree with the conclusions here presented, but none of them ever attempted to "coerce" the judgment of the investigator. The author takes this opportunity to express his admiration of their general competence and their almost universal concern to serve the public interest honestly and efficiently. They deserve, not the cruel caricatures arising from the current hysteria about "bureaucracy," but the respect and appreciation of the public for their efforts to serve its interest with honesty and skill. If a number of faults and difficulties are revealed in this study, they are not basically attributable to designing federal field officials. They are the result primarily of faulty structural arrangements, financial deficiencies, legislative inconsistencies or inadequacies, and the pressures of special interest groups over which, for the most part, the field officials have but slight control.

A final word of explanation: This volume is offered not as a complete statement of the facts and problems of regional administration of natural resources. It is more nearly a "progress report." A fully rounded study would include many important factors which could not be adequately explored for lack of time. The relationships between federal resource functions and the complementing duties of the states and local governments have been mentioned only incidentally. This omission is not due to lack of appreciation of its importance. No regional administrative plan for natural resources can be complete without the participation of state governments. A careful delineation of existing federal-state-local relationships and of desirable rearrangements needs urgently to be made. In addition, some federal programs partly concerned with resource management—such as those of the Office of Indian Affairs and the Production and Marketing Administration—have not been carefully scrutinized in this study.

Yet, despite the incompleteness of the inquiry, the main issues of public policy and of administrative structure which emerge and call for decision seem reasonably clear. The study is presented now in the hope that its analysis and suggestions may help to resolve them.

CHARLES MCKINLEY

Reed College

ABBREVIATIONS

AAA	Agricultural Adjustment Administration
BAE	Bureau of Agricultural Economics
BAI	Bureau of Animal Industry
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
CBIAC	Columbia Basin Inter-Agency Committee
CCC	Civilian Conservation Corps
FERA	Federal Emergency Relief Administration
FPC	Federal Power Commission
FSA	Farm Security Administration
FWS	Fish and Wildlife Service
GLO	General Land Office
NPS	National Park Service
NRA	National Reclamation Association
NRC	National Resources Committee
O-and-C	Oregon and California [Revested Land Grant Administration]
OPM	Office of Production Management
PMA	Production and Marketing Administration
PUD	Public Utility District
PWA	Public Works Administration
REA	Rural Electrification Administration
SCS	Soil Conservation Service
TVA	Tennessee Valley Authority
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USPHS	United States Public Health Service
WPA	Works Progress Administration

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CHAPTER I

The Pacific Northwest Its Natural Resources and Management Problems

Physical Features

WHAT ARE the natural resources which Uncle Sam manages in the Pacific Northwest and what problems do they present? A century and a quarter of white civilization has wrought many changes from the primeval condition of the land, water, and forests; human exploitation has carelessly added many problems to those which nature posed. We shall find it necessary therefore to look not only at the region's natural endowment, but also at the evolving uses of that heritage made possible by our technological culture, and to envisage the difficulties which we and our children will face unless we modify our management practices to conserve these life-giving riches.

But first, what is the area included within the region of our scrutiny—the Pacific Northwest? A geographic definition would undoubtedly erase the international boundary line which separates us from British Columbia. But because we are concerned in this study with the functions of our federal government in relation to the region, we rule out that part of the Pacific Northwest which lies north of the Canadian border. This exclusion cannot be complete, for, as will be indicated later, there are certain resources (particularly fisheries and the waters of the Columbia) requiring joint Canadian-American management for which international administrative mechanisms have either been established or will be required in the future. Even for this United States Pacific Northwest region two slightly different definitions are possible and proper: The first is the drainage area of the Columbia River system plus the watersheds of the short coastal rivers of Oregon and Washington that empty into the Pacific Ocean and Puget Sound and into the interior drainages of Oregon. That "Pacific Northwest" is the concern of the new federal water consultative

body called the "Columbia Basin Inter-Agency Committee," a subcommittee of the Federal Inter-Agency River Basin Committee. The area includes all of Washington, all of Oregon except the Klamath River drainage, all of Idaho except the Bear River drainage, Montana west of the Continental Divide, a small part of northwest Wyoming, a small enclave of northern Nevada and a tiny corner of northwest Utah. These boundaries, if rounded out to include the Idaho drainage of the Bear River and the Klamath River Basin of southeast Oregon, would contain an area of something like 180,000,000 acres or 281,000 square miles.

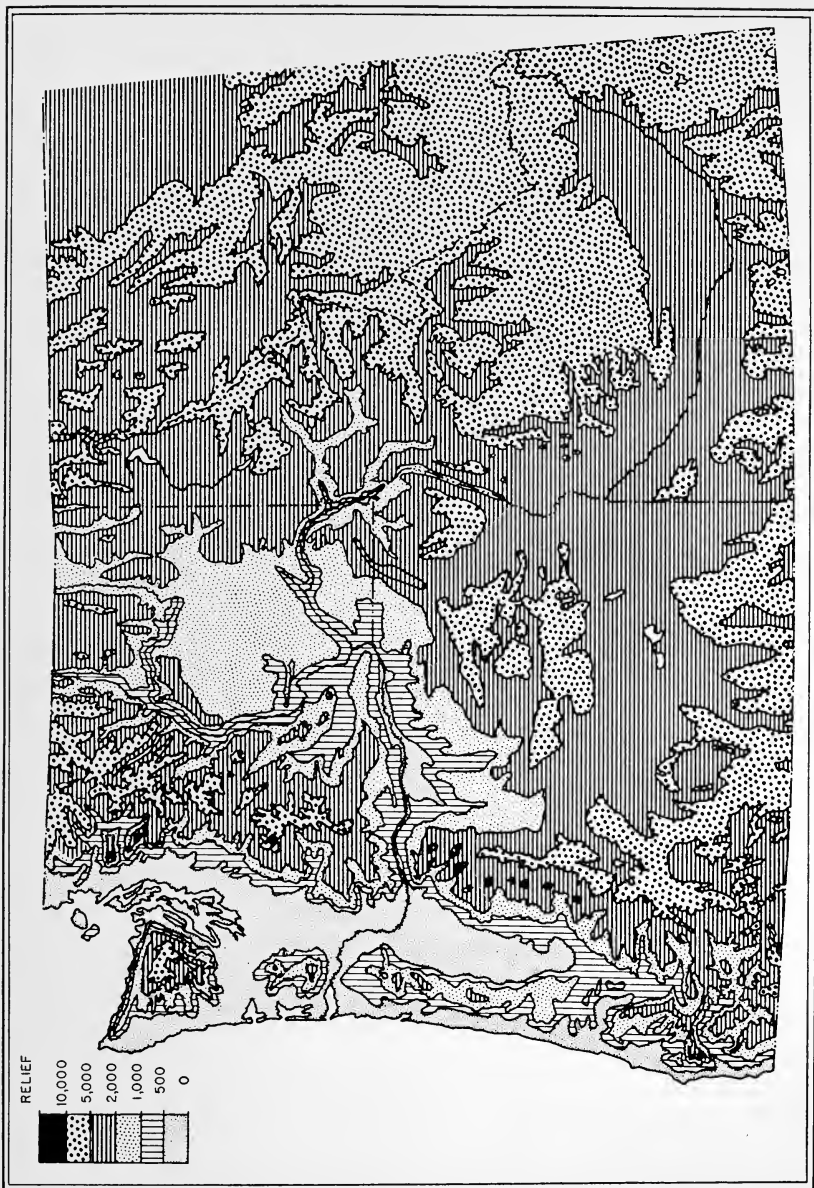
Because the Columbia River system dominates the water resources of the region and is both actually and potentially so important for the life of the people, this areal definition of the Pacific Northwest is valid for a number of governmental purposes.

The second definition refers to land resources. It would be equally appropriate to define the Pacific Northwest as consisting of Washington, Oregon, Idaho, and western Montana—an area of about 188,000,000 acres, or 294,000 square miles. The land-resource agencies, unlike the two major river-development bureaus, do not follow river-system boundaries marking out their regional administrative areas, but ordinarily include whole states. Most of them have heretofore put Oregon, Washington, and Idaho under common regional direction.

The region thus defined nearly coincides with an area that is relatively homogeneous in those economic and social interests from which spring many of the subjects of governmental activity. The sense of community of interest is therefore an ingredient in the determination of a "political" region, as in some degree all civilian governmental administrative regions must be. The Pacific Northwest is a conception with genuine validity as marking out an area whose citizens are confronted by many common civic problems which call for a political consensus.¹

Under either regional boundary the Pacific Northwest measures nearly 500 miles from north to south and an average of about 600 miles from east to west. This large land mass shows great diversity of climate and physical features and consequently of natural resources upon which a civilization may build. The massive mountain ranges of the Rockies form its eastern border, and alternating ridges and valley troughs lie in a northwestern direction. Near the Pacific Ocean at the west edge of the region are other paralleling ranges, the low Coast Range overlooking the sea, and less than one hundred miles to the east the higher and more extensive Cascade Range with its spectacular volcanic peaks—Baker, Rainier, St. Helens,

¹ See the detailed preliminary analysis of this difficult problem of regional definition as applied to the Pacific Northwest, by Charles McKinley and Blair Stewart in *Regional Planning, Part I: Pacific Northwest*. National Resources Committee (May 1936), pp. 96 ff.



Topographic Relief Map.

Source: Adapted from *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 3.

Adams, Hood, Jefferson, and the Three Sisters—bordering the east side of the Puget Sound and Willamette Valley depressions. Between the Rockies and the Cascades smaller mountain masses—the Klamath, Blue, Wallowa, and Steens Mountains—more irregularly oriented, still further break the topography into valleys and high lands and contribute to the variability of climate, landscape, and physical resources. Here also are great plateaus where dry farming, grazing, and irrigated agriculture occupy most of the land surface.

Humid diversified agriculture covers the floors of the land troughs between the Cascade and Coast ranges—the Willamette, Cowlitz, Chehalis, and Puget Sound valleys.

The Columbia River is the great natural physiographic force which disputes the dominance of the mountain chains. Its headwaters, reckless of international boundaries, draw from the snows of the Canadian and American Rockies, as do a number of its northern tributaries. When it reaches the southern boundary of Washington, after skirting the eastern edge of the Cascades, it suddenly turns west and plows its way for over fifty miles through the Cascade Range. Emerging into the broad plain of the lower Willamette Valley it turns north, skirting a chain of high hills on its left bank until once again it aims directly at the Pacific and, easily breaking the Coast Ranges and Willapa Hills, lazily joins the sea.

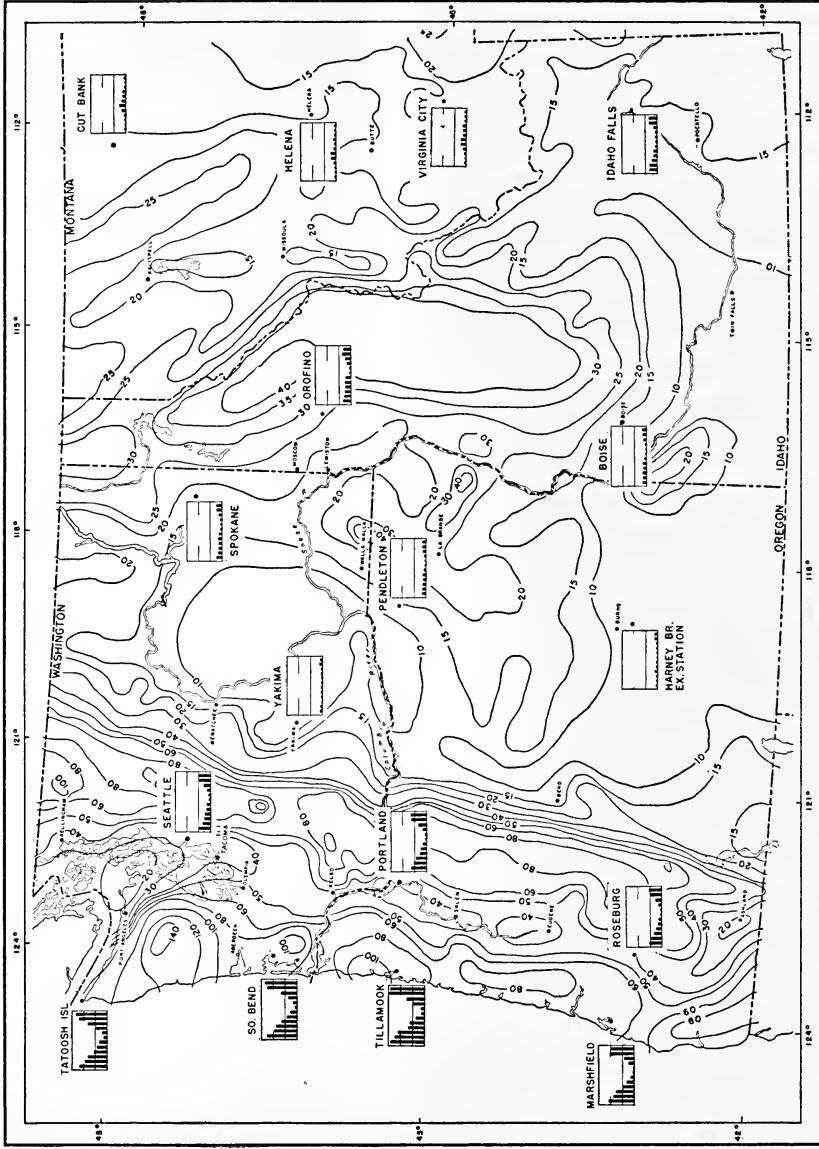
This 1200-mile-long river and its major eastern tributary, the Snake, not only played host to the great schools of salmon that once spawned in great numbers in its upper waters, but they helped the first white fur traders to push their commerce from sea to mountain hinterland, helped the pioneer farmers of the Oregon country across the mountain barriers to their new homes, and bore the cargoes of wheat, apples, and timber from the Willamette Valley en route to the “forty-niners” in California. Since that time the river has responded again and again to the new cultural techniques and needs of the people of the Pacific Northwest. After the Civil War it afforded steamboat transportation for the miners who sought gold and silver in the stream beds and surface outcrops of its Blue Mountains, the Coeur d’Alenes, the Rockies, and the Cascades. When the railroads came puffing from Omaha and the Twin Cities, its narrow shore line accepted the new and greater burdens of modern commerce, offering a water-level grade for the cheap and easy movement of the wheat, timber, and other bulky products of farm, mine, and mill through the mountains to the sea. Though many of its eastern tributaries have, since early settlement, supplied life-giving water for irrigated agriculture, it is only in recent years that the main Columbia has been harnessed to serve the farmers’ need for great irrigation projects and the public’s demand for cheap and abundant electric energy.

While proximity to the ocean gives most of the region what is called a "cool marine" climate, its varied and irregular topography creates such diversity of altitude, temperature, and precipitation that local differences constitute its outstanding climatic characteristic. The air masses that influence its various climates come predominantly from the Pacific Ocean. During the winter the prevailing winds are heavy with moisture and mild in temperature. As they strike the land surface, moisture is precipitated in the form of rain, or, at high altitudes, as snow. This marine-winter-rain characteristic prevails over or influences all of the Pacific Northwest from the seacoast to the Bitterroot Range in western Montana. The higher the land elevations on the west slopes of the mountains at a given longitude the greater the deposit of moisture, but as the air currents move east the successive mountain ridges wring decreasing amounts of rain from the ocean-generated clouds. The moisture deposits on the lee side of the mountains and in the valleys between ranges are always markedly less than on the windward side. These "rain shadows" account for interesting and important climatic variations, most strikingly illustrated by the semiarid condition in Sequim Valley on the east side of the Olympic Peninsula and on Whidby Island in the midst of Puget Sound. Both have such scant precipitation that they need irrigation, although a short distance to west and east deluges in excess of 100 inches a year pour onto the highland areas.

Another example of the same phenomenon is the contrast between the average 140 inches of annual rainfall on the west slope of the Olympic Range and the 6 inches only two hundred miles away on the plateaus east of the Cascades, furnishing a contrast in land cover between an ever dripping jungle of dense trees and underbrush and sparse, semiarid vegetation. Generally, the annual rainfall in the well-settled parts of the area between the Coast and Cascade ranges is slightly over 40 inches, while on the plains and plateaus between the Cascades and the Blue and Rocky Mountains it varies from 6 to 20 inches. While some of the farmlands lying closest to these eastern ranges are favored with a considerably larger amount of snow and rain, on the whole that part of the plateau east of the Cascades is semiarid and this fact sets an important limit to its agricultural use—a limit which only man-made irrigation projects will be able to break.

The summer is a period of scant rainfall for the humid western as well as the dry eastern part of the region. The prevailing cool winds from the northern Pacific bring to the Willamette Valley and Puget Sound areas a summer climate unsurpassed in any part of the United States, though they are dry winds with little or no moisture to deposit on the land.

Snowfall is influenced by a similar combination of air currents, topog-



Average Annual Precipitation.

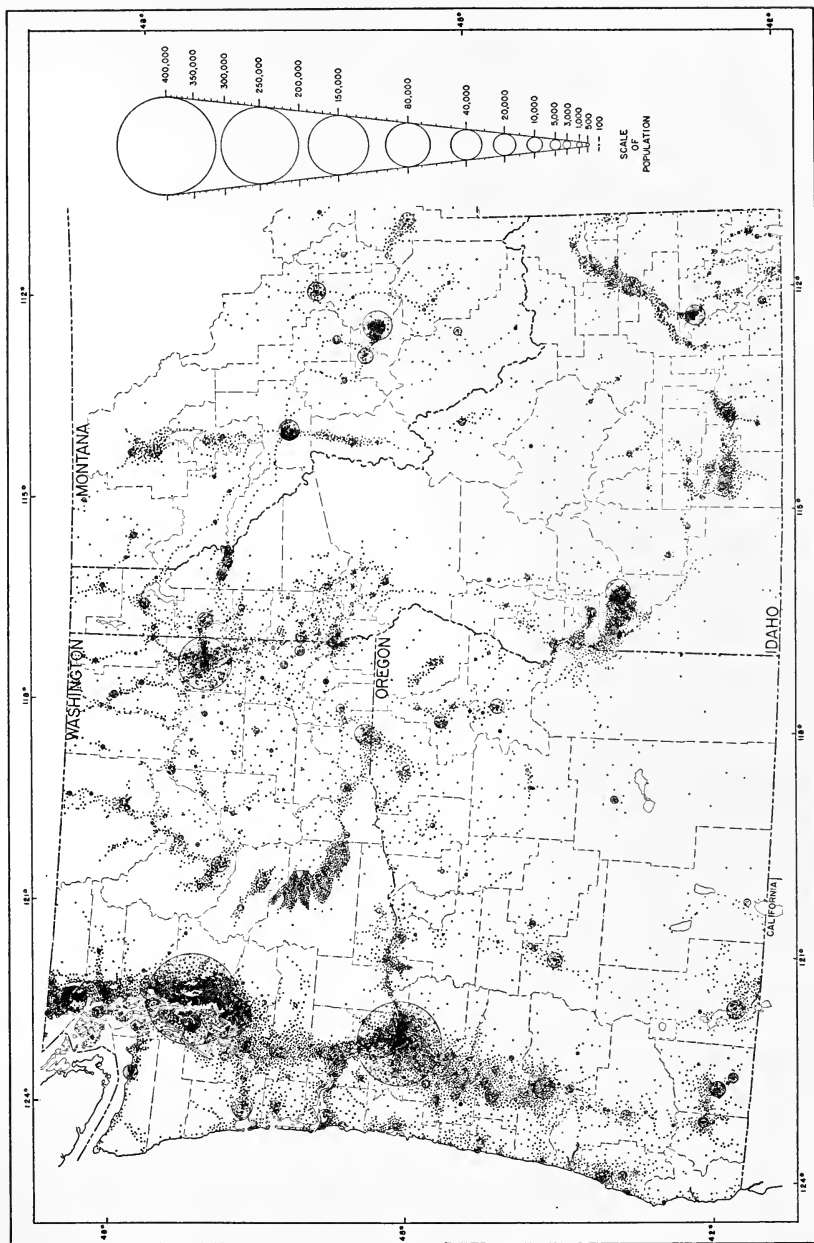
Source: *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 13.

raphy, and temperature. Since the extremes of temperature are moderated by proximity to the ocean, it is to be expected that little snow would fall in the Coast Range (except on the higher peaks and on the Olympics at the north end of the chain), or in the western valleys. The high Cascades catch great quantities of snow, the amount varying directly with the altitude. At Paradise Inn near timberline at Mt. Rainier the winter total averages 591 inches. But on the plateau areas the lower winter temperatures yield little snow because the Cascades appropriate so much of it as the air moves east. The Rockies and the Blue Mountains are also collectors of the snow, which is of major importance in feeding the Snake and the upper Columbia tributaries during the summer season, and in reducing the flow during the coldest winter months. Polar air masses moving down from the continental Arctic meet the marine air currents in the plateaus and valleys between the Rockies and the Cascades, producing much lower winter temperatures and high summer daytime temperatures on the eastern side of the region.

The length of the frost-free season, so crucial for farming, varies greatly, particularly as to the dates of the last killing frost in spring. These differences depend upon altitude and distance from the ocean. As so much of the region is in mountain and plateau areas, frost dates are important limiting factors in agriculture. In the lowlands west of the Cascades the growing seasons are long, ranging from about 180 days to more than 300 in the valleys along the Pacific shore, and winter seasons are occasionally entirely free from killing frost.

The People and Their Economy

The postwar (1947) population of the region is estimated at 4,400,000, an increase of approximately 25 per cent over that of 1940. About 1,400,000 people live in the Puget Sound area of which Seattle, Tacoma, Everett, and Bellingham are the principal urban capitals. Nearly as many more are concentrated in the Willamette Valley and the lower Columbia communities, with the Portland-Vancouver metropolitan cluster as the chief trading, transportation, and service center for lesser cities scattered from Eugene on the upper Willamette to Astoria overlooking the Pacific. Only about a third of the region's population lives in the eastern two-thirds of the region and much of that is concentrated in the "Inland Empire" comprised of the eastern border of Washington, the Idaho panhandle, and northeast Oregon, with Spokane as its capital. A secondary concentration is in the south Idaho country where a narrow ribbon of irrigated farms and agricultural towns borders the middle and upper Snake and its tributaries. There are large areas in central and southeast Oregon and in south



Distribution of Population.

Source: *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 5.

Idaho so arid as to support only an extensive livestock agriculture; people and towns are few and widely scattered.

It is clear that the migration to the Pacific coast for war industrial and military purposes created a new population situation. The belief that with the cessation of hostilities, the end of ship and war-plane construction, and their supplemental industries and services would precipitate an evacuation and backflow of people to the farms and towns of the interior whence they came, was confounded. Once the workers, soldiers, and sailors came to know the Far West, their desire for civilian homes in that region was very pronounced. Not only did most of the war workers elect to remain, but the veterans originating in the area came home in large numbers, many of them with wives and children. Many boys from other parts of the nation who were stationed in the West during their war service also chose to begin their civilian careers in the Pacific Northwest or in California.

Although, historically, migration within the United States was always associated with improved economic opportunities, the permanency of war migration to this region was apparently strongly influenced by the psychological factor of taste for the region and its climate and by other preference imponderables. This unpredictable permanent increase of people in the Columbia Valley region has also been affected by the remarkable postwar expansion of commercial, industrial, and construction activity, which has easily absorbed the large number of migrants choosing to stay, as well as most of the returning veterans. The latter, with their war savings, terminal-leave pay, and unemployment compensation, have not been forced to rush "back home" or elsewhere to take the first job that was offered. They have had time to wait and fit themselves into the economy of the region to which they have become attached.

The war gave the Pacific Northwest a decided push in a few new industrial directions of large potential importance, though it is too early to know what permanent changes in the economy of the region will result from the war-induced activities. While there is clear indication that the new aluminum and electrochemical industries will modify the prewar economy in important particulars, we cannot yet discern the degree of change. The production of pig aluminum greatly curtailed for a short period after the end of fighting has been resumed, and the great reduction plants are producing at nearly the war volume. The fabrication of aluminum-finished products, despite the closing of part of the big war-built rolling mill at Spokane, has been growing steadily. Aluminum is coming into common use within the region and elsewhere for truck bodies, for irrigation pipe, for barn roofs, for warehouse siding, and for many other construction and "gadget" purposes. Even though these uses have been stimulated by the abnormal prices of steel and wood, it seems certain that

many of them will persist. A light-metals industry of small but promising proportions has thus been added to the opportunities for human and capital employment in the Pacific Northwest.

The chemical industries, attracted by low rates for hydroelectric energy and by war markets, have also built a number of plants of basic industrial value. The establishment of plants producing caustic and calcium carbide has set the "stage for a wide range of chemical production from drugs to plastics."² A number of branch processing or assembling plants owned by large national producing and merchandising companies have also been built and staffed since the end of the war. These doubtless reflect the larger market for a variety of products which the growth of population since Pearl Harbor has created within the region and in California. Their location here has not only stimulated temporary commercial construction, but will afford permanent new jobs for the local population.

Yet, despite these evidences of new industrial activity, the people of the Pacific Northwest will for some time to come be dependent primarily on the same elements which constituted the region's prewar economy. Under that basic pattern agriculture, in the first place, and forestry, in second, were the sources, direct and indirect, of the livelihood of approximately 75 per cent of the regional population. Of the region's factory workers, 62.5 per cent were employed by industries based on forest resources, while 15.8 per cent were in food processing and manufacturing—a total of 78.3 per cent. This is clear indication of the preponderant place which agricultural and forest-land resources have heretofore taken in supporting the population of the Pacific Northwest. Mining has declined in relative importance since 1900, but a very significant mining activity continues in Idaho and western Montana, especially in certain localized areas such as Butte and the Coeur d'Alenes.³

Although most of the population depends for its living upon the extractive industries drawing directly upon the natural resources of the region, a considerable number of people from Seattle and the Puget Sound and a few in the Columbia River section participate in the fishing and mining industries of Alaska or serve that vast territory with transportation, financial, commercial, and professional services. To this extent the Pacific Northwest economy is joined with that of Alaska.

The level of economic well-being in the region in terms of per-capita

² R. F. Bessey, "Pacific Northwest States' Economic Potentials," in *Proceedings of Pacific Northwest Marketing Conference, Seattle, Washington, May 23-24, 1946*, p. 23.

³ This summary of the prewar economy is based on data developed in 1942 by the Pacific Northwest Planning Commission in its study *Migration and the Development of Economic Opportunity in the Pacific Northwest*, pp. 85 ff.

income compared favorably before the war with the United States as a whole and has certainly not been lowered since that time. From 1929 to 1937, except for Idaho, the per-capita income tended to move ahead of the national average; in the state of Washington it was continuously higher than that average despite the highly seasonal employment in agriculture and the timber industries. Instability of annual employment has been one of the major characteristics of the employment pattern. In this rosy period of continuous high employment which the Second World War introduced, we are prone to forget that insecurity of annual employment is much greater in the Pacific Northwest than for the nation as a whole; and that those who are directly employed in the region's extractive industries will probably again be victims of its blight, unless some of the incipient changes in the lumber industry are carried much further with greater speed, and also unless new industries high in continuous employment opportunities are added to the region's prewar economy.⁴ This is the fundamental consideration, regionwise, for the conservation of those physical resources which, as the tale to follow will make clear, have been wastefully depleted or incompletely utilized. The need of employment security likewise underlies the case for the greatly expanded development of such water resources as hydroelectric energy which, with proper management, need never diminish or wear out. Such water development, when applied to the latent minerals and to the products of farm and forest, might become the basis for a high standard of living for even more people than those already electing to make their homes here.

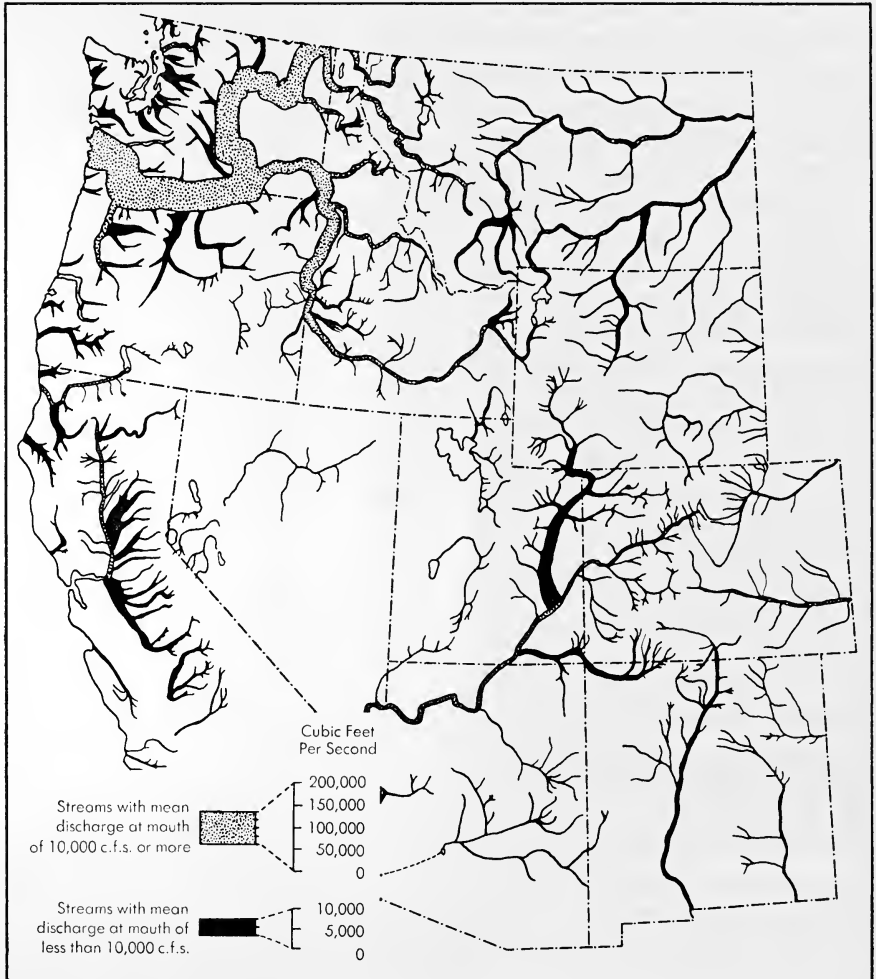
From this brief résumé of the outstanding physical and human characteristics of the Pacific Northwest, let us turn to the principal natural resources and the management problems which they pose.

Water Resources and Problems

We have noted the unusual character of the Columbia River and its contributions to some major human needs in the history of the Pacific Northwest. A more careful inspection of that stream and its twenty-six largest tributaries will show that they vein the entire region except for narrow coastal fringes along the Pacific Ocean and Puget Sound and the "closed basin" of south-central Oregon. The short coastal streams of relatively large volume have carved out a series of narrow bottomland valleys now used largely for dairying, for access to the heavily timbered coastal hills,

⁴ See the more detailed summary of these prewar traits of the regional economy in the author's paper "Five Years of Planning in the Pacific Northwest" in *Proceedings of the Fifth Pacific Northwest Regional Conference, Seattle, April 27-29, 1939*, pp. 20-21.

and as gaps through which, during the last generation, improved automobile highways were built to link the coastal communities to the towns of the thickly settled Willamette and Puget Sound valleys.



Mean Discharge of Major Streams in the Eleven Western States.

Source: Adapted from a map prepared by the Bureau of Agricultural Economics, U.S. Department of Agriculture, Berkeley, California, 1945.

The Willamette and Cowlitz tributaries are mighty streams in their own right, the former traversing the region's richest agricultural valley and serving one of its two greatest lumbering, industrial, and urban concentrations. East of the Cascades, the Deschutes, long a mecca for the sports

fisherman, is now being harnessed to an increased area of irrigated farmland. The Yakima and the Wenatchee have for years been the foundation for the wealth of fruits and vegetables that, with assured regularity, spring from their valley soils. The Snake River is half the state of Idaho. It swings in a great arc from Yellowstone Park and Wyoming across to the western border fronting the state of Oregon. Along the banks of the Snake River and its tributaries, the Boise and the Payette, in a verdant ribbon a score or more miles wide, are clustered the numerous substantial agricultural towns that process the products of its irrigated farms.

The entire Columbia River drainage basin consists of 259,000 square miles of which 39,000 are in Canada. Although the Columbia's total yield of water is very high (estimated at 155,000,000 acre-feet annually) the runoff of its various tributaries varies greatly from year to year and from season to season. Some of the tributaries in the arid sections have little or practically no flow in the dry summer months. To irrigate all the potential projects—estimated at 5,360,000 acres of land now arid or only partly irrigated—would require storage capacity for approximately 25,000,000 acre-feet of water.⁵ Although there appears to be an overabundant supply from the Columbia for that purpose, water is not so plentiful on some of the less productive tributaries where the need and the opportunity for irrigation are greatest.

For this reason the mountain states of the region, under the legal doctrine of prior appropriation which prevails in the West, are jealous of their rights to the waters within their borders. Not only do the streams in actual or potential short supply present problems of carefully planned and operated storage systems where these are feasible, but sooner or later their use must be made the subject of comprehensive interstate agreements if their maximum utility is to be attained. For some tributaries, such as the Kootenai, Clark Fork, and Flathead (as well as for the main Columbia), international settlements will be requisite to full development. It should be clearly understood that all federal river projects for use of these waters come under the limitations of state water rights. Therefore, unless and until the states settle conflicting claims where there is a water deficiency, federal projects may be delayed or thwarted. This is not yet a serious matter in the Pacific Northwest, but it may become important in the not too distant future, as it has on the Colorado and elsewhere in the West.

The ground waters of the region are difficult to estimate or evaluate because of the paucity of data. Already the return underground waterflow

⁵ The acreage figure is based on the estimate of the Bureau of Reclamation. (See its 1946 *Columbia River Basin Report*). The estimates of potential land development and water need correspond approximately with figures compiled by the Pacific Northwest Regional Planning Commission in 1935 and 1942.

from irrigation projects of the Snake Valley and of other streams such as the Umatilla, are of great importance in maintaining irrigation-water supplies. In the Willamette Valley these underground water reservoirs may greatly affect the extent to which supplemental irrigation becomes feasible. Ground-water supplies are of special importance for maintaining domestic and industrial services. Spokane draws all its water from the ground, as does a considerable part of the town and agricultural populations in the semiarid parts of the region. There is a major need for more complete inventorying of the quantity, quality, and location of this component of the water resource.

The Pacific Ocean and the bays and river harbors that front it offer inter-coastal and international water transport routes for the bulk products from the forests, farms, mines, and fisheries. Ocean traffic traverses the straits of San Juan de Fuca to serve the cities and mills of Puget Sound; traffic regularly uses the lower Columbia and Willamette rivers to dock a hundred miles from the sea at Portland and Vancouver, which are important export and import centers. It is now physically possible to bring seagoing ships nearly one hundred miles farther upstream to the grain and fruit city of The Dalles.

While navigation on the mid- and upper Columbia and its major tributaries does not occupy the place it held before the coming of the railways, it has been revived since the building of the Bonneville Dam for the shipment of oil and grain. Its extent is limited by constricted channels of the Celilo Canal, and rapids such as those at Umatilla, but with the construction of the dams authorized at that point and on the lower Snake, the waters of the Columbia system will be ready for a renewed and expanded river freight traffic from Lewiston, Idaho, to Astoria, Oregon.

Hydroelectric Energy

Hydroelectric power, the major product of the rivers of the Pacific Northwest, has grown rapidly in importance for the regional economy as well as for the comfort and convenience of both its rural and urban dwellers. While estimates of the potential development of this vital resource are only approximate, pending complete surveys of all the streams and tributaries, the best information available indicates that it would be possible and economically feasible to develop between 20,000,000 and 30,000,000 kilowatts of continuous power after making due allowance for prospective irrigation and domestic requirements of water. Disregarding the cost factors, it is said that the whole Columbia (including the Canadian section) could produce 50,000,000 kilowatts of continuous power. Ben Torpen, the

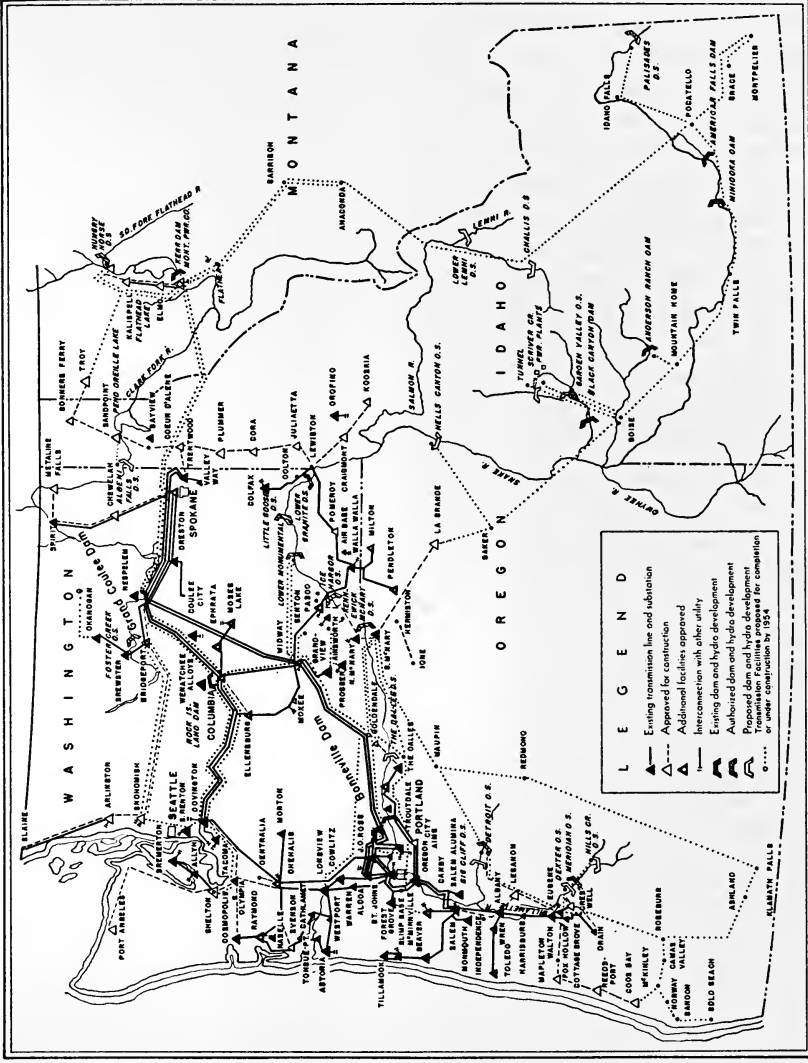
civilian engineer who supervised for the army the building of Bonneville Dam, has made clear by his studies of upstream storage, that 80 per cent of the potential firm power depends on storage. He has brilliantly demonstrated that 100 per cent realization of the river's potential through storage is economically impractical, but that a headwater's storage program of 30,000,000 acre-feet would produce more than two-thirds of the estimated potential firm power of the river system. The program would produce this power by raising the minimum discharge of the river, which at present is only 20 per cent of its annual mean discharge, to 65 or 70 per cent of the annual mean.⁶ A number of the coastal streams have good power potential (as witness the Skagit from which Seattle City Light draws most of its energy) but it is the Columbia River system which offers nine-tenths of the potential power, many times that of any other North American river system.

The installed capacity of hydroelectric generators in the region was about 2,800,000 kilowatts in 1948, of which half was contained in the generators which Uncle Sam had placed in the Bonneville and Grand Coulee dams. All installations were completed at Bonneville, but at Grand Coulee only nine of the potential eighteen were ready for use in 1948; the remaining units were scheduled for installation in five years. To meet the anticipated growth of power load, the installations at the authorized Hungry Horse, McNary, lower Snake, and Foster Creek dams were expected to be required.

These federal river projects were linked to the power market centers of the region by a 230-kilovolt transmission system. It was designed to pool the energy from all the existing and future dams for the benefit of all parts of the region touched not only by the central grid but by the smaller 115-kilovolt feeder transmission lines bringing power to distribution centers and systems. That design played a part of crucial importance during the war, for, by means of interconnection, it allowed the transfer of power from all the major public and private generating systems to nearly every part of the region and at times even beyond the Pacific Northwest to Salt Lake City and eastern Montana.

The outstanding characteristic of this abundant electric resource has been its cheapness. This had already led to a very high per-capita use of electric energy, 3,500 kilowatt-hours in 1943 as compared with the national average of 1,410. During the war this high level was partly caused by the huge quantities consumed by aluminum and chemical plants but since the war the demand from every kind of consumer has so increased that the

⁶ See *Storage for Power, Columbia River Basin*, Memorandum by B. E. Torpen, U.S. Engineer Office (Portland, Oregon: August, 1945).



Federal Transmission System: Bonneville Power Administration and Bureau of Reclamation (as of January, 1948).

Source: Adapted from map prepared by the Pacific Northwest Coordinating Committee, U.S. Department of the Interior.

per-capita consumption continues to rise rapidly. The key to indefinite continuance will be the low cost of energy to the consumer. Here is presented one of the major problems of federal field management. The rate of \$17.50 per kilowatt-year for power delivered by the Bonneville Power Administration (BPA) anywhere on the transmission system is the lowest regional rate in the United States.

Aside from recent jealous efforts in Congress to raise the rate, two high-cost hazards confront the construction of additional major hydroelectric works: (1) the natural tendency of successive new projects to be more costly than the earlier dams at Bonneville and Grand Coulee, and (2) the inflated price level of the war and postwar period. Can construction techniques and policies be devised to reduce the cost of generation and transmission? A further rate problem is presented in the need of irrigation for power revenues to defray irrigation costs in excess of farmers' ability to pay. How far should this objective modify that of offering the lowest economic rate to consumers of energy?

Finally, there is the problem of lowering the costs of distribution after the power leaves the federal transmission system. Here federal management of power marketing must choose whether to be neutral in the issue of public ownership of electric utilities or to side with the groups and agencies working for reduced consumer costs through local public ownership. The Congressional stipulations in the Bonneville Act that preference in the sale of federally generated energy be accorded to public and coöperative bodies and that the benefits of Bonneville power be spread throughout the region, were the legal basis for the administrative policy of the secretary of the interior and the administrator of the BPA to encourage local organized public groups who desired to acquire or build their local distribution systems. The conservative postwar turn in national politics, reflected in drastic Congressional cuts in funds for transmission purposes, along with the heightened demand for power in excess of installed capacity, make administrative encouragement of public and coöperative ownership of distribution facilities difficult. What shall transpire in this matter during the next few years will play a vital part in determining how widely and fully the social benefits of this federally developed resource shall be enjoyed.

A closely related problem is the extension of the transmission system and the uniform low rates into the upper Snake River Valley. The reclamation enthusiasts in Idaho and elsewhere have fought that extension as a menace to the economic feasibility of new irrigation projects which might depend upon surplus-power revenues. This issue has been administratively resolved by the secretary of the interior in favor of incorporating south Idaho into the regional transmission system; but Congress has not pro-

vided the funds for this extension, so that the actual linkage of that part of the region with the rest of the Pacific Northwest into a common transmission and rate area is yet to be achieved.

Another problem to which the hydroelectric resource may be the key is the development of new employment opportunities to (1) take the place of declining employment in the timber industry when its war-induced boom is over and the depleted timber resource can no longer maintain its current tempo or even the more normal prewar volume of employment, and to (2) reduce the long periods of idleness that have cursed the industrial employment pattern of the Pacific Northwest. The continued partial operation of the pig-aluminum reduction plants and the big rolling mill at Spokane which were established during the war offers reasonable hope that eventually there will be added the fabricating and manufacturing processes essential to an integrated aluminum industry. This would be an important step toward filling employment voids left by a declining timber industry. At present, however, although the aluminum-reduction plants take a high proportion of the total available energy from the Bonneville and Grand Coulee dams, the employment which they afford is relatively insignificant.

If either of these two important social objectives is to be realized, the BPA, as Uncle Sam's marketing agency, must be equipped with staff and facilities to search out, assist, and encourage those types of electricity-using industries that will fill these employment needs at decent wage levels. Such partial staffing as it possessed for these purposes the Eightieth Congress deliberately destroyed by cuts in its operating appropriations.

All hydroelectric generating facilities, public and private, and most of the high-cost steam generators are now fully used to meet the unprecedented demand for electric energy. Equipment is, in fact, operating on an overload similar to that necessitated during the war. Moreover, the demand is growing by leaps and bounds, and joint forecasts by private and public agencies say that by 1953 over 2,000,000 kilowatts of new installation will be required in addition to approximately 3,000,000 now available. Although part of this new load can be met by completing installations in existing structures, a large part can be supplied only by new dams. To take the new energy from the generators to the load centers, a number of new high-tension transmission lines will be needed to supplement the saturated capacity of the existing grid system.

Although forecasts share some of the traits of prophecy and could be wrong, the informed views are unanimous that to meet the growing requirements of the next six years new river-structure generators must be scheduled upon the basis of these estimates lest serious impediments arise not only to the convenience of the population but to the economic develop-

ment of the region. To use our rapidly shrinking oil resources to generate electricity in a region with so vast an unused surplus of inexhaustible water power would also be a tragic blunder from the standpoint of national welfare.

The hydroelectric needs of the region thus set the stage for accelerated construction of the great river structures, one of whose several benefits will be to furnish new blocks of power, or, through upstream storage, to augment greatly the productive capacity of existing installations. This immediately raises the issue of harmonizing, so far as is humanly possible, the power objectives in regional river development with plans for irrigation, conservation of the salmon resource, navigation, protection against floods, and recreational opportunities. Here we are confronted by questions of administrative organization and program policies of the several field services of the federal government, which will be explored at length in the following chapters.

River Floods and Their Control

Nature's bounty in river waters not only offers uses beneficent to man but, on occasion, destroys him and his works. The tragedies which have been so regularly reenacted on the flood plains of the great Mississippi-Missouri River system overshadow the destruction which the incompletely regulated Columbia and its tributaries bring, from time to time, to the people of the Pacific Northwest. Yet the May-June, 1948, Columbia River flood brought into regional, and perhaps national, consciousness the terrible peril to lives and property lurking in the infrequent great Columbia floods. From the Montana and Idaho headwaters to the sea, along the entire course of this far-flung river system, lives were lost, livestock drowned, town after town partly inundated, farmers and city residents forced to flee their homes.

Even while this was being written the people of Portland and Vancouver were trying to care for the families of Vanport, a city of twenty thousand, which in a single hour on a beautiful May Sunday afternoon, was completely destroyed by the swirling snow-fed waters of the Columbia. Shortly after four o'clock in the afternoon of May 30, 1948, and without more than ten minutes' warning, a dike protecting the war-built city of Vanport suddenly crumbled. Like a small tidal wave the river waters surged over the city, lifting and tossing the houses like match boxes, trapping the totally unprepared population in their homes, in the streets, and at play in the parks. It seems almost miraculous that only a few lives were lost. Had the dike given way in the night the destruction of human life would surely have been catastrophic.

It was more than half a century since a similar combination of climatic events produced a similar stage of flood waters, inundating so large an area of the river bottomlands. None had caused so tragic a loss of life and property, yet the crest of the river at its 1948 highest was lower than in the great flood of 1894.

These Columbia River spring "freshets" are usually mild affairs, covering but narrow strips of the flood plain. As the population grew and industries developed in recent years, men forgot or discounted the tales of the floods of 1876 and 1894, and built their homes, their industries, and their airports on land which had been washed by the great flood fifty-four years before. Much of this land had been diked in the intervening years, but some of the dikes were too low for the high water of 1948, some weakly gave way under the pressure. Low-lying sections of most of the cities in the industrialized lower Columbia—Portland, Vancouver, Kelso, St. Helens, Kalama, Camas, Washougal—as well as the rich dairy and mint farms, were under water. Important sections of the industrial and transportation facilities were paralyzed when highways and railways were cut in two, as dike after dike broke or wavered under the weight of the water.

This flood scoured the soil and inundated the man-made structures in the narrow alluvial valleys of the upper tributaries in western Montana, the Idaho panhandle, and along the mid-Columbia section of the main river. The central business area of Bonner's Ferry, in the northeast corner of Idaho, was under water; Wallace, the capital of the Coeur d'Alene mining country, was in distress; so was Lewiston at the juncture of the Clearwater and the Snake. Wenatchee, Ellensburg, Yakima, Kennewick, Pasco, Richland, and The Dalles suffered unprecedented flood losses. These cities had grown from the merest villages or from the bare desert since the flood of 1894.

The magnitude of the damage wrought by this flood was not known until weeks after the river had returned to its normal channel. The property loss at Vanport was probably in excess of \$20,000,000 and the best estimates by the Corps of Engineers placed the total property damage at approximately \$100,000,000. Fifty-two lives were lost.

These rare but highly destructive main Columbia River floods are the result of a combination of special weather factors. The meteorological history of the 1948 disaster must begin with the heavy rains of the late fall 1947. The whole watershed was thoroughly soaked. Before the moisture could drain away or be consumed by vegetation, subfreezing temperatures suddenly descended on all the area from the Cascades east. The saturated ground froze, to remain frozen and inhospitable to the infiltration of melting snow in the spring. Snow came with the cold weather; it kept coming throughout most of the northern tributary and Canadian drainages of the

upper Columbia. Even so, measurements made by the snow-survey courses, revealed that the pack, although above normal in some of the northern sub-basins, was not greater on April 1, 1948, than it had been two years before on the same date.

The month of April was freakish. The usual April showers on the highland were mostly snowstorms. The snow pack deepened and such rain as fell was caught and held by the deep mantle of snow. The usual April snow melt which eases the snow pack on the mountain elevations did not occur. The moisture-laden winds that normally originate south of the 40th degree of latitude on the Pacific blew from the cold Pacific north of the 60th degree.

Yet on the great Snake River tributary watershed, above Weiser, Idaho, as well as on most of the Oregon tributaries to the mid-Columbia, the snow column on April 1 had a moisture content distinctly below normal. By the end of the month this had been increased, though snow depth was still generally below the average for that date in the spring.

At the lower altitudes in the farming areas of eastern Washington and northern Idaho cold rains fell throughout much of April and early May, 1948. These soaked pastures and fields were thus ready to add to the runoff from the higher elevations when warm weather should bring the snow rivulets coursing down into the valley tributaries.

In mid-May came a sudden drastic shift in the air currents flowing over the great interior basin of the West. Winds from the southern Pacific, coming up through the Gulf of California and across the hot interior deserts of Arizona, Nevada, and Utah, swept into the upper Columbia watershed. With them rode violent thunderstorms, local cloud bursts, and a general blanket of warm rains. Temperatures rose after May 15 and remained higher than normal until mid-June. This delayed but sudden warm spell kept the thermometer up not only during daylight, but throughout the night as well. In some parts of the Columbia Basin the rainfall during May was 400 per cent of normal, and it was above normal everywhere except on the upper Snake River drainage. Eastern Washington and northern Idaho experienced the greatest May precipitation in a period of fifty-six years.

Under the impact of the high temperatures and the warm rains the snow dissolved and rolled in sheets of water down the steep slopes into the ravines, canyons, and tributaries—and the great flood was on! The northern tributaries—the Kootenai, the Flathead, Clark Fork, Bitterroot, Clearwater, Salmon, Methow, Wenatchee, Stehekin, and Yakima—rose with dramatic speed, overtopped their banks, raced across their valley floors, and poured their burden down into the main Columbia.

Fortunately, the lighter pack on the watersheds of the middle and upper Snake (above Weiser) and on a number of the eastern Oregon tributaries,

plus moderate temperatures, held the levels of those streams to moderate or low flows. Had this not been true, and had the Willamette and its tributaries also carried unusual volumes of snow melt, the river stages at Portland and on the lower Columbia would probably have broken all historic records.

A final contributor to the flood height on the lower Columbia is the ocean tide. High tides occurring simultaneously with river flood may push the water in the Portland-Vancouver-Astoria district a foot or so above the levels resulting from river conditions alone. This was one important cause of the excessive damage in the flood of 1894.

It is evident that the prevention of damages from these Columbia River floods is linked with the creation of upstream-river storage reservoirs.⁷ Diking and channel straightening, though helpful for the many lesser spring freshets, can not be relied upon to prevent the catastrophic consequences of the really great floods. Since storage would at the same time provide river regulation for increased production of firm hydroelectric energy, the key to the mastery of this great periodic evil would seem to rest in the economic feasibility of a huge volume of upstream storage, to be paid for in part by the ability of the region to buy the vast amount of electric energy thus made available. This question poses a fundamental issue of Congressional policy toward river-development costs chargeable to federal hydroelec-

⁷ Since the release early in 1949 by the Forest Service of data from a study conducted by its research staff, headed by the director of the Ogden experiment station, a new dispute has arisen over the issue of watershed-management practices versus storage reservoirs for control of these Columbia River floods. This survey group made careful observations by air and ground of the relation of cover to runoff on the forest and mountain areas whence the greatest contributions to the flood were originating. These observations indicate that wherever the ground was timbered the snow melt was markedly delayed, and the runoff did not disturb the surface of the ground. In many places the forested areas retained their snow two or three weeks longer than did the adjacent bare slopes.

Comparison of timbered with bare areas on the same slope showed a blanket of snow remaining on the timbered ground when treeless areas even at elevations one thousand feet higher were bare of snow.

The fact that forest fires on these upper tributary watersheds of the western Rockies have taken their toll of timber on millions of acres of land during the past half century has been pointed to as a major cause of the 1948 flood. The study does not substantiate this conclusion. It does, however, make clear that forest cover will greatly retard runoff from snow melt as well as practically eliminate erosion during the melting process. The period of unusual flood conditions was so prolonged in 1948 and its incidence covered so great a part of the Columbia upper watershed that, even had the original forest mantle remained, the flood would still have occurred on the main river. However, had there not been so much destruction of timber on the higher areas it is possible that damage to some of the tributary valleys might have been lessened; and that the difficulties which are experienced in times of lesser flood on the Columbia when the combination of adverse weather factors is not so overwhelming and prolonged, would be greatly reduced and, perhaps, on some tributaries, practically eliminated. These are questions which, as noted in chapter vii, will evade accurate answers until funds for watershed research on the Columbia River system are much more ample. (November, 1949.)

tricity in the West. Shall power continue to pay an increasing share (as at Grand Coulee) of the cost of irrigation projects, an expense which tends to grow constantly, or will some other way be found to finance reclamation so that low power rates can be maintained for an ever-expanding consumption?

Until upstream storage for major floods is provided there will continue to be local flood problems in the semiarid eastern watersheds of the Columbia River Basin. These will occur even though no great river-wide flood is under way. Every spring, local flood disturbances resulting from snow melt and occasional cloudbursts have brought forth appeals to the army engineers to extend their flood-control work back into these remote semiarid valleys. The most important flood areas along these upstream tributaries are on the Kootenai, Flathead, Clark Fork, and Pend Oreille in Montana and Idaho; the Spokane, Okanogan, Yakima, Walla Walla, and Mill Creek in eastern Washington, the Boise River Valley (with its extensive irrigated farmlands below the capital city of Idaho) and the upper Snake in the far corner of southeast Idaho.

On the west side of the Cascade Mountains, in the most thickly settled valleys of the Willamette, Cowlitz, and the Puget Sound, winter floods between November and March recurrently menace life, land, and property. Heavy and prolonged rains, particularly those which melt the winter snows in the Cascade Mountains, quickly send these streams of western Oregon and Washington out of their banks onto the extensive flat flood plains. During the past decade the frequency of these floods, particularly on the Willamette, coupled with the increased human occupancy of the lowland areas, has created a major flood problem.

Fortunately, long-range plans for protection of the most valuable areas have been drafted and appropriate projects authorized by Congress, but the speed with which these projects may be executed depends upon the size and continuity of Congressional appropriations. The most extensive program authorized for these Western valleys is the Willamette Valley project, which, as originally approved in 1938, contemplated seven large reservoirs on the upper river and its tributaries. While for economic and other reasons some of the proposed reservoir plans have been changed, the program, when completed, will eliminate most of the evil consequences of both lesser and major floods on the Willamette River system.

Fern Ridge and Cottage Grove reservoirs are completed and have proved their worth as helpful control instruments in the five major floods that struck the upper valley since their completion. Dorena and Detroit dams are now under construction, and if the remaining structures are financed within the next few years the winter floods (which are the major menace above Portland) will be practically eliminated in this, the most

thickly populated and richest agricultural valley in the entire Pacific Northwest.

In the Puget Sound Valley the most serious flood hazard was associated with the Puyallup River and its tributary, the White River, which in 1933, as previously at intervals, had inundated the industrial section of Tacoma and the farms of the lower Puyallup. Mud Mountain Dam, the highest combination earthfill-rockfill dam in the world, has provided control of this menace. Begun before the Second World War, it has recently been completed and will furnish control for a runoff 50 per cent greater than the record flow of 1933.

Not for a long time will the destructive early summer floods of the Columbia River like those of 1894 and 1948 be entirely eliminated. In the meantime, it is important, not only that local dikes and other protective structures be properly built and maintained, but that disaster plans be ready and emergency operating organization and finance be available to prevent loss of life and reduce property losses. As will be described in the following chapter, an efficient and successful disaster plan was developed, used, and kept current for the Willamette Valley winter floods. For this the Corps of Engineers took leadership. The lack of such an emergency disaster program, adjusted to the size and prolonged character of the great May-June Columbia River flood of 1948, is one reason for the excessive price in lives and property which was so painfully exacted. It is earnestly to be hoped that this costly lesson will not be lost and that a responsibly centered and coöperative flood disaster plan will be ready for high-g geared use when the forecasts again indicate the onset of danger. The gratitude which local folk may feel for army-built dikes and revetments will crumble as rapidly as did the Smith Lake dike on that anguished Sabbath of May 30, 1948, unless a comprehensive and efficient precautionary and emergency program is ready for swift execution.

It is ironic that even while the Columbia continued to disgorge at flood crest, and army-directed emergency crews toiled to hold the weakening dikes against the swollen river, the House of Representatives drastically cut the appropriations for stream gauges, which the Geological Survey installs and maintains in coöperation with the states and other units. These tools for charting stream flow and predicting river stages are indispensable for emergency-flood periods even as they are essential for many other important but less dramatic uses.

Land Resources and Problems of Government

A century ago the Pacific Northwest was a wilderness of timber and grass. West of the Cascades nearly every acre was tree-covered, while east of the

mountains the grassy sage-covered basins of the Columbia and Snake rivers were surrounded by pine-covered mountains and hills. The only bare land in the entire region consisted of a few sand dunes along the ocean front, a few arid inland spots, occasionally a recently burned forest or grassland area, and the high mountain peaks. These made up a negligible percentage of the land area.⁸ Yet beneath this universal mantle of verdure the soils vary greatly in quality because of differences in the basic underlying geologic structure from which they came, or as a result of the topography, precipitation, temperature, humidity, winds, sunshine, "the degree of surface drainage, and the character of the plant cover under which they developed."⁹

Perhaps the most outstanding fact concerning the soils of the Pacific Northwest is that so small a fraction of the total vast area is suited to tillable agriculture. Of the total of approximately 188 million acres in the region (that is, Washington, Oregon, Idaho, and the nineteen mountain counties of western Montana) the cropland in the 1930's comprised slightly less than sixteen millions or only 8 per cent. Adding the farm pastures available for plowing brings the total to eighteen million acres or 9.5 per cent of the region. While farm pasture land amounted to nearly thirty-two million acres, more than twenty-nine millions of it consisted chiefly of semiarid low-yield rangeland unsuited to arable agriculture. Outside of the land in "farms" are sixty million acres of semiarid rangeland and eighty millions of forest land, which together comprise nearly 75 per cent of the regional area. Some of the land now under tillage is incapable of successful farming and because of its submarginal character ought to be retired. An estimated three million acres in Washington, Oregon, and Idaho were thus maladjusted in use in 1934.

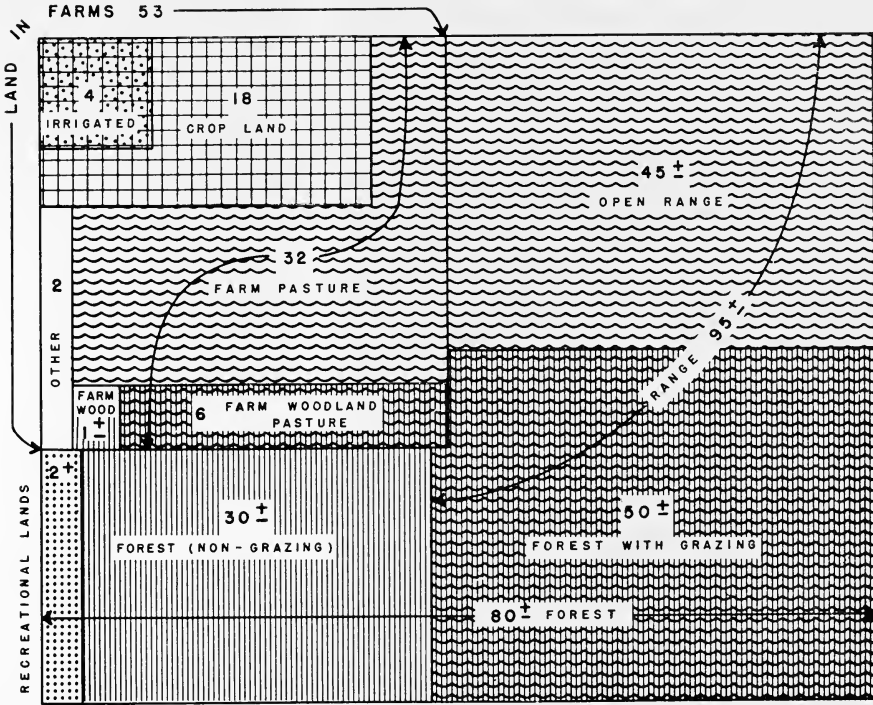
On the other hand, large acreages of good soil require only the application of moisture to make them valuable for crop production. Thus the prospect of offsetting the retirement of land which cannot maintain successful tillage farming rests upon the economic, hydrologic, and engineering feasibility of irrigation. Compared with the total regional area the potential increase of arable land by watering of nearly four million new acres (the latest Bureau of Reclamation estimate) seems small. But measured by the existing cropped land it would add 20 per cent to the region's tillable resource, which in view of the high assurance of crop success in irrigation agriculture is a significant potential expansion of the agricultural industry of the region. There are also many small scattered tracts of brush and timber land potentially suitable for crop production, esti-

⁸ C. E. Deardorff and W. A. Rockie, in *The Pacific Northwest*, ed. by Otis W. Freeman and Howard H. Martin (New York: J. Wiley & Sons, Inc., 1942), p. 129.

⁹ *Loc. cit.*

mated at perhaps a million acres, and possibly another quarter million susceptible of intensive cultivation through drainage.

A second regional peculiarity is the uneven distribution of arable land. It is concentrated in the moist lowlands west of the Cascades, in the small



PACIFIC NORTHWEST LAND TOTAL ± 180 MILLION ACRES

Land Uses.

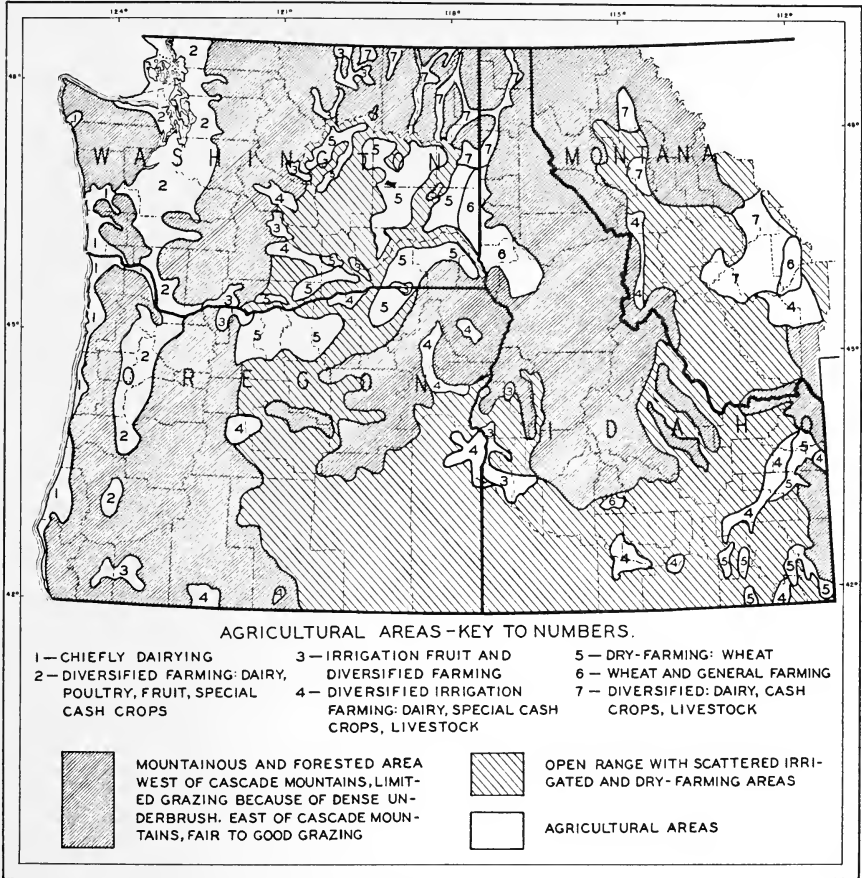
Source: Adapted from a chart prepared by the Pacific Northwest Coördinating Committee, U.S. Department of the Interior, 1948.

irrigated valleys near the foot of the east slopes of the Cascades, in the western valleys of the Rockies, along the Snake and its tributaries, and in the "dry-farming" plateau wheat lands of eastern Washington, western Idaho, and north-central Oregon. With the bringing of water to the lands of the Columbia Basin project and to the other potentially irrigable soils in the mid-Columbia area, the spacing of farmland areas will be somewhat evened out.

The arable lands, being in private ownership, are ordinarily not subject to management by the federal resource-development agencies. The only publicly owned arable lands are those in process of reclamation through irrigation by the Bureau of Reclamation and not yet sold to settlers. Even

though these projects contain public lands, a considerable area is usually privately owned.

Yet the federal land-management agencies are interested in private lands because of the national concern with soil deterioration (chiefly

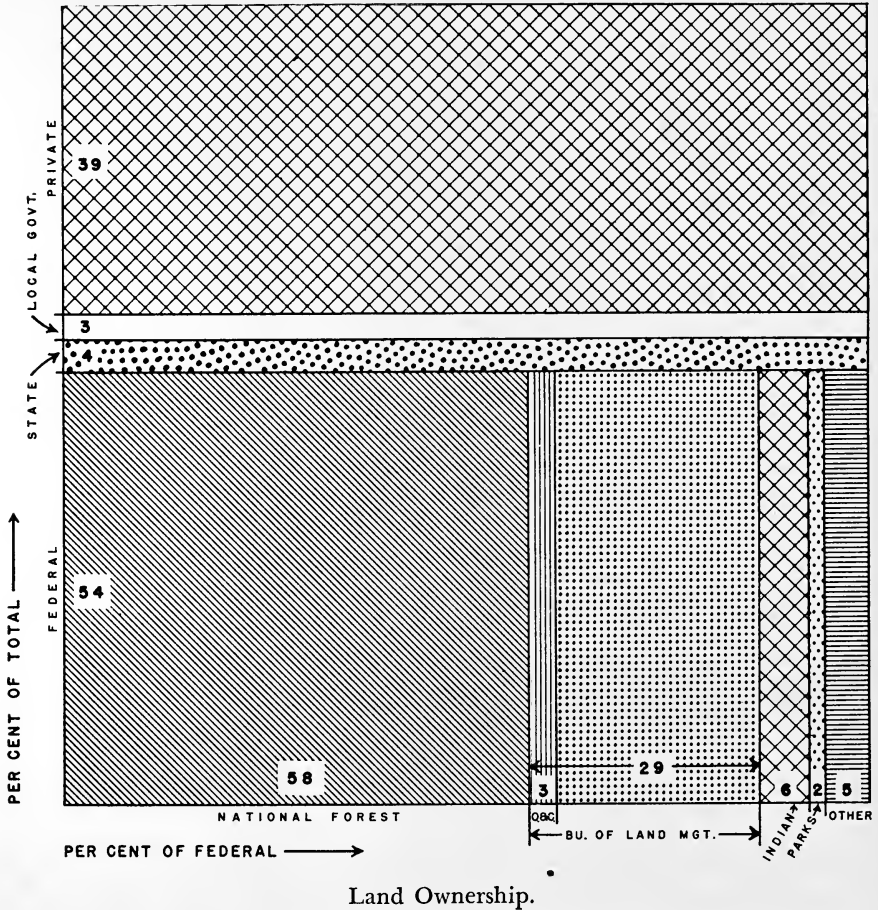


Type of Farming Areas.

Source: *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 29.

erosion) and with the depressed conditions among the agricultural people, which react adversely upon the conservation of the basic land resources. The latter difficulty in times past has tended to center in the wheat-summer-fallow areas of the intermountain plateau where, in the dismal 'thirties, drought and the curtailment of foreign as well as domestic markets produced widespread distress. Wheat ceased to move abroad except when a

give-away boat load was sent to China or Europe under government subsidies. It was a "surplus" crop the price of which sank so low that in some of the remoter dryland areas, such as Wallowa County, the freight cost to the Portland terminals ate up nearly its entire value. The fact that the postwar demand and general inflation sent wheat soaring to price altitudes



Source: Adapted from a chart prepared by the Pacific Northwest Coordinating Committee, U.S. Department of the Interior, 1948.

never known in this region before will not alter the long-time trend toward modest or low prices; nor will it eliminate the need, for farm income and soil conservation, to reduce the wheat acreage and drastically change the wheat-summer-fallow farming system. When the downswing strikes, it is probable that, as in the prewar orchard crisis in Wenatchee, the federal agricultural agencies will be called upon to help formulate and finance a

program of transition to other uses and to assist in other ways in its achievement.

In considering the land-resource situation we must not overlook the great extent and economic importance of the native grasslands. Originally ninety million acres east of the Cascades were covered with an abundant grass vegetation, chiefly of the perennial bunch-grass type. Even though settlers have converted an estimated twelve million acres of grassland to crop agriculture it is evident that an enormous area remains under a grass economy. Unlike the northern Great Plains these Pacific Northwest grasslands did not support large herds of buffalo; wild grazing animals were limited to small bands of antelope and wild horses. But the settlers from the East soon filled the range with cattle and sheep. It is estimated that by 1900 in the three states of Oregon, Idaho, and Washington there were 1,177,000 cattle and nearly 4,500,000 sheep, the great majority of which were range herds and flocks. No reliable estimates are available of the increase in range livestock since that date, but it is known that the numbers did grow and that during the First World War the patriotic appeal for more meat production still further augmented their numbers. By the end of that conflict both public and private grazing lands were badly overstocked. When the bottom dropped out of meat prices in the agricultural deflation that soon followed, it became difficult for the Forest Service, the only federal agency then pursuing a policy of active range management, to reduce livestock numbers on its badly needed but depleted summer ranges.

Consideration for the restoration of the forage and its long-time maximum sustained yield for both livestock production and watershed management had to be balanced against and to some extent compromised with the financial difficulties of the debt-burdened stockmen. Thus the reduction of numbers was slow and the restoration of the grass and browse was delayed, though they did improve gradually in most national-forest areas. On private grazing lands and on the unmanaged public domain the pressures persisted. Overgrazing continued to reduce the quality and quantity of the grass and to open up the soil for capture by unpalatable weeds and shrubs, such as the useless sagebrush, and by annuals of such low nutritive value as the insubstantial cheat grass. On all overgrazed lands the character of the ground cover has accelerated the runoff from rain and snow melt, impairing the reservoir functions of the watershed and eroding the topsoil.

So far as the region's basic agricultural industry is concerned, this maladjustment in the rangelands reduces its natural advantage in livestock production. It is estimated that whereas a square mile of the original grass cover on the open range would support from 220 to 290 cattle for a month,

the carrying capacity by 1942 was only from 70 to 140 animals. The result is that unless the number of animals is reduced or domestic sources of supplemental feed are increased, the animals will come off the range lighter in weight and in less profitable condition.

This reduction in livestock productivity of the range need not persist (as will be shown in detail in later chapters) provided proper management of rangelands, private as well as public, is practiced. There is overwhelming evidence that the range resource can be restored and made to contribute to a greatly increased and less costly livestock yield. But to do so will require a new conception of management by private owners and by some public agencies, and it will take considerable expenditure for water-conservation structures, for range improvements, and for reseeding.

Depletion of the ranges also directly affects irrigated agriculture, for much of the irrigated land is used for production of winter feed for stock that lives on the range during the rest of the year. The whole agricultural complex in the arid parts of the Pacific Northwest is thus vitally affected by the management programs of the federal agencies which share in the operation of approximately 46,000,000 acres of federally owned grazing lands.¹⁰ It is also concerned with the aids and inducements offered by the Production and Marketing Administration and the U.S. Soil Conservation Service (SCS) for the restoration of depleted private rangeland.

Soil Erosion

When the National Resources Board in 1934 published the epoch-making reconnaissance survey of erosion conditions in the United States, which was performed by the technicians in the Department of Agriculture, citizens of the Pacific Northwest, though startled by the widespread destruction or deterioration of topsoil throughout the country as a whole, may have felt reassured when they learned that important sections of the Pacific Northwest were included in that one quarter of the national area which showed the least accelerated erosion. The survey indicated that the most extensive areas still virtually undamaged were the forested regions, including the "wide forest belt extending from Canada to Mexico bordering on the Pacific Coast." This 1934 catalogue of man-damaged land exempted another extensive area of Western mountains and intermountain basins, because there was not time for the careful study necessary to discriminate between the eroding effects of human culture and of normal geologic processes.

Yet a more careful examination of this first comprehensive survey of the

¹⁰ This estimate was kindly prepared for the writer by W. A. Rockie of the Soil Conservation Service.

state of our country's soil resources would have revealed that even in this new and incompletely developed region some serious damage had been done to our topsoils. Approximately 50 per cent of Idaho was already showing some erosion damage, and 17 per cent of that state gave indications of severe sheet, wind, or gully erosion. Over 6,000,000 of Oregon's 61,000,000 acres had already lost more than three-fourths of the topsoil, and from one-fourth to three-fourths of the topsoil had disappeared from nearly 36,000,000 acres. Over half of Washington's lands had been robbed of topsoil in excess of 25 per cent of the original accumulations.

The summaries of erosion on farmlands make even more pointed the relation to agriculture of the erosion process already under way in the Pacific Northwest. Thirty per cent of the agricultural land in the intermountain zone of the Pacific Northwest region was subject to severe wind erosion while an additional 11 per cent was slightly eroded. About 4,500,000 acres of cropland in the semiarid parts of the region had been so injured by wind and water that much of it had been abandoned for cropland purposes when, during the 'twenties, low prices and extra dry years had added their discouragement to its cultivation. Water erosion had carried away about half the topsoil from 6,000,000 acres of the intermountain zone making it necessary to try subsoil farming operations on some of these lands and leaving about 197,000 acres worthless for wheat raising.

On the green side of the Cascade Mountains in Oregon and Washington lie some 5,000,000 acres of good agricultural land where erosion resulting from tillage had made but slight headway except on some of the hilly farms subjected to clean cultivation. Three-fourths of the forested land of that humid west part of the region was free of accelerated erosion, and only a minor percentage appeared to be severely affected. East of the Cascades about 10 per cent of the forest lands, where repeated forest fires had occurred, was severely eroded. On another 10 per cent the reduction of forest and grass covered by fires, overgrazing, and logging had so increased runoff as to cause moderate and occasionally severe erosion in local areas.

Within the three states of Idaho, Oregon, and Washington were 58,000,000 acres of open rangeland. The review of 1934 indicated that on 3,000,000 acres the topsoil was either gone or worn very thin, and on approximately 7,000,000 acres it had been so badly damaged that even the best of management could probably not restore as much as half the native carrying capacity. The balance of the rangelands showed varying degrees of lesser erosion damage.¹¹

¹¹ In the use of the term "Pacific Northwest" for summarizing the 1934 survey data only Oregon, Idaho, and Washington are included. Data were not available for parts of states such as western Montana or northwest Wyoming. These data are reported in *Soil Erosion: A Control Problem in American Agriculture*, Part V of the Supplementary Report of the Land Planning Committee to the National Resources Board (Washington: 1935).



Erosion.

Source: *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 33.

Since the 1934 reconnaissance the SCS has been refining its study of the extent, location, and character of erosion. Unquestionably the most serious situation exists in the rich farming area known as the Palouse country, which has been not only the principal bread basket of the region but one of the most productive centers for export wheat. Its dark loamy stoneless soil has supported one of the most prosperous farming populations in the world, yet it is now estimated that every year an average of four cubic yards of topsoil per acre is lost from the 5,000,000 acres of this fertile area.

The wheat-summer-fallow system of tillage practiced for so many years and recently modified by the addition of pea culture has invited the accelerated movement of topsoil down these steeply rolling hills into the valleys and streams. Light-brown spots on the plowed hilltops and the thin crops produced there are clear evidence to all who look that the subsoil is being exposed and will not give forth the high yield which once was common. Each spring when the snowdrifts on the bare north sides of the top slopes begin to melt the water carries large loads of earth down the steep north sides. In a goodly proportion of these Palouse hills that process has gone so far that the subsoil is beginning to wash and to bury the topsoil on the lower slopes.

Because there are no adequate studies of the effects of these soil losses on the situation in local streams we do not know what further damage is taking place in or adjacent to the river channels, or how important is the danger of siltation in the reservoirs that upper-river development will create.

At the drier western border of this same agricultural belt strong winds constitute another erosion hazard in the spring and summer by lifting the fine exposed soil particles and transporting them in dust storms for many miles. Sometimes a newly developing wheat crop is "blown out" and the land left naked, as occurred in Douglas County, Washington, in 1939. Until adoption of the "trashy fallow" practice and the use of cloddy plowed surface were encouraged by the SCS and later by the Agricultural Adjustment Administration (AAA), the summer-fallowed land was an open invitation to the elements to seize and carry off the best and most fertile loam. From each of 2,000,000 acres in the Big Bend country, which includes Douglas County, Washington, sheet and wind erosion are carrying away each year an average of one cubic yard of topsoil. This same combination of wind and sheet erosion is also present in dangerous proportions on the high plateau south of the Columbia River in north-central Oregon. There, in Gilliam, Sherman, and Umatilla counties, nearly 1,750,000 acres are gradually being destroyed for cropping purposes by the average yearly loss of two cubic yards of soil per acre, much of which moves toward or into the south-bank tributaries of the Columbia River.

Were it possible in dry farming areas like the Palouse country and the Big Bend district of central Washington to take out of wheat culture the land least suited to that crop and to replant it with perennial grasses, or to introduce general and systematical sweet-clover rotations with the wheat, domestic pasture and cultivated hay could greatly relieve the pressure on the rangelands of the grazing districts and the national forests. Sweet clover could be pastured in the summer when it would simultaneously build humus for wheat rotations.

Skyrocketing prices for wheat and dried peas have been obstacles to such a shift in crop practices. Wheat price will doubtless remain far above the levels of the 'twenties so long as the United States must remain a principal center of staple-food supply for the countries devastated or disorganized by the war. However, unless the world is once more engulfed in war, wheat will almost certainly again become a surplus crop, and the problem of income from it, so acute in the 'thirties, will recur. If and when that happens the farmers of the Pacific Northwest will probably shift their agriculture from wheat or a wheat-and-pea cropping system to one in which livestock will assume a new importance.

Quite apart from the lack of current economic incentive to modify the wheat pattern with much greater attention to livestock, are three social factors which impede the transition: (1) discontinuity in farm ownership, (2) habits centering on mechanized and large-scale grain culture which inhibit interest in and knowledge of livestock, and (3) the prevalence of tenancy, even though tenants are "big" farmers of considerable means. These impediments will be difficult to remove.

The owners of the highly productive but rapidly eroding Palouse farms occupy an economic and social status different from that of the impoverished hillside farmers of the damaged Tennessee Valley watershed. Except for the relatively brief period of the 'thirties they have been among the most prosperous farming groups of the United States. Their incomes have usually placed them on a level with professional and small business classes. During the Second World War when prices for wheat and peas were at an all-time high, they rose to real affluence, many enjoying net incomes of \$25,000 to \$50,000. To be sure, these were years not only of abnormally high prices but of plentiful moisture and excellent crops. Yet the problem of so changing the attitude of these farmers toward the soil as to conserve its fertility, is radically different from that which is presented in agriculturally depressed and socially backward farming regions. In these prosperous farming areas it is not always possible to appeal to self-interest to induce a change of attitude.

Irrigated lands in such valleys as the Yakima and Wenatchee and on other projects with uneven topography present a threefold conservation

problem: (1) erosion, (2) fertility leaching, and (3) sterilization by dissolved alkali salts. The eroding effects of row crops and orchards on sloping soil, so evident on the east end of the Kittitas project and the newer land of the Roza project, are due to improper use of steep slopes, to failure to contour the rows and ditches, and to inefficient and wasteful farm distribution systems. Some farmers on these reclamation projects, attracted by the high immediate returns from potatoes, sweet corn, and other row crops, continue to plant, cultivate, and water straight downhill on slopes as steep as 20 per cent in grade. It is not surprising that only fifteen years since the Badger Pocket section of the Kittitas project was placed under water many of its fields are seriously damaged.

Down on the new lands of the Roza project the light sandy soil requires delicate handling and carefully engineered farm distribution systems until several years of cropping shall have built into the desert soil the humus which it lacked when the Bureau of Reclamation brought water to it. In various sections of that project the soil is not more than 12-20 inches deep and will soon be lost if erosion is not quickly controlled. Even with proper crop rotations, distribution systems on such soil must be carefully designed and engineered to keep the ditches short, to provide gentle gradients, and to serve accurately the fields into which, for rotation purposes, the farm must be divided. To retain the soil the whole rotation cycle should be planned before the distribution system is constructed. Not only is technically competent agronomic and engineering advice necessary for those who are to farm these projects, but some sanctions which will compel observance of elemental precautions and rotations will probably be necessary if the goal is to be attained. This should not be impossible on federally constructed irrigation projects which may legally attach precautionary conditions when the land is sold.

The sprinkler method of irrigation, which is coming into use on some of the orchard lands around Wenatchee and Yakima, holds great promise as a preventive of erosion and fertility loss. Used along with cover crops on sloping lands it avoids the washing effects so characteristic of rill irrigation while at the same time it obtains a much more even water distribution than is usual under the traditional method. Its greater initial expense, however, is a deterrent to its adoption.

Fertility losses on irrigated land may result from bad rotations, from leaching caused by improper or excessive watering, or from other factors not yet fully understood.¹² Water used in too great quantities is likely to

¹² See the testimony of P. V. Cardon, Administrator of Agricultural Research of the U.S. Department of Agriculture before the House Committee on Irrigation and Agriculture, (H. R. 520, May 4, 1945, part 2, pp. 256-259) for a summary of the infertility facts and the imperfect knowledge of their causes.

carry away many of the soil elements which are essential to continued production. There can be little doubt that the excessive drainage on such projects as the Kittitas results from the use of undue amounts of water, which carry down to the river fertile soil that will be costly to replace. As the result of a combination of factors including erosion and leaching, crop yields on one of the projects near Sunnyside and Yakima dropped nearly 50 per cent within a few years.

The improper use of water is also responsible for the sterilization of productive soil by alkali. Beneath the topsoils of many irrigation projects are salt chemicals which, when dissolved by water and subjected to plant action, are lifted toward the surface of the land and brought into contact with the plant root systems. Excessive quantities of these chemical substances thus introduced into the area of root structures may render land unfit for further productive use. The quantity of water used in relation to particular soils and the absence or presence of a proper drainage system are important factors in reducing or avoiding these results so tragic not only for many farmers but for the perpetuation of productive soil.

Perhaps the most inexcusable destruction of rich topsoil which is taking place in the Pacific Northwest results from gold dredging operations in the small alluvial valleys of eastern Oregon, Washington, and Idaho. There are no available figures of the acreage of rich soils thus destroyed. But the importance of their destruction for a permanent agriculture in the arid parts of the region cannot be measured merely by the number of ruined acres. The narrow ribbons of rich bottomland along such rivers as the upper John Day, the Sumpter, the Coeur d'Alene, and the tributaries of the Boise Basin, are of great strategic value for forage production to carry through the winter months the livestock that graze on the dry watershed rangelands above the streams. Large parts of these choice feed lands have been forever destroyed as support for a permanent livestock production by the most ephemeral type of extractive industry. Any legal cure for this prodigal waste of a precious soil resource will have to be sought through state rather than federal action.

Despite these danger spots it may be said that the erosion problem in the Pacific Northwest as compared with that of the East and Southeast is chiefly a matter of prevention rather than of repair of ruined or badly damaged land. In the words of W. A. Rockie, one of the best-informed authorities on erosion problems in the region, "the task is to forestall serious damage and to keep healthy land good."¹³ This situation offers the prospect of high dividends for soil-conservation programs. However, in March, 1947, Mr. Rockie completed an estimate of annual soil losses that indicates continuing serious damage. His calculations suggest that on

¹³ *The Pacific Northwest*, pp. 160-161.

TABLE I
SOIL CONSERVING FARM PRACTICES REMAINING TO BE ESTABLISHED
(All figures in acres)

Practices	Idaho	Oregon	Washington
<i>Crop land</i>			
Contour plowing	1,465,000	1,936,000	2,896,000
Crop residue management	2,364,000	2,086,000	2,278,000
Crop rotations	1,292,000	1,815,000	2,420,000
Green manure	1,482,000	341,000	918,000
<i>Irrigation</i>			
Farm distribution and group distribution system	1,421,000	832,000	426,000
Land preparation	831,000	349,000	1,250,000
Methods of water application	1,100,000	500,000	250,000
Perennial hay crops	556,000	562,000	1,068,000
Strip cropping	148,000	175,000	378,000
<i>Grazing land</i>			
Deferred grazing	4,965,000	8,548,000	4,226,000
Exclusion for erosion control	1,462,000	172,000	
Proper stocking	4,720,000	9,309,000	5,910,000
Rotation grazing	4,827,000	10,131,000	4,225,000
Salting	2,327,000	7,505,000	5,195,000
Seeding	1,027,000	2,174,000	730,000

(Selected from Department of Agriculture—Soil Conservation Service, *Soil and Water Conservation Needs and Estimates for the United States*. By States. Washington: June, 1945.)

the approximately 111,000,000 acres of land in Idaho, Oregon, and Washington which are being used for farming and for the grazing of domestic livestock, some 626,000 acre-inches of topsoil are being lost each year.

As a result of research inaugurated during 1930 the preventive methods for holding the topsoil are pretty well established. Even for the hilly Palouse land and the high plateau country, modifications of the wheat-farming systems which include long-term rotations of grasses and legumes for hay, pasture, green manuring, or seed give promise of keeping these lands permanently productive, while yielding good agricultural profits. We shall describe later the comprehensive program for soil conservation developed and initiated by the U.S. Soil Conservation Service which, through direct management by local soil-conservation districts, is now operating in the region.

Although a real beginning has been made, particularly in Washington and Idaho, the accelerated acceptance of careful farm planning for soil-conserving practices is urgent if a preventive program is to yield maximum dividends. Time is essential in the race with soil deterioration. If the race is to be won the present program must be extended to cover all the farming

areas of the region; the Soil Conservation Service must be financed for the employment of adequate technical staff to give the districts prompt and good service; the PMA conservation payment program must supplement more effectively and pointedly the district programs; prices for soil-depleting crops must recede to more normal levels; and the attitudes of many farmers, bankers, and others who influence crop practices must be brought into harmony with soil-conservation essentials.

The extent of the task remaining is indicated in Table 1 taken from a more complete summary compiled by the SCS in the spring of 1945. This shows a few of the more important farm practices which then needed to be applied in three of the states in the region.

The Diminishing Forest Resources

Forests occupy nearly half the land of the Pacific Northwest. Most of us think only of trees when the word "forest" is used. But actually a forest is a "biological universe consisting not only of trees within its borders but also of numerous other forms of plant and animal life, all forming a complex association."¹⁴ It is this complex of biological forces, plus the climate and soil, which give the chief key to proper forest management. That good management of their forests is fundamental to the continued economic well-being of the people of the Northwest has already been briefly indicated. It is also of great national moment, because these forests constitute the largest reservoir of standing saw timber in the United States, amounting to nearly half the remaining total. One-third of the total timber cut, 16 per cent of the wood pulp, and nearly all the softwood plywood produced by the nation during the last year of the war came from the forests of the Pacific Northwest.

Of the region's 744,000,000,000 feet of saw-timber reserves the heaviest concentration, estimated to constitute 70 per cent of the total, lies in the Douglas-fir area of western Washington and Oregon. The remaining 30 per cent is distributed over the 62 per cent of the region's forested area which lies east of the Cascades. The classification of forests into types (as shown on page 40 demonstrates the importance of the Douglas fir, which predominates in most of the forest in the West-coast subregion; of the ponderosa pine in the intermountain subregion; of the combination of white pine, ponderosa pine, and lodgepole pine in the northern Rocky Mountain area; and of the spruce and hemlock on the humid strip between the ocean and the high Olympics and the lower northern Coast Range. Most recent available estimates by the Forest Service give these volumes

¹⁴ Stephen N. Wyckoff, "Forests of the Pacific Northwest," in *The Pacific Northwest*, p. 260.

of the major timber species: Douglas fir 357,000,000,000 board feet, ponderosa pine 103,000,000,000, western hemlock 97,000,000,000, true firs 67,000,000,000, sugar and white pine 21,000,000,000.

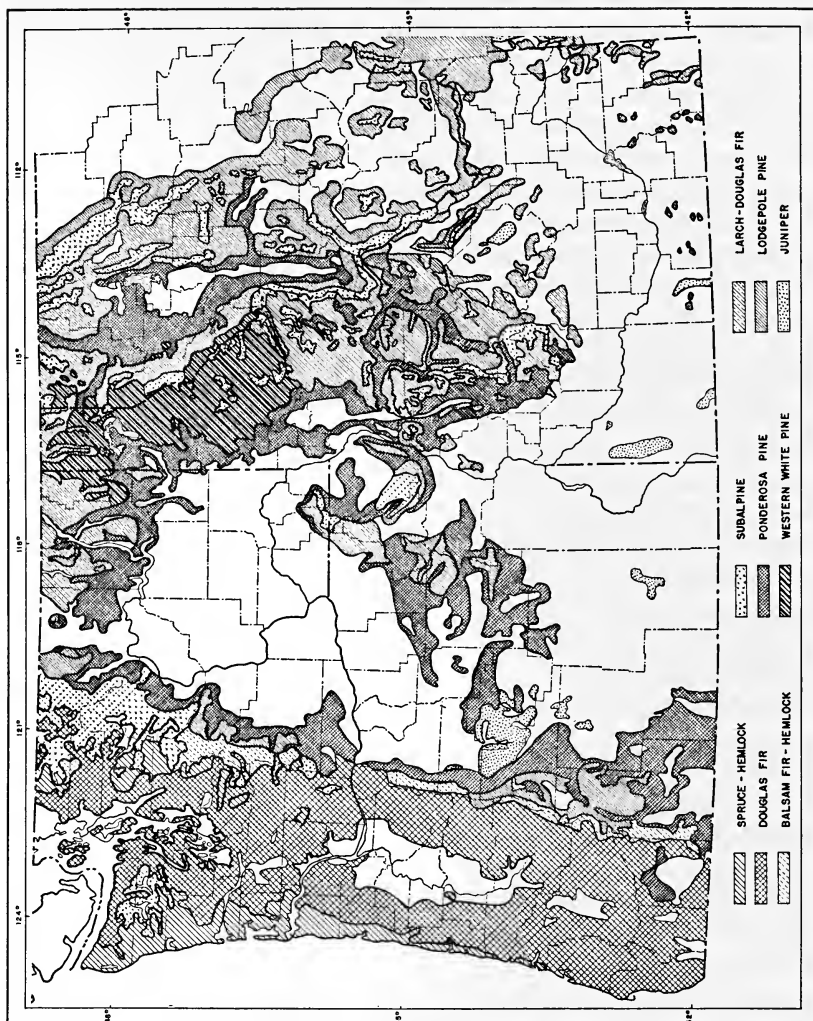
The use of the concept "forest type" obscures the fact that the timber stand in a forest is rarely of a single species. Normally a number of species occur together. "Preponderance" is not always an indication of numerical dominance because the classification is dictated also by economic considerations. Thus the white pine varies from 80 per cent of that stand to as low as 15 per cent in forests which are still classified as white pine because of the economic superiority of that species over others in those forests. Even in the Douglas-fir forests where normally Douglas fir constitutes 90 per cent of the stand by volume measurement, other firs, Western hemlock, and red cedar are also usually present. The spruce-hemlock forests average about 60 per cent hemlock and 11 per cent spruce, with the remainder distributed among the numerous fir species, alder, and maple.

It is possible that new techniques in the treatment of timber may so alter the economic values as to warrant changes in the forest classification. The war demand gave commercial value to formerly unmarketable species such as the lodgepole pine, and such new uses for wood pulp as rayon have constantly expanded the utilization of species formerly neglected or wasted.

During 1944 when the man-power restrictions limited production, 119,000 workers were employed in the region's primary forest industries, of whom 75 per cent worked in the Douglas-fir region. Logging employed 36 per cent of this working force (45,000), while manufacturing required 50,000 in sawmills, 12,200 in pulp and paper, 10,500 in plywood and veneer, and 2,600 in other primary establishments and products. Another 9,000 workers were employed in plants producing sash, doors, furniture, boxes, and many other timber products. Undoubtedly since the end of the conflict the employment in all these establishments has substantially increased.

The importance of the harvesting and manufacture of timber to the Pacific Northwest is indicated by the fact that forest products made up nearly two-thirds of the prewar railway freight tonnage originating in the region. Population densities in Oregon, north Idaho, and western Washington tend to coincide with timber activities. In 1930 all but four of the cities above 20,000 and a great many of the smaller towns were in areas where lumbering was the chief activity.

The magnitude of this timber industry represents a terrific drain on the timber supply. The trend, punctuated by cyclical recessions, was steadily upward from a little less than 4,000,000,000 in 1904, when fuller data first became available, to over 15,000,000,000 in 1926 and 1929. The average annual cut in the 'twenties was more than 10,000,000,000 feet. The industry was hard hit by the end of construction in 1929, slumped in 1932 to a



Forest Types.

Source: *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 10.

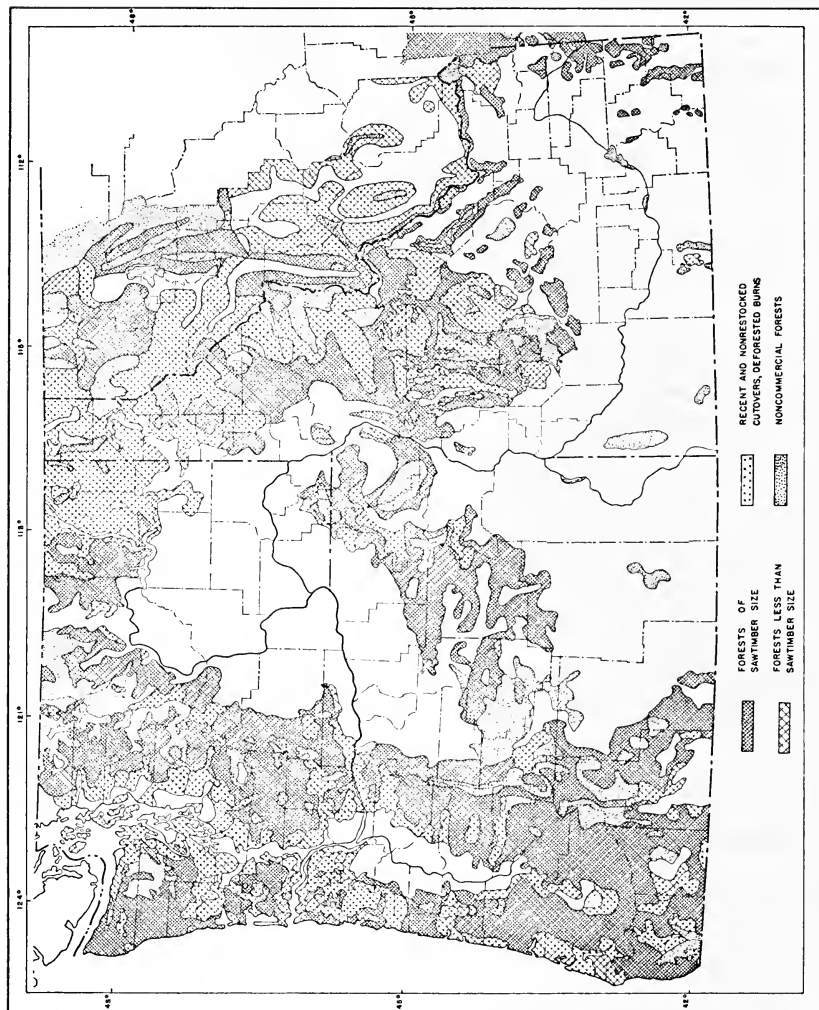
cut only slightly above that of 1904, then began to climb again.¹⁵ With the coming of the Second World War the felling of trees resumed its tempo of the golden 'twenties and was further accelerated since the end of the war. The demand blew the ceiling off man power and prices. The mad scramble for stumpage spurred by unprecedented war and postwar profits produced much overcutting in private timber management, which resembled the farmers' disregard of soil-conserving practices while they cashed in on the high wartime agricultural prices.

In addition to the reduction of the timber supply by cutting, there are losses from fire, insects, fungus, and other diseases, which brought the total drain from all sources in 1944 to an estimated 16,300,000,000 board feet. The significance of this to the perpetuation of the timber industries and their dependent communities is clear when that drain is compared with annual timber growth, now calculated at 5,500,000,000 feet. Briefly put, the timber is being used and destroyed three times as rapidly as it is being produced. The situation is even more crucial than this ratio suggests, because the high rates of growth occur in the well-stocked young forests. There are millions of acres of mature old-growth forests where little or no net increase is taking place and there are other large cut-over and burned-over areas which are not restocking with thrifty trees. Although silviculture and timber-management research have already furnished part of the information needed to help accelerate restocking and timber growth, it will take time, money, and much wider public and private acceptance of the indicated forest practices before forest growth will show appreciable improvement. Yet in the very long run it should even be possible, with proper forest-management practices on both private and public land, to step up annual growth in excess of recent average annual cut.

Moreover, the high wartime prices for lumber and timber products and the even higher postwar inflation have led to great inroads on the most vigorous and rapidly growing second-growth stands of trees which have attained sufficient size to turn into lumber. To continue this practice for a considerable period would irreparably damage the prospect of converting the timber industries into permanently sustained economic activities with high employment and output. Even before the war boom some of the most productive subareas in the region were facing the permanent stagnation of their timber economies and the repetition of difficulties akin to those which have cursed the cut-over regions of the Great Lakes states.

In 1937 the staff of the Pacific Northwest Regional Planning Commission compiled a list of seventy-six towns where severe loss of population had

¹⁵ *Forest Resources of the Pacific Northwest*. A report of the Pacific Northwest Regional Planning Commission, National Resources Board (1938), pp. 1, 27 ff.



Condition of Forests.

Source: *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 21.

followed the abandonment of lumber mills. In western Washington and along the lower Columbia River community after community had already seen its mills close or reduce their cut because the available good stumpage was exhausted. These are the precise areas where timber had been of highest quality and easiest access. The war gave some of these decaying communities a temporary revival, partly through military or other war activities and partly because high prices for lumber and pulp made it economic to re-log much cut-over and burned-over acreage.

When this last spasm of timber activity is over, as it will be when prices drop, the dependent communities will face a wait of two generations or longer before the forests will be ready for a resumption of the kind of timber industries the communities have lived upon in the past. In a recent summation of excess plant capacity and the outlook for wood-using industries in the Pacific Northwest, the Forest Service points out that the lumber industry, which takes nearly four-fifths of the cut, is greatly overdeveloped in relation to the available supply of logs. In Washington 270 mills, about half of the total, are already short of logs and an additional 25 per cent will exhaust their supplies of private timber in five to fifteen years. Since there is not sufficient public timber to make up the deficiency, many mills will have to close. Puget Sound, with 100 sizable mills soon to exhaust their private stumpage, will be particularly hard hit.

Although Douglas-fir production is increasing in the more remote upper Willamette and southern Oregon stands, the output will be limited by the requirements of sustained-yield production. The fir plywood industry of western Oregon and Washington, which used nearly 1,000,000,000 feet of logs in 1942, faces a shortage of material and is expected to decline in production and employment in the next twenty years to half its present plant capacity. In some of the most productive pine subregions (Bend, Klamath Falls, and Lakeview) shortages are expected in ponderosa logs.

On the brighter side, the outlook for pulp and paper manufacture (which now takes 11 per cent of the cut) is good. It may even expand by use of mill and logging waste, smaller trees, and a wider variety of species now neglected.¹⁶

Some timber towns will never revive, for improvements in transportation will take the logs from the new forests to the larger cities where integrated wood-using industries will offer superior markets. Hope of forestalling the catastrophic decline in the timber economy in these and other subareas where the basic resources of Douglas fir, ponderosa and white pine have been rapidly depleted lies in (1) the accelerated development of more refined fabrication of the remaining trees into small wooden arti-

¹⁶ Manuscript statement by the Division of Forest Economics, Forest Service, U.S. Department of Agriculture (October, 1946).

cles and (2) the discovery of higher use for the logging waste now allowed to rot or burn in the forests, and for mill waste now used for fuel. Fortunately, hopeful beginnings in both directions are under way. But time is essential in this race between economic technological improvements in timber utilization and the new chain saws of the lumberjacks.

We must face the fact, however, that no matter what may be done to spin out the utilization process, the elimination of waste alone, important as it is, will not prevent the ultimate reduction in the annual timber cut. The Pacific Northwest and the nation may choose between two alternatives: (1) high industrial activity merrily pursued for a few decades, then suddenly dropping to the stillness of dead communities falling one by one into decay, and (2) a planned program of reduced annual harvest adjusted to the total perpetual yield from forests set aside for the economic support of specified timber-producing communities. This is the stark reality. But it is difficult to face it in a regional sense, both because the illusions born of war and postwar boom obscure the relations between basic resources and a healthy economy, and because the depletion disaster strikes one community at a time. The blow may even send new mills into an area like southern Oregon, the one sizeable remaining area where the timber—though inferior to that harvested earlier and more difficult of access—is relatively untouched. A community with only a few years' supply of raw materials for its mills may remain complacent because the shriek of the saws and the roar of the planers may continue unabated until the last log is cut. Only silence breaks the illusion and awakens, belatedly, community awareness. Much headway had been made against this intellectual lassitude by the depression-born state and regional planning agencies which by 1939 had gained an appreciable hearing within the region.¹⁷

But the war and its prosperity erased from public consciousness much of the earlier anxiety. People who listened for years to official agencies proclaiming in unison the need of ever-increased speed and volume in production of lumber for the armed forces and for homes for war workers and veterans, forgot the old concern about resource exhaustion and the need for sustained yield. The coincidental stimuli of patriotism and profit, followed by the apotheosis of "private" enterprise as the sole solvent of economic difficulties, has created an opinion climate inhospitable to sober reflection about conserving the region's reserve of timber materials for the lasting welfare of all its people. But as we recover from this attitude "jag" and inaugurate sustained-yield operations we must seek substitutes for part of the employment and wealth heretofore identified with the

¹⁷ Charles McKinley, "Five Years of Planning in the Pacific Northwest" in *Proceedings of the Fifth Pacific Northwest Regional Conference, Seattle, April 27-29, 1939*, pp. 14-15.

timber industries. Some of these, as we shall indicate below, may be found in the fabrication of the region's minerals.

Watershed Problems

An important consideration in the treatment of forests and grasslands is its effect upon the preservation and use of the moisture which falls upon the region's watersheds. Little is known about the effect on erosion, or on runoff, of the cutting and burning of forests between the crest of the Cascade Mountains and the Pacific shore. There are large burned-over areas in that western part of the region which are not restocking adequately, but which after successive burns are revegetated with brush that offers continuous invitation to repeated fires. Superficial observation indicates that some sheet erosion takes place during the first year or two following a fire, but it seems probable that after that period the rapid growth of vegetation on these more humid watersheds checks further soil deterioration.¹⁸ While it is possible that adequate study of this area may reveal more damage than is here suggested, it is clear that on this west slope there is, except in the most unusual seasons, an adequate and dependable water supply for domestic and industrial purposes and for limited irrigation.

But east of the Cascade crest the situation is different. Annual precipitation of more than 61 inches at Lake Keechelus (one of the reservoirs on the east side of the crest which impound the irrigation waters for the never failing harvests of the Yakima project lands) drops to less than 7 inches at the city of Yakima, about seventy miles away. The agriculture and the towns of that valley depend upon the ample supply of pure water caught in the form of rain and snow on the high Cascade watershed. This relationship between a cool-humid "mountain island" mass and hot-arid valley lands is repeated throughout all the Pacific Northwest, except in its green western strip. Cities and towns have grown up where mountain-produced streams meet and feed the good irrigable lands in the sun-baked valleys.

The southeast part of the region, including eastern Oregon and southern Idaho, is more dependent on watershed management and moisture yield than are the semiarid parts of eastern Washington, the Idaho panhandle, and western Montana. The upper Columbia carries such an ample volume of water and is so susceptible of large additional yields by means of storage, that most of the arid lands in these northern sections could be cared for by its supplies if this were economically feasible. Yet even there most of the early irrigation projects (which number into the thousands) utilized minor tributaries that were more readily manageable from the

¹⁸ This is the view of W. A. Rockie of SCS.

standpoint of engineering and capital requirements. These local watersheds may require special attention and care, because if allowed to get out of repair they will bring down gravel and silt into the irrigation works and onto the land; or their supplies may fail, especially in times of subnormal precipitation, because the watersheds no longer keep the water in the ground against the summer season when it is needed.

In the upper Snake River section of Idaho many tributaries tumble out of the mountain highlands onto the plain which contains most of the existing and potential irrigated lands. Here, too, are the thriving cities and towns that process, prepare for market, and transport the many specialty crops produced by the small irrigated farms. Although settlement is not so concentrated as along the Wasatch front in Utah, the economic relationship between the warm desiccated valley and the mountain watersheds is practically the same. Thus the population concentrated in the Boise and Twin Falls localities with annual precipitation of from 7 to 12 inches depend for water upon the Boise and Snake rivers, which are fed from precipitation on mountain watershed areas that comprise only 30 per cent of the drainage area.¹⁹

The coming of white settlement to these watersheds has disturbed the balance which nature, through climate, topography, geological structure, soil mantle, and vegetal cover, had worked out in millenniums of time. The consequences of that disturbance suddenly came to full view in August, 1923, when the disastrous mud-rock flows roared down four of the mountain canyons between Salt Lake City and Ogden, pushed rock, gravel, and five-hundred-ton boulders onto the valley's garden and farmlands, blocked the highways and railroads, destroyed houses, and killed several people. Recurrent disaster in the same and adjacent communities signaled maladjustment on the watersheds, which in the twenty thousand years since the recession of Lake Bonneville (the parent of Great Salt Lake) had never before discharged that kind of sterile and unassimilable material onto the valley lands.

Research by the Ogden Forest and Range Experiment Station has clearly demonstrated that these disastrous flows occurred because fires and continuous overgrazing on relatively small areas of the mountain watershed had destroyed the ground cover and the ability of the soil to absorb the sudden summer cloudbursts without loosening the soil structure. These studies are suggestive for some parts of this region.

Funds have been available for systematic studies of only two watersheds in the semiarid part of the Pacific Northwest. These are the Boise and the Walla Walla surveys, neither of which has been completed and released. We do not therefore know the exact condition of these natural resources

¹⁹ Reed W. Bailey, *Yearbook of Agriculture, 1941* (Washington, D.C.), p. 194.

in this part of the region. Partial information collected on the Boise in the 'twenties and 'thirties indicated serious trouble ahead.²⁰ A quarter of the watershed consisted of "overgrazed grassland on which sheet erosion is widespread and gullies are present in a serious degree."²¹ In the twelve years following the completion of Arrowrock Reservoir in 1915 some 7,500 acre-feet of silt lodged in the reservoir, despite heavy sluicing every few years. Excessive erosion was depositing debris into many of the smaller tributaries whence spring runoff and summer freshet carried it to the main channel.

Forest Service officials undertook a careful examination of the Boise National Forest to determine the causes of the erosion and to discover methods of protecting the watershed. They concluded that grazing with its attendant depletion of "plant cover and litter and trampling of the soil is the most important factor contributing to erosion." One reason for the susceptibility to damage from grazing was the peculiar nature of the soil structure, which was shallow, coarse, deficient in clay particles for binder, and therefore peculiarly susceptible to disturbances of plant cover. More recent tests of the effect of rain on these granitic Boise watershed soils indicate the crucial importance of well-managed ground cover for absorbing water as well as for preventing erosion.

By means of an artificial "rainmaking" apparatus, operated to equal a heavy downpour, they showed that good bunch-grass cover, typical of the undisturbed range, absorbed 99.6 per cent of the precipitation and allowed the loss of only 6 pounds of soil per acre; on an overgrazed area a rain-storm of the same intensity caused a runoff of 45.4 per cent and losses of 7,382 pounds of soil per acre.²²

It is clear that where the upper Snake and its several tributaries debouch from the mountains onto the plains an increasingly important flood-control problem is developing, largely because runoff is more rapid than was the case before the upper watersheds of these streams were grazed, denuded of timber and brush, or (in a few instances) dry farmed. The exact bearing of these conditions on water production has not been studied, but it may be extremely important in that area of scant summer precipitation as more and more land along the upper Snake is brought under irrigation. If so, watershed management will need to be greatly intensified and refined to suit the many diverse local situations of soil, slope, cover, and climate. We can not make headway in this sector of the region's resources

²⁰ *Conditions Influencing Erosion on the Boise Watershed*, by F. G. Benner, U.S. Department of Agriculture, Technical Bull. no. 528 (Washington: October, 1936). See also address by Reed W. Bailey, at the Western Regional Farm Conference, Old Faithful Inn, Yellowstone National Park, June 23-25, 1938 (mimeographed).

²¹ A. L. Haffenrichter, in *The Pacific Northwest*, p. 154.

²² Bailey, *op. cit.*

without more widespread and intensive research on watershed conditions and characteristics by the appropriate agencies.

If one of the primary purposes of watershed management is so to handle the land as to provide for a high yield of water with a minimum of erosion, the data from a watershed-management study by the Forest Service in cooperation with the Colorado State College on the headwaters of the Colorado may be of great interest to citizens in the arid parts of the Pacific Northwest. These indicate that the yield of water from rain and snow can be increased one-third in that area by selective cutting of virgin forests. The amount of moisture in the soil in the spring, available for runoff, from the managed forest was 40 per cent greater than for the untouched forest. These figures apply to a particular watershed, but the principle revealed by the experiment would appear to point the way toward one of the important goals of management in all of the arid West.²³

Wildlife Resources of Land and Water

Because so much of the Pacific Northwest region is mountainous and covered with timber and grass, the encroachment of civilization has not been so devastating to the wild creatures of the region as it has in those parts of the country where a higher proportion of the land is suitable for cultivation. Further advantage to wildlife has been the public (federal and state) ownership and management of a large proportion of the land of the region.

The management program on the national forests has for a number of years included systematic attention to wildlife conservation. The national parks are also wildlife refuges which permit only sports fishing. More recently the Grazing Service has increased its attention to the preservation of the game and upland birds that use the grass and browse of the grazing districts. The Fish and Wildlife Service (and one of its predecessors, the Bureau of Biological Survey) created numerous wildlife refuges which afforded protection primarily to migratory fowl and big game, but also to all wild animal species. These refuges also contributed to the perpetuation of those forms of wildlife that today are principally associated with outdoor recreation, and with the commercial activities that cater to recreational needs. State governments which regulate the harvesting of game have also joined the work of scientific conservation management and are supplementing the federal refuges by refuge areas of their own.

²³ See the address by Chas. A. Connaughton, director, Rocky Mountain Forest and Range Experiment Station, September 16, 1943, at Denver to a joint meeting of the Rocky Mountain section of the American Waterworks Association. Also see C. A. Connaughton and H. G. Wilk "Post-War Management of Western Forested Watershed Lands for Water Yield," in *Transactions of 1944 of the American Geophysical Union*.

These helpful provisions have enabled the Pacific Northwest to retain, within the limits of such adverse factors as disease and drought (which determine feed supplies), a reasonable number of the most attractive species of game birds and animals. Deer, antelope, and elk are relatively plentiful and are increasing. This is probably the result of the reduction of predators (coyotes and cougars) as well as of positive measures of protection. The available winter range, which is the principal limiting factor for these animals, is being gradually increased by public-acquisition programs. In a few wildlife areas the increase in deer population has outrun the food supply so that the animals die of malnutrition or disease, the browse is heavily overgrazed and livestock forage is consumed.

On a few watersheds in the national forests the competition of deer with domestic animals has become so keen that one or the other must give way if a proper ground cover is to be maintained. Occasionally livestock reduction in the interest of forage restoration has been more than offset by the increase in deer, necessitating still further cattle and sheep reductions by the Forest Service. Since the Forest Service is bound by state laws regarding the harvesting of deer, this problem can be solved only by federal-state coöperation.

Animals of the fur-bearing species are today a pitiful remnant of those which abounded when the trappers and traders of the Hudson's Bay Company and the American fur-trading companies conducted the principal economic enterprise in the Pacific Northwest. However, under the favoring management of the national forests and the protective measures recently adopted by the states, there is good promise that the beaver may be restored in considerable numbers and that some of the other fur bearers such as the mink and otter may be replenished. This will require the enforcement of effective trapping regulations and the transplantation of surviving specimens to the most favorable habitats.

Population of migratory water fowl which use the great nesting areas on the marshes of upper Klamath, Malheur, and Warner lakes, appear to rise and fall with favorable and unfavorable climatic factors affecting their nesting and feeding grounds. The dry 'thirties were difficult times for them. But with the return of moisture, with the improved management of some of the lakes as national refuges, and with the law-enforcement policies supplementing the protective international treaties with Canada and Mexico most of the valuable species had by 1944 been restored in good numbers. Since then another decline, but as yet a more moderate one, has occurred.

The dry open country east of the Cascades has been a paradise for upland game birds which have thriven in great variety and in large numbers. Six species of grouse were native there, as were two of quail, and the bobwhite

quail has been deliberately introduced. Many foreign birds—the Chinese pheasant, Hungarian partridge, and others—have been propagated and released by the state game agencies for the delectation of the sportsmen, but it is said by two leading authorities on wildlife that little or nothing has been done effectively to prevent the ultimate extermination of the native grouse and quail.²⁴

For the sports fishermen the principal game is the trout. The two chief native species, the cutthroat and the rainbow, thickly populated the streams and lakes when settlement of the region began, and they still predominate, though the introduction of such varieties as the Eastern brook has added interest to this form of outdoor recreation. The chief problem associated with trout has been to offset by artificial propagation the depletion which inexorably follows the population growth when thousands get within easy distance of fishing waters. The clear swift streams and blue lakes of the Cascades, the Olympics, the Coast Range, and northern Rockies are a mecca each summer of increased numbers from outside the Pacific Northwest who join its residents in the fishing and camping for which the region furnishes unparalleled opportunities. Artificial propagation has thus far not been able to maintain the natural supply, but that objective may be approximated whenever the state agencies make adequate use of scientific research into the habits of the trout and the biological problems surrounding artificial planting. It is probable that a great deal of money has been wasted through neglect of fishery biology.

A wildlife resource of even greater public interest is provided by the commercial fisheries of the Pacific Northwest, which exploit more than forty species of commercial fish. In 1944 the over-all take was 225,400,000 pounds, of which salmon contributed 39,400,000 and tuna 26,300,000 pounds. Halibut is third in importance as a food fish, and great quantities of soupfin shark and grayfish are taken for their high concentration of vitamin oils. Shellfish, chiefly crab, clams, shrimp, and oysters, account for 10 per cent of the fish taken in 1944 and for 12 per cent of their value.

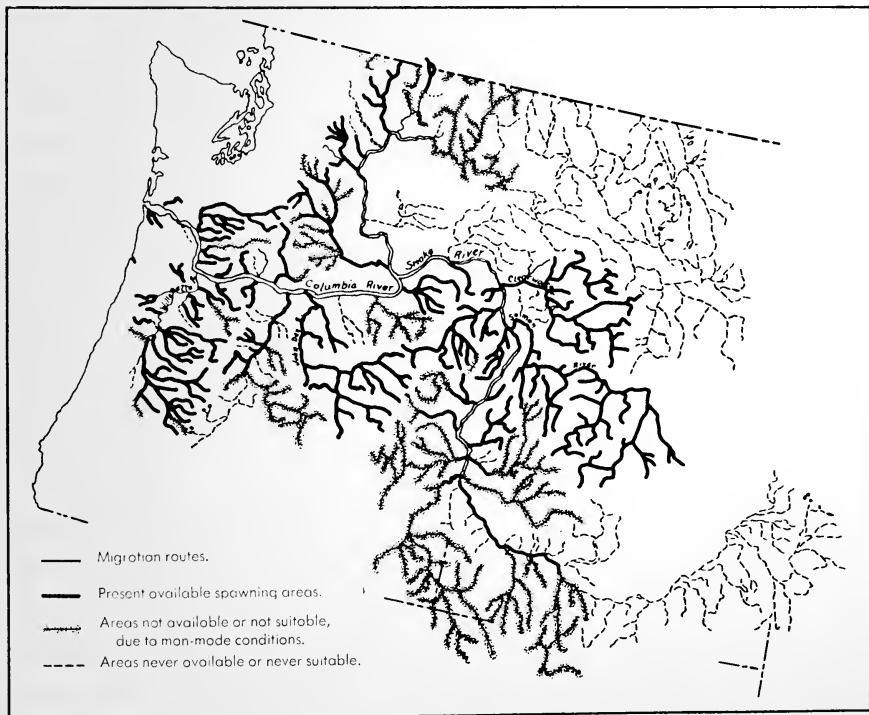
These gross statistics suggest that nature has endowed the Pacific Northwest with a favorable physical environment for this valuable human food supply. On the broad continental shelf jutting out from the Pacific shore line and its favorable water temperatures and currents are luxuriant marine pastures of the plankton, essential to a populous marine fish life. The islands and fiords of the British Columbia-Alaska-Puget Sound coast line, the shallow protected bays of the Washington coast, and the many streams and inland headwaters lakes furnish a most favorable habitat for a variety of both cold- and warm-water fish of high commercial value.

White settlers, aping the Indians' interest in salmon, early turned to

²⁴ William and Irene Finley in *The Pacific Northwest*, pp. 302-305.

the taking of this greatest of anadromous fishes and opened the first commercial cannery on the lower Columbia in 1866 producing a pack of 4,000 cases. By the end of the century the Columbia River salmon industry had reached its peak of 633,000 cases per year. The pack has since shrunk to half that size despite the use of less desirable species in place of the depleted blueback. On Puget Sound an even greater salmon industry grew up and after 1919 suffered an even more drastic decline, falling from a yearly pack of more than 1,000,000 cases to a little more than 120,000 in 1940. The decline in salmon production in the Pacific Northwest has been partly offset by the more recently developed and more effectively regulated Alaska salmon industry.

Even apart from the increased efficiency of the white man's fishing gear, civilization has taken heavy toll of the salmon. Farming and logging operations have changed the regimen of many streams, destroyed spawning areas, altered water temperatures, while irrigation has rendered many parts of streams unsuitable for fish life during the low-water season. Pollution from



Changes in Salmon Habitat.

Source: Bureau of Reclamation, U.S. Department of the Interior, *The Columbia River, 1947.*

domestic sewage, industrial waste, and mining silts has taken a heavy toll on some of the major tributaries of the Columbia River and on the coastal streams. At certain stages Portland's untreated sewage almost completely robs the water of the Willamette of the oxygen essential to fish life. It is as effective as a solid concrete dam, miles in length, in blocking the passage of these races of salmon which formerly swam up the river at such periods to their immemorial spawning grounds.

Uncoördinated and unscientific fishing regulations by the states of Oregon and Washington in times past made nonsense out of the efforts at minimizing depletion from overfishing of the Columbia River. The failure by the states in granting water rights for irrigation, industrial, and municipal purposes to reserve minimum water supplies for fish during low-water season, the lack of safeguarding screens at diversion points and of efficient fish ladders over dams have all contributed to the steady depletion of the Columbia River salmon runs. Statistics show a continuous decline in the salmon catch from 1895 to 1934 when the first big federal dam on the Columbia was in process of construction. Despite the apparent success in transplanting races blocked by Grand Coulee, the surviving part of this resource is undoubtedly menaced by the many projects for harnessing the river and its tributaries for power, irrigation, flood control, and navigation. Current efforts to salvage the present Columbia salmon industry and to preserve for the indefinite future a part of this most valuable resource of human food will be described in a later chapter.

The greatest concentration of commercial fishing in the region is on Puget Sound. The most valuable Puget Sound species, the sockeye, suffered a catastrophic decline after 1913 and 1914 because of rock slides at Hells Gate on the Fraser River, the stream which furnished the extensive spawning grounds required by this species. These slides blocked the stream at crucial water stages against upstream migration. This accident, following the gradual but steady depletion from overfishing since 1890, caused the closing of many Puget Sound canneries and the loss of millions of capital investment and of annual income for fishermen, boat operators, cannery operators, and workers. The 1937 treaty with Canada put that problem under the jurisdiction of the International Pacific Salmon Fisheries Commission. After eight years of scientific studies that body has recently begun to put the sockeye salmon under management and regulation in Canadian and American waters. There is hope that it may be able to repeat the success of the International Fisheries Commission which since 1924 has worked a near miracle in the restoration of the depleted north Pacific halibut fisheries, and has apparently placed that resource on the basis of a sustained yield of more than fifty million pounds a year.²⁵

²⁵ This optimism regarding the enduring results of halibut management is shadowed

It should be emphasized that the problem of restoring or maintaining the supplies of salmon is much more difficult than was true in the case of the halibut, or would be true for other offshore fisheries such as the tuna and sole. The salmon industry has declined in every location chiefly because of the destruction of spawning and rearing places by the many agricultural, industrial, and urban activities which civilization sets in train. These factors are much more difficult and complicated to overcome than is depletion from overfishing, even taking into account the increasingly efficient methods of catching the fish.

The most valuable native shellfish resources are the razor clam, the Dungeness crab, and the oyster. The first are found chiefly along the sand beaches in Washington where their take is controlled by state regulation. The crab remains an important fishery although incomplete and delayed regulation has driven it from bays and shores where it was formerly found. The native oyster is limited to special locations and is today greatly overbalanced in importance by the Japanese oyster introduced about twenty years ago on the tide flats of Willapa Harbor, and since extended to Grays Harbor, Puget Sound, and Coos Bay.

The offshore fisheries have gained rapidly in importance during the last decade. There has for many years been an unsolved problem of regulating salmon fishing beyond the three-mile limit. Neither state nor federal government has had legal jurisdiction over taking of salmon along the Pacific shore line before they enter the rivers to begin the inland spawning journey. Recently states have attempted to regulate this and the tuna and pilchard catch by restrictions applied to all craft which land fish at ports within the state. Obviously such control can function only if Washington, Oregon, and California have identical regulations. Accordingly, commissions on interstate coöperation (the state agencies regulating commercial fish) drafted an interstate compact and presented it to the Eightieth Congress, which properly gave representation to the federal Fish and Wildlife Service on the governing agency to be created. It is said that the state spokesmen, resenting that intrusion of federal "bureaucracy," withdrew the proposal. It is to be hoped that so silly an exhibition of state "bureaucratic" jealousy will not prevail and that the compact will be ratified.

The Second World War gave a big fillip to the use of offshore species which had formerly been disregarded in large measure by the fishing industry. Ten per cent of the weight of the six-foot-long soupfin shark is made up of liver so rich in vitamin oils that it sold for \$9.00 a pound in

by at least one cloud, namely, the possibility that the fishermen of other nations may invade the north Pacific halibut grounds and nullify the regulations which bind only Canadians and Americans—the sole parties to the present international control.

1941. The flesh, when kippered, won instant favor as a salmon substitute. This shark is now in great demand, and indications are that it is being overfished. Similar new interest in other shark species and in the dogfish for vitamin production is also manifest in the greatly increased catch of these species.

There is a parallel trend in the take of ground fish, formerly caught only sparingly. The most important of these species are rockfish cod, ling cod, and sole whose use as food has been multiplied by new freezing and filleting processes and new marketing techniques. Thus from 1932 to 1943 the quantities of rockfish landed at Seattle increased more than tenfold, of sole more than twentyfold, and of ling cod nearly fifteenfold, totaling altogether more than 16,500,000 pounds in 1943. The new interest of the Seattle fishing industry in these useful species was shared by the fishermen of Canada and of other American ports. Depletion is certain to set in, as it did in the case of halibut and sockeye salmon, unless there is created a Canadian-American agency to develop the necessary scientific data concerning the life habits of the various species, and to prepare the kind of international controls which will permit a high sustained yield. It remains to be seen whether regional public opinion on both sides of the 49th parallel will wait until these newly useful species are seriously depleted before the necessary constructive international management of this resource is undertaken.

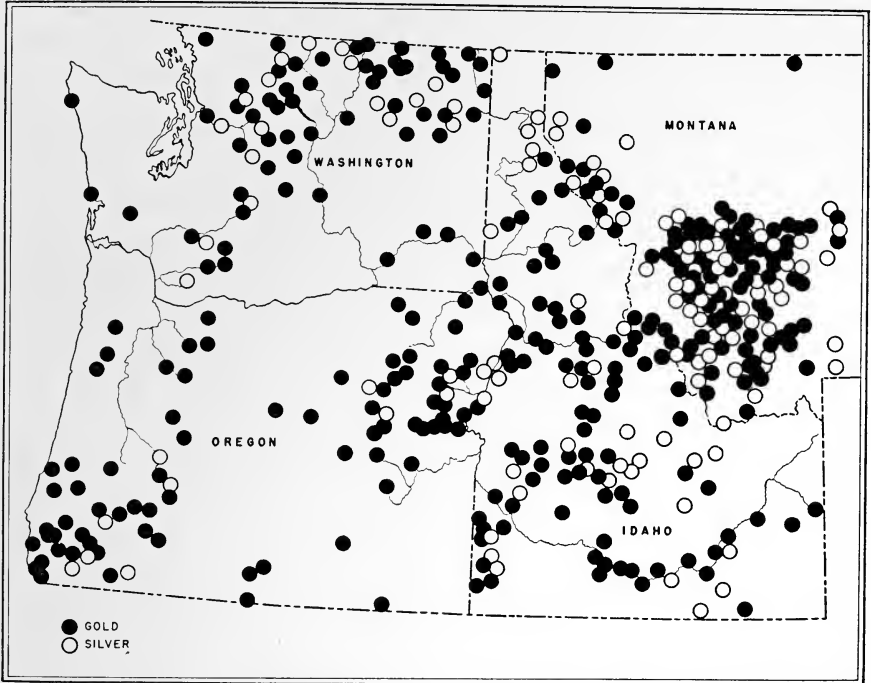
Minerals and Their Industrial Value

The California gold rush in the middle of the nineteenth century soon spread to the north, first into the upper Rogue River Valley and then up the Columbia into the Cascades and Rocky Mountains where miners panned the sands of many streams for the yellow metal.²⁶ On the Clearwater, the John Day, the Powder, Boise, Salmon, Owyhee, and Clark Fork rivers, rich placer deposits contributed heavily to early gold shipments. Mining of precious metals has continued through the various technical stages in the evolution of that industry, each stage marked by processes directed toward the exploitation of lower grade and more complex deposits. As late as 1940 the regional output of gold and silver (confined chiefly to the northern Rocky Mountain area) totaled more than \$45,000,000, exceeding by about \$12,000,000 the value of the production of copper, the most important single mineral. Silver is found chiefly in association with lead, zinc, copper, and antimony ores. Its production is concentrated in Idaho,

²⁶ In preparing this section heavy reliance has been placed on data furnished by Ivan Bloch, consulting engineer, formerly of the Bonneville Power Administration, and on information developed by the Albany division of the Bureau of Mines.

which leads the United States; Montana holds third position. The "Sunshine" mine in the Coeur d'Alene district is the largest single producing silver mine in the world.

The metal minerals of the Pacific Northwest have been found principally in the Rocky Mountain and Blue Mountain areas and secondarily in the



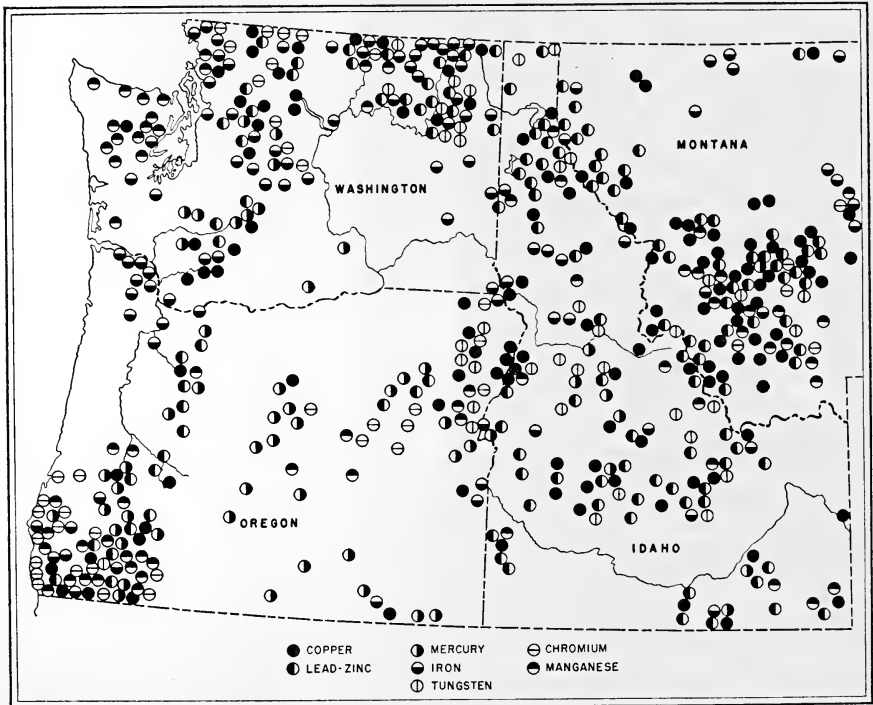
Occurrences of Gold and Silver.

Source: Adapted from *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 37.

Cascade and Klamath Mountain subregions. (See distribution of the various metals in the maps, pages 55 and 56.) The geological structure of the region rules out the probable discovery of metallic minerals in the expansive intermountain plateau areas whose surfaces are underlaid with great lava flows hundreds of feet in thickness, which bury the metal-bearing rocks too deeply to be explored or mined economically.

The Coeur d'Alene district of northern Idaho has already become a source of the lead-zinc base metals, second in the nation only to the Tri-State mines of the Midwest. Augmented by the recently developed and explored metal deposits of northeastern Washington this area will probably become the chief national source of these metals. The other major

mining industries are now located in western Montana, along what is known as the Boulder batholith. A great variety of ores, including the precious metals, occurs in that formation. On it the great Butte mining district has thrived for many years and has already produced more than \$2,000,000,000 in base and precious metals. There is good prospect for its indefinite continuance, because the ore bodies are believed to be sufficient to sustain the current rate of production for many years. Copper, for which Butte is famous, is also produced by one other large operation in the northern Cascades, near Lake Chelan, at smaller mines in the Siskiyou of southern Oregon, and as a by-product of the silver ores of the Coeur d'Alenes.



Metallic Minerals.

Source: Adapted from *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 35.

It is impossible to state with assurance the extent of the metallic resources of the Pacific Northwest. Private companies rarely reveal the content of their properties, and there is no way of compelling this information. The promising geological areas have not been adequately explored by the new scientific techniques that now supersede the "bird dog" surface scratching of the old-time prospector. This is true even in the northern Idaho and

western Montana districts where mining has been actively prosecuted for over sixty years.

During the Second World War the U.S. Geological Survey (USGS) and the Bureau of Mines undertook extensive spot investigations and drilling programs in Pend Oreille and Stevens counties of northeast Washington, which is known to be a lead-zinc district of great promise. But before a good estimate of its resources can be made, a far more comprehensive mapping and exploration program will need to be completed. In the much rougher and less accessible mountain areas of the northern Cascades and the Rockies in central Idaho little systematic exploration has been done despite the fact that these are known to be highly mineralized areas.

In the humid parts of the region the heavy vegetation has greatly retarded the discovery of minerals as is well illustrated by the error of the USGS in estimating iron ores in Columbia County, Oregon. In the early 1900's one of its leading geologists explored that area and reported that there were no iron ore bodies of consequence. When the Survey reexamined the identical area a few years ago at the request of the Bonneville Power Administration, it found over 4,000,000 tons of ore. This contradiction resulted from the removal of timber, the cutting of roads, the digging of wells, and other man-made disturbances, which have allowed the geologists to see more clearly than forty years ago what lies beneath the surface of the ground.

Only the big companies can afford to undertake systematic exploration for metallic minerals, and even many of them wait for government agencies to do the large-scale prospecting. Thus Alcoa made no move to prospect the aluminum-bearing materials in the Pacific Northwest until exploration by the Oregon state geologist had disclosed that the iron ore of Columbia County was rich in aluminum. If the small mining outfit is to remain an instrument for mineral development it seems clear that the government must not only continue its geological and topographic mapping on a greater scale, but must also do most of the ore-discovery work. Most of the large ore bodies that reveal themselves by surface outcrops or by float deposits have been found. Henceforth additional deposits will be located only through the use of seismic, gravimetric, magnetic, electrical, or other scientific methods in association with detailed geologic and topographic maps. During the war a method of discovery by airplanes was developed through the joint efforts of the technicians of the Geological Survey and the navy. They developed a magnetometer and adapted it to prospecting for certain ores by plane. New possibilities of basic-ore discovery by the use of geochemical and biochemical methods are the subject of pioneer research now being prosecuted by the technicians of the Geological Survey. If these turn out to be practicable, only those private corporations that

can afford to maintain a corps of specialists highly trained to detect the presence of minerals through analysis of vegetation, soil, and water will be able to compete in the search for significant new mineral bodies, unless public agencies step in with a service to all on equal terms.

Although the total value of the precious metals dug from the sands and rocks of the Pacific Northwest is impressive, the long-term economy of the region is more likely to be linked with the base metals and the nonmetallic minerals. Historically, modern industrialization has depended upon a favorable conjunction of iron deposits and coal. While that combination has become less essential than formerly, it still exercises a favorable influence on industrial growth. The Pacific Northwest is not as well favored in this respect as other industrial regions of the United States. Its most extensive iron deposits (in western Oregon) are of low grade. Small deposits of higher quality occur in Idaho, Washington, and Montana. Insufficient ore has been discovered to promise large-scale iron and steel development, though a small-scale electric furnace operation could be supported were other circumstances favorable. It would appear feasible to develop the small-scale electric furnace smelting and also the electrolytic production of powder iron. Past attempts (Simeon Reed's ill-fated venture at Oswego near Portland and the later Irondale and Kirkland efforts near Seattle) to compete with Eastern iron and steel manufacture have ended in failure.

The region has deposits of nearly all the ferroalloy metals so increasingly used in steel fabrication. But knowledge of their extent and quality is still incomplete. Manganese has been produced in considerable volume in western Montana near Butte and Philipsburg since 1916. Small production of tungsten and molybdenum has been under way for some years in Stevens County, Washington, and deposits are known elsewhere. The chromium deposits in northeast Oregon were used during the Second World War. Nickel is found in various mineral combinations in Oregon, Washington, and Idaho but production has not yet taken place. In general, the future value of this group of metals is tied to steel developments and to the more complete discovery of the extent and quality of ore bodies.

Metals are rarely found in a pure state; they are complex materials, frequently with a number of minerals intertwined within a geological matrix of waste rock. Their economic use depends upon the feasibility of concentrating the desired minerals, removing the wastes, and purifying the useful substances. The ore bodies first used were generally of much higher quality than those that remain, so that the technology of concentration and purification must be constantly improved without too high cost. The increased quantity of rock which must be extracted to obtain the same net amount of metal necessitates larger and more expensive processing plants. Yet as the processes of extraction, concentration, and beneficiation are improved,

the result is actually an increase of the reserves because lower and lower grades of ore can be utilized. This is a problem toward which both private and public agencies must continuously direct research and experimentation.

Coal, traditionally the nonmetallic partner associated with the development of industries, is found in western Montana, in western Washington south and southeast of Puget Sound, and in the Cascades near Wenatchee, with minor deposits at Coos Bay and on the Rogue. The most general industrial use of coal has been for steam and heat,²⁷ although it is also of great importance as a supply of the carbon essential to many chemical and metallurgical processes. The region has an estimated 64,000,000 tons but most of it is not suitable for coking. Although the Puget Sound deposits are fair in quantity, the veins are badly faulted and contorted and the coal is broken and intermingled with ash and stone, which makes it expensive to produce the pure carbon with a minimum of ash required by metallurgical and chemical industries. Unless present research by the U.S. Bureau of Mines can find ways through these difficulties, or unless other economic sources of carbon are discovered (such as the conversion of wood waste into charcoal) the development of metallurgical industries in the Pacific Northwest will be greatly impeded.²⁸

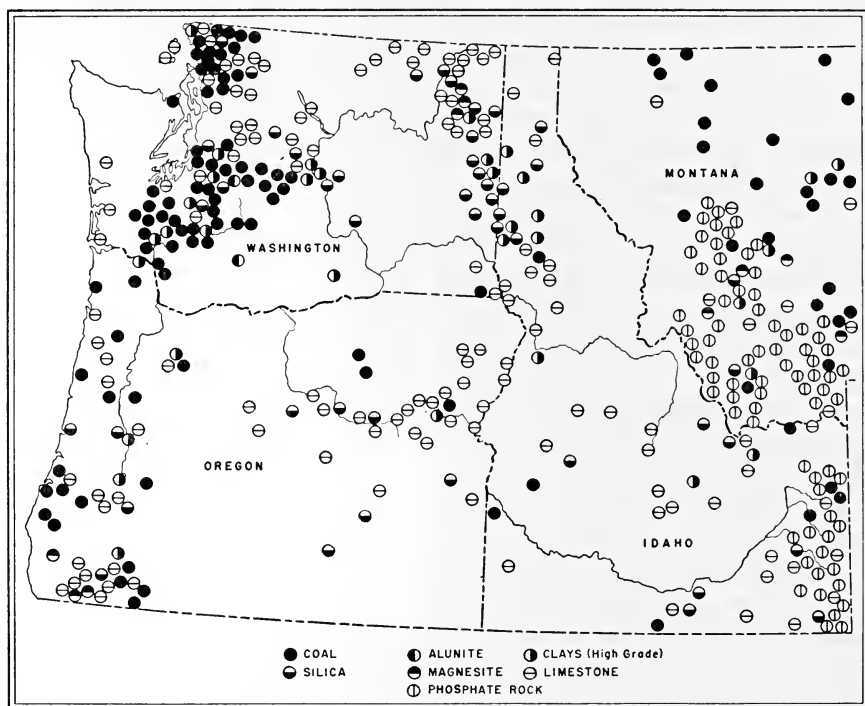
The light metals are represented in the region by large deposits of magnesium in eastern Washington, by dolomite in all states of the region, by serpentine, and olivine. Because magnesium, the strongest light metal known, utilizes these minerals, and is already being extensively used in transportation equipment as well as in buildings, these deposits in combination with cheap electric energy may some day support a thriving magnesium industry. A magnesium plant was built by the federal government at Spokane during the war, but was closed when military needs ended. The future peacetime development of that industry will depend largely upon improved and less costly methods of beneficiation.

A similar forecast also applies to the reduction of aluminum from native clays and ores. Although iron ores in the lower Columbia area contain bauxite, only a few small deposits of pure bauxite have been discovered. Clays of high aluminum content exist in large quantities in Washington, Oregon, and Idaho but their use for the making of aluminum depends

²⁷ In view of the Columbia River's hydroelectric potential and of its public development since 1934, industrial dependence on coal for these purposes will decline in relative importance. Nevertheless, if underground gasification should become feasible or if hydrogenation processes are perfected, regional coals will assume added economic importance, particularly in an area almost entirely devoid of deposits of petroleum and natural gas.

²⁸ At present high-priced carbon is supplied by the petroleum coke produced in California refineries and in the oil-gas plants of Portland.

upon cheap and successful extraction by electric energy. An experimental plant built and run during the war at Salt Lake City did not succeed; a second experimental plant at Salem, Oregon, for testing out an acid process did produce alumina but the cost was many times that of the alumina made from the imported bauxite; thus far all other attempts in the United States to utilize native clays have proved excessive in cost.



Nonmetallic Minerals.

Source: Adapted from *Economic Atlas of the Pacific Northwest* (2d ed.; Portland, The Northwest Regional Council, 1942), p. 39.

Unless the current experiments by Alcoa to extract the bauxite component of the Oregon iron ores should be economically successful or the use of regional aluminum-bearing clays becomes feasible, the aluminum industry of the Pacific Northwest must continue to depend upon imported raw materials as do the big reduction plants producing pig aluminum at Vancouver, Troutdale, Longview, Spokane, and Tacoma. Whether an integrated light-metals industry engaged in the fabrication of all kinds of finished aluminum products will develop on the foundation of these reduction plants, depends on diverse economic factors of freight cost, markets, and monopoly. Shortage of steel and wood products creates a new market

for aluminum objects while at the same time the expansion of light-metal manufactures is limited by shortage of electric power. Just how large this new industry will become under normal relationships of supply and demand cannot be foreseen. But there can be no doubt that a permanent aluminum industry of considerable proportions will remain.

To describe the deposits of the many other metals known to underlie the earth's surface in the Pacific Northwest would convert this summary view into a catalogue. Many of these deposits will probably at some future time have real economic significance for the region and the nation. A most favorable circumstance for their ultimate utilization is proximity to abundant and cheap electric power. Just as the flotation process made it possible to separate and aggregate complex and low-grade metallic ores, so the application of electricity to the reduction of both metallic and nonmetallic minerals makes possible the further utilization of complex and low-grade ore bodies not hitherto economic to mine.

Smelters have been so far apart that freight charges to them from the remoter mining areas have wiped out profits for the low-grade and complex ores so characteristic of the Pacific Northwest. Electrical reduction will permit the location of smelters nearer to the ore bodies. Moreover, the electrolytic processes permit the recovery at more reasonable total cost of each of the elements contained in complex ores, thus making worth while the use of many low-grade rocks that otherwise would remain undisturbed in the earth. In effect, therefore, region-wide distribution of low-cost electric energy will have the same result in prolonging mineral wealth as would the discovery of new ore bodies. Consequently, one of the most essential keys to expanding and conserving that part of the regional economy which is based on mineral resources is the early extension of high-tension power lines from the present Bonneville grid system into the heavily mineralized areas of the Rocky Mountains (that is into western Montana, north and south Idaho, and northeast Washington).

A second problem is the improvement of metallurgical processes which will make possible the use of minerals of potential but no present economic value. This is one of the functions of the Bureau of Mines, but until recently its experimental metallurgical work has not been planned with a view to strengthening the various regional economies of the United States. As we shall indicate below there are signs of change, and the prospect is good that the research facilities of the bureau at Albany, Oregon, will be more systematically directed toward solving metallurgical problems of regional as well as of national importance.

Thus far our discussion (except for that relating to coal) has been limited to the metallic minerals and their bearing upon the continued expansion of mining communities and of metallic industries. But we must not

overlook the great potential value of the nonmetallic minerals to the economy of the region. The huge deposit of phosphate rock may top all other regional resources in the long-run national interest. This mineral is concentrated in the eastern and southeastern border areas—southeast Idaho, southwest Montana, and smaller adjacent areas in western Wyoming and northern Utah. Here are 60 per cent of the known phosphate reserves of the nation and more than half of the world's proved supply of high-grade rock. Only a small fraction of these deposits has been used because (1) the centers of phosphate fertilizer use have heretofore been the South and New England, to which freight costs have made shipment prohibitive, and (2) the method for producing such fertilizer, before TVA's development of electric-furnace techniques, has required sulphuric acid, a by-product of smelter fumes, available in the West only in limited amount. Approximately 75,000 tons of phosphate rock per year have been shipped from the Montana mines to the smelters at Anaconda and Trail for conversion to fertilizer. In view of the deficiency of phosphate in the soils not only of the West but of nearly every farming section in the country, these deposits are destined to play a controlling part in the agricultural production of America. The key to their utilization, now that the experimental work of the TVA has demonstrated the feasibility of concentrating high-percentage superphosphate by electric-furnace methods, is the presence of cheap and plentiful electric energy. Because the electric-furnace process achieves much higher concentrations than the standard superphosphate, the shipment of phosphate fertilizer has become economically possible not only throughout the West but as far east as the North Central States, so that farmers throughout the Middle West may benefit from these north-west deposits.

The incipient postwar development of a phosphate industry in Idaho cannot expand appreciably until hydroelectric energy from the Columbia and Middle Snake is made available. That must await the completion of river projects now authorized by Congress, but not yet fully financed; the investigation, planning, and design of new multiple-purpose dams on the Columbia's tributaries in Idaho and Montana; and the construction of suitable transmission lines to carry the electricity to the furnaces that should be built in the vicinity of the raw materials. In the meantime many complementary activities by industry and by the federal government, on whose lands these rock deposits lie, are essential to prepare for the expanded fertilizer industry.

The secretary of the interior, under stimulus from the Bonneville Power Administration, the Geological Survey, and the Bureau of Mines, has already set in motion a coördinated program of detailed geological surveys, economic mining studies, metallurgical-process experiments, smelting tests,

and plans for revising federal land-leasing regulations to encourage private and coöperative investment in the essential production facilities. But Congressional financial support is needed for this basic preparatory developmental work.

Other nonmetallic minerals are important to the regional economy, particularly limestone and fluorite for industry, light-weight aggregate for construction, and ceramic materials for brick, tile, and pottery. The region's supply of these is only superficially known and will remain obscure until federal and state governments undertake the necessary systematic surveys.

Here then are the principal physical elements which underlie the economy of the Pacific Northwest, the wise use of which will vitally affect the kinds of work, the number and size of the farms, ranches, villages, and cities where the people of the Columbia River Valley will dwell, and the level of economic well-being they may attain. Whether we like it or not, national ownership of so high a proportion of the land and mineral resources of the region and legal jurisdiction over its navigable waters have made the federal government a partner with states and private citizens in the use and development of these resources. The region's resource problems, which have been briefly and incompletely summarized, are therefore in a peculiar as well as in the ordinary sense problems for federal interest and participation.

But the federal programs and management tasks in the area are not limited to the federal estate and properties. They include many functions of assistance and leadership in the wise management of state and privately owned resources. So interlocked are the management decisions of private owners of forests, farms, water rights, fishing privileges (to cite but a few examples) with federal ownership interests and established federal programs of assistance to private owners and citizen consumers that *what* Uncle Sam does, and *how* he operates his agencies are matters of outstanding importance to all present and prospective dwellers in the region. Notwithstanding the services performed by the several states to promote the private use and enjoyment of natural resources, the limited and separate areas of state jurisdiction, the absence of a regional government to express a distinct regional interest, and the state's slender fiscal resources have slowly but steadily brought the federal government into the center of a large number of regional resource-conservation and -development problems. This will be amply illustrated as we look, one by one, at the tasks already undertaken by the principal operating agencies of the national departments involved in these kinds of field activities.

The people of the region are vitally affected by the *manner* in which

these federal field services are administered. For many years little popular attention was directed to administrative questions. But with the multiplication of federal tasks, the birth of new agencies to perform them, and the expansion of federal water developments on the Columbia River system the conduct of federal field functions takes on a new importance. Many citizens have complained of divergent or conflicting policies and of the piecemeal conception with which programs have been planned. Despite the denials of federal officials and client-group spokesmen, evidence of lack of articulation across agency and departmental lines and of too narrow a view in planning and operation has built a prima-facie case for the need of improvement in administrative structure, areas of jurisdiction, and procedures.

But still another larger and more basic need has emerged into public consciousness since the creation in the early 'thirties of the Tennessee Valley Authority and the stimulation of regional planning activities by the late National Resources Planning Board (such as the Pacific Northwest and the New England regional planning commissions). That is the need for leadership in aiding officials and the public at all levels to view the whole regional resource situation with reference to (1) the maximum feasible development of unused and neglected resources and (2) the maximum feasible conservation or restoration of resources unduly exploited, wasted, or abused—both goals, of course, to be conceived in the light of their effects on the well-being of the people of the region and the total welfare of the nation. This function can only be fulfilled by some political entity whose jurisdiction is coextensive with the entire Pacific Northwest area. Inescapably, therefore, this key service can be performed only through some unifying federal administrative instrumentality.

What direction ought the change to take? We can be prepared to find reasonable answers only if we know how the existing organizations operate, what they are doing, and the points at which their relationships with each other produce friction instead of coöperative performance of joint tasks. We turn, therefore, to a review of the programs and administrative characteristics of the principal operating agencies through which Uncle Sam has been managing and developing physical resources in the Pacific Northwest.

CHAPTER II

The Corps of Engineers of the U.S. Army

Water Planning and Development

THE CORPS OF ENGINEERS of the U.S. Army was the first federal agency to engage in river-improvement activities. Before the Civil War it performed a great many diverse civilian engineering functions, including such tasks as road, canal, and lighthouse construction, harbor improvement, land surveys and mapping, that have long since been discontinued. But during the Civil War period it began to concentrate attention on river problems connected with navigation. The act of 1879 which established the Mississippi River Commission within the Corps of Engineers for work on that great stream, mentioned flood control as one of the river-improvement functions which might be undertaken, but it was not until 1917 that Congress gave flood control equal status with river and harbor work in the duties of the engineers. This act, which is still in effect, extended to the flood-control examinations, surveys, and construction the same legal provisions already applied to river and harbor activities.

In general, the corps planned and operated upon the basis of individual projects authorized by Congress for particular locations, usually after the corps had determined that public expenditures for river and harbor improvements were justified. An historian of the corps notes that in the 'twenties the engineers developed a comprehensive plan of internal improvements for the Ohio and Mississippi rivers and the Great Lakes, a system of canals connecting the principal bays along the Atlantic coast north of Washington, and an improved highway from Washington to New Orleans. But nothing came of this effort to develop a comprehensive water-transportation plan. "This was the only attempt ever made by the Corps of Engineers to view the country as a whole and to adopt a policy of internal improvements or river and harbor improvements in accordance with that view! Since then the practice adopted by Congress, or drifted into, has been

to improve rivers and harbors haphazardly and not as a part of a comprehensive and continuous plan of development.”¹

The failure of the army, the Congress, and the public to recognize and apply the conception of multiple-purpose development a generation earlier was not due to lack of public formulation of the idea. As early as 1908 when the Inland Waterways Commission, appointed by the president, reported to the Congress, the conception of comprehensive multiple-purpose river development had been clearly and forcefully stated. This is evident in the following excerpt from President Theodore Roosevelt's transmittal letter: “The report rests throughout on the fundamental conception that every waterway should be made to serve the people as largely and in as many different ways as possible. It is poor business to develop a river for navigation in such a way as to prevent its use for power, when by a little foresight it could be made to serve both purposes. We cannot afford needlessly to sacrifice power to navigation or navigation to domestic water supply, when by taking thought we could have all three. Every stream should be used to its utmost. No stream can be so used unless it is planned in advance. When such plans are made we shall find that instead of interfering, one use can often be made to assist another. Each river system from its headwaters in the forest to its mouth on the coast, is a single unit and should be treated as such.”

But President Roosevelt was not content merely to emphasize river systems, multiple-purpose planning, and development. He went on to the problem of unified administration, as follows:

“The first condition of successful development of our waterways is a definite and progressive policy. The second is a concrete general plan prepared by the best experts available covering every use to which our streams can be put. *We shall not succeed until the responsibility for administering the policy and executing and extending the plan is definitely laid on one man or group of men who can be held accountable.*”²

It was not until the Hoover administration that the corps undertook to examine its water-development work in the Pacific Northwest in terms of the Columbia River system as a whole. The acts of 1923 and 1927 authorized the “308” reports, named after House Document No. 308 in which the Corps of Engineers and the Federal Power Commission, acting upon instructions given them by Congress in 1925, recommended a number of surveys; the engineers were instructed to survey all navigable

¹ William Stull Holt, *The Office of the Chief of Engineers of the Army, Its non-Military History, Activities and Organization* (Baltimore, Md.: Johns Hopkins Press, 1923), pp. 6-7.

² Sen. Doc. 325, 60th Cong., 1st sess., pp. iv-vi. (Italics mine.)

streams and their tributaries showing promise of hydroelectric development, and to include in their studies consideration of flood control, hydroelectric power, markets for power, competitive sources of power, irrigation, hydrology, rainfall, evaporation, stream flow, runoff, silt content, and municipal water supply. This legislation furnished a foundation for multiple-purpose planning, even though it has taken some time for such planning to expand into the full potentialities thus permitted. But watershed management and development, fisheries, recreation, and pollution problems were still excluded from the scope of army river-planning purposes.

In pursuance of this authority the corps, in 1932, published its first "308" report dealing with the Columbia River. In this study the Snake and the main stem of the Columbia were the particular subjects of investigation. For these streams the engineers outlined a series of projects which involved, among other things, the construction of ten dams to serve the combined purposes of navigation and production of electric power. The report, in pursuance of Congressional instructions, also gave attention to other uses which might be served by a long-term development plan. While it fell far short of a comprehensive multiple-purpose drainage-basin program, still the broadened conception incorporated in this study represented a sharp departure from the tradition which had theretofore been followed by the army and by Congress.

Since this first comprehensive report on the Columbia River was published, the conception of multipurpose and watershed development has been widely publicized and has won large public support. The dramatic 1934 report on the Mississippi River by the Mississippi Valley committee of the Public Works Administration, under the chairmanship of Morris L. Cooke played a major role in bringing to the attention of all agencies and of the public the importance of watershed treatment as well as the multiple-purpose approach to water planning.³

The report of a special cabinet committee created by President Franklin D. Roosevelt in early 1934 entitled *Development of the Rivers of the United States* expressed a point of view concerning river development approximating that ultimately included in water planning by the Tennessee Valley Authority. The secretary of war qualified his acceptance by a highly critical dissent which favored the traditional lines in river planning and its performance by the Corps of Engineers.⁴ About this time the work of the Tennessee Valley Authority was inaugurated and the publicity attend-

³ See *Report of the Mississippi Valley Committee of the Public Works Administration* (Washington D.C.: 1934).

⁴ See H. Doc. 395, 73rd Cong., 2nd sess., especially pp. 4, 9, 10-14.

ing its activities has substantially forwarded the same broad conception. Today all federal agencies operating in the Pacific Northwest profess this point of view.

Organization of the Corps in the Pacific Northwest

Civil projects of the Corps of Engineers in the Pacific Northwest are under the jurisdiction of the Pacific Northwest division, with headquarters at Portland. Originally a single division covered the entire Pacific coast, including Alaska. During the construction of the Bonneville Dam a temporary North Pacific division headquartered at Portland was set up to give that job closer supervision. With the coming of the Second World War and the creation of the western defense command for the Pacific Coast States, the North Pacific division was dissolved. In March, 1946, it was re-established. The restoration of this division is probably the result of the problems incident to the preparation of the forthcoming comprehensive review report of the Columbia River system; and also of the need to give closer attention to the work on new projects already authorized or in prospect (such as the McNary Dam at Umatilla, Foster Creek Dam, Detroit Dam, and the other units on the Willamette Valley project) and of the heavy volume of military engineering projected in the Alaska district.

Jurisdiction over the Columbia River system is divided between two districts, which maintain one office in Portland and one in Seattle. The Portland district engineer has jurisdiction over the main stem from the river mouth to Pasco, over all tributaries flowing into the Columbia from the south, and over tributaries arising in Washington west of Pasco. The Portland district also includes all streams in Oregon which flow into the Pacific Ocean. While these are not strictly a part of the Columbia River system, they are so closely related to the western tributaries of the Willamette River as to make convenient their supervision by the Portland office. Thus, the Portland district embraces most of the state of Oregon, all of southern and central Idaho, a small enclave in northwestern Wyoming, an irregular strip in Washington along the north side of the main stem of the Columbia plus the southeast corner of that state (drained by the northern tributaries of the Snake and the Walla Walla rivers), a small part of northwest Utah, a fairly extensive area in northwest Nevada, and three little triangular strips along the northern border of California.⁵

⁵ This situation was changed in the fall of 1948 when a third district was established, with Walla Walla as its headquarters. Its jurisdiction subtracts from the Portland district the Snake River and its tributaries, and adds that part of the main stem of the Columbia from the mouth of the Umatilla to the Seattle district boundary above Pasco. This new district has supervision of the McNary Dam project and other authorized projects on the Snake to be started in the near future. (November, 1949.)

The upper tributaries of the Columbia and its main stem above Pasco lie within the Seattle district. That office also cares for river and harbor and flood-control improvements for the coast streams in the state of Washington including those emptying into Puget Sound, and for rivers and harbors in the territory of Alaska. Because of the vast extent of the area drained by the Columbia River system and the coast streams, the Portland district is said to have the largest volume of river and harbor work of any district in the United States. The importance of this office for regional development becomes clear when, in addition, the comprehensive program for flood control, navigation, power, and irrigation on the Willamette tributary system is considered, as well as the authorized and prospective new navigation and power dams on the main stem of the Columbia and Snake rivers.

Projects already undertaken or authorized are widely distributed in the vast territory which the army engineers control. Beginning with the river and harbor work, on nearly every coast stream from the Coquille River on the south Oregon coast to Grays Harbor in the north and on the streams emptying into Puget Sound, the Corps of Engineers has built and maintains some river or harbor improvement. On the Columbia the corps constructs and maintains navigation facilities from the bar at the mouth inland nearly three hundred miles to Pasco and thence up the Snake past Lewiston and on to Johnson's Bar Landing at the upper end of Hell's Canyon in central Idaho. In Washington it is engaged in river work on the lower Columbia tributaries such as the Cowlitz, the Lewis, Skamokawa Creek, Greys River, and Deep River. It has navigation projects on the waters of every major port city fronting on Puget Sound.

As noted in chapter i, floods are not confined to the lower-river valleys, so that requests for army projects come from every section of the Pacific Northwest. In addition to the extensive flood-control projects along the lower Columbia, in the valleys of the Willamette, and the streams of Puget Sound the engineers have undertaken numerous small flood-control projects to relieve local situations in the arid or semiarid interior. During the past two decades, the Corps of Engineers has been increasingly engaged, under Congressional direction, on such interior streams as the upper Snake, the Umatilla, the Walla Walla and its tributaries, the Flathead in Montana, the Kootenai in Idaho, and the Okanogan in eastern Washington. In the semiarid regions of the Columbia Valley, local flood disturbances resulting from snow melt and occasional local cloudbursts have called forth appeals to the engineers to extend their flood-control work back into these arid hinterlands. In the autumn of 1945 the Sacramento district office held hearings at Burns, Oregon, on a flood-control project connected with Harney Meadows. The rainfall in that area is less than ten inches a year,

yet it has a flood problem caused by spring snow melt on the watershed that drains into the meadows. In the spring of 1946 active interest in flood protection developed in the upper Snake Valley where man's disturbances in the land and water regime have created local flood problems. The cone delta built by the Snake River where it debouches from the mountain gorge onto the plain (as well as similar land forms created by such tributaries as the Teton) furnished opportunities for easy irrigation to the early settlers. The irrigation works, abetted by changes in vegetative cover back in the mountain grazing areas, have gradually produced flood conditions which

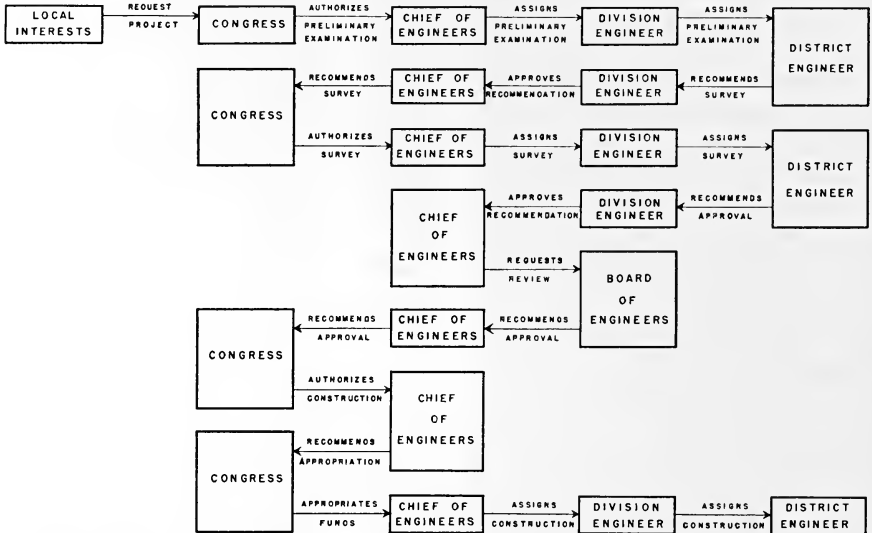


Diagram of Procedure for the Construction of Army-Engineer Projects.

menace the farms and villages on these irrigated deltas. Such conditions illustrate some special reasons for the upstream extension of flood-control activity.

Before we describe in more detail the work of the Corps of Engineers in the Columbia Valley it is desirable to understand the procedure which has grown up for bringing to birth this agency's water projects. Whether it be for a flood-control or a river and harbor project, local agitation starts the process. This is usually initiated by a chamber of commerce, a drainage district, or some group of citizens concerned with their local situation and desiring a water-improvement project. Customarily such a group first goes to its congressman (often on the advice of the district engineer or his local representative). The congressman may either consult the chief of the Corps of Engineers about the inclusion of a budget item for a preliminary examination or may prevail upon the appropriate subcommittee of the House Appropriation Committee to add the necessary funds.

The chart on page 70 shows the long-drawn-out process by which the preliminary examination may result in a survey, which in turn may produce a recommended project; and how the latter, after traveling from the district engineer through the reviewing offices of the division engineer, the chief of engineers, the board of engineers, and back through the chief's office, may come to Congress for authorization.⁶

But authorization does not mean the project will be constructed. That waits upon further independent Congressional action by which funds are made available, and this appropriation act is usually contingent upon prior budget recommendations by the chief of engineers and approval by the Bureau of the Budget (the latter step not included in the charted story). Once the appropriation is made, building by the district engineer must wait until the work is assigned by the chief engineer and in turn by the division engineer.

Of course, nothing in this process precludes Congress from independently including an item for a survey or for construction, regardless of recommendations by the Bureau of the Budget or the Corps of Engineers, and a good many army projects have been initiated by Congress in this fashion.

Another legal basis for army flood-control activity should also be noticed. For some years an annual appropriation of \$1,000,000 was made available for the chief of engineers to spend at his discretion for emergency flood control. As a result of disastrous floods in 1943 this fund was augmented during each of the following three years by \$10,000,000 and later by \$12,000,000. In June, 1948, emergency funds were increased to a total of \$33,000,000 by Congress. This has enabled the chief of engineers to undertake "emergency" flood-control projects. As will be shown later the definition of "emergency" has been very generous.

The long-drawn-out procedure which Congress and the corps have developed for launching river-improvement projects undoubtedly contributes to a good many difficulties that may arise between a survey and the beginning of actual construction. Although the delay between the 1936 survey of the south Santiam River unit of the Willamette Valley project and the beginning of construction was undoubtedly caused in part by the intervention of the Second World War, it illustrates in exaggerated fashion the ill consequences of undue procedural slowness. The 1936 study proposed the inundation of the village of Sweet Home, then a small town with few costly structures. Acquisition would have been relatively inexpensive.

⁶ The National Rivers and Harbors Board is a group of seven engineers of high military rank attached to the chief engineer's office, who review all plans for proposed river-and-harbor and flood-control works before the chief recommends them to Congress for authorization. This board also performs miscellaneous duties concerning water terminals, inland water-borne freight movements, and the design of floating plant for river maintenance.

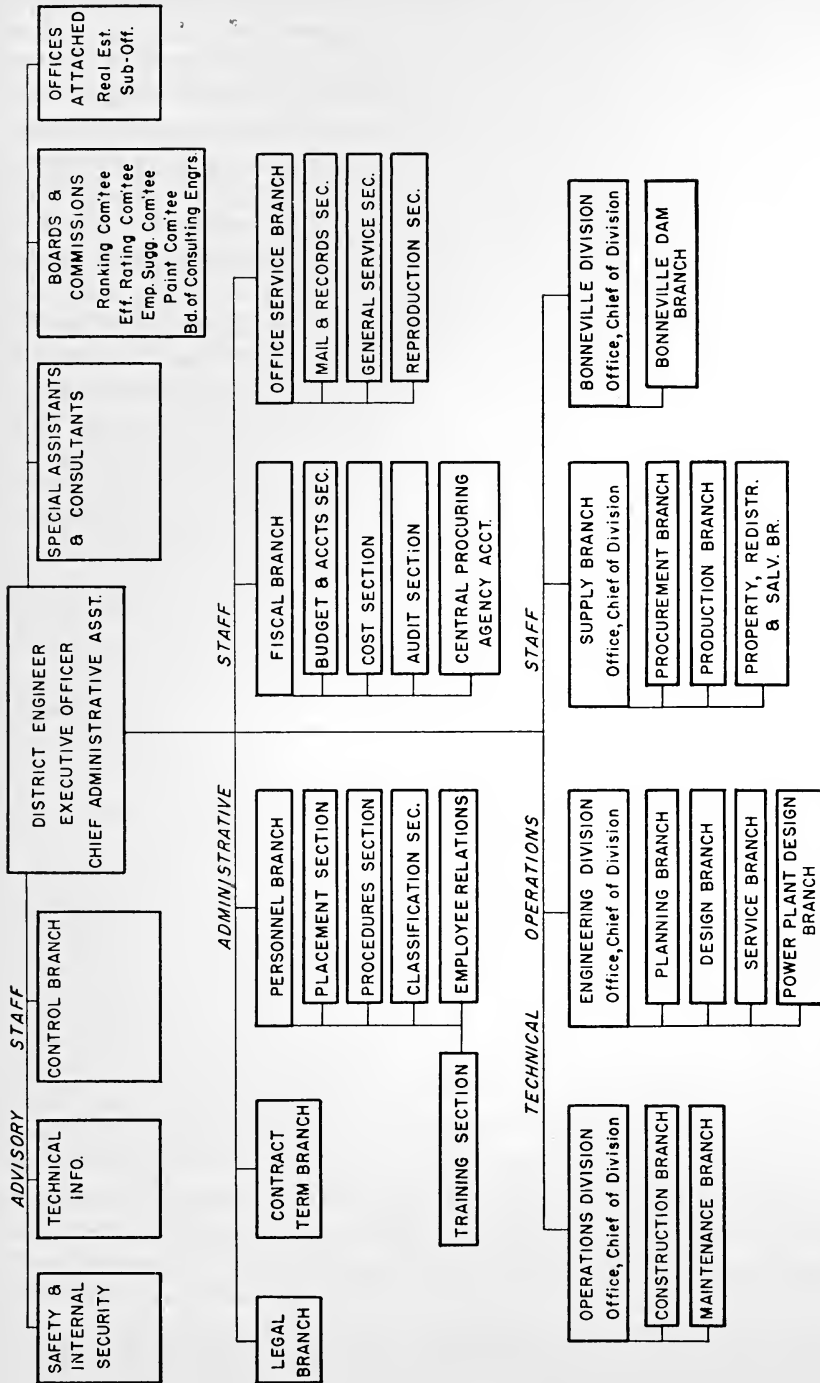
In the twelve years since the study was completed and plans made, a heavy influx of population in that part of the valley accompanied the rapid increase in forest industries. New public and private structures so multiplied and so increased acquisition costs that the most suitable reservoir site had to be abandoned. Had there been no long delay between the making of the first plan and the provision of funds for construction, this difficulty could have been avoided without damage to the growing lumber industry and with but slight inconvenience to urban uses.

Before we scrutinize in detail the functions of the Corps of Engineers, it may be helpful to outline the nature of its organization. The district, as has been suggested, is the major operating unit. The Portland district will illustrate this characteristic. It employs approximately 2,300 people, though the number fluctuates with the volume of work.⁷ About one-third of these are professional personnel grouped into two major operating divisions: (1) the engineering division which does the survey and planning work, prepares the designs for structures, and performs the many incidental technical services, such as mapping and hydrologic studies; (2) the operations division, which directs the construction and handles all the maintenance work. There is also a small special maintenance division in the Portland district charged with the operation of the Bonneville Dam. In addition are the auxiliary and staff facilities usual in any operating organization, such as finance, personnel, and office and legal services. Military engineering activity of the district engineer was reduced to small proportions since the completion of the military installations within the region, and may completely vanish.

Resident engineers are established at a few points outside of Portland and Seattle, where a continuing maintenance job is to be done or where construction requires a temporary decentralization of engineering work. In spring, 1946, the Portland district had resident engineers at Eugene, Boise, Empire (near Coos Bay, Oregon), Astoria, and Celilo Canal. These assignments result partly from the division of certain stretches of the Columbia River and the seacoast into maintenance units. The upper Columbia unit consists, for navigation purposes, of the slack-water pool extending from Bonneville Dam to The Dalles, the navigable stretches east of Pasco, and the Snake from its mouth to Johnson's Bar Landing; it includes the special job of maintaining and operating the Celilo Canal and locks.

Another resident engineer, at Portland, directs maintenance on the Columbia from Bonneville Dam to Vancouver. Dredging on these two units of the Columbia system is done at different dates, which permits the

⁷ Creation of the Walla Walla district reduced the Portland district staff. (November, 1949.)



Corps of U.S. Army Engineers: Organization Chart, Portland District.

maximum use of equipment: on the Columbia it must be done immediately after high water, and on the Willamette it is done just before the water level drops too low to float the dredges. From Vancouver to the estuary of the Columbia big ocean steamers are the essential consumers of navigation facilities, and the maintenance work requires equipment and activities peculiar to the stream and to that kind of traffic.

At the mouth of the Columbia is a bar built from river silt. To maintain the channel depth of forty feet across this barrier, to look after the jetties and the bays south to Newport, another resident engineer reporting to the district's operations division is stationed near the mouth of the Columbia. At Coos Bay, a resident engineer not only supervises general maintenance for the southern Oregon coastal region, but oversees small construction jobs and represents the entire organization on numerous matters. A similar task is that of the resident engineer at Eugene who controls the operation of the new Fern Ridge and Cottage Grove reservoirs, supervises small construction and maintenance jobs along the Willamette, maintains small repair shops for mechanical equipment, and acts as a center of information for the community on the functions of the engineers and the procedure for obtaining their help.

Whenever the Seattle district has a number of jobs concentrated in a particular area, it sets up temporary project offices. It also maintains resident inspectors on contract jobs, and survey parties measuring channels and dredge spoil. Because the Alaska district has not taken over civil projects, field stations in that territory (such as the Nome superintendent of floating equipment) report to Seattle. Most of the district engineering staff, however, work in or out of the Seattle or Portland headquarters. When survey work is required in connection with investigation or planning of projects, survey parties either work from the district office or are temporarily stationed in the vicinity of their field work.

At the head of this organization is the district engineer, a military officer, ordinarily a West Point honor graduate. He is assisted by an executive officer and two executive assistants, also military officers. In the spring of 1948 there was no other military official in the Portland district organization and rarely have there been more than four or five commissioned officers at any one time. The professional engineering work of the Corps of Engineers is done by civilian engineers who are under civil service and subject to the same tenure and pay conditions as other professional civil employees of the federal government. Under the army plan for officer training the district engineer and the other military executive officers ordinarily serve not more than four years in a district. Because of this constant flow of administrative military personnel through the district, continuity in engineer-

ing experience, in both the district and the divisional organizations is provided by the civilian engineers and other civilian executives.

The function of the division is chiefly to provide a check upon the engineering plans of the district technicians. The division engineer, a military man, has a small corps of civilian engineers of slightly higher classification status than their counterparts in the district offices, who advise with the district technicians during the planning of any large projects and review all plans completed by the district office. During the construction phase they visit the project to observe progress and give advice.

At the head of the corps stands the office of the chief of engineers in Washington whose engineering staff furnish specialized assistance to the districts. Among its consultants, for example, are experts on such subjects as concrete, spillway gates, reservoir outlets, soil embankment, and hydrological problems. The design engineers in the district office call upon the chief's office for assistance on problems outside their own experience. Occasionally the district and divisional technicians are called into conference with the technical officers in the chief's office on a major design feature of unusual character. This was done in designing the Detroit Dam whose great height involved a number of difficult features.

But the district engineers also rely on private consulting services for important structures or unusual problems. Thus a special board of civilian consulting engineers and technicians was employed to check plans for the Bonneville Dam, and the same practice was followed for the authorized McNary and Meridian dams. However, the highly trained specialists in the Denver office of the Bureau of Reclamation were not included on such boards.

The army organization, then, turns over to its lowest unit, the district, the initiation of all engineering work from preliminary investigation through the design stage for construction projects, big and little; but it checks this wide latitude by a double-barreled review furnished by the division and the chief's offices and, for all important jobs, by special consulting boards. With a few exceptions, the division gives final approval for small projects (namely, those costing a quarter of a million dollars or less). Once a project has been authorized and money for it appropriated, the district moves ahead with construction. It is free to spend the construction money within the appropriation or allocation limits, thus possessing a wide degree of authority to complete projects which reach the construction stage. But this decentralization of power is guarded (and sometimes impeded) by elaborate standards of procedure set forth by the chief in orders and regulations.

It may be useful to describe in some detail the nature of the activities

incident to river and harbor and the flood-control projects in this region. River projects consist principally of channel dredging, channel straightening, the revetment of river banks, and the construction of channel dikes. On the Columbia the Corps of Engineers maintains a thirty-five-foot channel from the river mouth into Portland harbor, and, from the mouth of the Willamette to Bonneville Dam, it is building and maintaining a twenty-seven-foot channel for seagoing vessels. Above Portland on the Willamette River it is authorized to keep an eight-foot, low-water channel to Oregon City, and from Oregon City to Corvallis a depth of from two feet five inches to three feet five inches. The corps is charged with removing snags between Corvallis and Harrisburg. If and when the Willamette flood-control project is completed these depths will be considerably increased.

Snagging and channel dredging are also continuing tasks on such Puget Sound streams as the lower Skagit and the Stillaguamish, in the harbor channels at Tacoma, Seattle, and other Puget Sound port cities, and in the shoals and channels of Grays Harbor and lower Chehalis River.

To keep channels clear requires the operation of dredges on a year-round basis, the construction of dikes to narrow and scour the channels, and the building of revetments at appropriate locations along the outer curve of the river, not only to prevent a break-through but also to stop erosion of the banks and the deposit of earth in the channel farther downstream.

Above Bonneville Dam, on the main stem of the Columbia, the army constructed, about 1910, the Dalles-Celilo Canal, an eleven-mile structure of rock and concrete designed for barge and light-boat traffic, and involving the operation of two locks. After nearly thirty years of almost complete inactivity the canal operators became busy servicing the barge traffic that sprang up when Bonneville Dam was completed. The Lake Washington ship canal (together with its lock structures), which the army built and maintains, has had a more consistent and ample use.

The corps has been working for some years on the Snake River to provide a navigation channel five feet in depth from the mouth to Johnson's Bar Landing above Lewiston, Idaho. This requires the blasting and removal of rock, the pulling of embedded snags, the excavation of gravel bars and silt deposits, and the removal of boulders and rock points. This project is only well started.

Harbor work, undertaken at numerous bays along the Oregon and Washington coasts, is illustrated by the project at Tillamook Bay where the army has built a fifteen-foot channel adjacent to the principal docks and a turning basin for ocean-going ships. It also maintains a fifteen-foot channel across the bar and has built a mile-long, rubble-stone jetty north

of the entrance to the bay. Across the bar at the mouth of the Columbia River a channel forty feet in depth and half a mile wide is maintained by dredges and by large and costly rock jetties. Such services require an expensive maintenance organization and the more or less constant use of a fleet of dredges. Some dredges are owned by the district; some are borrowed from the local port commissions; and others are hired under contract from private owners. The district may also borrow from the division or from another district the expensive seagoing dredges required for the Columbia River bar and certain other ocean harbors, but which cannot be fully employed by a single district. Dredging for new channel improvements is usually done by contract; but channel and harbor maintenance, which involve the frequent moving of dredges, is not profitable to private enterprise, consequently despite the preference of Congress and of the corps for contract work, most of it must be performed by a permanent force employed by the district engineer.

A continuous hydrographic survey is conducted by means of special boats equipped with sound instruments to check channel depths and to detect shoaling caused by freshets or by normal current action. The corps publishes weekly report sheets for the use of pilots. The charts made from these data become the guides to channel maintenance. Wherever they indicate shoaling beyond a safe depth, dredges are set to work to restore the channels. Dredging is always required at numerous places on the inland waterways after high water which accelerates erosion from banks and bars, and leaves deposits of eroded material in the channels. Constant agitation of the shallow water of the Willamette by propeller boats towing log rafts creates a continuous shoaling of the channel, necessitating perpetual dredging and the use of hired dredges to supplement army facilities.

To service these operating and construction tasks the army operates machine shops, supply depots, a floating plant of dredges, barges and boats, and laboratories for the analysis of construction materials.

Although channel marking on the Columbia and in the coastal areas is the function of the coast guard, there is a good deal of voluntary interchange between the two agencies. When buoys get lost or channel markers are accidentally destroyed, the district engineer notifies the coast guard of the need for replacement; and, the coast guard has to obtain the channel data for locating its markers from the engineers. Nevertheless, the jobs are distinct.

Flood-Control Program

There is a close physical relation between the revetments built for channel protection and the safeguarding of the bottomland along the river from

freshet overflow. Thus it is only a step from work undertaken initially as a navigation enterprise to the building of levees which act both as channel revetments and as important instruments for flood protection. Similarly, the work of deepening and straightening channels in order to facilitate navigation will often simultaneously perform essential flood-control service by making possible the rapid escape of water which would otherwise inundate the adjacent land. But the value of such local downstream projects has often been completely nullified by extreme high water which overtops revetments and levees and spreads out far beyond the normal channel of the stream. Hence the next and, in most river systems, the most fundamental step in the army's flood-control history was to build structures to regulate the flow of the water down the channel. This included the construction of dams on the headwaters which by impounding runoff and by planned release would reduce overflow on the reaches of the river where agricultural, industrial, and urban occupancy of the flood plains created important flood hazards. Such works performed a double service: they were essential for better flood protection, and by releasing water during periods of low natural flow could improve and stabilize navigation depths. This is the logic behind the comprehensive Willamette Valley project and its numerous multiple-purpose reservoirs, two of which have already been completed.

However, the flood-control program now brings the army into the irrigation picture, a situation which is developing in the semiarid hinterlands of the Columbia Valley no less than in the Willamette Valley. For example, the Corps of Engineers has recommended a reservoir at Lucky Peak on the Boise River near the Idaho capital. This will increase flood protection for the thickly populated area in the downstream reaches of the Boise. Nevertheless, it will call for an important modification in the operation of Arrowrock Reservoir (built by the Bureau of Reclamation in 1915) and of Anderson Ranch Reservoir now under construction. The three reservoirs, if operated as one system, will permit the reduction of storage reserves without causing damage to irrigation, while also greatly increasing total flood protection. (Lucky Peak Reservoir may also furnish some incidental increase in irrigation benefits.)

For whatever purpose dams are constructed, there is always the problem of fish conservation, particularly for the anadromous species such as the Columbia River salmon. Consequently, in planning flood-control reservoirs consideration must be given either to the installation of fish ladders and other devices for fish migration, or to facilities for artificial stripping and propagation.

But there is still another link in the chain of multiple-purpose consequences incident to the building of flood-control reservoirs. Without

damage to either flood control or navigation many reservoirs can also be used during a part of each year for hydroelectric generation. Consequently the army, as at Detroit, Lookout Point, and Quartz Creek dams, will become a manufacturer of surplus power. Under the terms of the Flood Control Act of 1944, that important commercial commodity must be turned over for marketing to the secretary of the interior.⁸ He has made the Bonneville Power Administration his agent and presumably will continue to allocate to it the marketing of power from other army-built dams. The Rivers and Harbors Act of 1945 ordered the marketing of electric power from McNary Dam to be brought directly under the Bonneville Power Act.

When the army began the construction of the first units in the comprehensive Willamette Valley project and built the beautiful flood-control lakes at Fern Ridge and Cottage Grove, it had no legislative authority to consider the recreational by-products of its handiwork. Recent legislation, however, permits the engineers to purchase additional land to protect reservoirs for recreational purposes. Undoubtedly army construction programs on the remaining flood-control reservoirs not only in the Willamette Valley but in other parts of the Columbia River system will conserve for public use the fishing, boating, and other recreational assets of these newly developed lakes.

Thus, from an early concentration upon navigation functions and later upon local flood protection, a whole chain of other purposes has evolved within the civilian work undertaken by the Corps of Engineers. This process suggests the necessary parallel development of interagency relationships between the army and other federal and state administrative departments. These we shall explore later.

Let us return for a more intensive view of the kind of work the engineers must do in performing their flood-control functions. Here it is essential to understand why local agitation leads to a continual stream of Congressional orders for preliminary flood-control examinations by the district engineers and to a smaller but steady stream of surveys, reviews, and projects. Undoubtedly the gratis character of the flood-control program together with the generous theory of economic benefits which has been developed to justify flood-control projects is basic to this steady volume of activity.

Congress has not explicitly formulated an economic policy for judging the soundness of recommended river and harbor projects. Its departure from "pork barrelism" in these matters is not indicated by an explicit measure either of benefit or of return to the federal treasury. Congress merely requires that in proposing river and harbor projects the commercial interest should be considered in relation to the need and expense of con-

⁸ See *Public Law* No. 534, 78th Cong., 2d sess., Section 5, chap. 665.

struction. This wide-open criterion is not available for flood control, even though most flood-control costs are assumed by Uncle Sam.

The justification formula for flood control is that annual benefits must equal or exceed the annual charges. Charges include interest and amortization as well as operating costs. But the method of allocating costs for multiple-purpose projects raises issues as difficult of economic demonstration as those implicit in the TVA or the BPA formulae for power-cost allocations in multiple-purpose projects where power is a major factor. Cost might be allocated on the basis of relative use of storage for various purposes, the cost of alternative methods of construction to obtain the various purposes, or on the basis of calculated relative benefits. The army has chosen, as illustrated by its Boise River report of 1946, to use the third method. Had it chosen relative use of storage space, flood control would in that program have paid for 92 to 99 per cent of the entire cost, whereas by using "relative benefits" as the measuring stick flood control would pay slightly more than 70 per cent.

On the benefit side of the equation, the validity of the formula rests not only on the assumption of a diffused social gain as justifying these expenditures, but also upon the realism and consistency with which flood damages are estimated.

Within the past decade a good deal of headway has been made in standardizing valuation techniques and in the detail with which flood damages have been studied. Thus, for example, in the Willamette Valley the flood plain was divided into twenty-one major zones, each of which was further divided into subzones. These divisions were based on similar land characteristics as to runoff, submergence, and the like. In connection with the 1943 and 1945 floods, house-to-house appraisals were made.

Out of the basic data now available, flood-damage curves for each subzone were constructed. When supplemented by spot checks on development and special factors of damage (such as the extent of ground cover, velocity of water, highway and railway damage) these curves give reasonably satisfactory estimates of damage for each flood stage of the stream. Appraisals of flood damage, some not so intensive as for the Willamette, were made for every stream on the Columbia River system. These data were summarized in the 1948 review report.

The second basis of benefit used in the army formula is the increased use of land in the flood plain, over the normal expected increased use, were no flood control provided. For farmland this is chiefly a comparative study of similar soils in flooded and nonflooded areas of the same locality and their net return if used for crops that could be grown under protection. Benefits to suburban land are based on presumed development under flood protection, though credit is given for other factors influencing de-

velopment. This aspect of benefit estimating cannot be standardized because of the infinite variability in suburban development situations. Here "guesstimating" may supersede estimating.

The only cost the army charges to the landowners benefited by local levee or diking projects and, since 1945, by drainage works, is for rights of way, or easements, on land actually used for levees, dikes, or drainage ditches. To be sure, the local folk must also agree to maintain the works after the army has built them, and elaborate regulations designed to implement this requirement have been promulgated by the chief engineer. But the fact is clear that there are no adequate sanctions even for this maintenance obligation. As a result, unless the whole locality faces severe and imminent natural penalties, it allows projects to fall into disrepair, and the district engineer is compelled to go back from time to time and mend them.

On the lower Columbia River where rich bottomlands have been diked as a part of the army's flood-control program, local maintenance obligations are well fulfilled because the penalty of neglect would be so hurtful to practically all the people that official sanctions are not really necessary. But along the Willamette River above Portland where local works have been less extensive and consist chiefly of revetments, many maintenance promises have been broken. From time to time the army has had to move in, either on order from Congress through specific appropriation designations, or upon pressure from the locality and its congressman for use of emergency or other available funds.

The legal definition given by Congress to "emergency" for the use of the emergency funds granted the chief engineer permits a generous interpretation of that term and opens the way to pressure-politics allocations. It includes not only repair and restoration work on damaged structures but work on structures threatened by flood. Such work may be performed not only on federally built levees but on works built by local folk with nonfederal funds. Under this definition, for example, during the short period from 1944 to 1946, inclusive, about \$600,000 of this emergency money was used to reconstruct local dikes in some twenty-nine separate locations along the Boise River below the Idaho capital. A number of old levees have been removed and new and better ones built in new locations. While this work is doubtless fully in accord with the legal meaning of emergency repairs it is a bit difficult for a layman to fit it into the ordinary meaning either of "emergency" or of "repairs." The allocation of these funds is normally the result of local group demand upon the chief engineer, often buttressed by the local congressman's intervention.

The value of local flood-control improvements to the community is illustrated by the work done for the farmers on Sauvie Island which lies

in the Columbia near the mouth of the Willamette River. The army built thirteen miles of levees, a drainage canal, a pumping house, outlet gates, and fresh-water gates at a total cost to Uncle Sam of approximately a million dollars. Along one side of the island a rock revetment protects the levee during high water from the swift current of Multnomah Channel. The local population through their drainage-district organization built subordinate drainage channels to collect the water into the main channel dug by the army; provided rights of way for the levees, the canal, and the pump house; and agreed to maintain the structures. Water gates located on the outside of the levees are closed whenever the water in the Columbia is higher than the water in the drainage canal and are opened when the levels are reversed. During the closed period the three electrically driven turbines keep the drainage water from backing up on the land. A good part of the island has thus been completely protected from overflow and, as a result of the drainage program and the pumping facilities, some of the interior lakes which formerly never drained have been turned into rich farmland available for food supply.

There can be no doubt that great economic and social benefit has resulted from this project, but the cost has been largely a gift from national funds to the locality. This is in marked contrast to Congressional requirements for farmer payments on irrigation projects or for sale of electricity generated by Bonneville, Grand Coulee, and the other federally built hydroelectric systems. When the Corps of Engineers explored the Willamette Valley project and presented its report to Congress in 1938 the current requirement for local financial participation in the construction of the flood-control reservoirs would have cost Oregon state and local agencies about eighteen million dollars. So large a local contribution would probably have prevented the early beginning of construction. However, before that project was authorized the local contribution requirements for flood-control projects were changed so that, except for certain minor works, the full cost is borne by the U.S. Government.⁹

The latest expansion of army flood-control functions was contained in Sections 2 and 11 of the omnibus Flood Control Bill of 1944, the first to include "channel and major drainage improvements" in local flood-control work. This means that hereafter the engineers' flood-control plans will provide for primary drainage canals and for cleaning out nonnavigable tributaries so as to permit the drainage of the bottomlands adjacent to the major flood-control works. Considerable areas of such lands are not usable even though levees, reservoirs, or other structures furnish general protection to the flood areas. As a consequence of this expansion recent reëxamination of the Willamette Valley project may bring within the immediate

⁹ See 52 *Stat.*, 1215, act of June 28, 1938.

benefits of the army's work large acreages of bottomlands excluded from the project in earlier reports.

There is a nice question as to how far the new drainage activity may extend. As construed at present by the Corps of Engineers it means the building of canals on the valley floor and the opening up of the sluggish tributaries to the navigable streams. The importance of this activity is illustrated by the Portland district engineer's study of the fertile and productive valley of the Tualatin River, a branch of the Willamette near Portland. Approximately 10,000 acres immediately adjacent to the river and its tributaries would be drained under the projected plans, and an additional 75,000 back from the immediate vicinity of the river would receive secondary drainage benefits if the owners provide secondary ditches to supplement the main drainage work of the engineers.

The act of 1944 does not require that landowners must organize to build these secondary ditches and to operate such drainage systems as a condition of obtaining a project. Yet in calculating the economic benefits of the Tualatin flood-control project the district engineer study assumes that secondary drainage works will be installed and maintained. It is expected that when the chief engineer's policy is established it will require both local coöperation and some local contribution.

This, and similar cases, raises issues not adequately covered by the statutes, which the corps must resolve. Unless the organization of a drainage district or some other appropriate local mechanism is made a prerequisite to drainage construction by the Corps of Engineers, there is danger that secondary ditches and works will not be built. Without such specific requirements, the owners of bottomland, whose property is drained gratis by ditches built and tributary channels cleaned by the army, would have little incentive to help organize local districts essential to maximum drainage benefits. There would be the further danger that once the army began building ditches for the bottomland, farmers adjacent to these lowest areas would demand similar gratuities. It is thus important that corps policy include requirements that will maximize secondary drainage activity by the local population without setting in motion a snowball of pressure politics to expand the Santa Claus role of their own organization.

Emergency Flood Assistance

Because of the recurrent floods in the Willamette Valley and the relatively dense population on the flood plain, a coöperative emergency flood plan was developed under the leadership of the Portland district engineer to mobilize and coördinate the resources for saving life and property. The district engineer allocated emergency flood duties to his own personnel.

When the river reaches flood stage on the key gauges the plan automatically goes into operation and takes precedence over all other duties. For example in January, 1943, when the forecasts received at the Portland office indicated that an emergency had developed, units of district personnel were dispatched at once in accordance with a predetermined plan to area offices at Eugene, Corvallis, and Salem. There they were maintained on a twenty-four-hour basis for the rescue and evacuation of refugees from the flooded areas. The men commanding the area offices had arranged in advance for the coöperation of the Red Cross, the local officials, the telephone companies, and the state police. They coördinated the use of all such equipment as row boats, motor boats, and outboard motors for rescue purposes.

The district engineer also obtained the assistance of the commanding officer at Camp Adair who dispatched about 400 men and officers to rescue stations, and of the coast guard which sent men and equipment, including surf boats and an amphibian plane from its coastal stations, to assist in evacuation and patrol work. During the flood period reports and forecasts of river levels at various points were organized jointly by the Corps of Engineers, the district representatives of the water branch of the Geological Survey, and the Weather Bureau. These agencies released the information to the public at frequent intervals through the radio and the press, and to local observers assigned to phone farmers and others endangered by the flood. This warning service enabled residents in low-lying areas to protect themselves, and sometimes their property, in time. During this flood 1,500 persons were evacuated in the Eugene area and over 700 in the other three areas, by the army, coast guard, and state police, which took them to central stations, usually schoolhouses, and turned them over to the Red Cross for emergency assistance, food, shelter, clothing, and medical care.

The leadership of the district engineer in this dramatic and useful work grew naturally from his possession of the basic information about the history and causes of floods and his detailed knowledge of the danger areas. Studying the history of the floods along the Willamette River made possible the preparation of large-scale maps showing in detail the areas likely to be flooded at different stages of the river. These are used to guide the warning and rescue service. This work was highly systematized and its success was fully demonstrated, particularly by the two major floods in 1943 and 1945.

Regulatory Functions of the Corps of Engineers

The regulatory duties given by Congress to the Corps of Engineers as the principal agency concerned with inland navigation, have long been ex-

tensive and diverse. Only the more important of these activities will be indicated here.

One of the most publicized functions is the regulation of bridges across navigable streams. A state may grant permission to build such a bridge within its boundaries, but the plans for it must be submitted to the secretary of the Department of the Army through the Corps of Engineers and must be approved in relation to any obstructive effect on navigation. Until 1946 bridges across interstate streams required the approval of Congress, but this function is now delegated to the secretary of the army. Rules for the operation of draw spans must likewise be approved by the secretary, who uses the Corps of Engineers to develop the facts (often after public hearings) and to make recommendations. There is a general rule that draws shall be opened promptly upon proper notice by the navigating vessel; but most large or important bridges require special regulations, so that the manual of regulations put out by the chief of engineers is burdened with detailed rules for a multitude of specific structures. Boat operators must consult this voluminous compendium of administrative regulations in order to know the conditions under which a bridge will be opened. Whenever a local government or private firm operating a bridge desires to change the draw-span regulations the same procedure must once more be followed from the district engineer up to the chief's office, and the modification must be finally approved by the secretary of the army. Some of the national regulations are a bit comical, incorporating even the name of the bridge tender who is to be called, but who may long ago have died or moved away. The following is an example of one of these special administrative laws: "203.720. Coos Bay, Oregon,—(a) Bridge (highway) across South Inlet. (1) The county highway drawbridge across South Inlet shall open for the passage of vessels or other water craft of any description upon verbal request to the person in charge of said drawbridge. The bridge tender is J. J. Burns, who lives at the west end of the bridge. In his absence R. G. DeMerritt, who resides at the west end of the bridge is in charge." ¹⁰

A special kind of bridge-operation problem is illustrated by the request of the Northern Pacific Railway to close permanently the draw span of the Lewis River bridge on its main line between Portland and Seattle. Notice of this intention mailed by the district engineer to interested parties brought a number of protests. Hearings were consequently held at which the local residents presented evidence that during flood emergencies the river was the only means of transportation for the upstream residents. On the basis of this hearing the district engineer disapproved the application

¹⁰ *Rules and Regulations Relating to the Navigable Waters of the United States*, revised to January 2, 1939. U.S. Corps of Engineers, pp. 193-194.

and the company did not elect to take the case up to the division and the chief engineer.

The army also regulates the tolls on interstate bridges to assure that they are reasonable. Official decision is made by the secretary of the army, but the analysis and recommendation concerning bridge tolls is the work of the district engineer.

But bridges are not the only structures which have to run the gauntlet of army approval. The erection of any structure in navigable waters which extends beyond harbor lines (where such lines have been established by the army) or which may interfere with navigation (where there are no harbor lines) must receive army approval. In the Pacific Northwest the predominant types of these structures are the booms, log rollways, logging dumps, and wharves that serve the lumber industry. Second in number are structures of the power and telephone companies and the fishing industry. Public utilities frequently desire to cross navigation channels with cables or power lines; sand and gravel operators want to dredge in navigable waters; the commercial fisheries present a stream of petitions for net racks, fish traps, and small fish-landing wharves. A special problem of fish traps exists in southeast Alaska. The Seattle district issues annual permits and has heretofore coöperated with the Fish and Wildlife Service by refusing permits on sites closed by that agency in its regulation of the salmon industry and by limiting the number of permits per season. Because of protests from the fishermen it has recently abandoned number limitations. All such requests are scrutinized as to their effect on navigation. The army regards it as important that neither the structures nor their operation detrimentally affect navigation channels, channel structures, or favorable water currents. Should a permittee desire to modify his structure or its operations he must obtain additional permission and sometimes a completely new permit.

The procedure for handling these cases has been well standardized. Every application must be accompanied by a drawing and blueprints, together with sounding of the channel adjacent to the proposed structure. The district engineer then notifies all known interests that may be detrimentally affected, particularly navigation interests, and asks that any objections be submitted by a specified date, usually within ten days. (In Alaska thirty days.) If no protests are received it is customary to grant the permit.

Although the district engineer has only limited authority to make final decisions, he may issue permits for impermanent structures such as fish traps, and for piling and dredging. The division engineer grants permits for some wharves and revetments upon recommendation by the district engineer. But only the chief engineer and the secretary of the army may grant permits for bridges and wharves to be erected outside of harbor lines.

As harbor lines have been established only in the principal port areas this involves a considerable volume of business. Permits for dredging operations call for systematic inspection by the district engineer's staff because they may vitally affect navigable channels or interfere with favorable stream currents.

It is the duty of the district engineer to see that owners remove any permitted structures which are not being properly maintained. However, in this region many structures such as fish traps and dolphins are abandoned by owners who cannot be located. They have to be removed by the Corps of Engineers at government expense.

Closely associated with this activity is the duty of the engineers to regulate the transportation and dumping of dredging spoil, garbage, or refuse. This function too is shaped by the army's interest in navigation rather than stream pollution. Under an act of 1924 the secretary of the army is directed to investigate the deposit of polluting substances in navigable streams and report his findings to Congress within two years. However, there is really no control by the army (or any other agency of the federal government) of sewage and industrial waste or other polluting substances unless they obstruct navigation. Congress also forbids the pollution of harbors by oil (because of the menace to navigation) and assigns to the Corps of Engineers the enforcement of this prohibition. But the U.S. Coast Guard and U.S. Customs Service are likewise enjoined by the statute to report violations. Oil pollution has been difficult to control on Puget Sound, where it not only increases the fire menace to harbor structures, but also contaminates oyster and clam beds.

Occasionally it is the duty of the district engineer to remove or destroy a wrecked and sunken vessel which has obstructed or endangered navigation for a period of thirty days. The cost is charged against the owner, but occasionally, as recently illustrated by a wrecked Russian vessel in the Portland district, the salvage value of the wreck does not cover the cost of removal. The deficit then comes out of the budget of the district engineer.

From time to time the Corps of Engineers is called upon to repair harbor lines. These ordinarily consist of a bulkhead line and, beyond it toward the channel, a pier line. Between these two no filling is permitted, in order to allow the movement of flood water and to facilitate proper harbor maintenance. The corps also has jurisdiction over the movement of ships in harbors with authority to set maximum speeds, establish anchorage grounds, and regulate the movement of ships within them.

It is clear from these and other minor regulatory functions that a wide variety of private activities must submit to the control of the army engineers and the secretary of the army in the interest of water transportation.

Collection of Navigation Statistics

The district engineer has small staff units engaged exclusively in the collection of commercial statistics relating to water transport. They obtain data on imports and exports by copying customs-office records at the port cities. Intercoastal traffic data are furnished by the steamship companies, which are required to give the district engineer copies of their manifests. Information concerning ships and boats (such as their type, weight, draft, or logs towed) which use the rivers and the coast ports is gathered from diffused and miscellaneous sources.

To keep the statistics complete and accurate the engineer's men must maintain continuous contacts and cordial relations with many commercial firms, all the boat companies, the Columbia River Pilots' Association, the lumber mills, and the log-towing companies. Some of this information is, incidentally, gathered at Oregon City and Celilo Canal locks which the district engineer operates. Money is also paid to part-time traffic checkers at the principal ports along the coast, and a monthly stipend is paid to the secretaries of the pilots' associations for copies of pilot reports. These data are organized in categories prescribed by the chief engineer's office and tabulated according to the river and other subdivisions used for maintenance work. This work is based on the legal requirements that the district engineer report to the chief engineer if any authorized project is not being used. A project may be ordered abandoned wherever its declining use no longer justifies its maintenance. From these data also the district engineer calculates the economic justification for new projects.

Hydraulic Laboratory Facilities

As an offshoot from the central hydrologic laboratory at Vicksburg which services the entire army engineer organization, a small hydraulic laboratory operated by men trained at Vicksburg was developed at the site of the Bonneville Dam. Here a number of models were built to work out problems of design associated with some of the major structures in the Columbia system. There are large-scale models of Bonneville Dam and of the river just below it, of Dorena Dam on the Willamette, Mud Mountain Dam on the Puyallup River built by the Seattle district engineer, and of the Columbia River near Umatilla where McNary Dam is being constructed. The Bonneville Dam model has been used to study the effect of changes in the design of the tailrace upon the river currents adjacent to the shore below the dam, and to determine methods of excavating material so as to reduce the turbulence of the river adjacent to the fishways and

navigation locks. The McNary Dam model reproduces the stream bed of that section of the Columbia River on a very large scale and is being used to try out different designs for various parts of the McNary structure.

Model studies make it possible to discover the effects of design upon the volume and speed of the water. They also demonstrate the differing effects produced by locating the penstocks and spillways on either side of the river. As the character of structures has a profound influence on eddies and cross currents, plans for reducing impediments to fish and boats can be worked out with assurance only through the use of such studies. Another experiment at this laboratory tests the effect of river silt on the erosion of various kinds of concrete by hurling silt-laden water at varying speeds against slabs of concrete of differing composition. This experiment is performed for the entire corps.

The development of the Bonneville hydraulic laboratory is justified by its convenience to the design engineers in the Portland and Seattle districts. The Vicksburg laboratory conducts similar experiments for all the districts, but its distance from the Pacific Northwest is regarded as a serious handicap to the district design technicians who work out plans for major structures. Even so, design problems of the Detroit Dam were studied at the Vicksburg laboratory, and concrete and earth-structure problems are investigated for all districts, including Seattle and Portland, at the Clinton laboratory near Vicksburg.

Interagency Relations of the Corps of Engineers

The dramatic conflict early in 1944 between the Corps of Engineers and the Bureau of Reclamation over plans for the development of the Missouri River, and the less publicized but equally bitter disagreements in Western areas such as the Central Valley of California and the Rio Grande, led to a Congressional effort to settle the basic jurisdictional conflict by statute. In the Flood Control Act of December 22, 1944, Congress not only declared that west of the 98th meridian the use of waters for navigation should be subordinate to "domestic, municipal, stock water, irrigation, mining, or industrial purposes," but undertook to enforce a system of clearances and cooperation between these agencies during the investigation and planning phases of water projects. The engineers and the Department of the Interior were ordered to give each other data developed by their investigations and "opportunity for consultation regarding plans and proposals and, to the extent deemed practicable by (whichever agency is making the study), an opportunity to cooperate in the investigation."¹¹

Shortly after this act was passed the chief engineer instructed his division

¹¹ *Public Law* No. 534, 78th Cong., 2d sess., Section 1.

engineers that while his office would handle the official transmission of engineer reports to the secretary of the interior (and to the state governors and their designated state officials whom the act likewise assured opportunity for consultation) "it is important that there be close coördination and coöperation between the Division and District offices and the Governors (and such state officials as they may designate) and the Department of Interior. It is desired that Division and District offices comply fully with the spirit of the section as well as with the stated provisions."

There was need for this legislative injunction to the two departments, although for a year before its passage a Federal Inter-Agency River Basin Committee had existed, set up by a voluntary agreement between the chief engineer, the commissioner of the Bureau of Reclamation (acting for the secretary of the interior), the land-use coördinator of the Department of Agriculture, and the chairman of the Federal Power Commission.

This interagency committee had announced on December 2, 1943, a procedure intended to obtain better coöperation in the preparation of reports dealing with multiple-purpose water projects. The committee promised that whenever an investigation on a multiple-purpose project was started by any of the agencies it would advise the others. It agreed to hold monthly conferences in Washington for discussing the results of such studies and investigations and for "adjusting differences of opinion and promoting ways and means for the implementation of this agreement." It promised that in all such projects the field offices would be ordered to communicate and confer with each other to determine what pertinent data were in existence and to arrange for the interchange of existing data and for a schedule which will avoid duplication in securing new data and will facilitate the concurrent submission of reports. During the preparation of reports field officers were to confer and to exchange information. Upon completion of reports "each office will be authorized to submit its comments on the report of other agencies, such comments to be forwarded with the reports."

When Congress in 1927 authorized the "308" comprehensive reports on various river systems and gave the Corps of Engineers the duty of reporting on the entire Columbia River system, it added a number of new purposes to those of navigation and flood control. That expanded authority pushed the Corps of Engineers into the orbit of many other agencies having a share in water-development problems in the Pacific Northwest.

This broadened authority was reinforced by the 1943 resolution of the Senate Commerce Committee, which directed the engineers to extend and revise the earlier reports and prepare a plan for further development and use of the water resources of the Columbia River system. With funds provided for this purpose the engineers blocked out a five-year study to be completed by October, 1948. The review task was broken into seventeen

major problems, and, was carried through by the Portland and Seattle districts under the supervision of the division engineer. But with the exception of problem no. 8 on navigation, the inquiry acknowledged the functional interest of the other federal agencies and solicited the cooperative aid of the following: Bureau of Reclamation, Federal Power Commission, Bonneville Power Administration, Soil Conservation Service, Farm Security Administration, Department of Agriculture, Fish and Wildlife Service, Coast and Geodetic Survey, Weather Bureau, Geological Survey, Bureau of Mines, Indian Service, Forest Service, National Park Service, and Public Roads Administration.

Numerous state agencies in the region affected were also asked to assist, as was the dominion of Canada, the province of British Columbia, and the Canadian-American International Joint Commission. Parallel to this study of the Corps of Engineers was an investigation by the international joint commission of those problems on the upper Columbia and its tributaries which are of joint interest to Canada and the United States.

Quite apart from this special systemwide planning project which Congress has entrusted to the engineers, other forces have been working towards closer relations between the engineers and other water agencies.

THE CORPS OF ENGINEERS AND THE BUREAU OF RECLAMATION

Not the least of these is the similar tendency for the Bureau of Reclamation to expand its interest in irrigation from isolated projects to system-wide development. Following its 1944 Missouri Basin report, known as the Sloan plan, which treated the main stem and all the tributaries of the Missouri River in one comprehensive development plan, the bureau undertook a similar review on other Western river systems including the Columbia. This latter study pushed bureau activities, formerly centered in the eastern and semiarid parts of the region, downstream towards the humid coastal areas west of the Cascades. The bureau has moved into the Willamette and the Rogue River valleys where simultaneously with the Corps of Engineers it is pursuing multipurpose water studies. It has even done some irrigation surveys in the Puget Sound Valley, including studies of the Green and Suwamish rivers at the request of the army.

In the pursuit of its expanded basin-wide interests, the bureau, like the corps, is now authorized to undertake multiple-purpose river development, limited however to projects that have some irrigation features. The army has been moving from the coast and the lower stream courses to the upper channels and tributaries of the Columbia, also searching for multiple-purpose projects possessing some potential navigation or flood-control benefits. In a few instances, such as the Foster Creek project, it has prepared plans for upstream structures solely for hydroelectric development.

Although this increasingly competitive situation, created as each agency moves into territory heretofore exclusively the domain of the other, has some useful by-products (chiefly in forcing each to pay attention to the multiple-purpose potentialities of each project) it is unquestionably increasing the sources of conflict as well as placing new demands upon the capacity for interagency coöperation.

There can be little doubt that, since the valley-authority idea has attracted wide attention—particularly in the Pacific Northwest—the official policy of both agencies has been “coöperation.” There have been many manifestations of joint field consultation, the exchange of data, and harmonious division of survey tasks between them. This is illustrated by the activities in the Willamette Valley. With the establishment in 1940 of a project office of the Bureau of Reclamation at Salem, Oregon, and the simultaneous launching of a resurvey of the Willamette Valley by the Corps of Engineers it became necessary to work out a number of arrangements for the coöperative performance of survey work. A request from the project engineer of the bureau to the Portland district engineer for such data as would be helpful for his studies was readily granted. The bureau prosecuted its first studies without reference to concurrent army field activity, but when it turned attention to the Yamhill and Tualatin sub-basins a partial division of labor was arranged which allocated to the army all flood-control phases. The bureau was furnished army data for its analysis of irrigation possibilities.

On hydrologic questions the two agencies attempted to get together whenever the same reservoir might serve flood control, irrigation, and power. Although no written agreements were entered into between the agencies, the field men or their Portland and Salem superiors conferred over a division of work. The amount of money available to each agency varied from year to year. The funds often determined the division of work, which therefore shifted accordingly.

A great deal of work is required to ascertain whether a site is really suitable for a dam and a multiple-purpose reservoir. Though initial tests may look favorable, and optimistic prospects may continue even through the seismic explorations, the site cannot be considered suitable until a great deal of drilling has revealed the character of the subsurface earth structure. Therefore, if either agency is financially pinched it may be glad to allow the other to use its available funds to make these investigations.

The process by which work was divided in the study of the Yamhill Basin illustrates field staff coöperation between the two bureaus. The Corps of Engineers being in the field first, made studies on the North Yamhill of flood damage, areas of overflow, and bank erosion, selected a promising dam site, mapped it, made the seismic explorations, and began to map the

reservoir area. By that time the Bureau of Reclamation had come in and decided that it would need a diversion dam and an intake for a canal system. The two agencies then agreed that they might be able to use the site of the diversion dam for the main reservoir and thus combine both major purposes. The bureau first made the subsurface drilling in order not to waste money if the dam site proved unsuitable; then the engineers mapped the new site and the reservoir area, using data assembled by the bureau.

On the South Yamhill the U.S. Geological Survey had mapped a dam site and reservoir in 1934. So the Corps of Engineers moved in to make the seismic explorations. But when its investigation disclosed that the flow-age problems were costly and the geological structure unfavorable, both agencies abandoned the site and moved upstream just above Grande Ronde where the army mapped a dam and reservoir area and the bureau did the core drilling for subsurface explorations. However, various objections to this location were raised, so the corps moved downstream just below Grande Ronde. Here too the bureau did the dam-site mapping and the subsurface explorations. After a good deal of preliminary work this site was abandoned for various reasons and the original site mapped by the USGS on the South Yamhill again became the center of study. The Bureau of Reclamation resurveyed this site using a new axis for locating the dam and made a thorough subsurface exploration of the new location which appeared to be satisfactory. The Corps of Engineers made the hydrologic flood-routing and flood-control-benefit studies.

It is clear from this example that the field parties of the two agencies and the men in the Portland and Salem offices carried on their respective investigations quite amicably. Whatever lack of coöperation there may have been in other areas, the Willamette was certainly not a scene of conflict.

Nevertheless, this example bears evidence that the sharing of jobs by two engineering organizations in a friendly partition of the same area slows down the pace at which items of work can be completed. Clearing of informational and routine matters by correspondence between the Salem project bureau engineer and the Portland army group takes time, which would not be required were there a single agency operating from common headquarters. This delay may not be serious because survey work for planning projects customarily proceeds slowly with a good deal of trial and error. A river-planning job is not like an operating situation; there are always phases of a project which may be simultaneously studied so that the staff can keep busy even though a particular job is held up pending the completion of informational exchanges between two agencies.

However, delay is more serious if a field office, like that of the bureau at

Salem, must obtain information from the other agency to enable its home office at Denver or Boise to go ahead with activities essential to the prosecution of the Salem-office field job; as for example, when the bureau office at Salem is notified by its Denver superiors that designs and estimates on certain sites will not be prepared until data on outlet capacities and flood routing have been obtained. These data have to be furnished by the Portland district engineer's office.

The problem of delay in the clearance of data for field parties of the two agencies is probably more important in the Snake River Basin, which is farther from Portland (even by air mail).

The foregoing problems in interagency clearance are cited simply to indicate the extra administrative motion involved when activities which possess much organic unity are split between two organizations. The cost of this in time, effort, and money is impossible to estimate.

Assurance is given by officials in both agencies that coöperation between the field parties of the Corps of Engineers and the Bureau of Reclamation at work in the same subdivisions of the Columbia River Valley is, on the informational front, quite complete; that they exchange survey data freely and regularly. Moreover, in launching the comprehensive resurvey of the Columbia River system the corps acknowledged the jurisdiction of the bureau over irrigation and turned to the Boise regional office for all information on irrigation needs and problems. Although no formal agreement was made which stipulated what studies the bureau would prepare for the army, conferences between bureau regional officers and the two engineer districts developed informal understandings as to the work for which the bureau would take responsibility and the conditions under which it would be completed. In the army's study and in the preparation of the concurrent bureau-led Department of the Interior basin-wide study the Boise regional officials have dealt directly with the Seattle and Portland district engineers, rather than with the division engineer.

The simultaneous preparation of these two Columbia basin-wide studies undoubtedly caused a feeling of disadvantage among the staff of the Bureau of Reclamation. This first comprehensive report on the whole river system by the Department of the Interior was prepared under strict time limits and without additional special funds. The army's 1948 review report, on the other hand, was a more deliberate and thorough job, because it included the results of new and well-financed field work. The Bureau of Reclamation had to pull together from existing data, and without benefit of new investigations, a comprehensive plan for all Department of the Interior water programs on the Columbia River. This means that its report must be sketchy.

The appearance within so short a time of two reports covering, in the

main, identical river problems could place the bureau's effort at considerable disadvantage. The habitual generosity of Congress toward the army in appropriating for upstream investigations, where increasing competition with the bureau is developing, gives many of the bureau people an inferiority complex. They feel that the bureau's relative poverty keeps it a number of jumps behind the army in proposing new projects. This is one explanation for the competitive exhibition staged by the bureau at the December, 1947, meeting of the Columbia Basin Inter-Agency Committee over the proposed Hell's Canyon project.¹² Such a situation must be recognized as an inescapable consequence of a competitive administrative structure in river-basin development. No matter how good-natured the competition may be (and it is not always good-natured) there are bound to be invidious comparisons to the disadvantage of the competitor that has not been lucky enough at the moment to obtain the lion's share of money and of Congressional authority for system-wide river planning.

Another sector of potential conflict between the Bureau of Reclamation and the Corps of Engineers in the Columbia Valley occurs in connection with the operation of reservoirs built by the bureau, primarily for irrigation but with some provision for flood-control storage. Congress attempted to resolve the problem of jurisdiction in multiple-purpose reservoirs along with the priority issue in the use of water, by certain provisions in the Flood Control Act of 1944. Section 7 stipulates: "Hereafter it shall be the duty of the Secretary of War to prescribe regulations for the use of storage allocated for flood control or navigation at all reservoirs constructed wholly or in part with federal funds . . . and the operation of any such projects shall be in accordance with such regulations." Consequently at Anderson Ranch Dam and the Palisades Dam (now being constructed by the Bureau of Reclamation) and at other reservoirs which the bureau proposes on the upper Columbia tributaries, the bureau must take orders from the secretary of the army for operating that part of each reservoir capacity allocated to flood control.

The bureau does not want the army to dictate the operation of its reservoirs during the flood season. Its officers therefore suggested a joint field board representing the two agencies which, upon the basis of a runoff- and weather-forecasting system, would determine the schedule of reservoir operations during each flood season. While the bureau would operate the reservoirs it would be governed with respect to flood control by orders formulated by the joint board. But these suggestions did not meet with favorable reception by the chief engineer, who believed, first, that the secretary of the army is not permitted under the statute to delegate his authority on flood-control operations to other agencies, not even to a multi-

¹² See chap. xiv for a more complete statement of this conflict.

purpose board; and, second, that the army can develop rules for reservoir operations in such terms that any difficulty during the flood seasons can be provided for.

An agreement was reached late in 1947 for operating the flood-control features of Palisades Reservoir, which may become a pattern for other upstream cases. This was drawn up by a joint field staff unit. It worked out the operating rule curves to be used for both Jackson Lake and Palisades reservoirs, which must be managed as a unit in order to obtain the best flow control of the Snake at Heise during the flood season and to assure summer irrigation needs. This agreement was facilitated because of the accuracy with which floods can now be predicted in the upper Snake watershed. Floods are caused almost solely by melting mountain snows. With the increasing completeness of snow surveys and with good meteorological records, properly analyzed, forecasting for considerable periods ahead becomes fairly reliable. The operating agreement also includes additional flood-storage reserve at the Palisades as a safety factor to provide for inaccuracies in forecasting.

It seems probable that a similar but more complicated integrated operating program will be agreed upon for Lucky Peak, Arrowrock, and Anderson Ranch reservoirs. Once the two agencies have reached accord, the Department of the Army will promulgate the proper regulations in the *Federal Register* and from then on it will be the job of the bureau to run the reservoirs.

Even before this stage of the program is reached many problems in the design of structures for these multipurpose reservoirs need coöperation between the district engineer, the regional director of the Bureau of Reclamation, and the Denver establishment (which is responsible for designing all major reclamation structures). In the past the Bureau of Reclamation has designed dam facilities for the release of water solely for utility in irrigation operations; but the joint use of established reservoirs for irrigation and flood control may require changes in outlets and spillways. In evacuating a reservoir for flood control a much greater volume of water has to be passed more quickly than is necessary for irrigation purposes. For example, under the plan of the Corps of Engineers for increasing flood protection in the Boise Valley, the Arrowrock Dam built by the bureau thirty years ago solely for irrigation, becomes one unit in an integrated flood-control plan involving a group of reservoirs. In order to make Arrowrock available for this new purpose its outlet capacity will have to be markedly increased. The bureau's Anderson Ranch Dam, where this problem was anticipated, was designed to serve both purposes.

Another illustration of the physical interconnection between the bureau's job of irrigation and the army's function of flood control is the

bureau's plan for the Mountain Home project. This project is expected to divert water from the Boise watershed into the Snake River Valley to irrigate a large part of the 380,000 acres that the project will supply with water. In turn this requires a diversional tunnel from the Payette River into the Boise watershed to help irrigate 20,000 acres in the Boise Valley. If this integrated multiple-diversion program is to be effective as between the Snake and its tributaries it will be indispensable that all reservoirs on the Payette River (Garden Valley and Cascade) and those on the Boise (Arrowrock, Anderson Ranch, Deer Flat, and Lucky Peak) be operated under a coordinated plan. Careful advance calculations for an operating schedule will have to be worked out as well as agreement upon the design features which will serve both purposes.

It is the new practice (as illustrated in the design of Anderson Ranch Dam) for the bureau to submit its spillway designs to the district engineer for field review. Some arguments have resulted, and occasionally it has been necessary to resolve a field dispute by Washington review.

It is evident that despite a good deal of cooperation, particularly on the technical level and in the field, there is serious conflict between these two important river-development agencies in the Columbia Valley region. Conflicts center in the question: "Who is to build new multiple-purpose projects?" A mild issue of this kind arose over the Hungry Horse project, which Congress assigned to the Bureau of Reclamation. That assignment was undoubtedly the result of the row stirred up in western Montana by the army's proposal to raise Flathead Lake to provide storage to firm up power at Grand Coulee and Bonneville dams. In 1943 when it appeared that the Northwest would be short of power to meet prospective war and postwar loads the army was asked to examine the sites at which storage could be most advantageously and quickly furnished. It proposed to raise the dam at Flathead Lake. But this would have inundated some farmland adjacent to the lake, thus damaging the market for the businessmen of Kalispell.

The outcry during the customary hearings held by the district engineer and later at field hearings of a House subcommittee, led to the abandonment of the Flathead proposal and the substitution of the Hungry Horse project, which Congress subsequently authorized. During the course of the House committee hearings, Bureau of Reclamation officials joined in the popular clamor, one Denver officer going out of his way not only to oppose the army project but to cast grave doubt upon the whole program of his own department's sister agency, the Bonneville Power Administration.¹³

¹³ See the statement by E. B. Debblor in *The Columbia River and its Tributaries*, Hearings before subcommittee of the Committee on Irrigation and Reclamation, 78th Cong., 1st sess., H.R. 262, Part I, pp. 65 ff.

As a consequence of its political ill luck at Flathead Lake and of losing the Hungry Horse plum, which Congress awarded to the Bureau of Reclamation, the army has been planning an alternative project at Springston. This plan, besides providing for additional power, would include other purposes more clearly within the army's jurisdiction.

The two agencies have a gentlemen's agreement regarding their respective claims to the construction of certain multiple-purpose projects. Projects primarily for irrigation are to be built by the Bureau of Reclamation and those primarily for navigation or flood control, by the Corps of Engineers. The question as to who shall build a project primarily useful for power purposes or one whose purposes are of nearly equal importance has not been resolved and will have to be settled by Congress. This means that until Congress speaks there will be intense competition for its favor in the award of particular jobs.¹⁴

This situation caused the conflict over the proposed Foster Creek Dam. The army's plan for this project showed no navigation or flood-control benefits and only a small amount of irrigation. Power potential, however, will be very substantial, ranging close to that of Coulee. Washington spokesmen for the Bureau of Reclamation criticized the project before the Senate committee as failing to make sufficient provision for irrigation. They suggested that dams lower down on the Columbia ought to be pushed ahead of the Foster Creek project. This attitude was contrary to the desire of other agencies in the Department of the Interior—particularly the Fish and Wildlife Service and Bonneville Power Administration—that the Foster Creek be built first.

The Department of the Interior through Assistant Secretary Chapman on June 14, 1946, formally requested the Senate Commerce Committee that the Foster Creek project be taken from the omnibus Rivers and Harbors Bill of 1944 and assigned to the Bureau of Reclamation for construction. Chapman based this claim upon the ground that the project had little or no value for navigation or flood control but was the kind of project which "under the established policy of Congress has traditionally been constructed by this Department." The effect of the row was disapproval of the project by the Senate Commerce Committee on the ground that since Foster Creek Dam was without navigation value and was almost entirely for power purposes the federal government had no constitutional right to build it. The committee later repented under pressure from the Washington senators, and Foster Creek was re-incorporated in the Rivers and Harbors Act.

¹⁴ An agreement between the Departments of the Army and the Interior was signed in 1949 which markedly reduces the competition for construction opportunities between the corps and the bureau. This is explained in the Postscript.

More recent evidence of fundamental jurisdictional conflict was the competitive scramble in the investigation of dam sites on Hell's Canyon section of the Snake River. The army beat the bureau to the draw by pushing its study to a project-proposal stage and holding a hearing at Lewiston. The bureau, handicapped by 1948 Congressional appropriation cuts for investigation work, hastily drew upon existing data to propose preliminary alternative plans at a different site on the same stretch of river. Any dams on this, the most spectacular river gorge in the Columbia River system, will be primarily for hydroelectric power and flood control; the dams will be outstanding engineering structures of great height and mass, calling for the best engineering talent and organizing ability. Instead of pooling resources and forming a joint investigatory party, which genuine coöperation clearly indicates, each agency sought to capture the prize for itself. Neither could afford, therefore, to participate in a joint planning venture. The bureau's counterclaim was staked out at the Baker, Oregon, meeting on December 10, 1947, of the Columbia Basin Inter-Agency Committee. At that time a suggestion for a joint investigation made by a neutral spectator was received in silence.

THE CORPS OF ENGINEERS AND THE HIGHWAY AGENCIES

The district engineers are only incidentally concerned with highway and road construction, some of their projects involving the relocation and building of highway facilities. Consequently the district staff is not ordinarily well equipped with personnel experienced in or organized for highway engineering. It therefore turns quite appropriately to the U.S. Bureau of Public Roads or to the state highway agencies for these incidental road jobs. For example, on the Detroit project the district engineer turned the relocation of the Santiam highway over to the Bureau of Public Roads, which designed the new highway and, once the design was approved, proceeded to construct it with money allocated from the army budget.

Relocated secondary roads in some of the other Willamette Valley project units will also be designed and built by the Bureau of Public Roads.

The activities of the bureau as agent for the Corps of Engineers are confined to areas in federal ownership, which in this region means chiefly national forests. Elsewhere, as at McNary Dam at Umatilla, the relocation of highways is turned over to state highway agencies on a basis similar to that described above. If the army-built levees are jointly used for flood protection and highways, the Corps of Engineers enlists the services of the Bureau of Public Roads to establish construction standards for the local agency. This is usually the county, which then builds the roads.

During the Second World War the Civil Aeronautics Administration turned to the Portland district engineer to build its air fields. The army

organization, having no engineers familiar with asphalt construction and no asphalt testing apparatus, arranged to borrow both from the Bureau of Public Roads. With its own organization thus supplemented it performed the services desired. This policy of recognizing another agency's specialization in engineering skills and experience resembles that long followed by the Forest Service in its road and highway construction program on national forests. It casts doubt on the wisdom of the proposal so often urged in the past (and endorsed by the President's Committee on Administrative Management in 1937) for a single federal Department of Public Works.

THE CORPS OF ENGINEERS AND THE U.S. GEOLOGICAL SURVEY

Every water-planning organization such as the Corps of Engineers and the Bureau of Reclamation must depend for basic data on a number of scientific agencies of the federal government.

The most important of these is the U.S. Geological Survey (now in the Department of the Interior), which was a historical offshoot from the Corps of Engineers. A number of its functions are of importance to the work of both the Seattle and Portland districts. Most essential are (1) the preparation of topographic maps; (2) the gauging of streams; (3) the survey of streams and the location of dam sites for hydroelectric development; (4) the study of ground-water supplies.

But these scientific activities have had small appeal to congressmen. As a result whenever the urge for accelerating the development of rivers captures the attention of the public and of Congress (as it did during the thirties and may be destined to do in the next few years) there is a woeful deficiency of maps and basic data with which to make accurate and assured plans for many important features of river development. Thus the Corps of Engineers upon whom much of developmental planning work in the Columbia Valley region has fallen has had to try to fill the gaps by (1) allocating money to the USGS to establish more gauging stations and to speed up mapping and survey work in certain parts of the watershed and (2) by itself undertaking a considerable amount of mapping and stream gauging.

The current status of mapping in this watershed is essentially as follows: Less than half of the area has been topographically surveyed by the USGS or has had ground-control lines established by the Coast and Geodetic Survey (within whose jurisdiction that primary survey job lies). Although a considerable part of the region has been photographed aerially and topographic maps could be readily made from these photographs, it will be necessary even for that purpose to run ground-control lines in order to determine locations and elevations. The Portland district engineer's office is well equipped with a battery of machines and a corps of technicians

capable of translating aerial photographs into topographic maps, were the ground work done by the other agencies.

In order to push ahead its review report on the Columbia River system the district engineers, using army funds, employed the USGS to speed stream-survey work on specified stretches of the river; at the same time the engineers were surveying other reaches of the river system with their own crews. The USGS made new dam-site maps and resurvey maps on the main stem of the Columbia from Priest Rapids to Foster Creek, and prepared water-surface profiles for the main stem of the Columbia and a number of its tributaries. It also prepared tail-water rating curves for some temporary sites. During the war survey work was halted in the Portland district although the Seattle district employed the USGS to survey an important section of the Columbia north of Pasco.

In making its detailed studies of numerous small river areas considered as potential sites for reservoirs, the army had to run its own ground lines from the infrequent points determined by the triangulations of the Coast and Geodetic Survey. It also made contour maps which are much more detailed than those prepared by the USGS. Such apparent duplication in map work is probably inescapable: the USGS would not be warranted in carrying its map studies of particular areas into great detail without knowing in advance that one of the development agencies would actually use the maps.

The district engineer at Portland reported that the stream-survey maps made by the USGS on the Willamette watershed proved exceedingly useful to the army in its preliminary plans for the various units in the Willamette Valley project. They were well done and contained sufficient information to suggest the probable location of dams and reservoirs, including valuable estimates as to the hydroelectric possibilities. Usually they also showed elevations up to about 500 feet above stream levels, which is sufficient for the preliminary examination by the district engineers.

In the fundamental task of stream gauging also the USGS is a central service agency. Yet even for this job it has not been given sufficient money (despite the matching funds from the states) to provide enough gauges for a great many river-planning activities on the Columbia. When the army requires additional flow data, it either supplies funds to the USGS for installing new gauges and recording the information or, if it desires an intensive study of an area, it may itself install temporary gauges which it will maintain and read.

The army hydrologists insist that this kind of information is so essential to wise river-structure planning that there should be a record of at least fifteen years of water history before a project is planned. There can be little doubt that one reason for the critical trouble or failure of so many private

and public irrigation projects has been the inadequate hydrological information upon which they were based. The drought drama of the 'thirties highlighted the inadequacy of many earlier river irrigation projects; yet the public and Congress appear still not to appreciate the fact that river developments cannot be accurately planned unless for some years prior to their design the fundamental hydrological information has been in process of collection. This information has to be gathered at points sufficiently numerous and representative to tell the long-time story of water runoff and stream flow in dry and wet years. Even after the army or the Bureau of Reclamation furnished funds to the USGS to install gauges which should be continuously maintained, some of them had to be abandoned because Congress subsequently failed to give the USGS money to operate them.

THE CORPS OF ENGINEERS AND THE U.S. WEATHER BUREAU

The Weather Bureau (now in the Department of Commerce) has in recent years played a part of increasing significance in the water planning needed for building and operating stream structures. This has been most spectacularly demonstrated in the Tennessee River Valley where in coöperation with the TVA (as will be described below) a comprehensive program of data collection and forecasting has become the key factor in operating the entire system of river reservoirs. Service-wide coöperative arrangements have been perfected between the Corps of Engineers and the Weather Bureau for

(1) operation of a nation-wide network of recording rain gauges; (2) study of major streams and the preparation of estimates of maximum possible precipitation for selected drainage basins; (3) coöperative networks for reporting rainfall and river stages; and (4) preparation of 48-hour quantitative forecasts of storm rainfall to facilitate the operation and maintenance of stream gauge stations for obtaining records of stream flow.¹⁵

In addition the Weather Bureau plays a leading role during time of floods by issuing forecasts and warnings of the approach of critical flood stages. In the Portland district this service, as noted above, has become of special importance on the Willamette River. It has more recently been front-page news as the 1948 Columbia River flood became the center of anxious attention in the region and the nation.

In the mountainous parts of the watershed of the Columbia River system snow fall is of major importance in determining runoff and stream flow. This fact is fairly obvious east of the Cascades where so large a percentage of the annual precipitation, necessary for irrigation and power and the basic factor in potential floods, falls on the higher slopes as snow,

¹⁵ *Report of the Chief of Engineers, 1944, v. 1, p. 12.*

But snow fall is also of great importance for such streams as the Willamette, the Cowlitz, the White River, the Snoqualmie, and others which find their source on the west slope of the Cascade range. Since the early 'thirties the systematic collection of snow data has become a matter of increasing concern to local irrigationists, power companies, and all federal and state agencies concerned with the use or control of surface waters. This has resulted in a system of coöperative snow surveys to improve the forecasts of runoffs to be anticipated during the melting season.

Agencies of the Department of Agriculture have taken leadership in these surveys because Congress, since 1936, has entrusted to that department jurisdiction over federal investigations of watersheds for runoff, water-flow retardation, and soil-erosion prevention. Because a large part of the upper watersheds of the Columbia and other rivers in this region lie within national forests the Forest Service has been particularly active in checking and recording the snow fall and changes in snow depth; but the Soil Conservation Service (to which the secretary of agriculture in 1945 gave new responsibility for department-wide water-planning activities) has supplied the central coördinating staff, which receives the coöperative snow-survey reports, analyzes them, and circulates the information to all interested parties. (See chapter viii for a more complete account of this work.)

The army engineers have become greatly interested in snow studies. This is due to their need to make plans for dams and reservoirs in the Cascade Mountain section of the Willamette Valley project, for flood-control work on the upper Snake, and for spillways for most of the dams in the upper Columbia Basin.

In the fall of 1944 representatives of the chief engineer, the Pacific Coast division and all Pacific Coast districts met with Weather Bureau officials to set up a coöperative snow-investigation project, part of which is directed by the technical staffs in each district engineer's office. The first of the programs is a series of special snow investigations which began in 1945 on the Willamette River, Puyallup and Flathead watersheds, and on the Snake, principally the Boise tributary. At each location snow-survey parties are kept constantly in the field during the winter season. Taking depth and content observations as they go, the survey crews travel along the profiles of the watershed (that is, from the valley floor up the slopes to the ridge in contrast to the ridge measurements made by the Forest Service and the Soil Conservation Service). They travel in an automotive crawler which has been very successful in traversing snow slopes. Their instruments record the moisture content of the snow column, the vaporizing conditions, physical texture, and other essential data. It takes about ten days to make a circuit on the Willamette watershed and from ten to fourteen days on the Boise. As soon as a circuit is completed the crew starts over again, thus

obtaining a practically continuous history of the snow throughout the winter season.

It so happened that a circuit had just been completed when the big flood on the Willamette occurred in December, 1945. It was therefore possible by taking observations immediately after the flood to estimate closely the loss of snow during the storms which caused the flood, and thus to calculate fairly accurately the contributions of the snow melt to the flood.

A new method is now being studied of prosecuting snow surveys by means of stereoscopic pictures taken from airplanes with cameras equipped with telescopic lenses. Before the snow season brightly painted stakes with distinct measurement gauges will be placed on high poles. If, as is hoped, these airplane pictures will show both the depth of snow and the precipitation records for each location it will be possible to make rapid surveys at low cost. In addition to full-time survey parties, men living on the watersheds are hired to check snow stations and precipitation daily. This fixed-observer program helps the engineers trace the recession of the snow up the slopes and to check the elevations at which new snow has fallen.

Before the inauguration of these snow investigations careful records were made of the physical features of the watersheds: steepness of slope, orientation, and vegetation cover. Because it is believed that these factors are of great importance in affecting runoff their precise influence is the subject of special study. The analysis of the snow records is made by the Weather Bureau technicians at San Francisco who also make use of the information collected by the Soil Conservation Service and other snow-measuring agencies.

The second phase of the West Coast snow-study program is conducted at three snow laboratories, one on the Flathead near the Continental Divide at Marias Pass (serviced by the Seattle district), one on the Willamette (upper Blue River), and the third on the Sacramento River. These outdoor laboratories are test areas chosen for their typical locations and characteristics. They are closely surveyed as to all physical and ecological characteristics and are intensively instrumented. Each has a crew of from four to six men, of whom one is always on duty. At the Flathead laboratory are a weather station and ten substations, scattered over a 250-square-mile area, which are used to determine how and why snow melting occurs, and the meteorological factors that affect it. The laboratory permits the analysis of the effects on melt of winds, vaporization, physical snow structure, temperatures, sunshine, and other factors. The instruments give details on such questions as the intensity of sunshine, the reflection of sunshine from snow, the absorption of sunlight under varying snow conditions. (It is known, for example, that new and old snow differ in their reflection and their absorption of the sun's rays.) The laboratory also indicates the sealing

effects of freezing and the bearing of orientation of slope upon precipitation and melting. For the latter purpose a complete orientation diagram has been made for each watershed. At the Willamette-watershed laboratory the principal problem is the influence of rain storms on snow melt. Incidental questions are the effects of orientation and slope of the watershed and of wind velocity on melting.

Guiding this entire program of snow studies is a technical advisory committee composed of one technician from each of the Pacific Coast engineering districts and one from each of the two regional Weather Bureau offices, plus the chief of the Sacramento laboratory. Two internationally known meteorologists are also employed as consultants.

To summarize, the chief purposes of this snow-study program are to determine (1) the maximum volume of water stored in the snow column, (2) the greatest volume of snow that can occur, (3) the distribution of snow as to elevation, slopes, and orientation, and (4) the rates of melt in the open and under forest cover. The results of these investigations should be exceedingly valuable not only in the planning phases of the army's work but also in the operation of reservoirs.

The Weather Bureau is interested in making its forecasting services more useful to the agencies which build and operate river structures. To this end it has for some years carried on an increasingly successful cooperative program with the Tennessee Valley Authority. In June, 1944, the Portland and Seattle district engineers, in conference with the chief of the Weather Bureau and his local officers, worked out a plan for daily five-day forecasts for the use of the engineers during the flood season. The Portland district engineer regards this program as of special value for operating the reservoirs of the Willamette Valley project, and particularly for the Detroit Reservoir. On the basis of flood data gathered since the 1936 report, it has been necessary to increase the flood-storage reserve of the Detroit Reservoir from 165,000 acre-feet to 300,000 acre-feet and to push the time for holding the reservation back to November 15. But to accomplish this new safety requirement with least construction cost and least damage to other multiple uses (especially the generation of electricity), it was proposed to make an ingenious use of five-day weather forecasts. By zoning the Willamette watershed and applying unit hydrographs to the part of the shed that furnishes the flow from the Detroit Reservoir, inflow to it could be determined in advance of the flood; in operating the reservoir the district engineer could take advantage of the quantitative rainfall for at least three days. By the design of enlarged outlets in the dam, during the three or more days before the arrival of the flood, the reservoir could be rapidly evacuated, reducing its contents by some 100,000 acre-feet within that brief time. The effect of this plan would be to increase the flood-storage

reserve by at least 100,000 acre-feet without either adding to the size of the reservoir or reducing the water available during flood season for power purposes.

This program to use the Weather Bureau's prediction services for the design and operation of the Detroit Reservoir so as to save space for flood reserve was vetoed by the office of the chief of engineers. It was felt that the data concerning flood volume upon which the program was based did not cover a sufficient period to prevent possibility of undue danger to flood control. Although the operating program has been disapproved for the present it is quite possible that the development of more accurate and complete information concerning runoff obtained through snow studies and through improved forecasting techniques may render this proposed program fully reliable.

THE CORPS OF ENGINEERS AND THE U.S. DEPARTMENT OF AGRICULTURE

In 1936 the Congress handed over to the Departments of War and Agriculture jurisdiction over investigations and improvements for flood control and allied purposes.¹⁶ This action was taken as part of the opposition to the president's use of his National Resources Committee for coördinating federal agencies in water planning. Under that legislation the USDA is to make "the investigations of watershed and measure for run-off and water flow retardation and soil erosion protection on the watersheds" (except when Congress provides for other arrangements as it did in authorizing the Department of the Interior to take over soil-erosion prevention work on public lands within its jurisdiction). Although the Bureau of Plant Industry, the Forest Service and more recently the Soil Conservation Service have engaged in a good deal of research relating to watershed cover and runoff, the Department of Agriculture had never made flood-control investigations prior to the 1936 authorization. It was therefore slow in getting its flood-control surveys under way. In the Columbia River Valley watershed only two studies (for the Boise and the Walla Walla rivers) were undertaken prior to Pearl Harbor and they were not published or approved by the secretary, although manuscript copies have been available to the local field staff of the Corps of Engineers. It is reported that these studies were held up by a departmental committee because of a disagreement over the method of computing benefits. However, they were reëvaluated for publication in 1948.

After these first surveys, funds were lacking for further watershed analyses until 1948 when a survey was undertaken on Willow Creek, Oregon, and a reconnaissance of the Yakima was completed.

¹⁶ See *Public Law* No. 534, 78th Cong., 2d sess. Section 2 for a recent restatement of this authority.

The Soil Conservation Service has charge of streams east of the Cascades, while the coastal watersheds are allocated to the Forest Service. The Berkeley Forest and Range Experiment Station in California, has been used by the Forest Service for all its watershed flood studies in the Pacific Northwest coastal areas. Consequently, the Portland and Seattle district engineers have had to keep in touch with the Berkeley forest technicians for data concerning coastal watersheds within their districts.

As noted above, the Soil Conservation Service has been designated by the secretary of agriculture as the department's principal water-planning agency. The officials of the Corps of Engineers must therefore keep in contact with that service, as well as with the regional foresters and the chiefs of the forest and range experiment stations of the Forest Service if they are to know what transpires on the upper watersheds of the region. Close association with the Forest Service is necessary because most of the upper watershed areas within the Columbia Valley region are in mountainous terrain of which a large part lies in the national forests and within the physical administration of the Forest Service. The latter, in the pursuit of its work, has come into possession of a great deal of information about the water-producing characteristics of these watersheds. Probably the most significant research on the influence of forest cover on water yields within this region has been performed by the Ogden Forest and Range Experiment Station in Utah, which has research jurisdiction over forest areas in the southern two-thirds of Idaho and western Wyoming.

It should be noted that the Bankhead-Jones Act gives to the Soil Conservation Service authority to acquire watershed lands whose misuse is conducive to accelerated erosion. The Forest Service likewise is permitted to acquire within its purchase areas small tracts of forest land that need cover protection. There thus appears to be sufficient legal authority to bring within the administrative jurisdiction of these two established agricultural agencies most of the problem areas on the higher watersheds of the Columbia Valley. Canvass of the Forest Service officials yields the judgment that in this region, unlike in the upper watersheds of the Tennessee River, there are no large areas in private ownership which present important erosion threats to the streams and land below.

The regional administrative areas used by the Forest Service and the Soil Conservation Service present obstacles to close coöperation with the Corps of Engineers. As explained earlier, the Seattle and Portland districts together include all of the Columbia River watershed. The Forest Service, by contrast, does not follow river-valley boundaries. It divided the Columbia Valley between three regional offices. One of these is centered in Portland and includes all of Oregon, a tiny bit of California, and most of Washington. The second regional office is at Missoula, Montana, and super-

vises the forests of northwest Washington, northern Idaho, and all of Montana. The third region headquartered at Ogden, Utah, takes in the great intermountain area: Nevada, a large part of Idaho, all of Utah, and western Wyoming. Correlation between the field staffs of the Forest Service and the engineers would therefore require close contact with the regional foresters and the heads of the forest and range experiment stations (who operate independently of the foresters) in these three cities. The Soil Conservation Service field establishment presents a pattern not quite so difficult. Its regional office in Portland has charge of all SCS work in Oregon, Idaho, Washington, Nevada, and California. But western Montana is responsible to the regional office at Omaha, Nebraska.

The limited awareness of the army engineering staff in this region of the functions of these two USDA agencies may be partly due to the small number of watershed surveys which the agencies have yet undertaken. Moreover, the volume of research on these questions in the Pacific Northwest completed by the Forest Service and the SCS is woefully incommensurate with the importance of the problem. Except for a few watersheds such as that of the Wasatch Range and limited areas in southern Idaho, little conclusive information of this character is yet available for the use of the district engineers in their river-structure work.

The army engineers are also interested in the siltation studies of the SCS, but as yet no siltation research has been undertaken in the Columbia Valley. At Sacramento the SCS has a sedimentation specialist working with the army on watershed flood control and the army is giving serious attention to his findings.

In addition to the information gathered in connection with its few watershed studies, the SCS has obtained hydrological information as a by-product of its aid to local Soil Conservation Districts. Its technicians not only make a survey of the lands included in each district to be established, but they also gather information concerning its streams and water resources. In the program for the review report of the Columbia River, the army has asked the SCS to assist it in the compilation of stream-flow records, flood data, and snow measurement.

The drainage functions of the army also touch the work of the SCS. As the state laws which set up soil-conservation districts customarily authorize them to deal with drainage problems, there is likely to be increasing contact with the Corps of Engineers, because the corps utilizes its new authority to include drainage in its flood-control work. Already on many of the river lands of the lower Columbia, dikes and their associated installations built by the army for flood control have brought the work of the two federal agencies into close contact. On Sauvie Island the internal drainage system is handled through a soil-conservation district which is advised by the SCS

technicians. On Puget Island the army also built dikes and installed tide gates but the local district, with the advice of the SCS technician, worked out with the army a modification of gate design to prevent injury to the deep-rooted agricultural plants grown by the farmers on that island.

The 1936 statute dividing flood-control work between the Departments of the Army and Agriculture did not clearly define their jurisdictions. What a "watershed" is does not appear in the statute, and perhaps it could not be clearly defined. It is therefore essential that the two departments work out an accommodation between themselves for each particular area. Heretofore the army has been primarily concerned with flooded areas and the Department of Agriculture with the highland where the flood water originates. But that situation may not continue. Again, with regard to drainage, the army is interested in the flooded bottomlands; the drainage of farmland generally is of concern to the SCS in its assistance to soil-conservation districts. Thus far no serious friction has resulted from the shadowy jurisdictional boundary.

THE CORPS OF ENGINEERS AND THE FISH AND WILDLIFE SERVICE

The pressure groups interested in greater consideration for fish and wildlife in connection with river-development structures obtained legislation in 1946 which *compels* the army engineers and other construction agencies to consult the Fish and Wildlife Service about their plans for impounding waters. Field officials of the FWS however evince divided attitudes toward the army's treatment of the Columbia River salmon fisheries. Some of them feel that the publication of the "308" reports for the Columbia in 1932 constituted ample notice to the fish people to begin assembling information about Columbia River fisheries so as not to hold up the programs of the construction agencies. Moreover, a great deal of the money for recent research on Columbia River fishery problems has come from the army rather than from Congress directly. On the other hand, the army's first comprehensive report on the Columbia system disregarded fishery interests, and that attitude prevailed even when Bonneville Dam was launched. The subsequent outcry of the commercial fishermen led to changes of design and the incorporation of expensive and elaborate installation not only of ladders but of elevators to assist migrant fish. It is fairly clear that these fish ladders have been reasonably successful in allowing upstream migration of salmon.

The army now employs at Bonneville an aquatic biologist and checkers to operate the fish structures, to count the fish, and to aid the FWS technicians in their research studies. The central unsolved problem there is the return of fingerlings down the stream over the dam. No one knows as yet whether they can pass over this barrier without undue mortality. By means

of elaborate statistical counts, analysis, and protection experiments the research men are trying to discover the migration facts and to devise facilities to assure the safe downstream journey of the fingerlings.

A program for the comprehensive investigation of the Columbia River salmon by the FWS was agreed upon as a result of discussions inaugurated before the Federal Inter-Agency River Basin Committee in the summer of 1944. The two river construction agencies (the Corps of Engineers and the Bureau of Reclamation) accepted the obligation of transferring funds for this purpose and an elaborate research program was launched. Its two major phases are: (1) the study of protective devices and of barriers to fish migration and (2) effect on the salmon of cultural changes caused by the reservoirs and pools behind the new dams. The first group of questions deals with the possibility of removing many natural and man-made barriers in the lower tributaries so as to open these streams to free migration.

The cultural changes involve such matters as temperatures, food conditions, artificial propagation, disease transmission, and the toxic effects of impounded water. This last problem was discovered in connection with the high mortality among the salmon reared in the impounded water of the reservoir behind Aerial Dam, built some years ago on the Lewis River by the Northwestern Electric Company. No one knows the precise cause for the dying of the fish. The army is helping the Fish and Wildlife Service to study the problem by use of the impounded water of the Cottage Grove Reservoir and of the Columbia River at Bonneville. The army is incurring a good deal of expense to make this experimental work possible. At Meridian Dam on the upper Willamette, which, like the other dams on that tributary, will be too high for salmon to pass over, a study is projected to determine what facilities will be required for artificial propagation and what the costs will be. The possibility is being explored of stocking the Fern Ridge and Cottage Grove reservoirs with warm-water fish.

Despite these recent manifestations of joint and coöperative activity, sharp conflict between the two agencies (with the Bonneville Power Administration sharing the army's interest) arose late in 1946 over the proposed acceleration of dam construction on the mid-Columbia and the lower Snake to care for the unprecedented and unexpected postwar demand for hydroelectric power. The interagency issues involved are fully explained below in our account of the Fish and Wildlife Service regional programs (see chapter x). Here we simply note that economic interests expressed through the Corps of Engineers, the Bureau of Reclamation, and the Bonneville Power Administration are too influential to stay the developments that menace the salmon runs and the commercial and sports fisheries dependent thereon, for whom the Fish and Wildlife Service speaks. It is well to note clearly that many of the interagency jurisdictional, con-

flicts that will be reviewed below can be understood only in terms of the underlying conflicts of social interests that are allied with and expressed through the several agencies.

Canadian-American Water-Agency Activities

The best management of the Columbia, some of its upper tributaries, and a few international streams in northwest Washington will require international agreement and administrative cooperation between the water agencies of the United States, the dominion of Canada, the state of Washington, and the province of British Columbia. The Canadian-American International Joint Commission was created to iron out grievances over international water problems as they should arise on the many lakes and streams that cross the boundary. The commission has not been interested in basic problems of river planning. Yet the water-development activities on the American side of the boundary in the Pacific Northwest, particularly those associated with the Columbia and its upper tributaries, present issues for joint planning and settlement that are likely to become increasingly important. It became evident that in preparing its report of the Columbia River the Corps of Engineers would find it necessary to obtain data on the British Columbia side particularly in relation to storage and runoff. The regulation of the Columbia system within the United States for power and flood control in particular cannot be fully achieved without ample and accurate knowledge of the hydrological facts of the watershed in Canada, without the development of Canadian storage, or without the integrated operation of structures and cooperation in hydrological reporting.

The realization of this unified international interest led in 1944 to the creation of a Columbia River Engineering Board by the international joint commission. This board of two Canadian and two American engineers in turn established a four-man field subcommittee, composed of Canadian engineers from the Dominion Water Power Bureau and from the Department of Public Works, the Seattle district engineer of the U.S. Army Engineers, and the project engineer for the Columbia Basin project of the Bureau of Reclamation. This latter group is in charge of field studies.

The Canadians have heretofore not engaged in federal construction of hydroelectric structures so that water-planning data on the Canadian sections of the Columbia were meager as compared with the information already at the disposal of the Corps of Engineers, the Bureau of Reclamation, and the U.S. Geological Survey. Nevertheless, since 1944 the Canadians have undertaken a four-year program of investigations including "aerial photography, precise leveling, topographic mapping, reconnaissance sur-

veys, hydrological studies, bathymetric surveys, and dam site investigations." ¹⁷ Even though these new engineering studies will be helpful in planning south of the boundary, they are not likely to be sufficient.

Beyond the problem of information are the issues of sharing of costs and benefits for projects that affect both nations. These are bound up with political considerations which will ultimately require treaty resolution. One difficulty is the lack of interest in this matter in British Columbia. There is a very small Canadian population in this eastern mountainous part of the province where the upper Columbia and the Canadian sections of its American tributaries lie, and the prospect of increase is slight. Moreover, such increase as may occur will probably be associated with mining, and mining may be handicapped by the drowning out of metalliferous areas by a reservoir-storage program. Power for the more populous western parts of the province can be more readily and cheaply generated and transmitted from sites on the Fraser and other western streams.

There are numerous localized river problems requiring international coöperation. For example, after Grand Coulee Dam was under construction, it was discovered that through an error in the elevation data the reservoir, when full, would backwater across the boundary. This was adjusted by special channel work furnished by the Bureau of Reclamation to the Canadians. Again, a joint irrigation- and flood-control problem on the Similkameen (a tributary of the Okanogan, which rises in British Columbia) led to a joint plan of engineering studies for that stream by the Seattle district engineer and the Canadian engineers.

Certainly the Canadian chairman of the International Columbia River Engineering Committee was correct in stating that the long-run prosperity and well-being of the residents of both the American and the Canadian Pacific Northwest will be expanded by control of the Columbia River to provide for power production, irrigation, and flood control.¹⁸

¹⁷ *Memorandum re Columbia River Studies in Canada*, by O. E. Webb, chairman Canadian section International Columbia River Engineering Committee, presented at the Sixth Regular Meeting of the Columbia Basin Inter-Agency Committee, Seattle, Washington, January 8, 1947 (mimeographed).

¹⁸ *Op. cit.*, p. 5.

CHAPTER III

The Bureau of Reclamation in the Columbia Valley

Growth of the Bureau as an Irrigation Agency

IRRIGATION in the Pacific Northwest long antedates the Bureau of Reclamation. Almost since the beginning of settlement in the most arid parts of the region, individual farmers have used water from streams, and private companies were organized to supply groups of farmers. In the Snake River, Hood River, Wenatchee, and other valleys irrigation was practiced long before the Bureau of Reclamation was created. Despite the fact that the Bureau of Reclamation has in the last quarter of a century become almost the sole agency developing new irrigated tracts in the United States, most of the irrigated land in the Western states still lies outside its projects. Commissioner Bashore of the Bureau of Reclamation estimated early in 1944 that there were approximately 21,000,000 acres of land under irrigation, of which about 4,000,000, including land receiving supplemental water, were on federal reclamation projects. At that time the Bureau of Reclamation had authorized or under construction a total area of approximately 8,000,000 acres. The bureau's monopoly on new irrigation is due to the fact that modern irrigation systems are large and complex programs. They require great amounts of capital to build huge storage works and other structures essential not only to irrigation but to power production, flood control, municipal and industrial water supply, and also to navigation.

In 1942 the relative importance of the Bureau of Reclamation as an irrigation instrument was even greater in the Pacific Northwest than for the entire seventeen states in which it operates: That is, a higher proportion of the total land irrigated or in process of being developed for irrigation was under federal projects here than in the other Western states. A tabulation by the bureau in 1941 showed that with the completion of projects then under way the irrigated acreage would be distributed between private and federal (including Indian Service) enterprise as follows:

	Washington	Oregon	Idaho	Montana
Private	216,083	1,124,206	1,038,978	1,871,468
Federal	1,875,899	412,213	1,680,108	746,259
<i>full</i>	1,687,522	228,648	548,460	746,259
<i>supplemental</i>	188,377	183,565	1,131,646	
Total	2,091,982	1,536,419	2,719,084	2,617,727

This preponderance of federal irrigation was due to two principal factors: (1) the large acreage included within the Columbia Basin project (to be watered by the Grand Coulee system) and (2) the large developments on the Snake River, which were begun just prior to the First World War and have been augmented by projects like the Black Canyon, Vale-Owyhee, and the partly completed Anderson Ranch and Palisades structures.

Behind the creation by the federal government of the Bureau of Reclamation and its predecessor, the Reclamation Service, lies a long history of effort to bring water to the arid and semiarid regions of the West by other methods. Private enterprise had been encouraged by the Congress in 1877 through the Desert Land Act, which provided for the sale of land in units of 640 acres at \$1.25 an acre to anyone who would irrigate it within three years. But this did not meet the rapidly increasing demand of settlement in the West. The next venture in promoting irrigation was a plan to encourage the states to take leadership. The Carey Act of 1894 gave to each of the Western states a million acres of desert land to be used for this purpose, with grants to individuals limited to 160 acres. But the application of the Carey Act resulted in many failures, because of improper engineering surveys of water and soil and because of financial inadequacy. By 1902 when the Reclamation Act was passed, only 11,321 acres had been patented, although nearly 7,000,000 acres were available for filing.

The spearhead for full entry by the federal government into the reclamation of arid land was a group of congressmen led by Senator Newlands of Nevada. But it took the dramatic assistance of the first Roosevelt in a special message to Congress to generate enough public interest to secure the adoption of the Reclamation Act of 1902, which is the basic authority for the work of the bureau today. This act allows the secretary of the interior to locate and construct irrigation works, including artesian wells, in the sixteen Western states and territories (Texas later became the seventeenth) by means of a special reclamation fund obtained from the sale of federal public land within those states. With the later addition of receipts from mineral leases and royalties, water-power licenses, and sales from naval petroleum reserves, these payments had yielded by June, 1945, a total of \$208,106,950.¹ The settler on a federal reclamation project was allowed to buy not more than 160 acres, and the statute forbade the supply-

¹ *Annual Report of the Secretary of Interior, 1945*, p. 34.

ing of water to the owner of a larger tract. The settler was obligated to repay to the reclamation fund the proportionate cost of developing his acreage, and the secretary was instructed to operate and maintain projects until payments should have been made for a major part of the land irrigated.

As to administrative arrangements, the secretary was entrusted with the responsibility of originating and carrying through all projects. This freedom, which contrasted so greatly with the procedure Congress has developed for river and harbor projects, was modified in 1910 to require the approval of new projects by the president.² Money received into the fund did not at first have to be reappropriated by Congress but was available for the secretary's expenditure as soon as he (later the president) had authorized a project. But repayment difficulties quickly developed on the first projects, because of the faulty choice of projects and because the ten-year repayment period required by the act was too brief. This was subsequently extended first to twenty, later to forty years, plus a possible development period of ten years. Consequently in 1914 the fiscal freedom of the secretary in this construction program was taken away and expenditure of the funds became subject to specific Congressional appropriation.³

The Reclamation Project Act of 1939 imposed new procedural requirements upon the Department of the Interior. The secretary cannot begin the construction of a new project or new division of a project until he has completed an investigation and reported to the president and Congress his findings as to: (1) the engineering feasibility of the proposed construction; (2) its estimated cost; (3) the part of the estimated cost which can properly be allocated to irrigation and probably be repaid by the water users; to power and probably be returned in new power revenues; and to municipal water supply or other miscellaneous purposes and probably be returned in various revenues.

Even with these curtailments of administrative discretion, the secretary of the interior does not have to run as lengthy a procedural gauntlet as does the secretary of war with projects built by the Corps of Engineers. Yet that difference is lessened by the fact that projects which the Bureau of Reclamation finances from the reclamation fund are today of far less consequence than are those specifically authorized by Congress and financed by appropriations from general federal revenues. Ever since the 'twenties the reclamation-fund receipts did not keep pace with the demands for irrigation projects, and repayments by settlers were frequently delinquent. As a result special appropriations from the Treasury began to be granted for new projects. In the early days of the New Deal these were greatly

² 368 *Stat.*, 836, act of June 25, 1910.

³ 38 *Stat.*, 686.

augmented by allocations from the huge sums appropriated for public works, recovery, and relief.

The federal treasury has thus come to be the primary source of money for the river-development projects that are being built by the Bureau of Reclamation as well as for those built by the army. The relative unimportance of the reclamation fund as a source of project activity today is indicated by the fact that the total investment of the federal government in projects built by the Bureau of Reclamation was at the end of the 1940 fiscal year almost a billion dollars, three times the total receipts in the reclamation fund at that time.⁴

The federal government's first irrigation projects were limited by law to that one purpose. That situation too has been completely altered. The transition to a multiple-purpose program was really signaled by the Boulder Canyon project, although a number of earlier irrigation works had included hydroelectric plants, first to assist in the construction work and a little later to operate the permanent structures on the projects and for some supplemental use by the settlers. The character of the Boulder venture as a multiple-purpose activity is specifically indicated by the act of December 21, 1928. The enacting clause authorized the secretary of the interior to construct, operate, and maintain a dam and incidental works for the purposes of flood control, improvement of navigation, the reclamation of public lands, and for the generation of electric energy as a means of making the project self-supporting.⁵

Section 15 directed the secretary to make a complete river-system investigation of the feasibility of projects for irrigation, electric power, and other purposes; included in the latter is the duty of "formulating a comprehensive scheme of control and improvement and utilization of the water of the Colorado River and its tributaries." Subsequent appropriations further extended the scope of this basin-wide multipurpose authority on the Colorado by adding such items as "studies of quantity and quality of water and all other relevant factors."⁶

This legislation marks the entrance of the Bureau of Reclamation into (1) multiple-purpose river development and (2) river-system planning in place of isolated project planning. Since the Boulder Canyon project and particularly during the past ten years, the bureau has been extending its project activities from the upper tributaries of Western river systems down upon the main stems of the larger streams. In the Columbia Valley and in the other Western river basins are few irrigation projects at present which, like the early tributary enterprises of the Bureau of Reclamation,

⁴ *Annual Report of the Secretary of Interior, 1945*, p. 33.

⁵ 43 U.S. Code 617.

⁶ Section 2(d) 54 Stat., act of July 19, 1940.

are concerned solely with the irrigation of small units of land. In the future if arid land is to be brought under cultivation through irrigation, it will be chiefly through large projects. They will combine other purposes with irrigation and so may bring down the farmer's part of the cost to a figure within his ability to pay.

The Bureau as a Producer of Electric Power

It is well to note here more fully the evolution of hydroelectric power as a feature in the projects built by the bureau. In 1906 the first power plant was installed solely for the purpose of aiding in the construction of the irrigation works on the Salt River Valley project in Arizona. The Black Canyon in Idaho, completed in 1925, furnished hydroelectric power to be used for pumping water onto the lands to be irrigated.

Henceforth this service became a regular part of many projects. But in addition to using the power for the pumping requirements of irrigation and drainage, surplus energy was available (particularly in the winter season) for the farm and town population in the neighborhood and the agricultural processing industries which grew up in the irrigated areas. The Boulder Canyon project brought the power function to the fore because 90 per cent of its total cost was to be repaid through the sale of falling water to the Metropolitan Water District of California and the California Edison Company.

It is true that this entering of the federal government into the power-manufacturing field was very gingerly. The law directed the bureau to lease the falling water to these two agencies and to install generators in the power houses at their direction. Generating equipment became the property of the utilities, which had complete responsibility for operation and maintenance, as well as for the distribution and sale of the power. Later the adjustment act of 1940 partly incorporated in the Boulder statute the precedent set by Congress in other projects authorized after 1928. The statute returned to the secretary of the interior the duty of operating and maintaining the power plant, although the two utilities continued as his agents. It also gave the secretary control over the power rates.

The transmission of electric energy to markets has also become an accepted function of the Bureau of Reclamation. This is illustrated by its transmission systems linking the power plants on the Shoshone, Riverton, Kendrick, and North Platte projects in Wyoming, which will soon be connected with the plants of the Colorado Big Thompson project. In many other parts of the West it has established the initial units in what promises to become a great transmission network.

The bureau has not stopped with the manufacture and transmission of

hydroelectric energy but is proposing steam plants to "firm up" the hydroelectric energy on a number of its projects. For example, the economic feasibility of the Central Valley project depends upon the production of a large volume of firm power; but because of the erratic flow of the Sacramento and other Central Valley streams firm power is available only a minor part of the time. So the plans include a steam plant of 150,000 kilowatts capacity, which it is estimated will increase the net income during a four-year period by seventy or eighty million dollars, reducing by that amount the costs which the irrigationists will have to bear.

It is not generally known that the bureau is now the greatest producer of electric power in the world.⁷ During the 1944 fiscal year it generated throughout its Western territory a total of 13,500,000 kilowatt-hours, or over 2,500,000 more than the Tennessee Valley Authority. The bureau had at that time a total of 2,440,000 kilowatts of installed capacity. But it had great expectations for a rapid increase in this already large power activity. Its postwar program for additional installations in existing structures (for which provisions have already been made) would bring its total installed capacity to 8,863,000 kilowatts. In the spring of 1945 the bureau laid before Congress an inventory of potential projects on which it was preparing studies and which it assumed Congress might authorize later. If that expectation should be realized the bureau's installed hydroelectric capacity would be expanded by nearly four times its present rating, reaching a total of 9,324,000 kilowatts of installed capacity. The output of Boulder and Grand Coulee dams with a total (1948) installed capacity of 1,852,000 kilowatts is marketed either by the Bonneville Power Administration or by private and municipal systems. Though the bureau manufactures the energy its responsibility in those instances ceases at the bus bar. But even so, the Bureau of Reclamation is rapidly developing as a transmission and marketing agency. It had in 1945 a total of 2,443 miles of transmission line with voltages of 22,000 kilowatts or more. Should a considerable part of its proposed postwar program be carried through there can be little doubt that it would be forced to build a major transmission network throughout the West.

Structure of the Bureau

The administrative organization first developed by the secretary of the interior for performing the functions of the reclamation program was a unit called "Reclamation Service," reporting to the director of the Geologi-

⁷ This statement was made by Commissioner Harry Bashore on April 12, 1945, to the House Committee on Irrigation and Reclamation. See the Hearings 79th Cong., 1st sess., H.R. 520, Part I, p. 82.

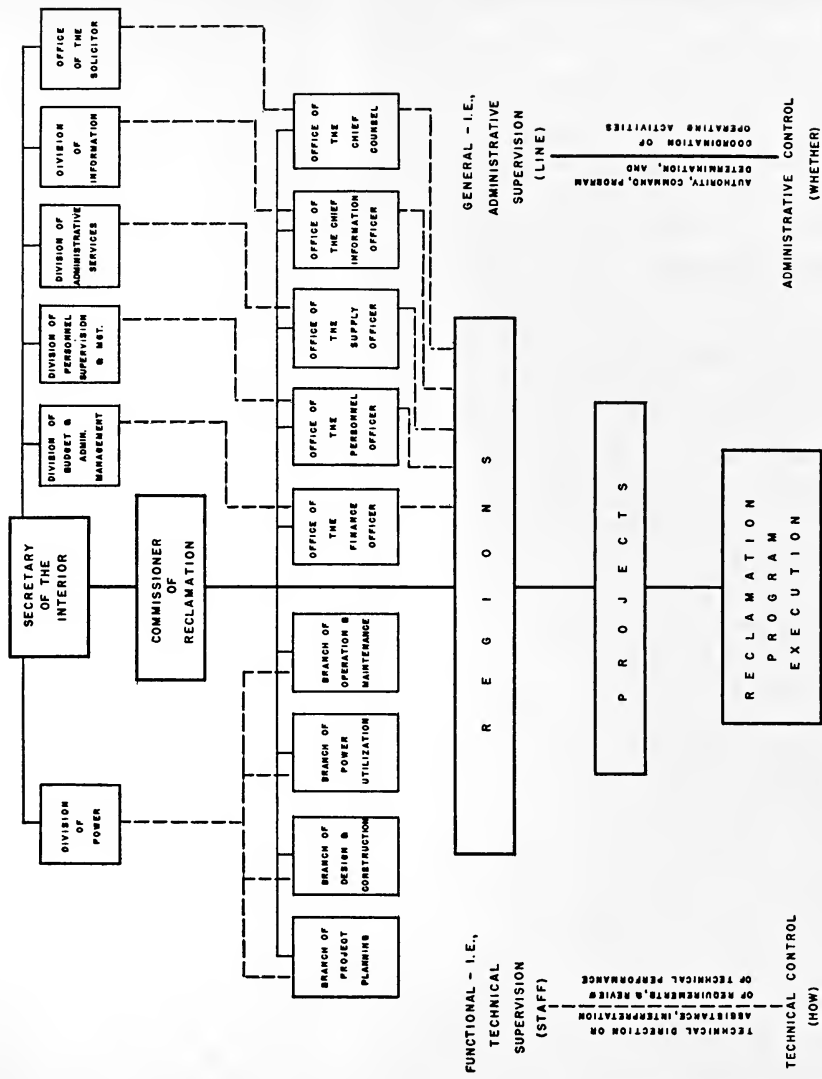
cal Survey. Its first staff was made up of the personnel of the division of hydrography of the Geological Survey. In 1907, however, the Reclamation Service became a separate bureau reporting directly to the secretary. Sixteen years later it was renamed "Bureau of Reclamation" and was headed by a commissioner with two assistant commissioners who were later made presidential appointees. Because the work of the new agency was confined to the seventeen Western states its center of administration was at Denver where for many years the chief engineer dominated the organization.

As the work developed and the pattern of administration was adjusted, all important decisions were made in the Denver office. The field organization for survey and construction work consisted of isolated and shifting project engineers. There was no intermediate regional unit in the bureau structure. A project engineer did not need to be concerned with any other project, even within the same state or region, unless it affected his own project assignment. In the early days, project engineers had some freedom in the design of structures, but that function was placed in the chief engineer's office in Denver, where much of it remains today.

Since 1943 a revolutionary change has taken place in the organization of the bureau. This has consisted of two main modifications: (1) the regionalization of the planning, construction, and operating activities; (2) the movement to Washington of most of the supervisory and policy-making functions. Some engineering activities are left in Denver, chiefly concerned with design, contracting, technical supervision of construction, purchasing, and research. The process of change is not yet complete. The organization will probably be in a somewhat fluid state for the next few years.

Linked to this break with the bureau's traditional organization pattern has been a marked shift in many of its fundamental policies. Its orientation toward its work had been primarily that of professional engineers: proud of the quality of its great structures and highly skilled in finding answers to the new and complicated engineering problems presented by their increasing size and scope. The social results of its work—prosperous farming communities created out of the irrigated lands or benefits resulting from the use of its hydroelectricity—received less attention than did engineering objectives. But today these social aspects are the object of increasing concern by the secretary of the interior and the top officials of the bureau. This shift in policy interest back to the original purpose of the Reclamation Act of 1902 is clearly reflected in many of the organizational features and implementing personnel policies associated with the regional decentralization program.

Region 1 is comprised of the Columbia Valley watershed, and the watersheds of the Rogue, the Umpqua, and the short streams along the Oregon and Washington coasts. The region thus includes all of Washington and



Bureau of Reclamation: Technical and Administrative Controls.

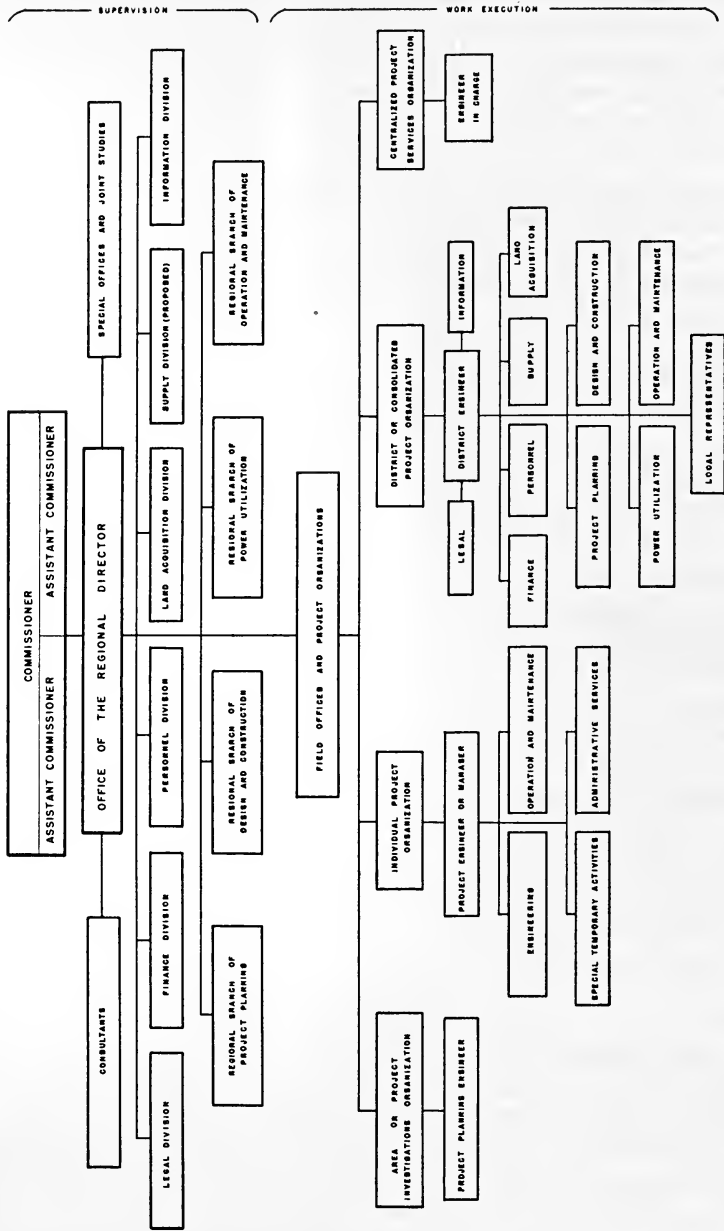
Idaho, all but a very small part of Oregon (the Klamath River watershed), Montana west of the Continental Divide, and small areas in Wyoming and Nevada. The regional capital is at Boise, Idaho. The regional director's position is conceived in broad terms. He operates in conformity with the basic policies determined by the commissioner of reclamation, the secretary, and Congress. At the same time he is responsible for the development and execution of an integrated regional irrigation and multiple-purpose program designed to promote the full utilization of natural resources and the development of the region and its subregions. For this purpose he has been given, step by step, but under supervision of the chief engineer, increased delegations of authority over the letting of construction contracts (recently increased from a maximum of \$10,000 to as high as \$133,000) on certain specified projects. He may also purchase supplies, acquire lands and water rights (involving values up to \$50,000), appoint part of his staff and approve certain promotions on his own responsibility, handle repayment accounts, maintain general ledgers of fiscal transactions, and perform detailed accounting for appropriations, allotments, disbursements, and collections. Delegations are continually being revised, and are steadily transferring more authority to the regional director and his subordinates.

ORGANIZATION WITHIN REGION 1

The precise scope of regional authority is still somewhat fluid because the bureau is faced not only with the job of redesigning its organization but with the need to educate many of its engineering supervisory personnel into new habits and new interests. Economic and agricultural phases of the bureau's work are being stressed as never before. For that purpose the regional office now directs certain functions that sooner or later may be delegated to the project offices. There is also the retention of the chief engineer at Denver as a center of top engineering supervision of the regional offices simultaneously with the reinforcement of the bureau headquarters in Washington. The regional structure has been geared to these two central offices. A third factor of uncertainty, as will be shown later, is the marked variability in the jurisdiction of the project and district engineers as to the scope of their authority and their dependence on the regional office. As future experience clarifies needs, many changes in organization structure below the regional level are probable. These changes will in turn affect the functions undertaken by the regional establishment.

At present (1948) the regional director of the Bureau of Reclamation heads four functional branches, dealing with planning, construction, hydroelectric activity, and operation.

First in sequence of work is the branch of project planning. A "project" is a proposed or operating irrigation program. It is ordinarily initiated as



Bureau of Reclamation: Regional and District Organization Chart.

the result of local demand. The bureau waits to make a study until a local group presents a proposal, frequently accompanied by an offer of money for the purpose. For example, the bureau's entry into the Rogue River Valley in southern Oregon was stimulated by a request from Jackson County and from Oregon state officials who contributed \$5,000; and the bureau's Willamette Valley project was requested by the chambers of commerce who desired the greater population that supplementary irrigation is believed to stimulate, with the attendant increased markets, higher land values, and other business gains. The Oregon State College was also actively interested in bringing the bureau into the Willamette area. (By contrast, the farmers in this valley have not been actively interested, but have thus far given the proposals for the bureau's irrigation program slight support.) Local congressmen also play an active part as agents for pressure groups in their constituencies. In the arid sections of the Columbia Valley the stockmen and some of the farmers have been active in asking the bureau to start new project investigations; but the railroads, working in cooperation with the local chambers of commerce, have been the greatest continuing influence for project expansions. They took the lead in the organization of the National Reclamation Association at a time when the temper of Congress threatened new reclamation projects.

What does a full job of project investigation involve? It requires field surveys of the physical factors in the projected area; a study and classification of the soil and the collection of a large amount of hydrologic, geologic, engineering, and economic data from official and nonofficial sources. These data must be analyzed in order to answer such questions as: (1) the value of the irrigation development in increasing agricultural production and expansion; (2) the possibility of providing for multiple-purpose uses; (3) the best plan and type of construction; (4) the engineering feasibility; (5) the cost; (6) the evaluation of the benefits and the equitable allocation of costs; (7) the proportion of costs which can probably be repaid or returned to the United States by the beneficiaries; (8) the desirability of the project to the state, region, and nation as determined by broad considerations of social and economic planning.⁸

The information assembled in making a planning report is akin to that found in a report by the Corps of Engineers. The same physical facts about hydrology must be ascertained and summarized, the same kinds of engineering data and estimates are presented; similar descriptions of the economic and social conditions are made and the same kinds of engineering structures are recommended. The principal differences are the greater emphasis

⁸ From a recent undated memorandum entitled *Form and Content of Reports on Detailed Project Investigations*, prepared by the Bureau of Reclamation for the use of regional planning staffs.

in a bureau report upon the agricultural characteristics of the project area, the irrigation features of the project, and the repayment ability of the farmers.

Each project-investigation report is initially prepared by the field project engineer. The project-planning staff of the regional office furnish guides to help the field offices in determining the economic and engineering requirements of projects, and reviews the reports to see that the technical requirements for planning work are observed. This may necessitate not only returning reports for amendment but sometimes revising and rewriting them in the regional office. Many uncompleted project reports which had been traveling back and forth between the field and the Denver office before region 1 was set up are being completed by the regional organization.

New bureau policy lays increased emphasis on land-classification studies and economic analysis. These require skills with which the field project engineers have heretofore been inadequately equipped. As engineers few of them were trained in such matters. The new emphasis means that guidance and even direct assistance have been furnished by the regional staff. Some other phases of project planning also receive special help from the regional office. For example, the regional geologist directs the drilling program after a project engineer has selected the site, or alternative sites, for a structure. His program is then reviewed by the Denver geologists and design engineers who may modify the drilling program. The Boise hydrologists assemble the hydrologic data for project plans, obtaining where necessary the assistance of other agencies, including the state engineers.

Despite the regionalization program of the agency, the chief engineer's office at Denver retained control over the design of structures (along with the letting of contracts above \$10,000), except for smaller structures, for which designs have been standardized. During the fiscal year 1948, because of limitations placed by Congress on the transfer of funds to the chief engineer for work performed in his office, further delegations of minor structure-detail plans along with numerous "transfers" of design and specification tasks were made to the field design units, set up in project, district, or regional offices.⁹ Although the line officers in the field were given ad-

⁹ In an announcement of the creation of these field design offices dated August 21, 1947, Commissioner Michael Straus explained that the chief engineer's work at Denver had been given 40 per cent less money than for the prior year although in the closing days of the Congress a supplemental appropriation had ordered the bureau to begin work on ten new dams in the Missouri Basin and to accelerate construction on others under way. Twenty-four field design units (including two for Idaho, one for Oregon, and two for Washington) were the answer to this problem for they would be on field payrolls. Nevertheless, the commissioner said: "The basic technical control over designs and specifications will continue to be exercised by the Chief Engineer. Experts to head these field offices will be detailed to those positions from the Chief Engineer's office. . . . The Chief

ministrative authority over these activities, the chief engineer retained technical control. Just what design work will be delegated was left to the chief engineer to decide.¹⁰ For the most part the function of the engineers at the regional, district, or project level with reference to this important task has heretofore been to furnish the basic field data for the Denver design specialists to develop both preliminary and final designs and specifications. Whether the developments of 1947-1948 may ultimately result in decentralizing preliminary design responsibility to the district or project engineers, or to the regional engineer, is not yet clear.

The second major function of the regional establishment relates to construction of the project after it has been approved and money made available. The scope of the regional engineering unit which looks after this function is still quite limited because the Denver engineers retain responsibility for giving technical direction to the project engineers, who do the actual building.

In the preparatory stage as well as during construction, there are many problems of design and construction which require aid from the central-research and laboratory-facilities headquarters at Denver. That unit works on special problems relating to spillways, gates, outlets, valves, concrete, earth structure, canal linings, percolation losses, and the like. It also prepares the building specifications for cements, concrete, paints, and other materials. With the technical direction of construction left in the chief engineer's hands the regional engineer appears to be primarily concerned with scheduling the construction program, budgeting and coördinating the time schedules for design and construction, seeing that the estimates and design data needed by the Denver office are forthcoming at the proper times, and assisting the chief engineer at Denver in maintaining his technical direction over district and project engineering.

A third functional branch of the regional director's office works on problems of hydroelectric power. It is an evidence of the increasing importance of hydroelectric development in the economic feasibility of new irrigation enterprises. This branch will develop a power program for the region and supervise its operation, although the operation of power facilities rests with the local project engineer. It analyzes power markets, negotiates power sales, and works out operating schedules for power facilities so as to obtain the proper use of water supply from the power standpoint. As the power features of reclamation structures increase in number and size it may be that regional offices will take over the direct operation of power facilities.

Engineer will utilize a small group of travelling experts to effect supervision and coordination."

¹⁰ See circular letter No. 3523, of December 26, 1947, from the commissioner of reclamation, for a statement on *Responsibilities with Respect to Design and Specification Work*.

Except for the Grand Coulee project, the bureau's irrigation works in the Columbia Valley have only small hydroelectric facilities. If power operations become a regional bureau job it will be contingent upon (1) the completion of the large power installations in projects now authorized and (2) the future relation of the Bonneville Power Administration to the marketing and transmission of power within the Snake River sub-basin of the Columbia River.¹¹

Finally, the Boise office is concerned with the operation and maintenance of bureau-built projects. When the completion of a project is imminent and the irrigated area is about ready for settlement, the regional office must be prepared to see that farmers obtain land in accordance with the statutory requirements for reclamation projects and that they receive aid in making proper use of the land. One result of the new emphasis which the bureau is giving to this function is the growth of jurisdictional issues with the Department of Agriculture.¹² This expanded interest is evidence of a laudable concern on the part of the bureau for the success of the irrigation farmers—a concern which was unfortunately not sufficiently evident in planning and operating many earlier projects. The operation and maintenance staff also supervise the use of water by the farmers in order to prevent waste and to protect the soil from erosion, loss of fertility, and sterility caused by the dissolved alkali or by water logging. To date the emphasis has been on water waste and drainage problems because they bear on economy of operations and on engineering questions.

The operation and maintenance branch of the regional director's staff also operates the reservoirs and other irrigation structures. The superintendents of the smaller reservoirs and of some of the projects report directly to the regional office. On larger projects, however, an engineer is left in charge, after the completion of construction, to superintend all operation and maintenance work under the guidance of the regional director of operation and maintenance. The latter also works out the repayment contracts which the water users must make.

Because many of the earlier projects were not repaid in accordance with statutory requirements, special repayment programs must be drawn up for a large number of irrigation districts on bureau projects. The Boise region has twenty such districts. Under amendments to the Reclamation Act, irrigation districts are now allowed up to ten years as a developmental period during which they pay no construction charges. After that they must pay for that part of the construction cost charged to them (without interest) over a forty-year period. Section 7, however, provides that if a

¹¹ See below for a discussion of the issues raised because of BPA's interest in the Snake River Valley.

¹² To be discussed below.

district cannot pay out, an economic survey must be made to determine its repaying ability; a report of the survey must be made to Congress, which may take what action it sees fit. The law of 1939 changed the basis for calculating annual repayment charges to the farmer from average gross crop returns to a percentage plan based upon the farmer's income. The studies and reports on these repayment problems are the direct responsibility of the regional office, which ordinarily makes use of state college technicians in carrying them through.

The statute permits the bureau to turn over to the districts the operation of irrigation canals and lateral systems. By 1942, in region 1 the Yakima-Kittitas district, the Okanogan district, and the Umatilla project were operated by the local population. In the Boise area, five irrigation districts joined together to form a "board of control" under which they are federated into an efficient operating organization.

On other projects where the bureau keeps full operating responsibility such as the Yakima, Roza, Owyhee, Sunnyside, and Black Canyon projects, a bureau district staff under a project superintendent operates the works. One irrigation manager and one water master supervise from twenty-five to thirty thousand acres of irrigated land. Ditch riders patrol the canals and laterals during the irrigation season. These men turn the water on and off to meet the water orders of the various farmers. They keep records of water used and report to the irrigation manager any condition of the canal system which may require maintenance work. The maintenance crew cleans and replaces structures, mows weeds, demosses canals, puddles the canal banks to stop leaks, rip-raps canal banks to control erosion, and cares for other maintenance problems involved in the canal system. Occasionally a job too large for them may be done by contract; for example, on the Black Canyon project where one of the main canals threatened to break, a new one was dug by contract. In the winter all members of the staff may be used to make concrete pipe, repair machinery, and make other preparations for the following irrigation season. The local project crew includes one or two office clerks who keep the water records and prepare the bills for the district and for individual water users. Elaborate water records are maintained at each reservoir and on each canal system, and on the streams where the projects are located. The accumulation of data of this character is of great importance in making accurate predictions of water supply and of needs.

SUBREGIONAL ORGANIZATION OF THE BUREAU

Beneath the regional establishment, the organizational pattern is still fluid. The ultimate objective is a district subdivision which "will assume responsibility for all project activities subject only to the guidance of a

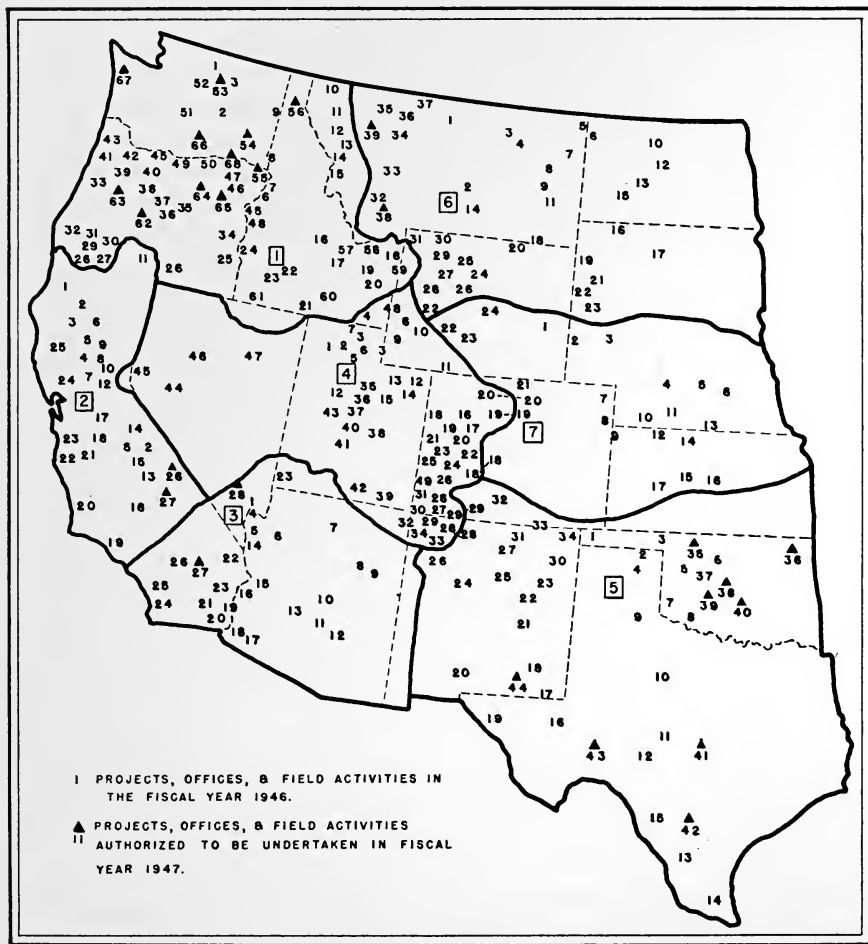
skeleton regional supervisory staff.”¹³ In region 1, however, only two districts have been formed, one for the Columbia Basin and upper Columbia area, and one for the central Snake River area. It is the announced intention to combine project offices into district offices “as rapidly as showing of economy and efficiency in specifications can be made. District organization has the further advantage of emphasizing basin and sub-basin development over specific project development.”¹⁴ Although it is probable that the Columbia River district is in some respects unique, it is interesting to note that the organization-chart description of the position of district engineer declares that officer to be “in charge of all activities of the Columbia River District and the Columbia Basin Project, including the engineering, construction, operation and maintenance of Grand Coulee Dam, and the development, construction, operation, and maintenance of the project works for the irrigation of more than a million acres of land.” Of course that general jurisdiction is made meaningful as well as limited by specific delegations relating to contracting; to the execution of change orders for construction; to the purchase and exchange of land and water rights; and to the right to contract with the local irrigation districts, appoint staff, and handle fiscal and accounting matters. In this district, in addition to the supervision of some ten staff and facilitating divisions, the engineer works through two principal line divisions: one for the Coulee Dam and appurtenant facilities, including also Lake Franklin D. Roosevelt and the Coulee equalizing reservoir, and the other for the irrigation, development, and settlement of the Columbia Basin project. The high personnel classifications given the district engineer and his principal assistants reflect not only the great prestige of Frank Banks as an engineer but the importance of the work proceeding within his district.

Elsewhere in region 1, the bureau's field work centers in project offices, established as required, and each supervised by a project engineer or project manager. Their scope and organization have not been standardized and show great variability. The official organization chart of December, 1945, states that “because their basic objectives and the conditions under which they operate are variable their locations, staff and functional responsibilities differ widely,” and no statement of field office organization structure and responsibilities would be typical. In general, they plan, design, construct, operate, and maintain irrigation and power systems. “Project planning activities may vary from preliminary investigation of small areas requiring the services of a few employees for a short time, to compre-

¹³ *Report on Progress toward Decentralization and Regionalization* from Commissioner Straus to Secretary Krug, dated March 11, 1947. This is an excellent summary of the story of bureau organization changes and results since the beginning of the decentralization move in September, 1943.

¹⁴ *Ibid.*

hensive studies on the engineering and economic feasibility of controlling an entire river basin requiring a large staff for many years. Construction also varies in size and complexity from relatively simple water diversion work to large multiple purpose dams and works." The construction, main-



Bureau of Reclamation: Field Offices, Regions, Headquarters.

Source: Adapted from a map prepared by the Bureau of Reclamation, 1946.

tenance, and operating organizations vary correspondingly. "Subject to the policies of the Commissioner, and to predetermined Bureau programs, and under the direction of the regional offices, field and project offices are responsible for the progressive completion of delegated area development programs or phases of such programs."

By way of illustration, the official chart outlines four different standard organization patterns for projects. These range from a centralized project service consisting of an engineer sent out from the regional office to carry out a certain task, to the district or consolidated project in which the district engineer is fully equipped with an organized staff to perform planning, design, construction, power utilization, operating, and maintenance functions; and with his own legal, information, finance, personnel, supply, and land acquisition services. This latter type of project has since 1945 been metamorphosed into the district (illustrated above by the Columbia River district). The project office at Salem illustrates an intermediate project establishment where the work is confined to the planning phase. The project engineer in the Salem office directs surveys and project plans for all the individual project units into which the Willamette Valley area was divided. He likewise investigates projects on the Green and Puyallup rivers and on the Olympic Peninsula near Sequim, Washington. His staff makes the field investigations for all projects in Oregon except in the Klamath area, which is in charge of another project engineer. The Salem organization has four subdivisions, one on surveys and project plans, another on land and economic surveys, a third on hydrology, and a fourth on geology. The first unit does the field engineering work, that is, it makes the surveys and prepares plans and estimates. The second unit conducts the land-classification surveys and economic studies. The hydrology unit carries on surface and subsurface water-supply studies which include stream gauging, precipitation, and studies of irrigation requirements. The geology unit consists of a drill foreman, a mechanic, and helpers who conduct subsurface explorations of the earth structure on dam and reservoir sites. The Salem project engineer has nothing to do with operations and maintenance.

Into this somewhat confusing picture of field structure it is necessary to inject one item of information which may add to the confusion: the use of the word "project" in describing the activities of the bureau. Every job which involves a "project plan" or a construction activity is officially listed as a "project." Consequently a single project engineer may actually have a number of projects under his care. Thus the engineer in charge of the Salem project office has supervised the following projects: Evans Valley, Illinois Valley, Applegate Valley, Rogue River, West Long Tom, Crooked River, Salem, Wapanitia, Yamhill, Canby, Tualatin, and Pendleton, all in the investigation stage. Should they reach the construction stage an entire revamping of the project organization would undoubtedly take place with reference to them. The pattern of field organization will undergo important changes as the bureau extends its activity from investigation through construction into operations.

During the fiscal year 1947 the work load for region 1, as indicated by

the number of its projects, was larger than that of any other region. Its 69 projects represented an increase of 15 over the work load during the previous year.

The bureau's activities are widely dispersed throughout the Columbia Valley region. During 1947 there were 12 projects in Oregon, one in Washington west of the Cascades, 19 in eastern and central Oregon, 6 in western Montana and 3 in northeastern Idaho. Eastern and central Washington included the biggest project of all, the Columbia Basin. The balance of the bureau's work was confined to the Snake River Valley in Idaho and northwest Wyoming. This geographic summary shows that the bureau is now planning projects over the entire region. It may soon be engaging in construction and operations work on the green side of the region, though its major activities will doubtless continue to be east of the Cascades in the arid and semiarid parts of the Columbia Valley.

Project Operation and the Irrigation District

The laws of the states in the Columbia Valley region authorize the establishment of local irrigation districts. These are the political agencies used by the Bureau of Reclamation in making its collective contracts with the farmers for irrigation facilities and water service. The initial function of the district is to agree with the secretary of the interior on the works to be built by the federal government, and on the obligations which the local beneficiaries will assume for repayment of construction costs, maintenance, and water use.

The district is the secretary's agent for collecting payments from individual landowners. The terms of these payments are incorporated in the district contract. It is customary to separate the construction charges, which begin at the end of the development period, from charges for operation and maintenance. The latter are based on fluctuating costs and are estimated in advance of each irrigation season. Half the assessment must be paid before the season begins. The district governing board also represents the farmers who enter into the collective contract, and becomes responsible for seeing that the financial duties of the district are met.

Some of the older and more successful projects in region 1 were turned over to the districts for operation and maintenance. But this is done only after many years of operation. It requires a considerable period—normally at least twenty years—for all the land of a sizable project to be "brought in," that is, for water actually to be made available to all parts of the project through the construction of canals and laterals to every farm. As in the Columbia Basin project, irrigation development proceeds by "blocks," and the timing of completion is a matter of engineering and economic deter-

mination. Until repayment to the United States by the farmers has given promise of substantial fulfillment of the district's obligations, the Bureau of Reclamation retains the operating and maintenance job. Even in those few older projects in region 1 which have been turned over to the districts for management, the bureau's activities are not completely eliminated. It still retains operating control over all but a few small reservoirs and diversion dams, and it makes inspections to assure a reasonable district maintenance program so long as the federal government has any equity in the project. On the newer projects the bureau also claims the right to protect the lands from deterioration through improper water use. For that purpose it attempts by regulations, as well as by its method of levying water charges, to penalize harmful water application.

Districts in Idaho which operate their own projects may band together under a "board of control" which becomes a joint manager of such common facilities as reservoirs, diversion dams, and main canals. Where a group of projects depends upon the same major structures some kind of federation is essential, unless the bureau retains the operating function for the large structures, as it does for instance on the Minidoka project. During the early years of a project the districts may shy away from exercising their operating rights, as they did on the Owyhee, in order to avoid the high maintenance costs often incurred before canal systems have become stabilized. Under bureau operation these costs may be charged to construction and thus payment may be deferred.

When a district takes over project management it must organize a staff to manage the billing and collecting of charges; the ditch patrol for reporting leaks and stoppages and for delivering, measuring, recording, and shutting off water during the irrigation season; the ordering of water from the reservoir; the maintenance of canals, laterals, weirs, gates, and other structures; the suppression of weeds which clog the flow of water and foul the land; the emergency repair of breaks in the canal system, and the off-season improvements for maintenance. For some of these tasks heavy machinery is necessary, consequently a road on which to move machines, trucks, and patrol cars is usually built on top of one of the banks of the main canals and the chief laterals.

In the distribution of water to the districts (including bureau-operated projects), towns, and individual users, the states play a major administrative role because of their legal control of water rights. The law of prior use has been adopted by all the states in this region. Therefore some state officer (such as the state engineer in Oregon or the water master in Idaho) must see to it that during the irrigation season when water is in demand, no claimant, including the Bureau of Reclamation, gets more than the amount to which he is legally entitled. Local water masters patrol the

various streams, checking on their use, the legality of the diversions made, and the amounts of water taken.

On some of the new projects the Bureau of Reclamation has undertaken to render additional services to the farmers by (1) renting to them its heavy equipment for land leveling during the seasons when the equipment is not needed for operation and maintenance, and (2) helping them lay out their farm distribution systems and advising them as to cultural practices and crops on irrigated land. This the bureau does indirectly through assistant county agents whose salaries it pays.¹⁵

Regional Establishment and Central Offices

In the dependence of its regional organization upon Washington the bureau resembles other resource-development agencies only in part, because the reorganization of the bureau still leaves the chief engineer and his staff at Denver. The Washington central bureau services, paralleling the functional units under the regional director, give technical supervision and formulate standards for all the regions. In no case do the Washington officials reach out to conduct operations in the region, but there is considerable difference among them in the degree of control they exercise.

Budget and personnel functions are only partly decentralized; the regional office handles appointments for positions up to and including CAF-11 and P-4. Appropriation allocations to the regions for investigations and for operating costs theoretically allow a good deal of discretion to the regional director in allotting funds to different projects, but he may not exceed his quarterly allotments without special permission. More important, he must observe the unwritten understanding between the bureau and the House Appropriations Committee by adhering closely to the itemized justifications that accompany the estimates. This practice in Congressional policy is common among civilian agencies. Ostensibly they are granted lump sum appropriations to allow discretion in spending funds, but they are in fact bound by House-committee practice to observe the detailed breakdown used in the estimates. On construction, Congress follows a policy of itemizing the precise sum for each project.

The Denver engineering headquarters exercises a closer and continuous engineering control over regional and field operations. There the chief engineer carries on most of the design work, writes the specifications for construction, lets the construction contracts, makes the estimates of cost during the planning and construction stages, and orders the facilities, such as generators, that go into the structures.

From Denver also comes the technical direction to the project engineers

¹⁵ See pp. 150-151 below for a more complete account of this activity.

during the building of the great structures like Boulder and Grand Coulee dams with which the bureau's name has become linked. Technical direction does not end with the completion of the structures but extends to engineering problems which arise during operation and maintenance, for example, to problems connected with concrete deterioration, repainting, and major repairs. It is also at Denver that the hydroelectric program of the bureau is planned, a program which appears to be rapidly heading toward making the Bureau of Reclamation one of the largest transmitters, as it is the largest generator, of hydroelectric energy in the United States.

Assisting the chief engineer in solving design, construction, and other engineering problems is a highly developed research and laboratory organization. Originated on a temporary basis to solve the unique problems posed by the unprecedented height of Boulder Canyon Dam, this was continued and enlarged to meet new questions raised at Grand Coulee and other projects. The size, peculiar site conditions, and the Congressionally directed change to a high dam at Grand Coulee presented questions for which the experience of even the best engineers afforded no certain answers. Illustrative of solutions to these new problems which the Denver organization devised were: (1) the artificial dissipation of heat (produced by the setting of concrete in the interior of the world's largest concrete structure) by means of cooling galleries and metal tubing embedded in the concrete and supplied with water from pumping barges on the reservoir surface; (2) designs to increase the stability of the structure; (3) methods of dissipating the force of the descending sheet of water over the spillways. The latter was resolved by some model tests simulating various conditions at the dam site. The spillway consisted of eleven openings 125 feet wide, separated by ten concrete piers. To care for outlet needs, thirty pairs of outlet conduits 18.5 feet in diameter were installed, with the conduits arranged in groups of ten pairs at each of three elevations 100 feet apart. In scale with the huge size of the structure the two gates for each outlet weigh approximately 384,000 pounds each, and together with the metal conduit link which forms a part of the same assembly the total weight for each unit is 527,000 pounds.

Without these research and laboratory facilities the bureau's engineer could not have forestalled grave difficulties in the construction and operation of such huge multipurpose structures.

In charge of these special studies is an administrative unit called "The Engineering and Geological Control and Research Division of the Bureau of Design and Construction." For the most part its research program has been directed toward solving immediate current problems, though as time has passed it has been necessary to push research activities back into basic research questions. These research programs require not only a staff of

highly skilled specialists in many different engineering fields, but mathematicians, chemists, physicists, and petrographers.

One group of specialists deals with problems of engineering geology, met with at all stages of the bureau's work. This group develops data on the availability and usability of earth and rock construction materials and assists in meeting geological problems which arise during construction; it furnishes technical assistance in making tests of foundations; it advises the engineers in design and other tasks wherever geological problems affect their activities. Its petrographic laboratory makes specialized tests on geological materials by microscopic, microchemical, photomicrographic, and many other specialized methods; its earth-materials laboratory discovers improved methods of applying the principles of soil mechanics to the use of earth materials for dams, canals, and foundations. From these studies the art of constructing earth dams and the sealing of canal banks has been tremendously advanced.

The engineering, geological control, and research unit generally is serviced by the hydraulic laboratory, with its special hydraulic library. Its work resembles that carried on at Bonneville Dam by the Portland district engineers and at Vicksburg by the central laboratory of the army. It makes the model studies of particular dams, canals, spillways, syphons, drops, and chutes which the bureau is about to build. Its large concrete model of the Central Valley project of California has been used to work out the problems in the Sacramento Valley caused by salt-water encroachment which threatened as the result of impounding the rivers of the Central Valley behind great dams. It was moved from Denver to California for perfecting certain tests and for demonstrating the feasibility of meeting the problem. The hydraulic laboratory built models of the Grand Coulee to try out different designs for the spillways and other parts of the dam. With the aid of its model tests the bureau designed the first Tennessee Valley Authority dams. So famous has become the technical work of the bureau in this field that the State Department arranged for the Chinese Nationalist government to use its laboratory facilities and staff in designing the great Yangtze River project, the largest projected hydroelectric development in the world. The Denver laboratory has also made model studies to assist India in planning its big hydroelectric, irrigation, and flood-control project on the Ganges.

Another section of the laboratory studies hydraulic machinery, using models of gates, valves, turbines, and pumps and supplementing laboratory studies with investigations of the actual field operations of such devices. Part of the research staff works on the fundamental principles of science relating to hydrodynamics and aerodynamics. Others design and build complicated laboratory instruments to study hydraulic behavior in

the structure in machinery models and in the field installations. To service the laboratory technicians another group reviews and digests the available literature, foreign and domestic, on fluid mechanics and related technical fields.

A great deal of research and laboratory work is done on the characteristics of concrete materials, including special studies of cement, aggregates, and concrete mixes. One laboratory tests the physical characteristics of metals, plastics, and other materials used in bureau structures. The engineering-chemistry section conducts chemical and physical tests on cements, metals, soil, water, and other construction materials. Because of its importance as a protective coating, paint is studied by a special group of technicians, and the findings are published in a paint manual for bureau-wide use.

The Denver technicians have themselves designed much of their laboratory equipment and some equipment used in operating the bureau structures. Illustrative of the former are the hydraulic pressure machine, the largest of its kind, which tests the vertical stresses in large samples of concrete; another machine which tests stresses from all directions simultaneously; and the elaborate instruments that permit the study of concrete under heat conditions which simulate those within the dams.

The following is a sample of projects listed in the monthly report of this Denver research organization for February, 1946: (1) for the Columbia Basin project, analysis of paint materials requested under a contract bid; (2) for the Soap Lake syphon laboratory, tests on Dennison Foundation samples from certain drill holes; (3) on the Owyhee project, analysis of paint materials; (4) Palisades Dam project, laboratory tests on sample rock to be used for foundation purposes; (5) Lower Power Dam on the Paulina project, the development of an exploration program for drilling purposes; (6) Big Prairie Dam on Post Falls project, petrographic and chemical tests on certain substances in the cavities of rock samples.

During that same month the organization published fifteen reports covering all regions.

For region 1 this report included three special studies: (1) an electric detector for locating reinforcement bars embedded in concrete to facilitate their avoidance during drilling operations; (2) laboratory tests on soil samples for a secondary highway, showing low strength and high bore pressure of these materials; (3) a study of the condition of the concrete on the Tunnel Canyon development of the Owyhee project.

Reports published for other regions included: an investigation of the best materials for spring-sealing drum gates; hydraulic studies for the design of tube valves for conduits; revision of a manual on the best methods for measuring irrigation waters in open channels.

The importance of this research service in improving designs, forestalling structural hazards and operating difficulties, and reducing costs is indicated by the following items recently reported by the chief of the division:

(1) The size of the apron at the toe of Grand Coulee Dam was reduced at a saving of \$4,750,000 for concrete; (2) power-plant operation was improved and \$300,000 saved by elimination of a spillway drum gate at Grand Coulee; (3) changes in the Grand Coulee inlet connections and draft tubes increased generating efficiency by an annual value of about \$40,000; (4) model tests indicated modifications of design for the outlet conduits at Grand Coulee to eliminate disastrous erosion of the stream bed and rapid breaking down of the conduits; (5) laboratory studies revealed the principles governing the design of jet pumps and devised an economical design which saved \$71,000 in installation costs at Boulder, Grand Coulee, and Shasta dams; (6) laboratory work on Portland cement increased the accuracy of specifications, reducing the risk to the manufacturer, lowering the costs, and improving the quality. The saving in the cost of cement for Grand Coulee alone was \$900,000.

The relationship between this research work at Denver and that in the field is important. Small testing laboratories are located on construction projects to determine the fulfillment of specifications for concrete mixes, paints, steel, and other materials. Here it should be noted that although the bureau, by order of President Coolidge's secretary of the interior, was compelled to give up the force-account method and to build by contract, it retained the function of purchasing the materials for concrete aggregates. These it tries to obtain nearby whenever the localities afford suitable materials. The bureau especially looks for materials on public lands which often surround the sites of project structures.

The reorganization program still in process contemplates a laboratory in each region to test the drill cores taken from the reservoir and dam sites during planning and construction. These have already been set up in three of the regions but not in the Columbia Valley region. The project laboratories at Grand Coulee however and at two other projects in the Columbia Valley do this kind of testing. But there is no intention of abandoning the Denver research and laboratory activity; the equipment and skills needed for its service-wide jobs are considered too specialized and too costly to be duplicated in each of the regions. For example, one machine for testing stresses in concrete is expected to cost about \$300,000. Certainly so long as design is centralized at Denver the bulk of research and laboratory tasks must also be located there.

There was a time in the history of the bureau when the design of the structures was the function of the project engineer. This was true when the Arrowrock Dam (above Boise) was built. Although good structures were built it is said that they were not standardized and were often too

costly. At any rate, specialization of technical skills has developed, and unless there is a large and continuing program in each region it would appear that the cost of maintaining the requisite number and variety of specialized technical people would be too large for a single region.

It is the present view of the engineering organization at Denver that decentralization of design to the regional offices is desirable only for those structures for which standard designs have been developed. An example of such delegation of design authority on the Columbia Basin project is the proposed addition to the big construction camp called Mason City. The project engineer was authorized to make the design, guided by standard plans worked out at Denver. However, even for this building the Denver engineers designed the utility system because no standards for that aspect of the city construction had been worked out.

The Columbia Basin Project

The largest and most spectacular reclamation project ever undertaken in the Columbia Valley is the Columbia Basin project. The Columbia Basin is an area of approximately 1,200,000 acres ultimately to be watered by the electric energy and water storage available through Grand Coulee Dam. Six of the great generators will drive the huge turbine pumps that lift the Columbia River waters over into the granite-walled Grand Coulee. This dam, together with two small earth dams to plug the upper and lower ends of the Coulee, forms the irrigation reservoir for the project. The project lands fill the southern half of the big bend of the Columbia and spread south and east to occupy the great triangular area bounded by the Snake and the Columbia with its apex near Pasco where the rivers unite. The irregular eastern boundary of the potentially irrigable lands fans out into land now growing wheat under dry-farming conditions. If and when irrigated agriculture has been applied to the suitable lands the whole area will resemble a green irrigated "continent" shaped like Africa, with numerous interior deserts such as the Pot Holes Basin, unreclaimed because of sterile soil or rough topography.

Many years ago during one of the wet cycles, land boomers sold much of this area to the unwary for orchards and farmland. But the return of normal aridity, which prevails over most of the area (about six inches of annual precipitation on the Wahluke-Pasco slopes), quickly drove out the settlers and dried up the hopes of the nonresident purchasers. So agriculture disappeared except on a narrow irrigated tract adjacent to Moses Lake and along the eastern wheat-growing fringe where it was hard hit by the low moisture and low prices of the 'thirties. In the boom period mentioned above, federal title to the project area was largely alienated. This greatly

complicates the present program of project development, as will be noted below.

When Secretary of the Interior Ickes took over from the state of Washington the building of Coulee Dam and the Columbia Basin project, and transferred it from the Public Works Administration to the Bureau of Reclamation, the times were propitious for a comprehensive and thorough consideration of all the economic and social factors implicit in so gargantuan an irrigation program. Criticism because of the soil and water deficiencies of earlier projects had already stimulated the bureau to greater care in soil analysis and classification. Studies by the Soil Erosion Service (soon to be expanded into the Soil Conservation Service) had revealed the need of closer attention to the effects of topography, soil structure, cropping practices, and farm-irrigation layouts upon the loss of topsoil. The National Resources Committee (and its regional agency, the Pacific Northwest Regional Planning Commission) were trying through interagency committees to bring about comprehensive land and water planning. The woes of the farmer, particularly his financial difficulties, which the desiccating 'thirties had made acutely critical in all of the Western states, had led to new action programs in the Department of Agriculture and to a new emphasis on agricultural planning.

In this new "climate of opinion" was born the suggestion, which Commissioner John C. Page readily adopted, that (1) there should be a comprehensive and detailed study of all of the major problems which the reclamation of this great Columbia Basin tract would involve and (2) that the best diagnosis and plans would come out of a series of investigations by special groups, each of which should represent the knowledge and skills of the federal and state agencies having a fundamental interest in the problem. In 1939 Page appointed Harlan Barrows, distinguished geographer of the University of Chicago faculty and planning consultant to the bureau, and William Warne of the bureau staff, to take charge of the planning and consummation of these inquiries. Under their leadership twenty-eight separate problems were formulated for which investigating committees were chosen. A resident coördinating and facilitating staff was chosen to help carry the studies to completion in time for action when the dam should be finished and before the bureau should move into the irrigation construction phase.

In the meantime the bureau's staff had already undertaken soil analysis and classification for all the 1,200,000 acres of the project area and was also making a complete and detailed topographic map. Simultaneously it had carried through a land-appraisal survey to conform to the provisions of the antispeculation act which Congress had adopted in the interest of the settlers of all bureau projects. To supplement these basic surveys it

decided to add a temperature-recording program designed primarily to indicate the dates of frost occurrence, and thus of growing season length, in some twenty-six locations on the project. This program has had the constant aid of the U.S. Weather Bureau in selecting locations and analyzing data. As a part of these studies a ground-water investigation to aid in locating domestic water supplies was made for the bureau by the U.S. Geological Survey.

The bureau's official justification for this comprehensive survey was the assumption that its task did not end with the provision of the physical structures for irrigation, but extended to the solution of all those problems which must be met before a successful pattern of rural and urban living could be developed on the project. Concrete questions for which studies of the bureau sought answers were concerned with farm economics and rural sociology. They included such matters as the size of farm units, kinds of crops to be grown, transportation needs, techniques of irrigation, methods of financing, the encouragement of organized coöperative endeavor among settlers, the standard of living to be planned for, local industries for the fabrication of farm products, the location and number of new villages and their integration with farm life.¹⁶

Of the other federal agencies drawn into the joint inquiries, those of the Department of Agriculture were most frequently used. The Bureau of Agricultural Economics, designated by that department as its central planning instrument, furnished a full-time field coördinating staff, located in Spokane. Its function was to carry through studies which the bureau had agreed to make, and to help expedite and coördinate the investigations for which the several bureaus of the department had made commitments. The Washington State College and Experiment Station was represented at all discussions of the problems concerned with types of farm economy, with the size, layout, and equipment of farms, with the needs and use of water and rural manufactures, and the problems of rural welfare.

Many other state and local agencies were enlisted for exploring the particular questions in which they had an interest and special knowledge. Undoubtedly the Washington State Planning Council ranked next to the state college in responsibility for state participation, for it was then well and vigorously led and ably staffed. But participation was not limited to governmental agencies. The railroads were asked to help study the transportation needs, to advise on the control of public and railway lands in the project area, the problem of freight rates in relation to markets for agricultural products, and the location and kinds of manufacturing facilities required for processing farm products. The chambers of commerce

¹⁶ *Columbia Basin Joint Investigations, Character and Scope*, U.S. Department of the Interior, Bureau of Reclamation, (1941), pp. 1-2.

studied recreational use of the reservoir created by Grand Coulee Dam.

Despite the difficulties of operating a planning inquiry involving so many agencies and people—difficulties enhanced by the coming of the war—much achievement is evident. For example, the initial reports on certain key problems (particularly that on problem 15, which related to methods of controlling privately owned land), led to the passage of the Columbia Basin Project Act of March 10, 1943. That statute tightened the anti-speculation features of earlier legislation; made more flexible the limitations on farm sizes so that soil, topography, and other relevant factors could be considered in designing farm units; plugged loopholes through which ownership limitations on other projects had often been drained of reality; anticipated hardships in local public finance during the first years by permitting the secretary of the interior to make payments to state and local agencies in lieu of taxes; and authorized the secretary to administer the public lands on the project, to establish townsites thereon, to dedicate parts of the lands “to public purposes in keeping with sound project development” and to acquire lands within and adjacent to the project which would help develop, improve, or protect the project.¹⁷

The relevant provisions of this legislation were incorporated into the terms of the contracts between the bureau and the landholders, and those between the bureau and the districts, which have been signed as conditions precedent to completion of the irrigation works.

Also included in these instruments are the recommendations on problem 13, which proposed to vary the payment rate per acre for construction costs in accordance with (1) relative productivity, (2) estimated cost of leveling, clearing and ditching the farm for agricultural use, and (3) the appraised value of the lands. This plan of payment requires the better lands (and those less expensive to prepare for farming operations) to carry a higher proportionate share than lands of poorer quality (or more expensive to make ready). The investigators recommended that the project be laid out in farm units based on soil and topographic considerations and of sufficient size to support a family at a “suitable level” of living. The act of 1943 gave a legal foundation to these proposals and the bureau became engaged in the task of carrying them out in the design of farm units on the initial blocks to be irrigated.

This method of designing the farm-unit pattern is the first of its kind in the history of the bureau’s work. The method was proposed when the Owyhee project was developed, but lack of legislative authority inhibited its application. This use of topographic considerations as a basic feature represents a major improvement in bureau project design because it promotes economies in irrigation structures and in the effort required of

¹⁷ 57 *Stat.*, 14 ff.

the farmers, and because it correlates roads and other physical improvements with the irrigation system wherever the topography is rough.

The development of family-size farms, varying in size in accordance with the predominant classes of soil, is another significant change. The recommendation for size limitation was accompanied by the explicit enforcement of the policy incorporated in the Columbia Basin Project Act of 1943. The committee declared that the federal reclamation policy "is to create opportunities for establishing homes and satisfactory livelihoods for the maximum practicable number of families, is not to create opportunities for a few families to obtain the largest possible income from farming."¹⁸

In fulfillment of this purpose the investigators recommended that even on the poorest class of irrigable land, the maximum of 160 acres per farm unit should be maintained.

The recommendations on this matter of size limits were made unanimously by the investigating committee, which consisted of one representative each from the Bureau of Reclamation, the Bureau of Agricultural Economics, the Soil Conservation Service, and the Washington State College. It is reported that the state college has said it is not officially committed to the recommendation; that even though it appointed the college staff member of the committee, he was acting as an individual, not as an institutional representative. This position creates difficulties for federal agencies in interagency coöperative effort: as operating administrative organizations they must assume full administrative responsibility for commitments of their staff.

The task of blocking out farm units in accordance with the proposed program is proving rather difficult because of existing private-ownership complications. The bureau can buy only land which is in excess of the 160-acre limit allowed the 1937 landowners. Therefore it cannot purchase the many small tracts into which much of the project land is divided, so as to reblock them into appropriate units of topography, soil type, and size. Unless therefore it is willing to certify that these small holdings are sufficient to maintain farm families at an adequate level of living, it can only try to persuade many such owners to put their small tracts voluntarily into large farm units. In other cases considerations of topography and soil dictate the combination of portions from several ownerships to make a good farm. The legal expense of these many transfers of title runs up the cost of the farm units.

Furthermore many owners of small tracts are absentees who, having bought the land years ago and having held on in the hope of water to make it "blossom as the rose," now are unwilling to sell.

¹⁸ Columbia Basin Joint Investigations, *Farm Size and Adjustment to Topography*, Problems 6 and 8. (Washington, D.C.: 1946.)

Lacking public ownership of the project area, the "rationalization" of the farming pattern for irrigation agriculture will be a slow and difficult process. It may therefore be necessary to reconsider this program. The change in the temper of the times since the joint studies were started has also brought a vociferous attack upon the size limitations. Farm prosperity has dimmed the concern for creating the maximum number of opportunities for decent farm life, and the bureau is being pressed to decrease the number of farms by raising the recommended limits on unit acreage.

Should the bureau so revise its policy as to disregard the recommendations on size it will deal the second blow that the project will have suffered to the creation of increased farming opportunities. The first came in the spring of 1946 when more than one-fourth of the good land within the project area was withdrawn from the irrigation districts, leaving less than 750,000 out of the 1,000,000 acres suited for irrigation. The coincidence of a wet cycle and skyrocketing prices for agricultural products has made dry farming along the eastern border of the project area so profitable that irrigation there has lost its appeal. It may be anticipated that dry years will return and prices fall. When that happens this land will probably again be seeking admission to the irrigation districts and to the water rights.

The physical-planning recommendations relating to the location of highways and roads are being followed by the Bureau of Reclamation and the Washington State Highway Commission. Similarly foundation plans for recreational facilities are being laid in accordance with the comprehensive program outlined in the special study of that subject. One county has already adopted land-use regulations and the others are considering similar zoning control. The bureau is aiding them.

One of the most important of the programs resulting from the joint inquiries consists of advising and assisting settlers in the first years of their irrigation farming when, as experience on the other projects has demonstrated, such aid is greatly needed. Under an interagency agreement drafted in 1945 the bureau, in cooperation with the Washington State Experiment Station and the Bureau of Plant Industry, is planning a group of "pre-development" farms, located in parts of the project which are representative as to soil, topography, and climate. The bureau will establish, equip, and operate the farms; the other two agencies will furnish staff, equipment, land, and buildings at their stations at Prosser and Hermiston, to carry on experimental studies of irrigation problems (including drainage and salinity control) peculiar to the lands on the Columbia Basin project. The bureau, as the farm operator, will try out the experimental conclusions indicated by the research people. Thus it is hoped to learn in advance of general settlement how to handle best the land and crops

for successful farming. When settlers arrive they will be taken to the appropriate predevelopment farm for a short course in farm operations.

The advisory plan also includes coöperation with Washington State College in the employment of qualified agricultural college-trained men as assistant county agents. They help the new settlers lay out their ditch systems, advise them on handling water, and generally work with the county agent as a member of his staff and with the Extension Service specialists in rendering direct "case" advisory service on all agricultural problems. In addition a committee of state-college and bureau technicians is preparing a series of subject-matter leaflets for the use of the farmers who will take over the irrigated farms on the Pasco pumping unit—the first to be watered on this great project.

The report which dealt with the rate of development of project lands (problem 17) urged a moderate pace in order that the local farming economy not be thrown out of gear, and that settler selection and advice be kept upon an efficient basis. The commissioner's office decided in 1946 to speed up the program so as to have from 400,000 to 500,000 acres in use by 1950 or 1951. But changes in the economic situation since then have precipitated a reëxamination and revision of the development program.

This unique interagency study program brought forth many other proposals which the bureau is examining. They will doubtless be accepted within the limits of practicability and legislative authority in an effort to forestall the tragic difficulties so frequently encountered by early settlers on the older bureau projects. This time the bureau is also equipped with factual information, ideas, and some legislative authority for planning better direction of the urban developments that will certainly take place simultaneously with the settlement of farm families on the watered project lands.

A formal review committee has been set up by the regional director to examine the recommendations and arrange the proposals into three groups: (1) those requiring new legislation; (2) those which can and should be adopted at once; and (3) those calling for further study before action is taken. It had been planned to make this review as the reports were written, but the delay in completing the studies and the interference of war activities made that impossible. At the time of writing, the committee's report was being reviewed by the regional director, and was to be finally passed on by the commissioner at Washington.

No formal appraisal of this elaborate interagency investigation has been made by the bureau. But it is the judgment of those most closely in touch with this experience that although the investigation undoubtedly achieved results of great merit, it required an undue amount of time. Those coöperating agencies which detached staff from their regular duties

and assigned them to work on the study completed their assignments with promptitude. But those studies which were merely added to regular staff duties were difficult and in some cases impossible to finish. As a consequence the bureau's field coordinator made many of the factual studies for review and approval by the interagency committees. This experience suggests that interagency research and planning must be properly staffed in order to be fruitful.

Interagency Relations of the Bureau of Reclamation

THE BUREAU AND THE DEPARTMENT OF AGRICULTURE

Although a number of activities in which the Bureau of Reclamation engages, such as the cooperative snow surveys, are carried on in harmonious cooperation with the Department of Agriculture, there can be little doubt that the bureau's relations with that department are among the most difficult. Conflicting relationships have arisen particularly with the Soil Conservation Service, the primary water- and land-planning agency for the department.

To understand the difficulties, it is necessary to realize that the Bureau of Reclamation is serving a basic agricultural function in the Western states. The end product of all its activity was, until the Boulder Canyon enterprise, the bringing into cultivation of new land. Even though since 1928 the bureau has branched out into multiple-purpose projects, these have been primarily concerned with the irrigation of agricultural land. The performance of this basic agricultural task by an agency in the Department of the Interior tended to generate jurisdictional conflict between it and the Department of Agriculture.

This situation was made more acute during the early days of the great depression by a concerted attack in Congress of the agricultural groups in the Middle West and East upon the reclamation program. That attack was joined by the former Secretary of Agriculture Arthur M. Hyde, who expressed this general antagonism to the bureau's agricultural program in his adverse report to the Board of Engineers for Rivers and Harbors which was then reviewing the first "308" report by the division and district engineers on the Columbia River system. Secretary Hyde, in vigorous and forthright language, opposed the irrigation of the Columbia Basin as suggested by the district engineer's report on the ground that the nation's agricultural plant was already too large, that with a third of present farm acreage we were already feeding and clothing our people and sending vast surpluses abroad, that agricultural prosperity required the prevention of these surpluses through reduction in acreage. Farmland he said was

low in price and the market for farms was glutted. Private enterprise would not and the government should not think of bringing into production 12,000 more farms. Secretary Hyde then went on to analyze the probable market situation relative to agricultural projects. He pointed out the trend toward stationary population in this country and its effect in reducing the demand for food. He noted the desperate struggle for self-sufficiency on the part of European nations and the cutting off of the foreign markets for American farm products. He criticized the reclamation policy of subsidizing the irrigation farmer by interest-free funds under the Reclamation Act. He insisted that it was unfair to the established American farmers in the Northwest as well as in the East—who had invested some fifty billion dollars in the agricultural plant—to complicate their economic difficulties by subsidizing the expansion of new acreage. He asserted that the Columbia Basin project meant aid not to farmers but to landholders speculating in land values, and that no national emergency existed which could justify setting up competition for farmers already struggling for their existence. And finally he contended that our future land policy was involved, that the farmer of today faced struggle with economic, not physical forces, and the governmental agencies should be aware of changed national needs and refrain from luring men to the land by unwise blandishments.¹⁹

Although the Department of Agriculture has drastically modified its attitude toward irrigation as expressed in 1932 by President Hoover's secretary of agriculture, the latent hostility which this historical episode epitomizes persists and is always susceptible of revival.

Equally important is the jurisdictional jealousy caused by the performance of agricultural functions by another department. The early history of Bureau of Reclamation projects was marked by frequent disregard for the selection of suitable soil for irrigation and by inadequate attention to the problems of the settler. This failure of many early projects to give the irrigation farmer a fair chance to succeed has been the object of continuous adverse comment by Department of Agriculture agencies. Now that the Bureau of Reclamation has awakened to a realization that it must pay attention to the problems of the farmers on its projects, that it must select good soil, that it must encourage production for which there is a market and, in general, that it must work toward the success of the project farmers, it steps into the center of jurisdictional jealousy. In its endeavor to achieve this new purpose the bureau is employing agricultural technicians. This shift in its personnel program is the subject of criticism by the agencies of the Department of Agriculture, which regard it as evidence of intentional duplication and as preparation for an invasion of their field.

¹⁹ H. Doc. 103, 73d Cong., 1st sess., pp. 538 ff.

This antagonism broke into the open in the spring of 1945 during consideration by the House Committee on Irrigation and Reclamation of a bill²⁰ which had been promoted by the secretary of the interior and the Bureau of Reclamation ostensibly in the interest of returning veterans desiring to take up farms on Bureau of Reclamation projects. In general, the bill provided for veteran priority in obtaining irrigated farms and for various forms of assistance. Secretary of Agriculture Claude Wickard appeared before the committee to object to what his department regarded as an expansion of the functions of the Interior Department into the field of agriculture. He opposed the objectionable clauses in Section 2 on the ground that they gave to the secretary of the interior new agricultural functions which would duplicate machinery already in operation within the Department of Agriculture, a policy both wasteful and in conflict with the rules of good administration. He contended that his department possessed the personnel and the experience to extend to settlers on new Bureau of Reclamation projects the services they would need in establishing themselves, just as it was already performing such services on irrigated lands outside of Bureau of Reclamation projects. He declared that any additional services for irrigation farmers should be administered through the Department of Agriculture.

As a result of this criticism Section 2 was materially modified to eliminate some of the proposed new activities although the revision did not fully meet the position taken by the secretary of agriculture.

This basic jurisdictional conflict between the Bureau of Reclamation and U.S. Department of Agriculture was recognized in the so-called Wheeler-Case legislation of 1940 which arose out of the special report to the president by the northern Great Plains subcommittee of the National Resources Committee. That report was pointed toward the development of a permanent rehabilitation program for the semiarid and arid parts of the northern Great Plains and other parts of the West. The special report recommended a program to provide opportunities for drought-stricken farm families to become self-sustaining on irrigation projects of a kind which could not be readily undertaken under the reclamation laws, primarily because of legal requirements concerning repayment of construction costs.

In response to this report Congress, in the Interior Department appropriation bill for the fiscal year 1940, provided five million dollars which the president could use in making allocations "for construction in addition to labor and materials to be supplied by the Works Progress Administration on water conservation and utilization projects in the Great Plains and other arid and semiarid areas of the United States." This legislation

²⁰ H.R. 520.

was subsequently placed upon a permanent basis by the Wheeler-Case Act.

In 1940 the president followed the recommendation of the northern Great Plains committee in fixing the administrative arrangements for these projects. He allocated to the Bureau of Reclamation the task of preparing the engineering plans and building the projects; to the Department of Agriculture went the job of making the plans for settlement, including the selection of families, the provision of rehabilitation loans, the furnishing of technical help in soil surveys, erosion control, and advice to the farmers on farm practices. The Wheeler-Case law on this point authorizes the secretary of agriculture, "pursuant to cooperative agreement with the Secretary of Interior," to arrange for the settlement of the projects, to furnish guidance and technical advice for settlers, to purchase agricultural land within the projects, and to arrange for the improvement of project land and farm preparation for irrigation.

Under the Wheeler-Case program the Bureau of Reclamation was restricted essentially to the engineering and construction tasks. The Department of Agriculture took over practically all responsibility for the project's agricultural success and acted as the collecting agency for farmers' repayments of the reimbursement cost. This pattern of jurisdictional division has come to be regarded by the Department of Agriculture as the sound one, not only for Wheeler-Case projects but for all reclamation projects. Actually Wheeler-Case projects did not differ in kind from other bureau projects except that (1) they could not involve expenditure of more than one million dollars in any individual case and (2) they used nonreimbursable contributions from the Works Progress Administration, Civilian Conservation Corps, and (during the war) special subsidies in the interest of war food production.

The act was amended after 1940—partly because of the demise of the Works Progress Administration and the Civilian Conservation Corps—to allow projects costing up to two million dollars. The amended act permitted the secretary of the interior after consultation with the chief of engineers to allocate not more than half a million on any one project to flood control as a nonreimbursable cost. The amendment also forbids the continuance or initiation of projects unless the secretary of agriculture, with the support of the president, approves them as an aid to the production of needed agricultural products. For such projects prisoners of war and nonreimbursable resources could be used by either of the two departments. Congress continued to appropriate money for studies of potential Wheeler-Case projects for postwar construction.

Post Falls near Spokane is the site of the only Wheeler-Case project within the Columbia Valley region. However, a number of potential projects have been studied, including one at Canby and another near

Grants Pass. Until the summer of 1945 the Department of Agriculture performed its Wheeler-Case functions through the Farm Security Administration, which made the economic survey, planned the land development, selected the families for settlement, and made the land purchases; it also advised concerning the construction charges which the land could carry and on the development period to be allowed before construction charges should fall due. When the responsibility was assigned by the Department of Agriculture to the Soil Conservation Service, the Farm Security Administration retreated to the position of an advisory agency. The Bureau of Reclamation prepared the hydrological data, surveyed the property ownership boundaries and the rights of way, and planned and constructed all the physical facilities of a public nature.

The proposed Grants Pass project illustrates the planning procedure for these interdepartmental projects. Demand for it came first from the local chamber of commerce and certain organized farm groups. Then the Bureau of Reclamation prepared a study of the water supply and made a quick reconnaissance survey to determine engineering feasibility. This included an examination of storage possibilities, the adequacy of the soil and other physical factors. The bureau district engineer reported the reconnaissance favorably to Boise and, orally, to the Soil Conservation Service officials who proceeded to make a reconnaissance study from the standpoint of the Department of Agriculture's interest. This also was favorable and a detailed study was then authorized, in the course of which it became clear that the feasibility of the project would depend upon the cost of developing the land; that is, of clearing, leveling, ditching, and so forth.

Had the project been authorized for construction, the Soil Conservation Service would have determined the maximum cost which farmers would be able to repay. The farmers individually would have contracted with the Soil Conservation Service to develop their farms, being permitted by the law to take forty years for repayment. They would also have contracted with the Bureau of Reclamation for the irrigation works. Soil Conservation Service would have acquired land held by an owner in excess of the antispeculation limit or which for some reason he did not care to operate as an irrigated farm. It would have developed the land before reselling, although it has no authority to erect buildings or to build roads. Such sales would be made under the terms of the tenant purchase provision of the Bankhead-Jones Act. During the ten-year development period operators would be given leases. An operator who made good would be sold the land and given credit for all improvements made during the lease period, including such improvements as fertilization and erosion control.

The Bureau of Reclamation recommended favorably the proposed project at Canby but the Department of Agriculture disapproved, chiefly because it believed the further subdivision of agricultural land in that area, which would result from irrigation, might create a rural slum. It has become customary in these Wheeler-Case exploratory projects for the field staffs of the bureau and of the Soil Conservation Service to consult one another freely. The bureau obtains its economic data from the Soil Conservation Service, which in turn uses the information on engineering prepared by the bureau. The Soil Conservation Service is responsible for the operation of Wheeler-Case projects.²¹

The recent widespread promotion of soil-conservation districts by the Soil Conservation Service has caused another important problem of relations with the bureau. The latter has been promoting new Extension Service activities on its project areas. When bureau officials on the Owyhee project in Oregon became convinced that the farmers needed special help to forestall serious mistakes in handling the soil, they obtained the assistance of a part-time agriculturist from the Oregon State Extension Service but this was not adequate. Consequently in 1940 the field officials asked the Washington office for a more active and extensive program under which the bureau would pay the salaries of full-time assistant county agents to serve the farmers on new irrigation projects. This program was approved for one project area in each of the five northwestern states. The first money was made available in 1940. One agent is employed on each of the following projects: at Boise, the Owyhee and Vale, the Roza division of the Yakima, the Deschutes, and the Pasco unit of the Columbia Basin project. These men are selected by the Extension Service with the approval of bureau officials and are trained by the bureau in the simple engineering skills needed to assist project farmers in the layout of their irrigation systems. An experienced former county agent is employed by the bureau to train them and to supervise their work. The Extension Service on the other hand provides special training in problems of irrigated agriculture. The proposed predevelopment farms on the Columbia Basin project will be used to complete the training of the assistant county agents. These assistant county agents are presumed to be completely under the direction of the county agent although their salaries are reimbursed from bureau funds.

It had been the hope of the regional director's office to expand this program to all new projects, keeping the assistant county agent there for a period of perhaps ten years. During that time help for the farmers is especially needed, not only for laying out their distribution systems, but in learning how to use the soil and to apply water without erosion or

²¹ See chap. viii for a description of responsibilities on the Post Falls project.

fertility loss. The assistant county agent could be helpful to the bureau in many ways: by helping estimate crop returns, and by learning farmer complaints and needs relative to the operation of the project and thus forestalling acute difficulties.

This plan contemplated the selection of prospective candidates from the students at the state colleges a year or so before their graduation. Their program of studies would be modified from the usual specialized emphasis to assure their exposure to all branches of agriculture. In addition they would be given an elementary surveying course in how to run levels, use plane tables for area calculations, measure water, and the like. During the summer before the senior year they would also be employed in the field as junior aids. Upon graduation they would receive a month of special training on the ground and then be assigned to an experienced county agent for a period of apprenticeship before they would be placed on projects of their own.

Into this promotional picture has come the Soil Conservation Service with its sponsorship of soil-conservation districts. These are local organizations intended to act as collective vehicles by which farmers receive technical assistance from the Soil Conservation Service in all kinds of activity affecting soil conservation. Under this district system technicians of the Soil Conservation Service help individual farmers make detailed farm plans, including complete studies of the soil; give advice on crops for which the lands are suited, on crop rotations and irrigation practices (where the district covers an irrigated area); and assist in the layout of farm irrigation systems including ditches, flumes or pipes. The district has also made available on a rental-at-cost basis the use of heavy equipment for leveling, draining, and clearing land. It can be readily seen that this district program duplicates in part the services of the assistant county agent under the Bureau of Reclamation subsidy plan to the Extension Service.

Some of the Extension Service officials in the Columbia Valley states have been lukewarm or hostile toward SCS activities and the district program, even outside the irrigated areas. They have feared lest the district programs take over what they feel are Extension Service functions. Consequently when the districts with the help of the SCS started programs in bureau project areas where prospect of bureau funds for assistant county agents were bright, feeling in some irrigated areas became hostile. In all the states the laws authorizing the creation of soil-conservation districts make the county agent chairman of the local organization meetings. He is therefore in a strategic position to exercise great influence, should he so desire, on the choice that the farmers shall make.

There can be little doubt that some bureau field members in the

Columbia Valley region regard the organization of soil-conservation districts on their projects as a deliberate encroachment by the SCS. On the other hand, on new projects where public land is to be opened for homestead entry, the bureau has more recently taken the lead in organizing interagency committees at the local level for planning programs of settler assistance. These committees are made up of representatives of the Extension Service, Farmers' Home Administration, Soil Conservation Service, Production and Marketing Administration, the appropriate state departments for Vocational Education, and the Bureau of Reclamation. Each agency assumes responsibility for that phase of the program for which it is best fitted. Such committees are already at work on two projects and another is being promoted for a third area.

Despite the jurisdictional conflict over agricultural aid to irrigation farmers, numerous activities are harmoniously shared by the Bureau of Reclamation and the Department of Agriculture agencies, including the SCS. For example, on the Owyhee project, difficulties arose in securing water infiltration in the peculiar soil which covers a considerable part of that area. A call for aid went out to the Department of Agriculture and the SCS assigned a technician to work on the problem. The task has been a difficult one and the technician's efforts were supplemented by the assignment of a specialist from the Bureau of Plant Industry, Soils and Engineering (another agency of the Department of Agriculture).

The bureau has used SCS technicians on other infiltration studies, improper infiltration being a chief cause of erosion on irrigated land. In our discussion of the Columbia Basin project we have pointed out how heavily the bureau there drew on the aid of the Department of Agriculture, particularly the Bureau of Agricultural Economics, in carrying through its important problem studies. A similar relation with the Bureau of Agricultural Economics is continuing today, for some of the smaller projects.

Nevertheless, optimism about freedom from friction does not seem warranted. It is apparent that the Department of Agriculture has determined on a general policy of resisting what it regards as encroachments by the Bureau of Reclamation on its agricultural functions to all irrigation farmers; and of using its position as statutorily authorized reviewing agent of proposed bureau projects to demand a more potent agricultural position in the initiating stages of reclamation projects. This is illustrated by the department's criticism of the bureau's proposed comprehensive plan for the development of the Central Valley in California, in which it complained that the report gave little attention to the capabilities of land proposed for irrigation and to the ability of farm production to repay the construction and operating costs. It felt that since 82 per cent of the

estimated benefits were expected to come from irrigation the report should have included adequate discussion of agricultural and watershed matters "such as this department is concerned with." This, it said, could have been done had the Department of Agriculture been allowed to participate coöperatively in the preparation of the report.

The review alleged (1) that the problem of siltation and watershed erosion had been virtually ignored, despite the fact that serious conditions of erosion existed in the foothill orchard country and in certain grazing and burned-over forest areas; (2) that the plan omitted consideration of drainage or drainage costs; (3) that it had not carefully appraised the economic problems caused by increased agricultural production or the crops that should be grown on the new land; (4) that it had ignored the classification of land according to its capabilities and had thus overestimated the acreage suitable for irrigation.

Aside from the further criticisms contained in this review it is clear that the Department of Agriculture is striving for a position of joint participation in the investigation of potential irrigation projects. So long as this general condition of tension continues it is bound to color particular operating agency relationships.

THE BUREAU AND OTHER INTERIOR-DEPARTMENT AGENCIES

When the regional office at Boise was asked by the commissioner in 1944 to review the irrigation prospects for the entire Columbia River Basin it soon became clear that this could not be carried through by bureau effort alone because other Interior Department agencies also claimed an interest. Consequently all operations of the department that impinge upon water development work were drawn into the study. The final report has been cleared with each of them and was sent to the president by the secretary of the interior in June, 1948; it is a departmental—or in some respects even an interdepartmental—product. This experience, stimulated as it was by the bureau report on the Missouri Valley, encouraged the establishment of a continuing intradepartmental field committee representing all Interior Department agencies which share in natural-resource management and development in the Columbia Valley region.²²

Many of the relationships between the bureau and other Interior Department agencies resemble those of the army engineers with the same agencies. Thus the bureau uses and augments the work of the Geological Survey, particularly in its water-resources branch and in the water and power division of the conservation branch, in much the same manner as does the Corps of Engineers. It too furnishes funds to increase the number

²² See chap. xiii for a description of that committee.

of gauging stations operated by the Geological Survey, helps to take measurements at the stations and supplies funds to pay gauge readers. Occasionally, as on the Yakima Projects, where there are a number of interrelated project units the bureau will permanently operate the gauges but use the USGS to assemble the hydrological information resulting therefrom. On the other projects it may for a short time operate a few temporary stations. The bureau's regional planning officials look to the Geological Survey to compile the basic hydrological data for its projects and, increasingly, for assistance in analysis. The bureau also makes use of the same kind of preliminary geological examination of reservoir and dam sites as do the army engineers. It is reported that the very good preliminary studies by the Geological Survey greatly aided the bureau engineers at the beginning of their work on the Hungry Horse site in Montana by calling their attention to some special site problems. The bureau feels a similar interest in the mapping program of the Geological Survey and a similar need to supplement the inadequacies of the latter agency by means of its own studies.

The bureau is following the practice of the army in providing funds to speed up and expand the studies of the Fish and Wildlife Service; the bureau's aim is to minimize the detrimental effect of river and irrigation structures on fish life. In 1946 it gave \$50,000 for the Columbia River salmon study by the Fish and Wildlife Service. Bureau funds are used chiefly for studies on the large upstream dams: how to pass the fish up the river, how to return the fingerlings without undue loss, the effect of dams on water temperatures, and the consequent results on fish life within reservoirs. Of course the bureau also observes the legal requirements for consulting the Fish and Wildlife Service to ascertain the effects on wildlife of any proposed impoundment or diversion of water. Accordingly it transfers funds to make possible the examination of the wildlife consequences of its various projects.

Despite the fact that the Bureau of Reclamation and the Fish and Wildlife Service are sister agencies in the same department, there is no evidence that their relations are any more cordial than are those between that service and the army. In fact it is said that they are not so good. It is alleged that, backed by the Izaak Walton leagues and the state fish agencies, the Fish and Wildlife Service has lent itself to a movement, thus far successful, to keep the bureau out of the entire Salmon River drainage basin and preserve that area for fishing. The dispute that started during 1945 continued unabated in the Rogue River Valley, which the bureau recently entered at the request of local irrigationists and businessmen. The bureau's proposals for irrigation in that valley resulted in a frontal

attack by commercial fishermen, recreationists, and sportsmen, supported by the Fish and Wildlife Service.

The National Park Service, also a sister agency in the Interior Department, is closely tied in with recent bureau development programs. A written agreement has been operating during the past few years under which the bureau finances National Park Service studies of bureau reservoir areas. Along the beautiful lake created by the Grand Coulee Dam, the National Park Service has made area plans (with the approval of the bureau), handles applications for use permits, supervises current uses, and negotiates leases; it administers the public lands and recreation areas except for certain reservation lands bordering on a part of the shore line, and for a small area immediately adjacent to the dam and the town which the bureau operates. This plan for the administration of Franklin D. Roosevelt Lake by the National Park Service was endorsed by the Forest Service despite the fact that it is one of the major recreation agencies in the Pacific Northwest. For some of the projects the bureau feels that it must retain general jurisdiction for irrigation purposes and therefore does not intend to go so far in transferring jurisdiction. Even for such areas the bureau intends to delegate the handling of special recreational features to the National Park Service or, for reservoirs lying within a national forest, to the Forest Service.

A number of Indian reservations within the Columbia Valley have land suited to irrigation, and a considerable amount of it has already been irrigated. The present practice of the Indian Service is to conduct such developments itself, although during the first twenty years of its life the Bureau of Reclamation did that work. It is said that the Indian Service's reasons for assuming the function are that (1) the Indians are a special group which requires special consideration in the planning and operation of irrigation work and (2) the bureau policy of building by contract instead of force account is not compatible with the need of the Indian Service to maximize employment opportunities for its wards. It may be added that as long as the Indian land irrigated by federal projects remains in joint ownership the Indians do not pay construction charges.

THE BUREAU OF RECLAMATION AND THE WEATHER BUREAU

Following the lead of the army and of the Tennessee Valley Authority, the Bureau of Reclamation in 1946 joined with the Weather Bureau in a service-wide study of maximum storms to be expected on watersheds where the bureau operates. This undertaking involves the maintenance at Boise of a bureau staff member who will first study the storm history of the Columbia Basin and compile the historical data; and then go to

Washington to be trained by a Weather Bureau official in methods of analysis for the purpose of predicting future maximum storms. This agreement is one more evidence of the enlarged part which the Weather Bureau seems destined to play in water-resource planning.

The minor relationships of the Bureau of Reclamation with the General Land Office and the Grazing Service will be described in Part II when we explore the work of the land-managing agencies. We reserve to the next chapter an examination of the relations between the bureau and the Bonneville Power Administration.

CHAPTER IV

Bonneville Power Administration

Creation of the Agency

THE BONNEVILLE POWER ADMINISTRATION (BPA) was born in the shadow of the oncoming European war. Its basic legislation was approved by the president in August, 1937, and in November, J. D. Ross, superintendent of Seattle City Light, and a widely known protagonist of public power, became its first administrator. With a small appropriation he started to build up his organization while war clouds began to loom across the Atlantic.

The initial concern of those in charge of the new agency was centered on basic problems of public-power policy. In fact, the birth of BPA had been delayed for more than two years while groups in the Pacific Northwest (working through their respective Congressional delegations) struggled over policy issues relating to the public- versus private-ownership controversy, and to closely associated questions of bureaucratic competition for jobs and influence. As early as January, 1935, Senator Pope of Idaho had introduced a bill for the establishment of a Columbia Valley Authority, patterned, in large part, upon the TVA, to handle the whole Columbia River development program including transmission and marketing of the power soon to be available at Bonneville Dam and a little later at Grand Coulee. That proposal aroused a tremendous amount of articulate opposition from chamber-of-commerce groups throughout the region.

Oregon's Senator McNary countered with a bill to intrust the marketing and transmission of Bonneville power to the Corps of Engineers of the United States Army who were building the dam. The policy favored by that agency in the marketing of Bonneville power had been clearly expressed by its division engineer, Colonel T. M. Robbins. It called for the sale of most of the power to new industrial enterprises located near the dam site, which it would encourage by a differential rate structure, increasing the charge for power in proportion to the distance from the dam at which it would be taken. The geographic area proposed to be traversed by Bonneville transmission lines would be restricted to the territory of the

lower Columbia River constituting the immediate hinterland of metropolitan Portland. Neither the army nor the Bureau of Reclamation was interested in tying Grand Coulee power with Bonneville power so as to pool the resources from these two great enterprises through a single transmission program.

The first multiple-purpose survey of the Columbia River which had been prepared by the Corps of Engineers under the "308" resolution contained a special study of the Columbia Basin-Grand Coulee project which the Bureau of Reclamation had made at the request of the corps. That study had clearly shown that the bureau wanted a transmission and marketing policy which would link Grand Coulee to the Puget Sound area and would rely upon power demand there and in the Spokane territory to absorb the energy produced at Grand Coulee. It had no program for a grid system running to Bonneville Dam or to the population centers in Oregon and the lower Columbia. There was a tacit understanding that the Corps of Engineers and the Bureau of Reclamation would divide the region between them. This agreement for each to market the power from its respective river development and each to generate only sufficient hydroelectric energy to serve the local demand not cared for by the private utilities, crystallized into the McNary Bill, which had the support of the organized business groups throughout the region. The Washington representative of the Portland chamber of commerce had his desk in Senator McNary's office during this period.

But at that time the political psychology in Oregon and Washington was still dominated by the depression revulsion against business leadership in public affairs. Thus there was a good deal of opposition to the McNary Bill, particularly on the part of the Congressional delegation from the state of Washington, which almost unanimously held the New Deal point of view. Because of Washington senatorial opposition the McNary Bill was not acted upon before Congress adjourned in the summer of 1935. It was reintroduced in the autumn with the support of Oregon's other Republican Senator, Frederick Steiwer, but met new competition in the form of a bill by Senators Bone and Schwollenbach and an identical bill by Congressman Pierce. This evoked further discussion with consequent delay in the establishment of an operating agency to sell the power from the Bonneville generators.

During the summer of 1935 another factor, destined to play an important part in the final decisions, entered the picture. This was a special study of the future development of the Columbia Valley which the president of the United States requested of his National Resources Committee, the recently created central planning agency for the executive branch of the government. This study was assigned to the Pacific Northwest Regional

Planning Commission which the National Resources Committee had authorized in 1934 and which represented the state planning boards of Washington, Oregon, Montana, and Idaho, with a chairman chosen by the NRC. This body assembled a staff which, with the assistance of the field offices of the various federal agencies, summarized existing available data about regional resources and problems. It recommended policies to govern the transmission and marketing of hydroelectric energy from Grand Coulee and Bonneville dams together with a plan of administrative organization for those functions. Its recommendations took a longer-range view of future developments in the Columbia River Valley than had theretofore been expressed. They were also predicated upon the conception of region-wide interests and benefits. The commission recommended a central grid to tie into a single super-power-network the principal centers of existing and future public-power generation by means of high-tension lines capable of supplying power reliably and uniformly.

This master grid would link together the Spokane, Puget Sound, and Portland areas. From the grid would radiate other lines to load centers throughout the region wherever demand might justify. It recommended that the rates charged for energy from the great federal projects near Spokane and Portland be as nearly uniform as possible throughout the transmission area so that regional benefit might be maximized and the fruits of federal investment shared as widely as possible. It proposed as the marketing agency a new independent commission, endowed with corporate powers. It favored a close organizational relationship between this new operating organization and whatever agency should be given the continuing job of planning for regional development.

There was very little organized and articulate public sentiment in the region in 1935 for a common regional transmission system which would either link Bonneville and Coulee in one transmitting organization or tie them into a regional grid. Nor was there articulate concern of consequence with a uniform regional power rate. During the late summer and fall of 1935 the Regional Planning Commission, after broadcasting letters of invitation which raised issues of fundamental organization and policy, held public hearings in Helena, Spokane, Seattle, Portland, and The Dalles. It received only three significant statements bearing on these issues: one from an Oregon State Federation of Labor official, one from the Tacoma Chamber of Commerce (containing the only proposal for a uniform wholesale rate policy throughout the transmission system) and one from the head of the engineering experiment station of the University of Washington. The chairman of the Idaho State Planning Board sent to some 1,200 prominent citizens in the Pacific Northwest a questionnaire raising the questions of a valley-authority type of organization and other

problems associated with regional river development. He reported a division between public- and private-power views but his summary of the replies contains no reference to a common regional transmission system or to a policy of uniform wholesale power rates. Grange leaders, although interested in public-power development, had not yet crystallized their ideas on these issues of organization and power distribution.

The National Resources Committee received these recommendations, endorsed them and transmitted them to the president. This endorsement was signed by all members of the committee except the secretary of war, whom the letter of transmittal listed as out of the city. This disclosed a conflict within the committee, the War Department objecting seriously to any plan that would take the marketing and transmission functions out of the hands of the army engineers. The latter had strong political support (as has already been indicated). In addition, the recommendation for a separate corporate agency, even though the regional planning commission and the National Resources Committee had explicitly limited its suggested functions to the single task of power marketing, appeared to many as a move for another TVA.

In recognition of the tough fight that would be encountered if the committee's proposal were urged by the president and because the early completion of Bonneville Dam called for speed in providing a marketing administration, the president chose to compromise. His suggestion early in 1936 to the senators from the Pacific Northwest that a temporary administrative organization be set up until such time as a permanent plan could be worked out was ultimately followed in the enactment of the Bonneville Power Administration Act of 1937. That measure contained the following clause: "The form of administration herein established for the Bonneville Project is intended to be provisional pending the establishment of a permanent administration for Bonneville and other projects in the Columbia River Basin."

This temporary compromise left to the secretary of war the completion and operation of the Bonneville Dam, including its electric generators. The War Department, however, was ordered to provide additional generation whenever the administrator of the Bonneville project should find additional facilities necessary to meet the market requirements for electric energy. The secretary was also directed to provide adequate station space and equipment "required by the Administrator for proper reception, handling and dispatching of the electric energy produced at the said Project, together with transformers and other equipment required by the Administrator for the transmission of such energy from that place at suitable voltage to the markets which the Administrator desires to serve."

The act created the post of administrator of the project, appointed by

and responsible to the secretary of the interior. As agent for the sale and disposition of electric energy generated at the Bonneville Dam not required for the operation of the dam and locks, the administrator was "authorized and directed to provide, construct, operate, maintain, and improve such transmission lines and sub-stations, and facilities, and structures appurtenant thereto, as he finds necessary, desirable, or appropriate for the purpose of transmitting electric energy . . . to existing and potential markets . . . to interconnect the Bonneville project with other Federal projects and publicly owned power systems now or hereafter constructed." This provision laid the basis for the regional grid system and for much of the administrative policy that was subsequently adopted in bringing energy to the many local distribution systems (chiefly publicly or coöperatively owned) that soon were eagerly demanding power.

The administrator was enjoined to act in consultation with an advisory board composed of representatives appointed by the secretaries of the interior, war, and agriculture and by the Federal Power Commission. The act equipped the administrator with powers essential to the performance of his main duty and laid down certain functional policies to guide him in its performance:

(1) He was to "encourage the widest possible use of all electric energy that can be generated and marketed," to provide outlets for it, and to prevent its monopolization by limited groups.

(2) He was to operate the project "for the benefit of the general public and particularly of domestic and rural consumers," giving preference and priority at all times to public bodies and coöperatives. To this end, the act provided time allowance and percentage limitations in the sale of power to assure public bodies and coöperatives of opportunity to contract for Bonneville energy. Moreover, it provided that the administrator should give such bodies a reasonable time in which to make financial arrangements for entering the business of distributing energy, and should allow local government bodies and coöperatives a reasonable time in which to hold elections or take other action to qualify themselves as distributors of Bonneville power.

(3) In a conflict between the application of a public body or coöperative and that of a private agency for the allocation of power the former shall have preference.

(4) No contract for sale "at wholesale of electric energy either for resale or direct consumption" is to exceed 20 years' duration, and any contract with a private distributor must provide for cancellation upon five years' notice if the administrator believes that any part of the energy concerned is likely to be needed to satisfy the requirements of public agencies or coöperatives.

(5) In contracting with private utilities the administrator shall make stipulations concerning resale and resale rates which will ensure resale to the consumer at reasonable and nondiscriminatory rates.

(6) The social policy incorporated in the rate sections of the law requires the administrator to make rates, subject to the approval of the Federal Power Commission, "with a view to encourage the widest possible diversified use of

electric energy. The said rate schedules may provide for uniform rates or rates uniform throughout the prescribed transmission system and encourage the equitable distribution of the electric energy developed at Bonneville project." This injunction is limited only by the stipulation that charges must be such as to recover the cost of producing and transmitting electric energy, including the amortization of the capital investment over a reasonable period of years. The Federal Power Commission is to make allocations of cost for the joint facilities of the dam chargeable to the production of electric energy.

These basic policies incorporated in the Bonneville statute make it clear that the Congress which wrote it intended the administrator actively to favor public-distribution agencies in his marketing program. It may be noted also that the basic rate conception proposed by the Pacific Northwest Regional Planning Commission and endorsed by the National Resource Committee was incorporated in the statute. While the act was a compromise between the conflicting points of view expressed by the original McNary Bill and the Pope and Bone and Schwellenbach measure, it was a distinct victory over the private-utility and chamber-of-commerce views on power policy. It was also a setback to the ambitions of the Corps of Engineers, and it contained the entering wedge, by the authority to interconnect federal projects, for taking from the Bureau of Reclamation the distribution of Grand Coulee energy. It is undoubtedly true however that had it not been for the active, though delayed, intervention of the president, buttressed by the studies and recommendations of the National Resources Committee and its regional agency, the legislation would have lacked many features of a regional program.

The Administrative Pattern of the BPA

The Bonneville Power Administration is an operating unit in the Department of the Interior. It is not a government corporation like the TVA, although its liberties and powers resemble those of a government corporation in certain minor particulars such as the purchase of materials, a special audit of its accounts, and the use of a reserve fund for emergencies. For the most part it comes within the same restrictions and controls with regard to finance and personnel as the traditional operating bureaus. The secretary of the interior appoints the administrator of the BPA without senatorial confirmation and he reports and is responsible to the secretary.

Authorized by the act to locate his headquarters "in the vicinity of the Bonneville Project"¹ the administrator selected Portland. A liaison

¹ *Public Law No. 329, 75th Cong., 1st sess., Section 2.*

representative is, however, maintained in Washington, D.C., to keep in close touch with events there. Otherwise, the whole staff of the agency is located within the region except engineering inspectors, who work at fabricating plants where equipment for transmission and station facilities is being made on Bonneville's account. This arrangement undoubtedly makes the BPA far more region-conscious than any Washington-centered operating agency would be. Its attention is confined to a single watershed of the nation and because the officials in charge live within that valley its needs are brought sharply into the focus of their consciousness. Perhaps indeed this concentration of attention upon a single region may at times produce myopia with regard to other regional or national issues.

Such a setup gives the BPA distinct advantages in dealing with other field offices of the Department of the Interior located in the same area. Such offices operate at a lower official status than does the administrator of the BPA; he has access to the secretary while they must defer to their Washington bureau chiefs for support. With regard to power policies inaugurated by the BPA, access to the secretary of the interior is usually but not exclusively through the Division of Power which has general supervision over all power functions within the Department of the Interior, including those of the Bureau of Reclamation and the Southwest Power Administration. Undoubtedly because BPA is a single-purpose agency its tie to this supervisory division in the secretary's office is closer than that of such agencies as the Bureau of Reclamation whose major function is not power production.

The administrator of BPA is a member of the department's water-resources committee and so is able to represent its interest directly on all water-resource questions within the department which affect its work in the Pacific Northwest. It was the intention (not fully realized) that the water-resources committee would iron out disagreements on water-development projects or other water-policy matters between operating agencies within the department and thus present a unified departmental policy in the discussion of the Federal Inter-Agency River Basin Committee, the principal agency for dealing with the whole national water-development program. Moreover, the administrator has been appointed a member of the recently organized Columbia Valley subcommittee of this federal interdepartmental committee. As the Bureau of Reclamation is also represented, this results in two Interior Department memberships on that subcommittee. The administrator has been assured by the secretary of the right to "participate in the work of any interdepartmental or intra-departmental organization or committee on which the Department now or in the future has representation for the making

of surveys, investigations or studies affecting power matters in or the water resources of the Pacific Northwest.”²

As the first generators at Grand Coulee approached completion the Department of the Interior had to face the competition between the Bureau of Reclamation and BPA as marketing agents for their power. It finally determined that there should be a single marketing agent for the two dams, and the president approved this decision in an executive order issued in 1940. After a series of contests BPA's sphere of authority has since been augmented by jurisdiction over the surplus power to be developed at Hungry Horse, McNary, the lower Snake River dams, Lookout Point, Quartz Creek, and Detroit. Under the provisions of the Flood Control Act of 1944 surplus power from new army-built dams in the region (such as Foster Creek—now Chief Joseph—and Willamette Valley project dams) will be marketed by the Department of the Interior and therefore, under secretarial policy tentatively announced in August, 1946, and definitely affirmed on May 19, 1948, by the Bonneville Power Administration.

The administrator has been directed

to such extent and in such manner as in his judgment the public interest may require and as are consistent with applicable statutes and executive orders to (a) integrate the power facilities of all power projects for which he is the marketing agent of surplus power; provided that nothing in this order shall be construed as conferring authority over the operations of the power producing facilities of such projects; (b) interconnect such projects with publicly owned power systems and to exchange electric energy with and purchase and sell electric energy from and to such systems . . . (e) sell the surplus energy in accordance with the policies of the various statutes governing the projects.

He is permitted to make such surveys, investigations and reports as he finds useful in carrying out the duties. He may make or cooperate in the research and engineering work appropriate to the tests of the results of his studies or to promote “the wider and improved use of electric energy for industrial, domestic and agricultural purposes. . . .” In carrying out these duties he is authorized to cooperate with any or all federal, state, and local agencies in the region as well as with cooperative associations interested in the resource development of the Pacific Northwest.

In order to

provide the widest possible use of and reasonable outlets for electric energy marketed by the Administrator and the purchase of this by the ultimate consumer at lowest possible rates consistent with sound business principles and to prevent monopolization of such energy by limited groups, the Administrator

² This quotation and the following outline of the authority delegated to the administrator by the secretary are taken from the secretary's order No. 2115 dated October 16, 1945, which is a codification and revision of authority theretofore delegated to the BPA.

is directed (a) to assist public bodies and cooperatives who are purchasers or potential purchasers of electric energy from the Administrator in the acquisition of electric energy facilities and distribution systems . . . and (b) to render to purchasers and potential purchasers of electric energy from the Administrator services pertaining to the financing, operation or maintenance of facilities and equipment for receiving, using or distributing electric energy or the sale of such energy.

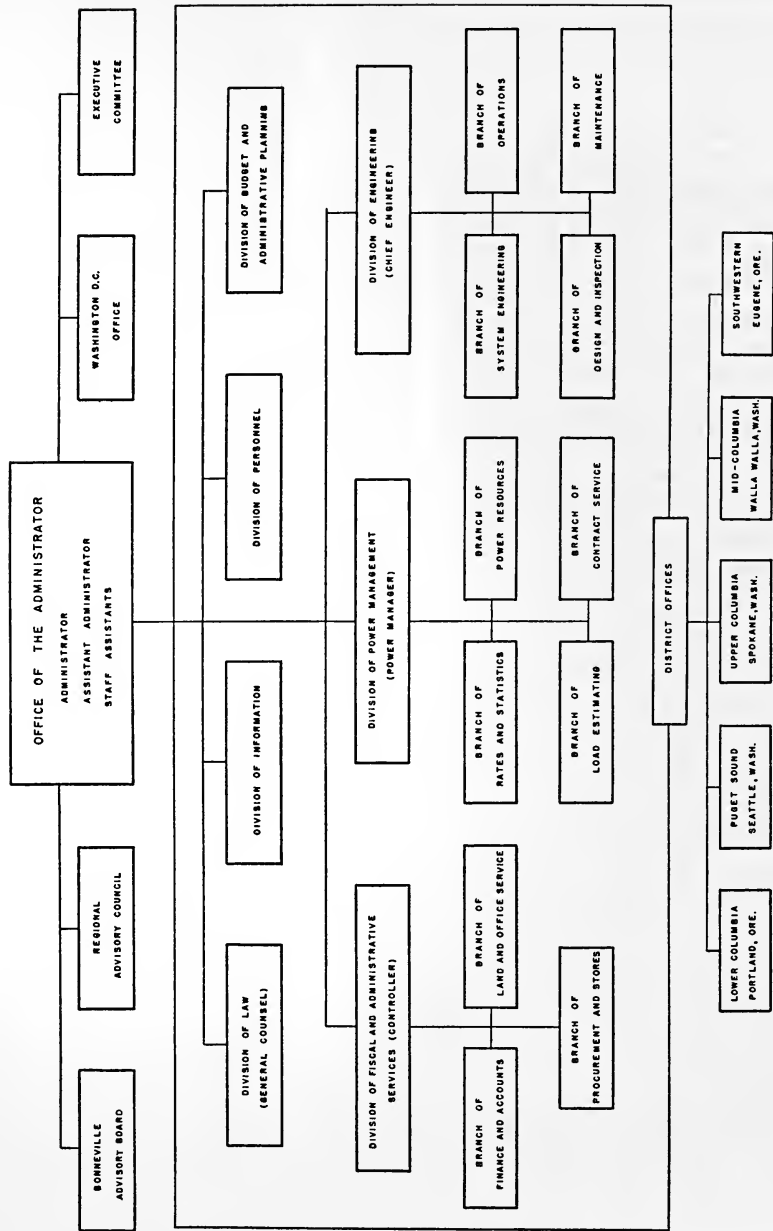
He has been told to sell energy under contracts which will safeguard the public interest as he sees it. Contracts with private utilities are to be drawn so as not to affect adversely public bodies or coöperatives which either exist or may later be organized and which desire to buy power in the areas served by the private utilities. Contracts are also expected to further the objective of making electric energy available to the consumer at reasonable rates.

The central organization of the BPA is headquartered at Portland and, to a minor extent, in the Vancouver substation. The administrative structure includes the usual auxiliary and staff services, legal counsel, information, fiscal and administrative services, personnel, and numerous special assistants for specific tasks.

Its major functional jobs are divided between two branches, one for engineering and operations and the second for power management. The first of these branches cares for the design, construction, maintenance, and operation of the transmission system. Until about 1943 this was the big unit and was largely engaged in construction. After the sharp drop in construction activity produced by war curtailments in 1943 the operating work became of greater relative importance.

Included in the operating job is of course the task of dispatching over the transmission system the energy required to service the distribution, industrial and interchange customers. During the war, and particularly after the organization of the power pool, this was a very exacting and strenuous activity because of the need to conserve every unit of energy to serve the needs of the war and of the increased civilian population which the war brought to the region. Closely associated with the operating job has been the servicing of customers with the facilities necessary to supply them with energy. Strenuous efforts in maintaining equipment were required to keep the system operating in its chronic condition of overload.

The second branch of the functional job relates to the management of power. It deals with the planning of future transmission lines based on economic and social prospects and requirements, the construction of rate schedules, and the making of sales contracts. It continuously studies the power resources of the region; plans a long-range program for the



Bonneville Power Administration: Organization Chart.

extension of the administration's transmission facilities; supervises the sales contracts with customers; assists customers to improve their operations and particularly to increase their power loads and returns. To this branch was attached the recently abandoned work on industrial resource development. In that unit was centered until July, 1947, the research work directed toward the use of electric energy by new industries, the conduct of economic studies relating to power marketing problems, and the effort through personal contact to secure the location in the region of important new industrial consumers of electricity.

As a part of its organizational facilities the administration opened field offices throughout the region. There are now five districts. The plans of the administrator, initially expressed in the growing use of the district offices for the negotiation of sales contracts, development of service plans for customers, adjustment of contractual difficulties, the performance of minor engineering assistance for the smaller customers, the coordination of construction timing and maintenance schedules with customer requirements, and general public-relations work, were suddenly interrupted by the Congressional budget cut for the fiscal year 1948. Today, therefore, a skeleton district staff performs only the more urgent trouble shooting, customer engineering, and public relations jobs.³

BPA Rate-Making Policy

The selection by Secretary Ickes of J. D. Ross, close personal friend of President Roosevelt, signaled the victory of the public-power point of view in rate making. Upon his appointment, Ross at once set about the task of determining a basic rate policy. As soon as the Federal Power Commission had issued its order on the allocation of costs, he announced a schedule intended to encourage the maximum use of electric energy. The charge was based on the kilowatt-year making the price of a kilowatt the same for the entire year as for any fraction of the year. This rate program was justified by Ross on the ground that electric energy is produced day and night as the water flows and since there is virtually no storage at the Bonneville Dam, power not used as it is generated is lost forever. He wanted the distribution agencies buying Bonneville energy also to fix their resale rates so as to encourage 24-hour and 365-day use of power. In the second place, his rate program made no distinction between small and large consumers or between public and private agencies. Rates would be the same for a small cooperative, a large municipal system, or a big private distributing company.

³ We summarize below the story of the budget cut in 1947 and its impact on the whole program of BPA.

The initial rate program was very simple and consisted of a charge for primary power anywhere on the transmission system of \$17.50 per kilowatt-year; for secondary power, \$11.50. In order to encourage load building in the many small coöperative and public-distribution systems, small systems with demands of less than a thousand kilowatts were offered an optional kilowatt-hour rate of half a cent for a two-year period. Recognizing the lower cost of power at the dam site, another schedule of \$14.50 for primary and \$9.50 for secondary power was announced for purchasers within fifteen miles of the dam who would build their own lines to the bus bar.

The differential between bus-bar and transmission rates has never been sufficient to induce the heavy energy-using industries to locate near the dam within the Columbia gorge. The rate policy has thus distributed throughout the entire transmission area the benefits of industrial development resulting from cheap electric energy by permitting other considerations of plant-site location to determine where a given industry would be established.

On August 26, 1940, the president by executive order made BPA the marketing agent for the power generated by Coulee Dam. The executive order was issued after the advisory board at its January, 1940, meeting endorsed the proposal for a single marketing agency to handle both Bonneville and Coulee power. The order not only directed the administrator to proceed with the making of contracts to sell Grand Coulee power but also authorized him to construct transmission facilities necessary to market it. On November 2, 1940, the Bonneville rate schedule was extended to Grand Coulee energy. During this early period the administrator developed a standard resale schedule as a guide in making contracts with all distributors, both public and private, thus implementing the Congressional directive to pass the benefits of public generation of energy to the consumer. In certain older established municipal systems difficulty arising from local charter provisions or customer practices has required some flexibility in resale conditions to suit each local contracting agency. In this respect the resale policy of the BPA differs from that of the TVA whose rates are identical for all public distributors.

The initial simple kilowatt-year rate of \$17.50 has been modified from time to time to suit the needs of industries or local distribution agencies which could not hope to operate twenty-four hours a day and the entire year with a steady demand. During the war, as will be shown below, a very large industrial load developed which greatly profited from the kilowatt-year rate. But in anticipation of the end of the war when a large surplus of energy was expected, plans were made for new rate variations to stimulate the electrification of railroads, irrigation pumping, steam-

required power factor from 85 per cent to 95 per cent. This was intended to obtain a more complete use of transmitted energy, much of which is wasted in the processes of industry and local distribution. The rate change would have put pressure on these customers to install conservation equipment, a move that is already under way among the larger private utilities. To offset this expense in part, and to modify the inflexibility of the kilowatt-year principle, particularly as applied to those industries most subject to cyclical fluctuations, BPA made a second proposal. It would have permitted an industrial customer during periods of surplus power to suspend his power demand for not more than 20 per cent of the life of his power contract on condition that he paid an additional 10 per cent during the periods when power was being taken. This was a kind of insurance program to help industries over a depression shutdown. Although these rate ideas were not acceptable to the commission they do express certain basic needs for which solutions must sometime be found.

Insofar as a rate program can stimulate more complete conservation of the energy produced and transmitted, formulae appropriate for that purpose are desirable. At the same time the simple kilowatt-year principle turns out in actual application sometimes to be unsuited, without modification, for a number of industrial uses. BPA's experience seems to indicate that a course must be steered between the old complex and often inequitable rate schedules once characteristic of private utilities and the economic rigidities that in actual application have sometimes resulted from the kilowatt-year rate for all customers.

Building of BPA's Transmission System

The actual building of the BPA transmission system got off to a slow start because Congress made no provision for that purpose in its initial appropriation for the agency. Not until May 28, 1938, did it provide funds to launch the system. It then authorized \$3,500,000 for a 230-kilovolt transmission line between Bonneville Dam and Vancouver, Washington, and a short line from the dam to Cascade Locks. To speed up the construction program Ross applied for an allotment from the Public Works Administration and was granted \$10,950,000 to start building 550 miles of line, from the Bonneville Dam to Grand Coulee; from Vancouver to Eugene, Oregon; from Vancouver to Aberdeen, Washington; and from the dam to The Dalles. He also applied successfully to the WPA for assistance in clearing right of way. In the spring of 1939 Congress granted a second appropriation of \$13,000,000 to complete and expand the projected grid.

But the delay in the adoption of legislation for marketing Bonneville power had allowed the completion of the first two generators at the dam

a month before Congress provided the first money for transmission construction. They were thus ready to generate power long before there were transmission lines to take it to local centers. A small amount of power was delivered over the limited capacity lines of the Northwestern Electric Company by special contract pending the completion of the administration's own transmission system.

Before the transmission system was started the administration developed and adopted a master plan based upon what is known technically as a "synchronized at the load system." This is a plan in which power from the generating system is "fed directly into a high capacity net work. In such a system the large generators or groups of generators are usually operated without any interconnection except at the point where they connect to the power grid. . . . Such a development comprises a ring of transmission lines with radial lines to the several important stations."⁴ The master grid as then projected anticipated the construction of 230,000-volt circuits in a great double triangle linking together Bonneville Dam, Grand Coulee, Seattle's Skagit system, and Tacoma's public-power system; and, radiating out from this central grid, other high-tension lines, up the Willamette Valley from Portland, down the Columbia to the coast, east from Grand Coulee into Spokane, the Idaho panhandle, and southeastern Washington, up the Yakima Valley and the other irrigated valleys such as the Wenatchee, and southeast from the main grid at Pasco into eastern Oregon and ultimately central Idaho.

This conception of a transmission system closely followed the ideas developed by the Regional Planning Commission in its 1935 Columbia Basin study. Some of the unique assets of such a master grid system spanning the entire region result from peculiarities of load diversity and from variations in stream flow within the Columbia Valley. By the former is meant that the maximum power demands occur at different times, both during the day and seasonally, at the various principal load centers in the region. Consequently the peak demand for the entire system is less than the sum of all the individual peaks. There is the further advantage that whenever the transmission system is extended into western Montana and southern Idaho the difference in time zones will permit the staggering of system peaks as much as half an hour. The diversity of stream flow means that the time of precipitation and runoff varies greatly among the different watersheds throughout the seasons of the year. This diversity makes it possible to coordinate hydroelectric generation and distribution over the region in such a way as to minimize the dependence on the use of fuel to operate peaking or standby plants.

Thus consumers in this area will have a perpetual source of energy at

⁴ See *First Annual Report of the Bonneville Administrator*, pp. 37 ff.

a cost lower than that in any other comparable region once the facilities are paid for and owned by the public. The realization of this situation depends largely on the full utilization of the diversity of load in daily and seasonal cycles, in the diversity of stream flow, and in the full development of stream storage.⁵

During the early period of organization and the beginning of construction the administration was also rendering assistance and advice to the rapidly multiplying public-utility districts in Oregon and Washington. Long before the New Deal was born, a strong public-ownership movement, urban and rural, had sprung up in Washington, and to a lesser extent in Oregon. Urban acceptance of this method for handling the distribution of electricity had been signaled by the municipal systems of Seattle, Tacoma, Eugene, and many smaller cities. In Washington the farm interests (spearheaded by the grange) had succeeded in obtaining the basic Public Utility District Act of 1930 and a number of districts had been organized before enactment of the Bonneville-project law. By November, 1938, Washington had twenty-five publicly organized power districts. These began active negotiations for the acquisition of private-utility properties, as a preliminary to application for wholesale Bonneville power. The administrator offered to assist them in these negotiations. He advised them to pay a fair price, even a generous price, for existing private properties as complete units so as to avoid undue severance costs and thus to lay the basis for rate reductions to consumers. Also, a number of municipally owned electric systems at once began negotiations for the purchase of all or part of their supply from the BPA.

During Ross' brief regime he advocated acceleration of generator installation at Bonneville so as to take care of the great increase in power demand which he believed was a fixed tendency of normal peacetime development. His insistence upon the speed-up of generator installation was no doubt also strongly influenced by the apprehensions which President Roosevelt communicated directly to him concerning prospective national defense needs. Ross died suddenly in March, 1939.

BPA as a War Agency

Paul Raver became Bonneville Power Administrator in September, 1939, one week after Hitler marched into Poland and the president declared a state of "limited national emergency." Raver's leadership was at once chal-

⁵ *First Annual Report of the Bonneville Administrator*, p. 44; also, Walter Heston, "Kilowatt Hours Pooled For War," *Electrical West* (March, 1944), pp. 1-2.

The electrical engineer, Charles E. Carey, who prepared the commission's studies on this subject, was chosen in November, 1937, by Administrator Ross as chief construction engineer for the Bonneville project.

	1940	1941	1942	1943	1944	1945	Cumulative total
Grand Coulee generation, installed kv-a		25,000	324,000	150,000	324,000	0	823,000
Bonneville generation, installed kv-a	101,000	120,000	120,000	120,000	120,000	0	581,000
System peak generation (kw) ..	74,000	210,000	468,000	841,000	1,355,000	1,427,000	—
Net substation capacity placed in service (kv-a) ^a	107,950	526,162	682,800	733,667	155,900	93,388	2,299,876
Net transmission lines placed in service ^b							
Miles 230 kv	72.8	386.0	100.4	495.8	0.0	183.0	1,238.0
Miles 115 kv	72.8	397.0	461.8	125.1	45.6	33.7	1,136.0
Miles other	3.8 ^c	210.0	70.0	28.8	37.6	2.3	352.5
Total miles placed in service	149.4	993.0	632.2	649.7	83.2	219.0	2,726.5

^a Excluding capacity removed.

^b Excluding miles removed.

^c Including installations before 1940.

lenged by the need to meet the emergency demand for power which our involvement in war would bring, while simultaneously moving to complete and fulfill the peacetime program already under way. Within four months after he took office the demand for power for the various defense activities had increased until it exceeded the rate of installation of power facilities already authorized by Congress. From that time to the close of 1945 the growth of new generating capacity and transmission facilities was geared almost wholly to defense and war requirements. The rate of growth was phenomenal, perhaps unparalleled in the history of the electrical industry. It placed a tremendous strain upon the new organization because it required a program of construction, installation, and service to meet a series of deadlines fixed without reference to smooth and stable operations or to economy of construction. The breakneck speed of development of these physical facilities from 1939 to 1945 is shown in the table on page 173.

Like other war construction programs, that of the BPA had to go forward in a period of drastic shortages of materials and skilled labor. As these became tight, it had to obtain clearances from the over-all national agencies set up to control and allocate scarce materials and man power. All the additional paper work necessitated by this system with its frequent changes of orders and of plan applied as fully to BPA as to private organizations. It is estimated that on the 153 projects built or under construction by the end of the fiscal year 1943 the excess of expenditure over normal costs totaled approximately five million dollars. These and subsequent additional project costs will be reflected in permanent charges for which the BPA is liable unless Congress sees fit to wipe them out as war expenses.⁶

It will be noted from the tabulation above that all ten generating units

⁶ APPROPRIATIONS AND ALLOTMENTS OF PUBLIC WORKS FUNDS FOR THE BONNEVILLE POWER ADMINISTRATION TRANSMISSION SYSTEM.

Fiscal Year	Approval Date	Public Number	Congress	Amount
1938	8/25/37	354	75	100,000
1939	5/9/38	497	75	165,000
1939	5/9/38	497	75	3,500,000
1939	6/21/38	Res. 122	75	10,750,000 a
1940	5/10/39	68	76	400,000
1940	5/10/39	68	76	13,000,000
1941	6/18/40	640	76	6,650,000
1941	10/9/40	812	76	3,850,000
1941	4/1/41	25	77	1,000,000
1942	6/28/41	136	77	4,000,000
				18,850,500
1942	2/17/41	353	77	30,000,000
1943	7/2/42	645	77	21,707,000
1944	7/12/42	133	78	b
Total as of May 31, 1944				113,980,500

a PWA money

b Congress has permitted BPA to use some carry-over moneys beginning 1944.

projected for Bonneville Dam had been installed by the end of 1944; at Coulee eight generators had been in operation, although two of these were built for Shasta Dam and have since been decommissioned and removed for return to Shasta. This cumulative table hides the story of continuous revisions of construction and installation schedules in which the BPA, with the approval of the advisory board and with the cooperation of the army at Bonneville and of the Bureau of Reclamation at Coulee, sought from Congress and the War Production Board the necessary funds and priorities to meet the accelerated war industry and defense establishment needs in the Pacific Northwest.

By June, 1945, shortly before the final collapse of Japan, the Bonneville transmission system consisted of 2,736.8 circuit miles of transmission lines and 55 substations. These lines constituted 82 per cent of the total mileage of 230-kilovolt lines in the region⁷ and are of key importance from the standpoint of integrating the electric resources of the Pacific Northwest. All the remaining 230-kilovolt lines were owned by the Seattle and Tacoma municipal systems.

Even at that time a number of important additions had been approved for construction. The outstanding new project was for a double-circuit 230-kilovolt line from Grand Coulee Dam across the wild northern Cascades to Snohomish on the east shore of Puget Sound and a single line thence to the international border to serve the war industries in British Columbia. Thus the war ended with all power facilities at Bonneville Dam installed, with Grand Coulee equipped with six of its huge generators, with a transmission system linking together all of the major load centers in the two most heavily populated states of the region, and with the authorization for additional high-tension lines tying into this grid the most industrialized section of western Canada.

One may marvel at the rapidity with which the federally owned hydroelectric resources in the Columbia Valley were expanded to meet the war requirements, yet had all the recommendations of the BPA and its advisory board been accepted and implemented with essential priorities by the War Production Board and the other central agencies controlling the allocation of materials and man power, an even greater development would have taken place. Thus when, in the late summer of 1941, the schedule for the Grand Coulee-generation installation was reviewed by the Office of Production Management the top rating requested for units one to nine inclusive was approved for only the first six generators, the Army and Navy Munitions Board insisting that generators seven to nine inclusive did not warrant a priority higher than A-2. Shortly thereafter OPM rescinded its

⁷ See *Report on the Columbia River Powers System, Fiscal Year 1945*, U.S. Department of the Interior, Bonneville Power Administration, pp. 14-15.

top priority rating for some of the essential transmission lines to carry the energy to the war-load centers in the Spokane area.

There can be little doubt that this refusal of the higher authorities to grant priority compelled the careful reëxamination of ways and means to meet the rapidly mounting demand for energy and led directly to the full coördination of all existing power facilities in the region, public and private, into what came to be called the "power pool" for the Pacific Northwest. It also led to a careful revision of operating and engineering policies so as to squeeze the maximum of production out of existing equipment by means of overloading (but with special devices to reduce hazards to equipment) and to enforce restrictions of use when possible, thus making many thousands of additional kilowatts available for war use.

Yet all these operating precautions and overdrafts upon the capacity of equipment seemed not enough to the administrator when Pearl Harbor came. He felt that the industrial demand which the full-fledged double-front war might make upon the region, taken in relation to the readily available quantities of hydroelectric energy that could be produced by the streams of the Columbia Valley, warranted a further rapid increase in generator facilities. He therefore drew up a list of possibilities, including the expansion of existing public and private facilities as well as feasible new projects which totaled an installed capacity of more than five million kilowatts. This list he presented to his advisory board, which endorsed the following program:

1. Expedite the installation of the six remaining units in the left-bank power house at Coulee Dam and make plans to install three units in the right-bank power house.
2. Speed up the installation of the last four generators at Bonneville Dam.
3. Increase the height of Seattle's Ross Dam on the Skagit.
4. Finish construction of the Rock Island Dam hydroelectric plant of Puget Sound Power and Light Company.
5. Expedite the city of Tacoma's Nisqually River project.

The War Production Board approved proposals 2, 3 and 5, but derated units 7 and 9 at Coulee Dam. However, it authorized the transfer to Coulee of two generators made for Shasta Dam, making a total installed capacity there of 798,000 kilowatts. It also approved interconnections between the various regional systems, together with two 50,000-kilowatt steam generators for private Utah companies. This program gave the region an expansion program of approximately 900,000 kilowatts—about one-fifth of the possible expansion outlined by BPA.

In February, 1943, the BPA engineering staff found that the rate of demand growth indicated that probably in 1944 and certainly in 1945 all

utility systems in the region would be short of power and require the aid of BPA. They deduced that steps should be taken to meet these demands on time and presented their data and estimates to the advisory board at its March, 1943, meeting. The board decided that 120,000 kilowatts should be added to the generator capacity by the fall of 1944 and, assuming the continuance of the war, 300,000-400,000 more by the following year. (During most of 1943 the BPA had been overloading its generators without any units in reserve although WPB had established a minimum operating reserve of 5 per cent and normal practice calls for 15 per cent.)

To implement these decisions the board recommended speedy action on its previous recommendations: the reinstatement of the last three generators on the left bank at Coulee; the construction of the army's Detroit project (a part of the Willamette Valley flood-control program already authorized) which would provide a 90,000-kilowatt hydroelectric plant; the development of not less than 3,000,000 acre-feet of water storage on the Clark Fork of the Columbia if possible by 1944 and certainly by 1945; and the beginning of the McNary Dam project to assure substantial additions to the power supply for 1948 and later years. It coupled with these a recommendation that BPA secure prior authorization to build the transmission facilities for the new power installations and for the war loads of the region.

J. A. Krug, then vice-chairman and director of WPB's Office of War Utilities, disagreed with these estimates of increased power needs. Conceding that some addition might be called for in 1945 he was willing to approve only further engineering investigations at that time, particularly for increased storage on the tributaries of the upper Columbia.

It was in the course of the hearings resulting from this quest for storage (which would increase the prime power generated at Coulee and Bonneville and the other plants on the Columbia) that the army engineers and BPA raised a hornet's nest of opposition to the army's proposal to obtain storage by raising Flathead Lake.

This opposition led not only to the abandonment of the Flathead Lake project but to new interest in a comprehensive development program for the northern Idaho and western Montana area and to a combined federal and state approach to the planning and programming of the projects to be included. Furthermore, the opposition contributed to the organization of the governors of Idaho, Montana, Oregon, Washington, and Wyoming into a temporary "Northwest States Development Association" which tried to further a balanced development program and to solicit the aid of the federal agencies to that end. It also led to the endorsement, and ultimate Congressional authorization, of the Hungry Horse project on the upper Flathead River as the initial storage project. In December, 1943, the gov-

ernors brought forward a general development plan which included the hydro projects that Administrator Raver had suggested a few months before as a desirable basin-wide program. Raver had proposed, in addition to the Hungry Horse project, storage dams at Cabinet Gorge and Albeni Falls in northern Idaho, the Foster Creek hydroelectric dam, the Detroit project, the navigation and power dam at Umatilla, Oregon (now known as McNary Dam), and the lower Snake River navigation and power dams. These were then being investigated by the Corps of Engineers and the Bureau of Reclamation. To tie together the generators on these upriver projects and the additional projects recommended by the governors, the administrator worked out a transmission plan, estimated to cost \$100,000,000.

By V-J Day Congress had designated the Bureau of Reclamation to build the Hungry Horse Dam and had authorized the McNary and Snake River dams. The secretary of the interior made BPA the agent to market their hydroelectric output. In the early summer of 1946 Congress authorized Foster Creek Dam, almost wholly a hydroelectric project whose generator output will be added to BPA marketing resources and tied into its grid system. These events make clear that the transmission and marketing activity of the Bonneville Power Administration was pushed by the war and subsequent developments into territory across northern Idaho and western Montana to the Continental Divide. It was also named by the secretary of the interior in his order No. 2115 (October, 1945) as agent for the army's Willamette Valley project units at Detroit, Lookout Point, and Quartz Creek.

The Power Pool for the Pacific Northwest

Early in 1942 demands for additional power facilities for the Pacific Northwest were pouring in upon WPB. Director Krug of the utilities branch urged Administrator Raver to provide the Washington Water Power Co. with an interconnection, to fill its urgent need for improved voltage to meet its load. In working out this interconnection, together with an exchange contract, representatives of the Electric Bond and Share Co., which owns Washington Water Power Co., pressed for similar arrangements with its other affiliates (Northwestern Electric, Pacific Power and Light Co.). Similar interconnections and rights to prime power were soon extended to the Puget Sound Power and Light Co., Portland General Electric Co., Montana Power Co., Idaho Power Co., and Utah Power and Light Co.

Prior to this linkage with the eight major private utilities Bonneville Power Administration was already tied to the municipal systems of Seattle and Tacoma. Thus was organized, as previously mentioned, the Northwest

power pool, designed to conserve all major power resources of the area from Puget Sound east to Fort Peck and from the Canadian border to Salt Lake City. Not only were interties provided for the transfer of power so that the impact of energy generated at Fort Peck might be felt on Elliot Bay, but a systematic joint operating and planning program was perfected to assure an efficient conservation program throughout the war period.⁸ It is estimated that this pool saved power equal to the output of an additional plant of 135,000-horsepower capacity. It undoubtedly saved thousands upon thousands of barrels of fuel oil and great quantities of coal at a time when there were shortages of these materials and of transportation facilities to haul them to the Pacific Northwest.⁹

It is clear that an effective regional pool would have been impossible without the federal transmission system built and operated by BPA. It was the high-tension 230-kilovolt lines owned entirely by the federal government and by the municipal systems of Seattle and Tacoma which furnished the stability and reliability essential to the successful operation of a power pool to service the large and dispersed military and industrial establishments called forth by the war. There were no private transmission lines in the region that could carry these essential voltages. Moreover, of the total power produced for pooled operations, slightly over 50 per cent came from Bonneville and Grand Coulee dams and a little over 8 per cent from the municipal systems of Tacoma and Seattle. During the fiscal year ending June 30, 1945, BPA furnished to the private and municipal systems in the pool an average of 32.3 per cent of their total energy requirements. To put the matter briefly, the chief reservoir of pooled energy was that developed by the federal government. BPA was the principal agency for sending this pool of power to all load centers where private companies were unable to supply their own needs and where military establishments and war industries had direct wholesale power contracts with the federal government.

An important by-product of the war-induced pooling of public and private energy was a change in the basic policy adopted by the BPA, under guidance of Secretary Ickes, in the sale of energy to private utilities. Before the war, contracts with the private distribution companies had been simply on an interchange basis or for temporary periods after a one-year contract renewable for a second year. During 1941 there had been protracted negotiations with the Portland General Electric Co. for a firm 20-year contract with resale provisions, and with permission for the public to purchase the system at a fair price fixed in the contract. It is alleged that these negotia-

⁸ The pool has continued to operate to meet the postwar demand.

⁹ BPA's power supply alone was estimated to have saved three million barrels of oil during 1944 by displacing oil-fired generators in the Portland and Seattle areas.

tions were terminated by pressure from the Electric Bond and Share Co. which threatened the Portland General Electric Co. with destructive competition if it should agree to such a plan.

But the pooling necessities of war temporarily terminated the BPA's contract withholding policy, and the private companies were served upon a firm power basis for the war period. Moreover, these contracts contain neither resale-rate provisions nor conditions facilitating public purchase of the private systems upon the desire of the people in the territory. It has been impossible to return to the prewar policy upon termination of these temporary contracts because the large private systems have become dependent on substantial amounts of BPA energy without which their customers could not be served. To cease furnishing them with power would mean drastic rationing of energy to their customers, and BPA, not the distributors, would receive the inevitable public blame for such a deprivation. The perpetuation of the day-to-day or temporary war contracts of service to the private utilities may be prevented by the shortage of prime power due to the burgeoning postwar demand. The growing loads of the public bodies and the coöperatives, to which BPA must by law give priority of service, may eat away the supply to the private companies.

Industrial Development and War Industries

The Bonneville Power Administration early employed a small staff to stimulate industry to take advantage of its cheap power. But the sanguine first administrator felt that the use of electric energy for industrial and other purposes was bound to expand of its inherent attraction and was not much interested in a comprehensive program of research and development. That phase of BPA's work was markedly expanded after Raver's appointment. One of the early research projects was the systematic study of plant sites available for industrial location which was undertaken with the coöperation of local chambers of commerce. The studies were first made for communities along the lower Columbia and were then extended to cover every feasible site along the entire river from Astoria to The Dalles. A large amount of accurate information and map material was compiled concerning the most favorable parts of Oregon and Washington for industrial location and in September, 1940, the studies were published for the use of interested parties.

Two years later a second volume containing the result of surveys in the communities of the mid-Columbia Basin was compiled for confidential use. In the fall of 1943 two final volumes were ready, one on plant sites in ten principal communities on Puget Sound and Grays Harbor in western Washington and the other on sixteen towns and cities in the Willamette

Valley and along the Oregon coast. These plant-sites studies proved to be of special value when the nation, feverishly expanding its war industries and its military establishments, needed suitable locations in the Pacific Northwest.

BPA made some early studies of wage levels, labor stability, unionization, and related subjects, designed to be of interest to industrial organizations looking for locations in a low-cost-power region. Attention was also directed to the possible utilization of regional minerals by electrochemical industries. This inquiry was pushed because of the large quantities of power required by such industries and also because new sources of raw materials were needed for new basic industrial enterprises to supplement the lumber industry. That industry had long been the principal industrial activity in the Columbia Valley but the supplies of private timber were rapidly dwindling. BPA made some compilations and a few preliminary studies of some of the most promising metallurgical possibilities, but did not have money or staff to carry these inquiries far enough to satisfy the needs of private entrepreneurs looking for new industrial outlets. Later it developed and maintained the most comprehensive inventory available of data relating to minerals found in the Pacific Northwest.

Shortly after the declaration of a "limited national emergency" in September, 1939, the president reconstituted the National Power Policy Committee and charged it with investigation of power supply in relation to defense needs. The administrator of the BPA was made a member of the committee whose chairman was a high officer in the Department of the Interior. Thus the BPA became very conscious of Washington's mounting concern with industrial problems of defense. This situation furnished the occasion for a special report by BPA in July, 1940, entitled: "Industry Important to National Defense Feasible of Establishment in the Pacific Northwest." This report assembled the available regional resource data useful to war industries and was particularly intended for use by the National Defense Advisory Commission which the president had recently established. The report recommended the establishment of shipbuilding, ordnance manufacture, explosive manufacture, ferroalloy and alloy steel production; expansion of existing aircraft industry, and of electrolytic zinc facilities, including brassmaking for munitions; the building of calcium carbide for acetylene and other chemicals; magnesium production for aircraft; and a large increase in chlorine and chlorate production for war chemicals.

In the preparation of these first defense-industry studies, as well as in its later investigations, BPA not only endeavored to help the region make its best contribution to defense and war purposes but to lay the foundation, whenever compatible with defense objectives, for a diversified peacetime

industry and as much perpetuation of the new industrial plant capacity as possible. It was seeking for diversity in types of industry and in location and it was concerned to fulfill its statutory obligation to prevent monopoly in the use of power.

This double-barreled interest in long-run regional development along with the war effort is well illustrated by BPA's policies concerning the war aluminum industry, though aluminum was not discussed in the first industry report. Already by early 1940 the Aluminum Company of America had built a reduction plant at Vancouver and later that year was planning for its immediate expansion and for an increased power contract. Of all the wartime industrial expansions in the region, aluminum was the most important both as a power consumer and potentially as a permanent integrated peacetime industry. When in early 1941 Alcoa, backed by the Office of Production Management, proposed a still further expansion of pig-aluminum production in one huge new plant at Spokane, BPA, with the aid of the secretary of the interior, vigorously opposed the plan. It did so not only on the ground that concentration of so large a productive capacity in a single establishment increased its military vulnerability, but primarily because it would be economically handicapped after the war and would be so large that only Alcoa could operate it. Bonneville contended that the need to introduce competition into the industry would not be met by the plan proposed. BPA was at that time also concerned lest too large a part of its power be used for a single industrial purpose, at the expense of a diversified industrial development more favorable to employment and general resource use. The BPA engineers also raised the technical objection that from the operating standpoint it was undesirable to concentrate so large a proportion of the power load in a single center.

The result of BPA's opposition was a change in program by which the new ingot-producing facilities were broken into three smaller plants operated by three different companies at three different locations in the Columbia Valley. Out of this struggle came the entrance of the Reynolds Company and the Olin Corporation into the Pacific Northwest as competitors with the Aluminum Company of America, then under indictment for monopolizing the nation's aluminum production. During this same period a drive initiated by BPA and spearheaded by the secretary of the interior succeeded in obtaining a revision of the lease conditions which the Defense Plant Corporation (Jesse Jones) had generously accepted for the operation of its plants by the aluminum trust in this region and in other parts of the country. It was felt that these changes greatly improved the government's position and increased the survival chances of these establishments after the war.

The immediate result of the concern of BPA and the Department of the

Interior with the war location of pig-aluminum plants was the addition to the Alcoa's plant at Vancouver of new government plants at Spokane and Troutdale operated by the trust, and the tide-water plants at Tacoma and at Longview operated by two new companies.

So long as aluminum production in the region was confined to the transformation of alumina to aluminum ingot while the great Western aircraft industries were using only finished aluminum parts, there was bound to be a tremendous extra burden upon the nation's groaning transportation system. Pig aluminum from the Northwest reduction plants was carried across the continent to Eastern fabricating shops, and returned to the Pacific coast as aluminum sheets and other finished products for the aircraft industries.

Arguing against this uneconomic procedure and with an eye to an integrated aluminum industry in the Pacific Northwest, BPA made vigorous efforts to convince the War Production Board that it would be feasible to locate additional extrusion and rolling-mill facilities in the region. It succeeded only in part. No extrusion mills were established in the Columbia Valley but a large rolling mill was built at Spokane. A year later the WPB decided to increase aluminum-extrusion capacity in the West, but because of the alleged man-power shortage and alleged transportation bottlenecks in the Pacific Northwest these plants were placed at Los Angeles (California) and Phoenix (Arizona).

The importance of aluminum production to the hydroelectric program of the region is indicated by the fact that in March, 1943, at the peak of its war services when BPA was selling a total of approximately 830,000,000 kilowatt-hours of energy, nearly 500,000,000 kilowatt-hours were going to aluminum alone. That figure declined subsequently but even for the fiscal year 1945 aluminum produced nearly 52 per cent of the total revenues from sales of Bonneville and Grand Coulee energy. Despite this enormous consumption of electricity, the aluminum plants in the region at their peak of war operation employed only 6,000 people. Because the postwar employment needs appeared likely to run to many times that figure the BPA sought at every opportunity to obtain other types of aluminum production as the basis for a fully integrated industry which it was estimated would more than quadruple the number of job opportunities.¹⁰

This concern of the BPA with the long-time possibility of a fully integrated light-metals industry led it also into studies of the domestic supply of alumina. Because of the scarcity of domestic bauxite coupled with the devastating effect of the U-boat campaign in the Caribbean area, BPA urged support for additional research into the use of aluminum-bearing

¹⁰ See Paul Raver's statement at Spokane on August 21-22, 1945, before a Senate committee investigating the national defense program.

clays as a source of alumina. It played an important part in the final establishment of an experimental plant at Salem, Oregon, and assisted the Kalunite, Inc. in its plans to build a semicommercial plant to test the pilot work which had already been done in the Kalunite process for recovering alumina from alunite.

When at the close of 1943 the War Production Board officials declared that so much aluminum was being produced that it was "running out of our ears," cutbacks in the production of pig metal were declared necessary and numerous pot lines were ordered closed. To fend off curtailment of production in the Pacific Northwest a committee of businessmen and public officials went into action. They argued that the Columbia River Valley had the outstanding advantage of the cheapest power for the most efficient production of light metals in the United States and should therefore be last on the list of shutdowns. The BPA officials were closely tied in with this group and the BPA staff serviced it with information. The cutbacks in the Columbia Valley plants were held to 25 per cent and when in early 1945 the WPB reversed its view about too much aluminum it planned to reopen all pot lines in the Pacific Northwest while leaving closed all but one of the government's plants.

Tied with the aluminum program in the Pacific Northwest during the war was one of the most fantastic episodes in national war production policy. It was an episode of great importance for its bearing upon (1) the extent to which the hydroelectric program in the Columbia Valley might be developed during the war, and (2) the prospect of peacetime sale in the foreign market of aluminum produced in this and other low-cost American regions. This was the Shipshaw program, promoted by the Office of Production Management—later the War Production Board—and financed with funds from the federal government. The story was told in the testimony and exhibits presented to the Senate's Small Business Committee in the spring of 1945, particularly in the data furnished by former Secretary Ickes and Administrator Raver. Suffice it to say here that the Shipshaw program provided the Canadian affiliate of the Aluminum Company of America with money to build its \$69,000,000 hydroelectric plant at Shipshaw, Quebec. The war over, that company could produce pig aluminum at a cost markedly below the cheapest ingot turned out in the United States, because its investment cost for power had been paid for by the United States (and largely written off by permission of the Canadian government). The facts indicate that the original contract for the Shipshaw purchase was made without any inquiry of BPA as to the ability of the Columbia River hydroelectric projects to furnish the large blocks of power essential to the enlarged program which in the spring of 1941 OPM had belatedly decided

was necessary. Even so; there was on file with that agency some days before the letting of the first Shipshaw contract a memo showing that within two years the Columbia River projects could furnish, by installments beginning early in 1942, over 800,000 kilowatts of new energy; and that, if necessary, the Grand Coulee generating plant could be expanded to a capacity of 1,800,000 kilowatts. WPB officials gave to Alcoa's Canadian affiliate the highest priority on materials and equipment for its Shipshaw project (at the very time they were refusing to give BPA similar priority ratings for Coulee generators—would in fact give no ratings at all to units 7, 8 and 9). Nevertheless, the Canadian plant was not completed until the latter part of 1943.

Administrator Raver testified that had BPA been advised by OPM of the need of more aluminum production at the time the first Shipshaw contract was executed "it would have been possible to arrange for completion of enough of the power installations in Bonneville and Coulee dams to provide nearly double the prime power capacity at Shipshaw." Grand Coulee was nearly complete in the spring of 1941; generators could have been built and installed so that power could have been produced just as promptly as in the plants of the aluminum trust's Canadian affiliate, had comparable priorities been forthcoming.

The story of BPA's effort to speed up and expand the power-production program on the Columbia River and of the rebuffs with which WPB had often met these efforts has been recited; but the full import of that history cannot be appreciated without bearing in mind that all the time these developmental requests were being curtailed the 1941 contracts (there was a second one in July) made at the request of OPM were creating some 700,000 kilowatts of firm power in Canada; this output was on so favorable a financial basis as to menace the new light-metals industries in the Columbia and Tennessee valleys in their struggle for postwar continuance.

It was ironic that while, ten days after the Shipshaw contract was signed, OPM suddenly announced the necessity for a big domestic aluminum program and with it an expanded power program, actual construction of the new American aluminum plants did not begin until more than six months later. The result was a very considerable waste at Bonneville and Grand Coulee during 1943 and 1944 of electric energy which might have produced aluminum for aircraft and revenue for liquidating the costs of Bonneville and Grand Coulee dams.

It will be seen that the BPA has inescapably been plunged into the thick of the national aluminum-industry problem. Its accelerated war program was necessary primarily for production of that metal. The continuing revenues with which to defray the costs of its plant expansions were con-

tingent upon the retention after the war of a considerable fraction of these aluminum loads. Hence much staff talent was engaged during the heat of the early war days in checking the programs of WPB, the Defense Plant Corporation and the Metal Reserve Company regarding plant locations, lease terms, lessees, and plant sizes—all of which would have a vital bearing upon the economic prospects of postwar operation. This is also the reason why throughout the war BPA's research staff was working on many of the national problems of aluminum. By the spring of 1943 two confidential reports were completed for the use of federal agencies concerned with the disposal of government aluminum plants. One dealt with the problem of power supply and costs as these relate to plant disposal. The other compared production costs and estimates for all plants in the United States and investigated the technical problems of inducing new producers to enter the industry by means of a government plant-disposal policy.

Yet despite efforts of BPA and those of Secretary Ickes, many plants were so large or so located as to make difficult their economic operation in normal times. Hence BPA has felt constant concern for the adoption of national policies which might salvage these war investments in the Columbia Valley as permanent industrial assets to the region and as continuing power consumers. With the additional cutbacks in aluminum production presaged by the defeat of Germany early in 1945 this concern became acute. Coincidentally in March of that year the federal government successfully concluded its prosecution of the Aluminum Company of America as a combination in restraint of trade. BPA's chief economist had been loaned to the Department of Justice to help prepare the economic data upon which that prosecution rested.

At that time the BPA officials, with the able and pungent assistance of Secretary Ickes, presented to the Senate Committee on Small Business a program for disposing of the government-built aluminum plants which would foster competition by offering inducements for independent aluminum producers to enter the industry. Believing that their success would require an integrated operation, carrying the production process from the mining of bauxite through to fabrication of finished members, BPA urged the Surplus Property Board to use its disposal power in such a way as to allow facilities to independent operators for every step in an integrated program. It also proposed that the government should assist in obtaining new bauxite supplies. To provide a temporary market for the independent operators it urged a policy of stockpile purchase of aluminum metal for contingent national defense needs. Its analysis showed that of the eight reduction plants built by the government during the war only four and a part of the fifth would have a decent chance of peacetime survival. It asserted that independent producers taking over even the three plants in

the Pacific Northwest where power costs are lowest would require special aid to get them under way.

Although aluminum held first place as a war industry and a prospective peacetime power consumer, the war period saw the establishment in the region of plants representing most of the industrial types proposed in the BPA 1939 study including a ferrosilicon magnesium plant, a large light-metals rolling mill, an electric steel rolling mill, and plants for the manufacture of metallurgical coke, calcium carbide, and electrolytic manganese. Some of these were closed down by the end of 1945.

It was expected that the loss of the war load after August, 1945, would leave the BPA without a market for at least half a million kilowatts of its capacity. Although the early slump was not so great as anticipated because of the almost immediate resumption of normal peacetime civilian demand, it did appear for many months as if the drastic drop in aluminum production would leave a large excess of capacity. It looked as if this excess could be absorbed only by a very aggressive campaign for the increase of space heating for homes, pumping for sprinkler irrigation, railway electrification, and other new nonindustrial uses.

Early in 1946 however the new interest in aluminum for peacetime purposes suddenly revived the big demand for power to serve the reopened pot lines and rolling mill. The high price of steel products and other building materials (including Pacific Northwest lumber) together with the reduction in aluminum prices caused by wartime mass-production techniques now enabled aluminum to compete with many of these materials. Moreover, the Kaiser automobile, Kaiser's housing activities, and many other enterprises offered prospects of big new markets for the white metal.¹¹ As a result, a year after V-J Day the two privately owned ingot-reduction plants in the Columbia Valley were operating at full capacity, two of the government-owned plants had been leased and were in full operation by the end of 1946, as was half of the huge rolling mill at Spokane. By January, 1948, all but one aluminum plant were in full production, and that one plant was to be reopened in mid-1948 if power could be made available to it. The new rearmament program and particularly the decision for a seventy-group air force introduced new pressure for the expansion of the production of aluminum, the key to which is the availability of electric power.

Other war industries which survived the end of hostilities included the ferroalloy plant at Portland which was going full blast, two calcium plants, one alcohol unit, one electric steel plant and rolling mill, and a sodium-chlorite factory. Some of these establishments have expanded their opera-

¹¹ See the outline of the aluminum story given by S. Moment to the Bonneville Regional Advisory Council on May 2, 1946. Minutes, pp. 21 ff.

tions to meet the peacetime demands. In addition, there has been a steady increase in consumer demand as electrical appliances appeared again in the retail trade. Equally important was the substitution of electricity in many small industrial establishments for oil and other fuels which had increased in price and scarcity. The rapid expansion in timber and food-processing industries throughout the region created additional pressure for new blocks of electric energy.

BPA's concern with the early postwar slump had disappeared by the fall of 1946, and from then on the unprecedented and unexpected increase in demand on all the systems led to a growing alarm about a shortage in power supply. The cities of Seattle and Tacoma soon shared the apprehension of the major private utilities in Oregon and Washington, and joined with them in a formal statement, on January 21, 1947, that new generator capacity in federal multiple-purpose Columbia River projects was necessary because "existing generator capacity is now fully utilized." They declared that new federal generator capacity of 318,000 kilowatts "over and above the 745,000 kilowatts of generating units now on order, will be required between now and November 1, 1949, to meet the present critical power supply problem, and that 1,565,000 kilowatts will be required by November, 1953. . . ." They urged the Congress to make funds available to the army and the Bureau of Reclamation for providing this supply and to the Bonneville Power Administration for new backbone transmission facilities to bring the power to the load centers.

This agreement was implemented by representations before the Congressional appropriations committees in Washington. In subsequent conferences the same private and public agencies have reaffirmed their conviction of power shortages and their unity of desire for accelerated federal construction of generating and transmission facilities. By mid-winter of 1947-1948 the combined federal and nonfederal generating and transmission facilities were barely sufficient to meet the region's requirements. There was complete agreement among all private and public distributors and generating agencies in the Northwest power pool, that the heavy power demands during the winter of 1948-1949 would require the imposition of conservation measures to care for the peak loads during the low-water winter season on the Columbia and that a long dry spell in the autumn of 1948 would be critical, requiring general curtailment in energy use. The Federal Power Commission's data show that the growth in peak-load demands in the Pacific Northwest between 1940 and 1946 was 102.2 per cent as compared with a growth of 58.2 per cent for the nation as a whole. This was markedly in excess of the growth in any other region. Estimates developed by the Northwest power pool place the expected further increase during the next ten years at approximately 100 per cent.

BPA as a Research and Development Agency

Our partial account of BPA's effort to further industrial use of its hydroelectric energy suggests that its marketing activity tends to go beyond mere sales and utilization work as traditionally viewed. The BPA has felt a constant pull toward regional planning and development activity. This grew in part from its belief in the imminence of a huge surplus of hydroelectric capacity at the end of the war, and in part from its pay-out requirement, which calls for revenues predicated upon the sale of the entire capacity of the great river structures. Huge dams such as Grand Coulee with provision for eighteen great generators can repay their capital costs only if the generators are installed and are producing revenue within a relatively brief period.

Beyond Bonneville and Grand Coulee dams loom other structures already authorized by Congress, many of which will have hydroelectric generating equipment that must also be put to work commercially. In view of the vast pool of electric energy latent in the streams of the Columbia River Valley and its well-nigh limitless human uses it is not difficult to understand why thoughtful men operating the marketing and transmission mechanism for this great energizing force should be concerned with general regional development. Unless their eyes are blinded by traditional stereotypes of narrow class interests they will be impelled to explore the diversity of economic conditions in the many communities that make up the region, and to try to link their own function to the improvement of those phases of regional activity which they can serve. If they are sensitive to social needs they will discover many opportunities for relating the sale of electric power to regional development programs and to changes in current practices.

It seems almost inescapable therefore that the BPA should have assigned a part of its personnel to make an inventory of the data about the region's natural resources; to study the prospects of using these in more useful and complete ways for producing wealth and employment; and to seek to interest business and other groups in enterprises directed toward these ends. The impulse to such an interest is all the more compelling when large quantities of energy spring into existence within a region heretofore lacking appreciable industrial development. Moreover, to use the potential electric resources of a fully developed Columbia River in an economy centered on raw-material extraction will be impossible until that economy is modified.

The transmission agency holds one of the keys to a more balanced combination of economic activities because the location of its lines fixes the areas in which fabrication processes can be developed. To locate them

wisely therefore necessitates a knowledge and consideration of many factors of regional economic importance. This basis for Bonneville's concern with regional development was well expressed in an address by Administrator Raver in July, 1944.

He stated that in the discharge of his duties he had found it necessary to bear in mind broad regional aims as well as sound business objectives. He emphasized the link between the welfare of the system and that of the region which provides its market. He argued that the system must concern itself not only with broad regional development of physical and human resources, including development and management of land, water, power, forests, minerals, and industries, and improved marketing and distribution arrangements, but with "social and cultural betterment and improvement of governmental and cooperative machinery."

Such a concern cannot be useful if it remains in the realm of generalities. It must get down to cases and to particulars. Consequently a staff of technicians—chemical and metallurgical engineers, economists, statisticians—was slowly recruited to develop and make known the essential information about raw materials, industrial processes, market demands, skilled labor, transportation costs, income and population trends, and other factors relevant to economic development. Had the National Resources Planning Board survived, a part of this task, which has gravitated to BPA, might well have been the continuing function of its regional representative, the Pacific Northwest Regional Planning Commission. But without such overall assistance the challenge to its long-run success has required that BPA attempt to fill a part of the void. Hence it developed its extensive file on minerals, a collection of technical information organized mineral by mineral, county by county, and state by state. The inventory included minerals not only in the Pacific Northwest but in California, Nevada, Utah, Wyoming, and Alaska, because these may be sources of some essential raw materials for Northwest industrial growth. This was the only catalogue of its kind in the West and was used by industrialists, mining engineers, and other government agencies. Yet BPA had no legal authority to do the general exploratory work basic to the full utility of such a file.

This constant interest in regional development also led BPA to make county economic surveys in cooperation with local business and official leadership. These county studies were accurate summaries of the economic life of the area, its raw materials, its trends in industry, business, and agriculture, and possibilities for more complete use of its resources. The studies were intended to enable local communities to see their economic situations and the possibilities for stabilizing or improving their economic wealth. They were of immediate importance to Bonneville in estimating future power loads within the areas investigated and in planning transmission

lines and facilities as well as in the promotion of sales. The local demand for these county investigations soon exceeded the capacity of the available qualified staff.

To stimulate thought about more complete utilization of regional resources, BPA developed a graphic analysis which matched the regional resources with a list of industrial products and processes actually or potentially available for their exploitation. This volume of maps, charts, and diagrams revealed many gaps in the current use of the region's resources and consequently in the opportunities for employment, which might be closed by more complete fabrication and processing.

In collaboration with the army engineers' review report of the Columbia River, BPA technicians prepared a series of industrial-process studies for about fifty major electric-industry groups. These studies were designed to facilitate the long-range estimating of industrial power requirements for the region. The analysis of each industry shows its present status throughout the United States and the factors affecting its possible development within the Pacific Northwest (such as available raw materials, production costs, transportation expenses, markets and possible plant-location sites). Using all fifty analyses the study attempts an over-all summary of the production, employment, and power-consumption outlook for the decade 1950-1960. In connection with these inquiries many questions have appeared concerning which research ought to be greatly accelerated.

The contrast between BPA's research and development activities and those of the TVA is suggested by the differences in total sums spent for these purposes. During the last year of BPA's research activity it was spending \$220,000 as compared with TVA's expenditure of \$7,000,000. BPA was charging all of this against power operations which was more than TVA attributed solely to power operations. TVA, however, had statutory authority to engage in research for the development of the region and its resources and it received direct appropriations for that purpose.¹²

BPA, unlike TVA, encountered statutory doubts as to how far it might go and whether it might finance other agencies such as the universities and colleges. The central fiscal review agencies construed the Bonneville Act to require that research be directly tied to power sales. But it was very difficult, perhaps impossible, to show an immediate relation to power sales of much essential research which, from the long-run point of view, ought to be undertaken. This is strikingly illustrated by BPA's early attention to research in railway freight rates, which are of great, sometimes paramount, importance to the marketing of the region's electroproducts. Since there are no published railroad freight tariffs for the Mountain-Pacific territory,

¹² See the statement by Assistant Administrator Marlett before the Bonneville Regional Advisory Council, May 2, 1946. Minutes, pp. 30-31.

freight rates are uncertain and subject to negotiation between producer and railroad, which makes the basis for freight cost calculations very uncertain and capricious. BPA therefore found it essential to begin an investigation of this key problem. Its preliminary exploration disclosed that existing freight rates were developed to encourage the long-distance movement to the East of raw materials such as lumber, and of semifinished commodities; and (2) by means of class rates to favor branch houses and the local distribution of goods. In short, the region does not have a body of interstate rates designed to encourage the movement of manufactured commodities over wide areas.¹³

The Interstate Commerce Commission has prescribed rates for the Mountain-Pacific territory on a piecemeal basis, never having made a general investigation of its class rate structure. For the other territories in the United States it has made comprehensive investigations and prescribed general class rates within them and between them. If there is to be any rationalizing of the confused and (from the standpoint of regional industrial growth) disadvantageous rate structure, action by the Interstate Commerce Commission, based upon thorough and comprehensive investigation will be essential. Thus BPA, in prosecuting its long-range interest in the regional development essential to the marketing of its large volume of hydroelectric energy, could not escape giving close attention to the economics of freight rates.

Sensing the importance which research on (1) long-range marketing topics and (2) on general problems of regional development might play in the ultimate usefulness to the region of the whole transmission and marketing job, Administrator Raver was concerned with finding a way through the legal and jurisdictional restrictions that impeded the most effective attack upon these fundamental questions. Amendments to the Bonneville Act were suggested by the Bonneville Advisory Council, "to the end that an adequate and broad program of industrial and basic research can be properly prosecuted, and further that such a program, in addition to using the research staff and facilities of the Bonneville Power Administration, should through grants-in-aid and cooperative agreements with other regional research agencies and institutions foster the best use and development of the region's research capabilities. . . ."

The same group also suggested that BPA take the lead in organizing a committee of existing federal and state agencies engaged in regional research tasks to make an inventory of present research activities and existing facilities as a basis for a cooperative program to provide better and more systematic coverage of research needs, and to help to define more clearly what BPA itself should do.

¹³ Statement of J. H. Goff, consultant to the Bonneville Regional Advisory Council, March 30, 1945. See minutes, pp. 23 ff.

The research phase of BPA's activities illustrates the fact that such a public agency, no matter how analogous its duties are to those of a private enterprise, could not wisely be guided solely by the objective of maximum financial return on its operations. The fact that it is a government service creates obligations in addition to those of mere efficiency in sales and transmission. It must be concerned with the effect of its total job upon the general economic and social welfare of the region; that is the fundamental justification for the performance of the job by the government instead of by a private company. Moreover, the magnitude of the program, with new river projects steadily adding to the hydroelectric capacity of the region, makes it essential to take a longer-range view as well as a wider regional view than a private enterprise could afford. Perhaps a Department of Commerce conscious of its opportunities might, through a properly equipped field service, have handled some of the far-flung research activity into which BPA was constantly being thrust. But since it had not undertaken these functions and since there was no over-all regional and national planning agency, BPA could not escape trying to fill part of the void.

All hopes and doubts about this whole research and development program were suddenly ended when the House Committee on Appropriations (sustained later by the House and Senate) eliminated the entire estimate for the fiscal year 1948 from the Interior Department appropriation act and expressed the judgment that "because the present demand for power, according to testimony, is in excess of the amount available, . . . it would appear to be unnecessary to investigate demands for additional power in the area."¹⁴ Though the act did not require it, the severity of general reduction in BPA funds for operation and maintenance, and the unmistakable temper of the committee, led (on July 1, 1947) to the reluctant liquidation of this entire function.

Congressional Retrenchment Hits BPA: 1947-1948

Since the fall of 1946 the Corps of Engineers and the Bureau of Reclamation have had their work in the region thrown out of gear by sudden alternating retrenchments and expansions of construction programs,¹⁵

¹⁴ H. Rept. 279, 80th Cong., 1st sess., p. 12.

¹⁵ This section draws heavily upon information contained in a paper read by Dr. Paul Raver before the April, 1948, meeting of the Pacific Northwest Political Science Association at Reed College, entitled: *Some Political Aspects of Governmental Proprietorship*, and from two senior theses at Reed College: (1) "The Effects of the 1948 Budget Cut upon the Bonneville Power Administration," by Stuart Gaul, and (2) "A Consideration of Federal Reduction-in-Force Procedures at the Bonneville Power Administration," by Norman S. Lezin.

with consequent damage to their organizations and inevitable waste of public funds; but the Bonneville Power Administration suffered both drastic construction and operating cuts at a time when its business was expanding by leaps and bounds. This agency had become the principal supplier of electric power for both private and public distributing systems of the region. Private companies, faced by the federal power program launched in 1933, had ceased to build new generating facilities. By the end of the war the federal government as the proprietor of the principal form of energy for industrial and other social purposes had assumed a function formerly performed chiefly by private business. By its great hydroelectric projects it had paralyzed the prospect of further generator installations of any consequence outside its own river developments.

The Bonneville Power Administration, as the agency for marketing this power and for meeting the extraordinarily expanded demand, did not only find itself suddenly deprived of funds for construction of new lines to serve communities handicapped by power deficiencies, or even for completing partly built lines and stations; but its operating and maintenance funds were cut from \$4,300,000 to \$2,500,000 for the year beginning July 1, 1947. Thus, not only was its current construction program halted and its proposed program drastically curtailed, but the delivery of electricity over existing lines and facilities was put in jeopardy. Normal maintenance of expensive transformers, switches, and other devices in the 59 substations had been postponed during the war years; clearing of brush regrown along the 3,000 miles of transmission lines had been put off; these and other maintenance tasks that had been deferred because of war shortages of man power and materials now demanded early performance if danger of expensive damage to the system and to continuity of service were to be avoided.

As noted above, the house committee had stipulated the liquidation of the entire research and development division; therefore the staff which had been engaged in the economic analysis of the regional situation, the exploration of utilization questions (such as space heating), the study of industrial trends and possibilities, on which sound system planning of transmission lines should be based, was completely eliminated. To save funds for the mere physical operation of the system, deeper proportionate cuts in the engineering aspects of every phase of planning work had to be made. To the demoralizing effects which resulted throughout the whole organization from the dismissal of so large a part of the staff were added the inefficiencies of "bumping" the occupants of the remaining positions in accordance with the Congressionally required system of priorities, chiefly veteran. The result of this last process was to shift probably a third of the remaining staff from jobs which they knew well, and from work they

wanted to do, into new posts to which they either were less well suited or which they did not like. The "team" relationships upon which good administration always rests were thus thoroughly disrupted.

Throughout the organization cuts in service and auxiliary activities were so severe as to impede the prompt performance of essential house-keeping duties and other routine functions that "grease the gears" in a smoothly functioning administrative mechanism.

On the construction side of the program, last-minute deficiency appropriations partly restored the regular budget eliminations, and later deficiency grants still further swelled construction resources. As a result crews and supervisory staff that had been fired, in order to keep expenditures within the probable budget, were now asked to return. But in the interval most of the experienced skilled craftsmen and engineers had obtained other positions and were in no mood to return to an employment so capriciously fluctuated by forces outside of administrative control and three thousand miles away. So new and less experienced men had to be sought in the effort to resume the construction program.

It was to solve some of the difficulties created by the unfinished construction projects that the half-million-dollar emergency fund permitted BPA was used for the first time. Lines where holes had been dug, poles distributed, insulators partly installed, simply could not be abandoned. Shifting of funds from one contract to another was resorted to in order to care for the cases calling most urgently for completion. Wasteful and exasperating as these half-finished projects were to the communities promised service, they had their more comical aspects. A farmer whose cow tumbled into an unfilled power-pole hole threatened to sue the administrator.

The irony of this across-the-board retrenchment was its imposition not only in the face of a rapidly growing power demand in every part of the region, but at a time when the power revenues were producing, after all charges, a handsome surplus which for the fiscal year 1947 was \$6,606,197 and for 1948 \$9,136,181. Unlike the TVA, the Bonneville Power Administration could not touch its revenues to meet operating expenses, emergency construction, or deferred maintenance needs. Unlike a private utility it could not draw upon its depreciation reserves for new capital outlays. Every new facility, transmission line, generator, or substation equipment, requires Congressional authorization and appropriation—and authorization does not always carry appropriation.

Some of the difficulties which this retrenchment caused appear to be inescapable by-products of a check-and-balance system of democracy which may at any two-year interval bring into one branch of government a shift of political control while other branches continue their former political orientation. Federal operation of any public-service enterprise will under

these constitutional conditions always be fraught with the danger of the appropriation negative. But the impact of these obstacles to the continuity of a proprietary operation, like that of the Bonneville Power Administration, could be cushioned by the delegation of greater fiscal freedom to the agency (under post review by the Bureau of the Budget) responsible for the service. The authority now granted the TVA in its financing of power operations is the minimum requisite for this purpose.

The Bonneville Advisory Board

The Bonneville Act stipulates that the administrator shall "act in consultation" with an advisory board of four officials representing the secretaries of the interior, war, and agriculture, and the Federal Power Commission. Less than two weeks after he took office Administrator Ross held the first meeting of the board which then consisted of officials serving their respective agencies in the field offices in the Pacific Northwest and the Far West. Until the spring of 1946, sessions of the board were held in Washington and usually but not always the departments were represented by Washington officials. Ross laid his plans for determination of the first and fundamental rate program before the advisory board for discussion, though he did not seek its endorsement. At that time also the board considered the allocation of costs of the Bonneville Dam, funds for line construction, and plans for additional generators. Administrator Raver used the board not only to clear proposed programs of construction which were of mutual interest between his agency and the Corps of Engineers of the Bureau of Reclamation, but to obtain its endorsement of other construction programs. The latter were particularly to the fore during the period 1940-1944 when the problems of meeting the war demand by means of additional and accelerated generator installation and new transmission facilities were of intense mutual interest to the Corps of Engineers (which always represented the War Department) and to the Bureau of Reclamation, because these two agencies were responsible for ordering and installing the generating equipment. The advisory board endorsed many of the administrator's recommendations for accelerated installations at both dams. It also recommended additions to the municipal generators on the Tacoma and Seattle systems; voted for a new storage program on the upper Columbia; and endorsed the army's recommendation for the early authorization of the dam at Umatilla and for the Detroit dam installations.

This is not to say that discussions were limited to a single interest. For example, at the first meeting of the board after Raver's appointment as administrator the subjects included: progress on plans for sale of power, contract negotiations, deliveries and revenues; the construction program;

budget plans, wholesale and retail rate policies; relations with public bodies including aid to Public Utility Districts and coöperation with Rural Electrification Administration groups; forecasts of load growth and power available; interconnection plans; installation of Bonneville generators 3 to 15; relations with Grand Coulee; general policy in constructing lines in advance of executing contracts; production controls and the change of name to Bonneville Power Administration from Bonneville project.

The advisory board early in Raver's regime expressed the view that there should be a single marketing agency for power from both Grand Coulee and Bonneville dams and recommended that the BPA be designated by executive order as that agency. It will be seen that the board in these actions tied in with the BPA program some of the programs of new project development for which the Corps of Engineers was working and in which both the Federal Power Commission and the Bureau of Reclamation had interests. After the end of 1943 when further expansion of the construction program appeared unlikely the advisory board meetings fell off in frequency and significance.

Increasingly the administrator felt that a board, all of whose members were working in and familiar with the Columbia Valley situation, would be of greater service. Consequently he urged that the personnel of the advisory board be combined with the proposed Columbia Basin subcommittee of the Federal Inter-Agency River Basin Committee. This idea finally won acceptance and in the spring of 1946 the new combined advisory board and Columbia River subcommittee held its first session in Portland.

It was at first the practice for the new Columbia Basin Inter-Agency Committee to hold its monthly sessions in the morning; after the conclusion of its business the federal agency members were convened as the advisory board, to which Administrator Raver presented his power problems. Feeling, with some other members, that this was a waste of time, he now presents his power matters to the Columbia Basin Inter-Agency Committee, and for approximately two years the board has not functioned as a separate entity. Because of the board's statutory status, at least one federal member is restive under this arrangement, and it is probable that there will soon be raised the issue of either repealing the legal provision for a board or formally reconstituting it.

The Bonneville Regional Advisory Council

On March 21, 1944, Administrator Raver addressed an invitation to twenty citizens from almost as many communities in the Columbia River Basin to attend a two-day conference in Portland to discuss with him the impact

of the BPA program upon the life of the region and in particular to consider a "comprehensive long range program for the further development of the central power system, and the marketing of its expanded output. . . ." He declared his need for closer contact "with the progressive and constructive leadership of the region so that we may bring the wide range of knowledge, experience and judgment to the consideration of our over-all program and governing policy." He declared his intention of laying before this group "our problems, both in the development, use and marketing of power and in the formulation of a broad inter-agency program to meet the present and future needs of the region." He asked of these citizens free and frank expression of their independent ideas and criticisms. And he indicated that the invitation had received the approval of the secretary of the interior and that the travel costs of those attending would be defrayed. Two years later the council members voted to pay their own travel and hotel expenses, which undoubtedly relieved the administrator of political embarrassment.

This call was the beginning of a citizens' advisory council which has been slowly discovering its function. Its personnel, now expanded to about 50 members, is drawn from most of the communities in the region interested in receiving low-cost power developed by the new Columbia River projects; it includes businessmen, chiefly from the smaller cities, officers of the Washington and Oregon state granges, labor union officials, city officials, former state planning-board executive officers, public-utility-district board members, newspaper editors, college presidents, a member of the Montana State Water Conservation Board (who was also formerly a member of the Pacific Northwest Regional Planning Commission), a college professor, and the superintendent of a small municipal electric system.

The Bonneville Regional Advisory Council became a vehicle for understanding and transmitting to the various represented communities and groups many of the problems confronting the BPA. This was of particular significance at a time when BPA faced the prospects of a large postwar surplus of power and when the private utilities in the region appeared to be gathering new strength to oppose further integration into a single transmission-and-marketing program of new federally constructed hydroelectric projects. Early meetings of the council were largely limited to acquainting the members with the work of the agency and to studying possible new uses for domestic, rural, and industrial electricity. There was at first some hesitation to express opinions on policy issues because the controversy over public versus private power insisted on getting into the regional picture. It was felt that issue might frighten from participation in the council the representatives of some larger business interests who might otherwise unite behind an industrial utilization program. These

larger business interests centered in Portland, Spokane, and Seattle where they were closely associated with chambers of commerce which had been uniformly hostile to the program of the BPA since Ross was named its first administrator. However, policy questions did gradually come into council deliberations and recommendations. These included power-rate issues, particularly the use of subsidy rates for reclamation and promotional rates for displacing other forms of industrial energy. A good deal of attention was given to the need for utilization and related research and for changes in the authority of BPA to engage in such research activity.

The hottest issue the council has considered is the Columbia Valley Authority question, which came to a head early in 1945 as a result of bills introduced by Senator Mitchell of Washington, Representative Horan of Spokane, and Secretary Ickes. The council chairman appointed a subcommittee which made a preliminary examination of the issues and, upon the basis of its discussion, the council recommended that Congress create a federal agency to enforce coordination of existing federal powers now concerned with river and resource development and operation. It recommended that the functions of existing agencies be preserved where possible, that the new agency be given additional power in the field of research, and that it be so organized as to provide more regional autonomy than now exists among the uncoordinated agencies.

The council referred these recommendations to the administrator for his information and use and expressed the view that they were the minimum requirements to assure the coordinated development of the resources of the Columbia Basin.

In the latter part of 1946 and early 1947 the administrator used council meetings largely to present the facts indicating the growing shortage of power supply and to ask for reactions on the problems of policy which that situation posed. The council was certainly a significant medium for communicating to the "folks at home" the administrator's concern for increased generating and transmission facilities. During 1947 and early 1948 the budget curtailments of the agency so burdened the administrator and his top staff that council meetings were infrequent; when they were resumed they were again focussed on the problems which the failure of new generating and transmission facilities to keep pace with the expanding power demand had rendered even more acute.

The original members of this council group adopted a simple organization which provides for election of a chairman and appointment of a few standing committees. A membership committee recommends new names for the administrator's consideration. The policy and research committees have utilized the assistance of the administrator's staff in developing facts and suggestions for the formulation of recommendations, but they have

felt entirely free to initiate, change, or reject staff proposals. The whole council has been equally free to disregard or modify any idea suggested by the administrator or his staff. This was true even before the council decided no longer to accept payment of transportation and living expenses by the administration.

It has been customary to invite from 20 to 50 visitors to attend the general sessions of the council's two-day conferences. These have been chosen largely from the communities where the meetings have been held, and since the meeting places have rotated, a considerable number of people have been permitted to hear and participate in the discussions. This has probably widened interest in and understanding of the administration's problems. The administrator has also invited as visitors the top field representatives of the principal federal resource-development agencies; namely, the Corps of Engineers, the Bureau of Reclamation, the Forest Service, and the Federal Power Commission.

Members of the Bonneville Regional Advisory Council have in common a friendly acceptance of the basic policies established by Congress for the BPA. In choosing the council members, the administration has regarded such acceptance as an essential common denominator in obtaining useful advice. Consequently, this advisory group excludes any person who has actively opposed the Bonneville program. After all, an administrator could hardly expect to obtain useful advice from people in basic disagreement with his job. In this sense the advisory council is hand-picked. Beyond this minimum requirement, however, there is a great diversity in public-policy convictions and viewpoints on the part of its present membership. There is, for example, no unanimity on the question of public-versus-private ownership of local distribution facilities. Neither is there agreement on the relative importance of irrigation development as against the use of power for other purposes. So long as this diversity continues, the advisory group is likely to be a useful agency. It has been fully conscious that its recommendations and actions are wholly advisory.

Interagency Relations of the BPA

BPA AND THE CORPS OF ENGINEERS

With the completion of Bonneville Dam, the Corps of Engineers was invested with full responsibility for its operation. It was essential, therefore, that an organic tie develop between the corps and Bonneville Power Administration in the operation of the generating facilities by the former and the transmission system by the latter. Unlike the administration at Coulee Dam, BPA has full control over the switch yard adjacent to Bonne-

ville Dam. The physical control of the army stops at the top of the power houses, at which point the Bonneville Power Administration lines take the energy across to the Washington side and through BPA's own switchyards.

Under a written agreement the army is completely responsible for operating and maintaining all generators at the dam. Yet in the delivery of power its operating personnel take orders directly from the Bonneville Power Administration dispatcher. The army staff performs this work as if they were members of a single generating and transmission agency. The Bonneville dispatcher makes his load schedule two days in advance and communicates it to the army men at the dam who furnish him a daily report showing all generator operations and reservoir conditions. During periods of high demand for power, this report includes estimates of the generator situation projected for the next three days to aid the Bonneville dispatcher in planning his program. Coördination by telephonic conference takes place between the army staff and the Bonneville operating group every hour and at times even more frequently. The incentive for this close articulation of activities was especially great after the establishment of the Northwest power pool. The only restraint on what the Bonneville Power Administration may order from the generators at Bonneville is the capacity of the generators to perform.

There must also be an integral relationship concerning the maintenance program for the generators in the care of the district engineer's staff. Since maintenance work on a machine takes it out of operation the maintenance schedule must be so arranged as to cause the least possible disturbance to the deliveries of power over the Bonneville transmission system. After the formation of the power pool each member, including the army engineers, worked out a maintenance schedule two years in advance. That has been printed and circulated to all members. However, it has been revised each year and could be changed in case of emergency.

The evidence appears clear that no important operating problem has yet been created for the BPA because of the control of the generators at Bonneville Dam by the Corps of Engineers. The continuance of this harmony depends on voluntary good will.

When we turn to the function of planning the development of the transmission system and to the marketing job which Bonneville must do, inter-agency relationships are not entirely devoid of problems. It should be kept in mind in this connection that the Corps of Engineers has a representative on the Bonneville Regional Advisory Board. As noted above, until the summer of 1946 this body usually met at Washington, D.C., although customarily the Portland district engineer attended the meetings. From the onset of the war in 1940 until 1944, a period when both BPA and the army were anxious to equip the region with additional power facilities for pos-

sible war requirements, there appears to have been close coöperation in formulating programs for that purpose and in urging the War Production Board and the other central control agencies to grant the necessary priorities. The army, as the construction agency, also coöperated fully in trying to meet the accelerated schedule of generator installations at the Bonneville Dam so that long before the end of the war all ten generators were turning. When the Office of Production Management in June, 1941 assigned a blanket priority rating of A-1-D (later changed to A-1-C) for both generating and transmission facilities, the Portland district engineer administered it for BPA materials, and greatly expedited the latter's procurement program.

But with the end of the war, the development of many new problems associated with postwar developments led for a time to a temporary let-down in the clearance of mutual problems, especially during the "gestation" stage when plans of action were formulated. For example, at the October, 1945, meeting of the advisory board the Bonneville administrator presented a proposed schedule for new generating facilities to meet prospective market demands. This was opposed by the district engineer as being a year ahead of the army's construction program. He later advised Bonneville Power Administration that construction could be speeded to meet the proposed schedule but only at a much higher cost. So the Bonneville schedule was retarded to obtain the lower construction costs. This difficulty need not have come before the board had there been closer informal contact between the agencies.

Another example of lack of articulation with the district engineer's office is the design for Foster Creek Dam. In the first "308" report, the army's estimate indicated a very low power cost—approximately a quarter of a mill—based upon a certain design. But the recently completed detailed study used a new design which it is said raised the cost of power to about one and a quarter mills. During the period when the Seattle district office was making this survey Bonneville Power Administration had no intimation of the contemplated change in power costs. The district's revised report took the usual procedure and did not reach BPA until after it had passed through and been approved by the division and the Washington offices. Bonneville then had only three weeks in which to study it. The BPA engineers say that had they been informed earlier in the planning process of the contemplated design changes and higher costs, a satisfactory modification might have been worked out.

Essential in adjusting interagency problems is a continuous direct contact between the division and district engineers and the Bonneville Power Administration. This has been increasingly realized and in the past two years conferences between top field officers and technical staffs of the two

agencies have been frequently and regularly held to iron out matters of mutual interest. Formal conferences are now the order of the day for reviewing the generator schedules developed in BPA's annual revision of its advance program.

Crucially important for the success of BPA is a free exchange of information with the army, which is continually planning new river projects to develop surplus electric power. BPA must build the transmission lines that tie all new generators into the central grid system for the region so that it, as the marketing agent for all such army-built projects on the Columbia and its tributaries, may advantageously dispose of the power. This concern was phrased in a BPA memorandum on the army's proposed review report on the Columbia River:

The BPA is fundamentally interested in the power generation aspects of the study and the Columbia Basin development program. Because of the fact that it is responsible for supplying the power market in the region with the maximum economy, fulfillment of this responsibility requires (1) that the power sites on the Columbia River and its tributaries be developed in the order which will enable the greatest efficiency in constructing the transmission system; (2) that installed power generation equipment be of such capacity that available water resources can be converted into electric energy in accordance with power requirements under anticipated load curve; (3) that live pondage be provided to the extent found feasible at each plant for daily or weekly regulation so as to permit the operation of each plant to be fitted most effectively into the load curve; (4) that up-stream storage be sufficient to obtain the most economic development of the prime power of the river; and (5) that the electric characteristics of the generating plant be specifically coordinated with the electrical characteristics of the transmission system.¹⁶

A concrete illustration of the necessity of BPA's concern in army construction plans, particularly in timing, and in a projected operating program (which in turn may vitally influence construction plans) is the Detroit flood-control reservoir of the Willamette Valley project. Studies have shown that power installations there (which the army has found fully compatible with flood-control objectives) can be used most advantageously to firm up the power from generators on the main stem of the Columbia during its low-water season from October to March. By operating the Detroit generators primarily to supplement the Columbia plants during that six-month period, it is possible to produce a larger volume of continuous power, and a much more commercially valuable power, than if they were independent of the Columbia River generating system. During the summer when water on the Willamette is low the value of the Detroit generators would lie chiefly in their stand-by capacity for emergencies and in their use in place of expensive synchronous condensers for producing that

¹⁶ A memorandum of November 29, 1945, to the Portland and Seattle district engineers.

mysterious but essential form of energy known as "reactive" required to stabilize transmission operations of the BPA network. This, then, is the general plan of operations upon which the Detroit hydroelectric installation has been projected. Obviously it is important for BPA to be kept abreast of the engineering ideas and facts used by the army in its planning activity.

But BPA is also much concerned with the dates when the Detroit generators will be ready for production. This was made known to the army by the assistant administrator of BPA who wrote the district engineer on October 12, 1945, about a recently completed study of anticipated power loads. The study indicated that the first Detroit generator would be needed to serve the 1949-1950 peak period and the second for the following winter, and asked the army to complete its installations by these dates.

In the current plans for McNary Dam an issue has arisen illustrating one of the frailties of the Congressionally imposed divided jurisdiction over the Columbia River power system. The army proposed to install the standard-type generators and transformers. These possess characteristics that the BPA regards as fundamental handicaps for economic long-distance transmission. (This involves production of a form of energy known as "reactive." The standard-type generator has a reactance of 44 per cent and the transformer 12 per cent, while the special types for long-distance transmission as recommended by BPA have 32 and 8 per cent respectively.) The machines preferred by the army are less costly for initial installation but the ultimate net saving to the whole power system for the special-type machines is estimated at \$100,000 per unit. But in addition to the ultimate financial saving the low-reactance machines have the advantage of superior utility for long-distance transmission.

It may be noted in passing that the army ordered for the first Bonneville generating units the same kind of standard machines because it then expected to market most of the energy at the bus bar and the remainder over short transmission lines to the lower Columbia-Willamette Valley area. Whether the past addiction of the chief of engineers to bus-bar sales from army-built hydroelectric projects to private utilities or industries continues to motivate the army's preferences in these generating devices is a matter of speculation, but the splitting of jurisdiction between the two independent agencies engaged in power production and its transmission is the basic cause for any dispute of this character.

An experience which has drawn the staffs of the two agencies together, and is begetting good habits of clearance, is their joint work on problems outlined for the army's review report of the Columbia system: (1) prospective power markets as related to agricultural and industrial development, (2) power distribution, and, more recently, (3) a power value study. After

some months of bureaucratic sparring over the degree of subordination of BPA's independent responsibility as a participant in the study, written agreements were signed by the district engineer and the Bonneville Power administrator. BPA undertook to forecast the future industrial, agricultural, domestic, and commercial development in the region as these related to the growth of electric power markets within the Columbia Valley "and contiguous areas." In so doing it agreed to cooperate with the many federal and state administrative and research agencies engaged in the study and development of the region, so that its report would "take into account the views of all these agencies and meet with their approval, insofar as possible." It also undertook, after lifting the veil that curtains market demand and growth, to plan a backbone transmission system with feeder lines to send power from the dams to the load centers in the quantities required, and to plan the distribution facilities required to take the power from the substations to the customers' premises. This was a very ambitious program, which carried the BPA and its collaborators into the heart of regional resource planning. While the army's studies of potential river-structure developments is predicated upon full water use and a distant and indefinite future, the BPA forecasts are pointed to the year 1960, or shortly thereafter, as the practicable time limit for market forecasts.

The agreements explicitly recognized that these studies would require periodic and systematic consultation between technicians of the army and of BPA, for neither group could perfect its work without exchanging facts and ideas with the other. Since two districts of the engineer organization were involved, there had to be not only informal interchange but also formal quarterly conferences at which both the Seattle and Portland districts were represented. The research program was carefully worked out, and systematically explored among other matters the basic raw-material needs and market prospects for fifty leading heavy industries that are high consumers of electric power. It also examined, one by one, the principal manufacturing industries that might be expected to develop from these basic industries.

There have been a few instances of failure to keep essential information flowing between the two agencies, caused apparently by inadequate communication between the chief engineer's office and Portland. An illustration is the confusion over appropriations requested for McNary Dam. As a result of the October, 1945, advisory board meeting referred to above, BPA changed its transmission-line-construction schedule to the new basis and incorporated these changes in its budget estimates. It also sent out survey crews to locate lines to serve the army's construction work at McNary Dam—all this on the understanding that the army's request for McNary Dam construction funds would be included in the same budget. It is

reported that not until the Bonneville Power Administration staff appeared in Washington the following February to defend its budget estimates did they learn (from a newspaper) that army appropriations for McNary for the next fiscal year had been omitted from the president's budget. The negotiations between the Army Department and the Bureau of the Budget resulting in this altered construction program had gone on in Washington without notice to the BPA, and without an opportunity for it to present the market-demand studies which, it believed, justified building McNary Dam at the time agreed upon with the army. Subsequently the Senate at the behest of the Oregon senators restored the McNary Dam item in the budget.

BPA AND THE BUREAU OF RECLAMATION

The bureau's marketing function is not so far advanced in the Columbia River Valley as in some other Western regions. Here its first production of surplus electric energy was a 6,000-kilowatt installation at Minidoka (Idaho) in 1909. There are two other installations, one on the Boise totaling a little less than 10,000 kilowatts and one on the Yakima, a small plant of 2,300 kilowatts. Only the Grand Coulee installation is of major consequence from the standpoint of energy for general consumption, which is, by presidential order, marketed by the Bonneville Power Administration. But projects now under way in southeastern Idaho will greatly augment the bureau's power functions in this region. Two of these, Anderson Ranch and the Palisades dams, will have initial installations of 57,000-kilowatt capacity and ultimately provide a total installed capacity of 90,400 kilowatts. Thus there has as yet been no occasion for an integrated bureau transmission system in southern Idaho. The transmission of power from present small installations has been handled by the Idaho Power Company which is rebuilding its transmission system so as to be ready to handle the power from southern Idaho projects now under construction. However, the bureau has itself been authorized to build transmission lines in this area, though funds for that purpose have not yet been appropriated.

Into this situation comes the Bonneville Power Administration's proposal to extend its high-tension system from La Grande up the Snake River into southern Idaho and perhaps down into Utah. In western Montana the bureau has already begun the Hungry Horse Reservoir on Flathead River, which will produce not only storage for power downstream but a large block of power at the dam site where the installed capacity is to be 142,000 kilowatts. The marketing of power from this project, however, has already been assigned to the Bonneville Power Administration which will undoubtedly tie Hungry Horse electrically as well as hydraulically with Grand Coulee, Foster Creek, McNary, Bonneville, and any other dams to

be built on the main stem of the Columbia. There can be little doubt that the transmission pattern already emerging will tie federal hydroelectric developments in western Montana and northern Idaho into the grid system already built and operated by the Bonneville Power Administration. At the present time the BPA system extends into the Idaho panhandle at two points, at Lewiston via Walla Walla and at Bayview on Lake Pend Oreille.

The prospective hydroelectric developments by the Bureau of Reclamation in south Idaho will increase the need for high-tension integrated transmission systems in the upper Snake. The inventory by the Boise office includes irrigation and multiple-purpose projects now contemplated for ultimate development in that basin totaling an estimated installed capacity of 342,000 kilowatts. Two contemplated single-purpose projects would add another 130,000 kilowatts. The estimated firm power from all of these prospective additions is 2,123,000,000 kilowatts. There would also be a considerable block of secondary power.

Two questions presented by these prospective developments—(1) who is to market the power and (2) at what rate shall it be sold?—have been the subject of irritation and acrimonious discussion between the Bureau of Reclamation and the Bonneville Power Administration, which have competed for the secretary's favor as the transmitting and marketing agent.

The background of experience within the Bureau of Reclamation was almost bound to produce a conflict with the Bonneville Power Administration. In the first place, some bureau old-timers feel that BPA snatched from the bureau its rightful function of marketing Grand Coulee power. Certainly it was the original intention of the bureau to market the power from Grand Coulee Dam within the Spokane and Puget Sound areas, and leave the army to dispose independently of Bonneville power in the Portland area.¹⁷ That was the proposal which the army engineers, undoubtedly with the blessing of the bureau, presented to the Congress in 1936 when this issue was hotly debated before the senate committee then considering legislation for the operation of the Bonneville system.

There is no doubt that bureau officials generally feel that the transmission and marketing of power from federally owned projects in the West should be the job of the Bureau of Reclamation. That conviction is well illustrated by the attitude of former Commissioner Bashore toward the Southwest Power Administration, an agency created by the secretary of the interior in 1943 to market power from the Grand River project (built with WPA money by the state of Oklahoma) and from the army-built

¹⁷ See the testimony by Col. Thomas M. Robbins, division engineer for the north Pacific during the construction of the Bonneville Dam for the army's localist conception of a transmission system for the market area of the dam. Hearings before a subcommittee of the Committee on Agriculture and Forestry, 74th Cong., 2d sess., on S. 869, S. 3330, S. 4178, and S. 4566.

projects at Dennison and Norfolk dams. Shortly before his resignation Commissioner Bashore urged the secretary to revise the power-marketing policy of the department in such a way as to transfer the functions and staff of the Southwest Power Administration to the Bureau of Reclamation.

Added to this wholly natural desire of an older organization to retain all of the functions developing from its own and similar construction programs, are other causes of conflict with BPA—basic differences in attitude toward power-marketing policies. First of all is a difference in attitude toward the public distribution of power. The bureau has heretofore not been keenly interested in promoting publicly owned distribution systems. It was not particularly sympathetic to the clamor for cheap power to the consumer. Bureau interest in electric power has in the past been primarily centered on the question: What will power return in revenue to subsidize irrigation work and thus reduce construction costs for new irrigation enterprises? The rate level it has aimed for has been that schedule that will return the highest net revenue. It is true that the Reclamation Act of 1906 enjoined upon the secretary of the interior a power-leasing policy which would give preference "to municipal purposes." It is also true that legislation for the Boulder Canyon project in 1929 ordered the secretary to let contracts for the use of its hydroelectric energy "in conformity with the policy expressed in the Federal Water Power Act." That act had ordered the Federal Power Commission to give preference to applications by states and municipalities when issuing licenses to build and operate hydroelectric works on navigable streams. During its long pre-New Deal life, the bureau had taken this public-ownership preference passively, as the law clearly permitted. Certainly the dominant political policy of national administrations during that period was not one to promote an active public-ownership attitude on the part of Bureau of Reclamation officials. But the bureau's own tradition concerning public and cheap power has been a more positive impetus toward, at best, a neutral position. First, the bureau has felt a growing need to find in electric-power sales the means of making its increasingly costly projects economically feasible. Secondly, the Western groups which most actively supported the reclamation program were largely made up of businessmen interested in Western development—people whose sympathies were customarily with the private-power companies. The third influence toward this lukewarm or cool position has been the dominance of the engineering profession from which the directing personnel of the bureau at all levels has heretofore been predominantly drawn. This profession, on the whole, has had no quarrel with private-utility systems or their practices.

Traditions which stem from factors of this sort are not quickly broken in any well-established government agency. With the continuance of the

same engineering personnel in important positions a characteristic indifference to cheap and publicly distributed power was bound to survive the arrival on the national scene of Secretary Ickes, President Roosevelt, and even a New Deal Congress with a new power program. This fact is well exemplified in a remark made to the writer by an old-time bureau employee of important status who said: "Of course I am for public power; I'd be fired if I did not say so. Still, I don't believe in pushing the private operators out of business and I think that Bonneville power should never have been sold as cheaply as it is being sold because the principal use of power should be to give as high a return as possible to help subsidize irrigation."

Hence the Tennessee Valley Authority power program, the Rural Electrification Administration legislation of 1936, the Bonneville Act of 1937, with their new emphasis on public or cooperative ownership of distribution systems at the expense of private utilities and upon the value of operating policies for the benefit of domestic and rural consumers, did not quickly alter the prevailing ethos within Bureau of Reclamation officialdom. Not until the Fort Peck Act of 1938 and the Reclamation Project Act of 1939 was the bureau's own job brought clearly within the orbit of the new legislative directive on power. Even so, it remained for the Flood Control Act of 1944 to emphasize the *low price* theory of power for bureau projects by saying that surplus electric energy from reservoir projects should be disposed of "in such manner as to encourage the most widespread use thereof at the lowest possible consumer rates consistent with sound business principles."¹⁸ The long regime of Harold Ickes as secretary of the interior and champion of public power, coinciding with an increased Congressional emphasis upon the federal construction of hydroelectric projects and a policy of distribution at low prices through publicly and cooperatively owned local distribution systems, has not only produced internal tensions between traditionalists and New Dealers, but has also brought tensions between the bureau and Bonneville Power Administration, which, with Ickes' backing, has championed programs for low consumer cost and public ownership of distribution in the Columbia Valley.

This kind of conflict between the bureau and the Bonneville Power Administration is well illustrated by a controversy over the Mountain Home project which came to a head during 1945. The bureau submitted to the water-resources committee of the Department of the Interior for consideration its planning report on an irrigation project in the vicinity of Mountain Home, Idaho. The Bonneville Power Administration, although it favored early construction of the project, objected to the financial analysis on which the feasibility of the project was based. It disagreed with: (1) assumptions in the plan concerning the cost to be charged to power

¹⁸ 58 *Stat.*, 887, Section 5.

revenues; (2) the rates for power; (3) the treatment of the rate and power features of the project in isolation from other hydroelectric developments both in the upper Snake Basin and the Columbia Valley as a whole; and (4) the exclusion of the Bonneville Power transmission system from southern Idaho.

Over the first point a controversy between these two Interior Department agencies had been raging for some time in connection with the preparation of a report on the allocation of costs and the burden upon power revenues for the Grand Coulee-Columbia Basin project. The bureau had taken the position that the Reclamation Act of 1939 required power revenues on irrigation projects to be charged with (1) the cost of operating and maintaining power facilities; (2) repayment of construction charged to power facilities plus that part of joint facilities allocated to power; (3) interest at 3 per cent on the investment required for power and allocated joint facilities; (4) a subsidy to the irrigation construction costs, which would reduce them to an amount which the farmers could be expected to repay within the statutory 40-year period. In reply the Bonneville Power Administration had contended that if it paid (1), (2), and (4), it should not be required to pay the 3 per cent interest charge to the Treasury to the extent that power subsidy equaled or exceeded the interest figure.

This issue was referred by Secretary Ickes to the department solicitor who on September 29, 1944, made a ruling which, though it did not accept the contention of either agency, was nevertheless favorable to Bonneville's desire to reduce the burden on power revenues and thus aid the low-rate policy for which it stood. The solicitor held that the minimum legal requirement may be met by rate schedules which will return: "(1) the share of operation and maintenance expenses chargeable to power development; (2) interest at not less than three per cent on the power construction costs; and (3) as 'other fixed charges' an amount equal to any excess over total net power revenues which would otherwise exist in the construction costs allocated to power to be returned from power revenues."

However, he went on to say that the secretary may include still other "fixed charges"; that his discretion "is sufficiently broad to enable him to include charges which will produce revenue sufficient to equal all construction costs allocated to irrigation which are beyond the ability of the water users to repay, in addition to the returns representing interest at not less than three per cent annually on the power construction investment. He is not, however, required by law to do this."

Disregarding this ruling the bureau assumed that in the Mountain Home project power revenues would be used to pay all the costs for which it had contended in the past. Its rate calculation placed the cost of power for commercial purposes at four mills per kilowatt-hour, which was appreciably

higher than the average cost under the basic \$17.50-kilowatt-year rate of the Bonneville power system. The bureau's financial plan would result in keeping the Bonneville Power Administration out of southern Idaho by raising the price of energy so high as to involve a loss to the rest of the BPA system should its lines be extended to market power from the bureau's southern Idaho plants. Thus it would preserve for itself the marketing job in southern Idaho.

The BPA contended that had the solicitor's opinion been followed, charges against power revenues would have been lower by about \$13,500,000. BPA proposed to eliminate this overcharge in order to reduce the cost of power to the people of southern Idaho, whom it contended should be treated on the same basis as other people within the Columbia Valley region. It also wanted to reduce further the charge against power revenues by helping to pay for the Mountain Home project with a part of a special fund of approximately \$70,000,000 set up under the Grand Coulee-Columbia Basin Allocation and Repayment of Cost report. The proposal for this special fund is as follows: "It is proposed that these revenues would be available as a basis for a reduction as circumstances warrant in the total obligations for construction charges which the water users are required to assume or a reduction in the amounts to be returned from commercial power revenues, and to be taken into account in the determination of the financial feasibility of various other irrigation and power projects that may be undertaken in the Columbia River Basin."¹⁹

BPA wanted the secretary to obtain legislation permitting him, in determining the economics of project feasibility, to pool the financial accounts of all projects within the river basin for which the Department of the Interior would be the marketing agency. BPA also insisted on its right to participate with the bureau in preparing estimates, plans, and designs for transmission facilities for the Mountain Home project. In short, it desired to integrate the transmission plans for this and other projects in southern Idaho into its own transmission system which it felt ought to be permitted to extend as far south as northern Utah. As a matter of fact, the BPA's budget program for the fiscal year 1946 projected a transmission line into southern Idaho.

The bureau's spokesmen insisted that the Joint Allocation and Repayment of Cost report was not intended to apply in the Snake River Basin. This plan had provided for a special fund with which to help subsidize other projects. The spokesmen also objected to the idea of a uniform rate policy throughout the whole Columbia region. They argued that costs in

¹⁹ See p. 54, *The Joint Report on Allocation and Repayment of the Cost of the Columbia Basin Project*, by the Bureau of Reclamation and the Bonneville Power Administration, approved by the secretary of the interior on January 31, 1945.

southern Idaho were higher than on the main stem of the Columbia and that not to express these costs in higher rates would both jeopardize further irrigation projects and prejudice rate problems of the Bureau of Reclamation in the adjacent Great Basin region where costs were still higher. They would not admit that the upper Snake Basin belonged in the BPA transmission and marketing area.

Although modifications in the report which went forward to the Federal Inter-Agency River Basin Committee and to Congress temporarily assuaged these differences, they postponed rather than solved the issues.

Partly as a consequence of the Mountain Home controversy and of conflicting budget proposals of the agencies, the secretary of the interior ordered a joint study by the two agencies of the power problem in southern Idaho. He asked them to determine "(1) the most effective power construction program in the upper Snake River Basin, including designs, location and scheduling of transmission lines and substations and (2) the proper rates to be charged for power in the area from the facilities controlled by the Department of the Interior." It was apparent that such a study would throw light upon the question of whether southern Idaho irrigation projects could supply the probable demand of that area for electricity, or whether the market would need additional energy imported from the plants on the main stem of the Columbia for which BPA was already the marketing agent. It was also anticipated that the study might reveal southern Idaho's need of lower power costs for development of its processing and mineral industries.

The staffs designated by Regional Director Newell of Boise and Administrator Raver at Portland proceeded very amicably to outline and carry through the fact-finding studies. These were completed early in the summer of 1946. The preparation of a transmission plan and a rate program may not be so easily and amicably performed.

While the study clarified the issue of potential power demand and clearly indicated the need for much more energy than could be supplied from the south Idaho bureau projects, it still left unsettled the issue of a separate marketing agency for south Idaho (for which the bureau had contended) versus the extension of the Bonneville transmission system into the upper Snake area. On August 9, 1946, before the report was finished but after the field studies had demonstrated the large potential power market, Secretary Krug, in an order to the two agencies, instructed BPA to proceed with budget estimates for a transmission-line survey in southern Idaho and to plan for assuming ultimately the marketing job there. He told it to apply the principle of uniform rates throughout its marketing area, though he recognized that the postponement of construction and the possible unsuitability of the \$17.50 rate might warrant the reexamination of the issue,

and promised further study of the \$17.50 rate for the eventual Columbia Basin marketing area.

The study and the order did not resolve the basic conflict between the bureau's concern for power revenues with which to finance a continuing construction program of reclamation projects and the desire of the BPA to hold down rates for electricity from generators built by either the bureau or the army in order to encourage the greatest use of power. As the marketing agent for the greatest potential pool of hydroelectric energy on any river system on the continent, in a region which has lived chiefly upon the extraction of raw materials of farm, forest, fisheries, and mines, the BPA is impelled to focus its attention on reducing the price of energy in order to encourage its increased utilization for all kinds of purposes. Moreover, it too is a construction agency. Its engineering staff is professionally inclined to desire a continuing program of transmission-line construction which its entry into the southern Idaho area would favor. Congress must ultimately bear responsibility for the inconsistency in fundamental policy between the injunctions to both agencies that they should furnish power "at the lowest possible rates consistent with sound business principles" and the bureau's use of power revenues to defray a large and increasing share of the cost of irrigation developments. The latter objective leans toward an "all that the traffic will bear" orientation; the former pushes toward the lowest wholesale rates consistent with payout, and toward publicly owned retail distribution systems which enjoy the advantage of low interest rates and freedom from the necessity to make a profit.

In the interest of low rates BPA has pursued the policy, which the TVA inaugurated, of controlling the distributor's resale rates to the consumer. BPA insists that distributors do not charge customers with costs not attributable to the power function. This injunction is particularly at variance with the federal government's own policy of financing irrigation projects from power revenues. It does for that purpose precisely what some local municipal systems have done in keeping local rates high enough not only to support electric services but to relieve the local taxpayer of other fiscal obligations.

Secretary Ickes on January 3, 1946, had attempted to unify the power policies of all Interior Department agencies by stating a set of principles to govern them in carrying out the injunctions of Congress. Among the operating principles listed in the memo are the following items which coincide with the BPA program as interpreted by its first two administrators: (1) active assistance during the planning, authorization, and organization of public agencies and coöperatives for the distribution of power; (2) nondiscriminatory wholesale schedules designed to bring lowest possible rates to distributors serving domestic and rural consumers; (3)

inclusion of retail rates and other provisions in contracts with distributors to assure lowest possible rates to the consumers; (4) active encouragement of a diversified development of industries to promote economic stability of the project and of the region.²⁰

While that statement in many particulars accepted the emphasis of the BPA, it cannot resolve the fundamental ambiguity which flows from the statutes and the fiscal policy of Congress. It is impossible to conceive of power rates and revenues as primarily designed to subsidize and make economically feasible the irrigation of new and higher-cost areas, while at the same time supporting a drive for lower-cost power in order to encourage industrial growth, increased employment, and the higher standards of living incident to high per-capita consumption of energy. One or the other objective must be sacrificed and which sacrifice any agency will favor will depend upon its basic program interest.

Moreover, in this dilemma of policy, pressure groups within the region tend to ally themselves in accordance with their interest in the functions of the two agencies and thus to encourage the continuance of the conflict over the interpretation of legislative and administrative policy. The controversy between the agencies was temporarily quieted with the appointment of Michael Straus as commissioner of reclamation. Sharing the power view of Secretary Ickes, he reversed the official stand of the bureau concerning interest charges to be lodged against power revenues and, standing on the solicitor's opinion, fought his agency's chief supporting pressure group (the National Reclamation Association) which had denounced that opinion and was vigorously urging Congress to compel power revenues from reclamation projects to pay into the general fund of the Treasury a 3-per-cent interest charge in addition to repayment of costs and operating charges.²¹

The Mountain Home controversy had brought into the open the issue of regional boundaries for the BPA transmission system. BPA had contended that all of the Columbia River system belonged to its transmission orbit while the bureau had clung to the right to transmit all power developed on its projects in the middle and upper Snake. On May 19, 1948, Secretary Krug made a more definite attempt to settle this dispute by a joint order to Commissioner Straus and Administrator Raver. He directed them to work toward "an interconnected power transmission network within the Columbia Basin region into which will be fed the power output of all the projects for which the Department or any of its agencies has power

²⁰ See the secretary's memo on power policy, January 3, 1946, to all staffs of the Department of the Interior.

²¹ See chap. xviii for an account of this row with the National Reclamation Association and its outcome.

marketing responsibility, including those located in southern Idaho." He declared that BPA should market over that network all the power of the projects thus connected. He affirmed the same level of power rates for southern Idaho as for the rest of the region. Recognizing that power would be available from Anderson Ranch Dam and other projects before a region-wide transmission network could be attained, the bureau was authorized in the interim to market the energy from these projects, but "under arrangements which will not interfere with the attainment of the above stated objectives." He declared it to be the purpose of the department and its agencies "to establish as soon as practicable the Bonneville Power Administration as the Department's single power marketing agency for the entire Columbia River Basin region, including the states of Oregon, Washington, Idaho and western Montana, subject to such minor borderline adjustments as may be specified from time to time."

In addition to these jurisdictional problems between the two agencies there are interregional issues about the transmission of hydroelectric power. An episode of this sort grew out of the sale of power from the Fort Peck generators. The bureau, as the marketing agent, recommended the sale of the power output to the Montana Power Company. In its original contract plan it proposed a rate considerably lower than that charged by the BPA for similar service to its customers in the Pacific Northwest. BPA complained that this was a discrimination adversely affecting its rate policy. As a result the bureau increased its charges to approximately the BPA rate level. Subsequent to the completion of this contract it developed that the Montana Power Company was using Fort Peck power to enable it to supply energy from company generators to the Washington Water Power Company which operates in the Spokane area. BPA became alarmed because it regarded the Washington Water Power Company, which operates within the Columbia Basin, as one of its own customers. It asserted that any sales contract with the bureau which allowed the Montana Power Company to sell power to the Washington Water Power Company constituted an invasion of BPA's territory. The bureau's rejoinder was that certain peculiar technical considerations associated with the Montana Company's system justified the export of a part of its power supply during off-peak periods to the Washington Water Power Company while at the same time the Montana Company used Fort Peck power in other parts of its system; and that other technical operating considerations at the Fort Peck plant made it very desirable for the bureau to tie its Fort Peck system closely with that of the Montana Power Company. The bureau's position won the secretary's approval. This episode illustrates the fact that in the transmission of power a strict regard to river-basin boundaries is neither wise nor practicable.

The BPA has itself proposed to send its transmission lines as far south as northern Utah where it would enter the Great Basin region. There is also the problem of interties between the Columbia River system and the bureau's Shasta-Central Valley project in California. With both regions now short of power the bureau is more urgently interested in the connection than BPA, which today would limit its export to California to off-peak power otherwise wasted. If and when the large proposed upstream-storage flood-control reservoirs are installed to prevent the recurrence of the major Columbia River floods, a new surplus of Columbia River power might become a major source of energy for northern California. These interregional jurisdictional questions are likely to multiply with the constant improvements in the techniques of power transmission. They will, therefore, pose a continuing series of issues for resolution at higher levels than either the BPA or the bureau's regional offices at Boise, Sacramento, or Billings.

The Bureau of Reclamation and the BPA are indissolubly bound together in their accounting functions because the former operates Coulee Dam as the initial part of the Columbia Basin reclamation project while the latter markets the dam's hydroelectric output; the BPA has the obligation to produce sufficient revenues to pay for the part of the investment allocated to power and to furnish a large subsidy toward the construction costs of the irrigation features of the project. Costs incurred by the bureau for construction, operation, and maintenance are facts of vital importance to the fiscal statements which the BPA must prepare for Congress when reporting its own financial status and seeking appropriations. Any discrepancies in the statements of the two agencies covering the same factors open the door to vigorous Congressional and public criticism. The consequent embarrassment is the more acute for the BPA because public-power developments are constantly under criticism by hostile groups, and any failure of the two agencies to reconcile their figures is almost certain to be used to the serious disadvantage of the power-marketing agency—particularly in its quest for appropriations.

An episode of this character occurred during the hearings on the 1946 fiscal year estimates before the House Committee on Appropriations. A number of discrepancies appeared in the statements prepared by the two agencies covering the same points. In the figures for power earnings and operating expenses for the fiscal year there were discrepancies because the bureau had used estimates while the BPA, with later data at hand, had used actual expenditures. Other items were in disagreement because of similar differences in the basis of calculations.

Of greater importance was the bureau's change without notice to BPA of the price index used in estimating the ultimate cost of the Columbia

Basin project. It substituted the price index of 1944 for that of 1940 although the latter had been used throughout the Joint Allocation and Repayment of Cost report which had only recently been signed by the two agencies, approved by the secretary, and sent to the president. Bonneville on the other hand had retained the 1940 index for its irrigation cost estimates. The use of the new index by the bureau without advance notification to BPA placed the latter in a most embarrassing position because it greatly increased the total cost and threw doubt upon the ability of power revenues to meet the obligations with which they had been charged in the joint report. Hostile congressmen were quick to take advantage of this discrepancy and to challenge the whole rate and financial program of the BPA. This added to the pressure from other regions for an upward revision of the BPA \$17.50-kilowatt-year basic rate in order to wipe out the differential in power rates as between the Columbia River Valley and other regions with less favorable hydroelectric potentialities. The administrator protested the bureau's use of the 1944 index, contending that it was no more realistic in estimating the total costs of the Columbia Basin project than the index figure for 1940. He argued that it would take more than twenty years to complete the Columbia Basin project, which would allow ample time for the high war prices to decline even below the level of 1940. It should be pointed out however that the bureau used the new index not only for the Columbia Basin project but for *all* projects for which it was preparing plans and estimates.

Difficulties of this kind as well as other issues of an operating character arising in the Grand Coulee-Columbia Basin project may be prevented in the future by a memorandum of understanding which the two agencies signed, after lengthy negotiation, on February 6, 1946. To understand the meaning of this memo it is necessary to realize that the operating relationships between the bureau and BPA at Coulee Dam differ in some important particulars from those between the army and BPA at the Bonneville Dam. The first generators installed at Grand Coulee were specifically designed to operate the huge pumps that will lift the water from the river and discharge big streams into the great equalizing irrigation reservoir in the upper Coulee. Because of this direct hydraulic service to irrigation they are unlike the ordinary hydroelectric generators. Very great generator capacity (65,000 horsepower) is required to start these pumps; the exciters are different from those on other projects; pumps and generators must be synchronized to build up speed together. The bureau regards these peculiar technical characteristics of the power facilities at Grand Coulee as one of the justifications for its jurisdiction over the designing, ordering, inspecting, and installing of generator equipment. Of course the same generators are used to make the commercial power which Bonneville markets; those

thus far installed will serve only the commercial and military needs rather than the pumping of irrigation water into Coulee Reservoir.

During the war BPA, as supplier of war industries and military establishments, initiated requests for additional generators at Coulee and was primarily concerned with the timing of design, purchase, delivery, and installation. It is still in that position today and will be until the irrigation features of the Columbia Basin project are ready for use.

The relationships between the two agencies at Coulee and Bonneville dams differ in that at Coulee the bureau designs, builds, and operates the switchyard facilities. Consequently BPA's ability as transmitting agency to serve its customers with the right amount of power at the right time and to work out the interchange between the two dams and the other public- and private-power establishments with which it has interchange agreements is dependent upon the way in which switching facilities at Coulee are designed, operated, and maintained by the bureau. The switching facilities control the transfer of power to and from the transmission lines.

An episode in the spring of 1945 illustrates the significance of such facilities from the standpoint of the respective responsibilities of the two agencies. A workman at the Coulee switchboard opened a panel door containing the relay device which controlled the exciters on all of the generators. The door stuck, then vibrated as it loosened, thus throwing the relay into action. The exciters kicked out, and all generators stopped. In the excitement of the moment, the Coulee operator pulled the switches on all transmission lines going out of Coulee including the very important line leading to the atom-bomb establishment at Hanford. With communication from Grand Coulee cut off for some minutes the BPA dispatcher could not put into effect an emergency program for correcting the outage by dropping loads of lower priority, thus bringing into operation all available resources. Although this outage lasted for only twelve minutes it would under usual operating conditions be regarded as a grave mark against the transmission agency's reputation for reliability, and a potential handicap in obtaining new industrial customers who seek a guarantee of uninterrupted flow of energy. The outage in this case appears to have resulted from faulty judgment in design which (1) located the relay mechanism where it was subject to undue hazard in operations and (2) located all the exciters on the same bus bar so that a breakdown of a single relay could immobilize the whole plant. The bureau had determined the first item while BPA had requested a single bus bar.

However legitimate may be the case for giving to the transmission agency control over the switching mechanisms that determine the ingress of electric current to its transmission lines, an equally good case can be made for allowing the bureau, as the responsible agency for power generation,

to retain its present control over the switching facilities. The Coulee Dam generators are so large that each is served by an individual transformer located in the power-house structure and tied directly to the generators by large copper conductors. From the transformers the current goes up to the switchyard on the hill above the dam where it passes through the big circuit breakers which protect the transformers and generators, then to the bus bar to which the transmission lines are attached. As the current starts out on the transmission lines it goes through another set of circuit breakers intended to protect the transmission lines in case of need by separating the lines from the power generating system. All of the machines which go to make up the generating facilities and switchyard system are protected by an elaborate relay installation which comes into play when a fault occurs and "kicks out" the circuit breakers protecting the faulty unit so as to (1) protect the system from damage and (2) assure continuity of service. All of these devices are managed in one central control room located in the power house at the dam. There an operating chief and his assistants ceaselessly watch the panel indicators which reproduce the entire layout, and manipulate the controls that govern the entire system.

From the standpoint of an agency charged by law with the construction and operation of the generating system, as is the bureau, the maintenance and operation of the transformers and the first set of circuit breakers are of great consequence. Each circuit breaker is the initial line of defense for the transformer and generator which it guards against injury or destruction from faults in other parts of the system. Conversely it safeguards other parts of the system from faults in its own generator or transformer. The grouping of the Coulee system into five sections with interconnection and protective devices gives added protection from any part of the generating system.

The jurisdictional concern of the generating agency over this part of the power system carries with it jurisdiction over the protective system of relays and other mechanisms that cut out and reconnect the larger mechanisms in the power structure. This takes the generator agency as far as the bus bar to which the high-voltage transmission lines are attached for the receipt of Coulee electricity. But not only do these transmission lines receive power from the bureau; they may also be used to receive and to send power from Bonneville and from other interconnected systems in the power pool (and ultimately McNary, Foster Creek, Hungry Horse, and other federal installations) and to send it through the Coulee switchyard and out over other parts of the transmission systems.

Should a fault occur on the transmission system there would be the contingent prospect that a great surge of electricity might back up to the Coulee bus bar and injure or destroy the bureau's generating, transform-

ing, and protecting mechanisms. The first line of defense against such a contingency is the second set of circuit breakers located beyond the bus bar to interrupt the flow to or from the transmission lines. Thus the logic of separate agency jurisdiction carries the bureau control even to maintenance and operation of the circuit breakers that disconnect the transmission line from the bus bar.

But turning the logic of a separate agency responsibility around, the need of Bonneville Power Administration as the transmitting agency to be prepared, within the limits of present electrical technology, at all times to serve its customers forces an equally valid conclusion: that it should control at least the switching mechanisms with their protective devices which govern the interruption and the release of energy to its lines. We are dealing here with a production and transmission process that has an organic character, every part of which is so interdependent on every other part that it is impossible to draw a jurisdictional line which gives to each agency a self-contained operation. Moreover the proper management of the process requires great accuracy and many forms of protection and insurance for continuous and safe performance. Any point of division between the two independent operating agencies is likely to leave each apprehensive about its ability to meet fully its own responsibility.

Moreover, it is cogently argued that to split the present unified switchyard management between the bureau and BPA in order to satisfy the latter's sense of responsibility would be costly. Instead of one oil-drainage and -rectifying system for the big circuit breakers as at present, a duplicate installation would be required together with duplicate maintenance staff. In place of a single "spare" circuit breaker for each section of the generating and switchyard establishment a second "spare" would have to be purchased and installed. Instead of a single protective-device system with its complicated cables, two would be needed, and two boards and crews would be required.

Other characteristics of the generating and transmitting process reinforce this organic relationship. Thus from the standpoint of the generating agency it may be desirable to send power at lower voltages than the transmission agency finds best for its purposes and its customers. The generating group may also find it desirable to produce electricity with a higher reactance component than is best for long-distance transmission.

This analysis seems to point to the conclusion that the transmission and the generating tasks require a common operating superior, responsible for reconciling the interdependent needs of the generating and transmitting functions. This is the arrangement which prevails in private-utility operations and on the Tennessee Valley Authority's electric system. The

precise point at which the power-producing group relinquishes jurisdiction and the transmitting group takes over would then be decided on the basis of efficiency and cost, and would be related to the peculiar installation arrangements required by the character of the entire power system. It is true, of course, that both the bureau and the BPA report to the secretary of the interior, but that kind of coördination is so far removed from immediate operating control that it can never be an adequate answer to this type of conflict.

The above-mentioned memo of understanding was intended to settle the relations of the two agencies concerning (1) the marketing of power from Grand Coulee by the Bonneville Power Administration; (2) the return of investment on the Columbia Basin project; (3) the administrative coördination between the two agencies relating to the operation of the Columbia Basin project. Under it the bureau retains the responsibility for planning, building, and operating the power plant and appurtenant works, including the switchyards. But it is to consult the BPA on all matters which affect the planning, design, and operation of transmission facilities. Similarly the BPA agrees to consult the bureau on its plans and designs for facilities which affect those of the bureau. Each agency is pledged to coördinate its activities in such a way as to "achieve maximum effective use and reliability of their mutual operations." The bureau promises to turn over to the BPA all electric energy available at Grand Coulee in excess of that reserved for operating the dam, building and operating irrigation works, and servicing government construction towns near the dam. Subject to exceptions relating to the operation of the bureau's own facilities it agrees to "operate the dam power plant and appurtenant works so as to release or store water and to make available and dispatch electric power and energy as requested by the Administrator" of BPA. It is the duty of the latter to avoid interference with the water and other property rights of all third parties, to warn third parties of the release of water which might injure or damage them, and to comply with the statutory requirements relating to the operation of the project for flood control and navigation.

Under these stipulations the BPA controls the release of water behind Coulee Dam. Past experience makes clear the need to link hydraulic control with transmission and marketing responsibility because the hydraulic releases determine when and where the electric energy is to be generated and whether water is to be used for generation as against some other purpose such as navigation. A few winters ago the freezing of the Snake River so reduced the flow at Bonneville Dam that BPA was unable to meet its load demand. At that time, when obligations of one agency to another

were not fixed by agreement, the release of the water needed from Grand Coulee had to be accomplished by time-consuming negotiations between the operating officials of the army, the bureau, and BPA.

The generators to be installed at McNary Dam will also be dependent on the same water conditions which affect Bonneville Dam. Only by the release of Coulee Dam water reserve can BPA regulate the output of dams at Bonneville, Foster Creek, Umatilla, and The Dalles, all of which are primarily intended to produce hydroelectric energy. This new agreement straightens out that operating problem. The physical act of raising and lowering the spillway gates is performed by the bureau but upon instructions from the BPA, which takes full responsibility for the department to see that use of space at Coulee for navigation and flood control conforms to the law and the Joint Allocation and Repayment of Cost report, and coordinates hydraulic and electric operations.

The agreement also obligates the BPA to transmit without charge the energy reserved for operating the bureau's secondary pumping plants, for construction operations and for maintenance of the irrigation project. Before building Coulee transmission lines it is to consult with the bureau on their location and design. The function of determining the rates for energy from Coulee is left to the BPA subject to the approval of the secretary of the interior; but it is agreed that BPA will consult the bureau before making any revision in rates which might materially affect the revenues from Grand Coulee power or might affect the ability of the bureau to market energy from its other reclamation projects near the market areas of the BPA.

To promote maximum effectiveness in the operation of the works of the two agencies, their operating officials are authorized to make and amend supplementary operating rules for coordinating the use of their facilities. "It is the intent of the parties that such operating arrangements shall be sufficiently flexible to meet operating conditions as they arise." Moreover, during emergency or other unusual operating conditions the agencies are pledged to such mutual aid as the lending of personnel, tools, material, or equipment as required.

For the purpose of clearing up some causes of past irritation in the matter of account books and access thereto the agreement requires each agency to use the system of uniform accounts established by the Federal Power Commission. Each is to make its accounts available to representatives of the other agency for inspection, audit, or information at any reasonable time. Because the two agencies are so intertwined in their fiscal operations such an agreement appears indispensable, particularly for the BPA, if financial statements are to be accurate, complete, and prompt. The memo also contains a lengthy series of clauses embodying the financial terms of the Joint

Allocation and Repayment of Cost report and a financial study of the project, setting forth in detail the manner in which the fiscal facts are to be shown until the end of the minimum repayment period on June 30, 2017.

If this memo of understanding works out as intended, it should forestall many of the minor irritations that have characterized the relations between the Bureau of Reclamation and the BPA since the latter was established. However, it is not likely to eliminate tensions that arise from the divergent policy attitudes to which the two agencies are attached. For example, it will not prevent irritations produced by aggressive marketing activities of the BPA in seeking new power loads through irrigation pumping projects. This was the cause in 1946 of a secretarial order to the heads of the two agencies. The commissioner of reclamation complained about the surveys and reports for programs of pumping and sprinkler irrigation prepared by the BPA at the request of the people of Canby, Pendleton, and The Dalles, Oregon. The bureau's report, following studies of the Canby area, showed a higher cost than did Bonneville's, although differences in the plans might have justified the higher cost. When challenged by the bureau, Bonneville took the position that if the bureau's policies made it impossible for the local sponsors of these projects to obtain satisfaction from it, BPA was not justified in turning them away when the proposed project involved possible power markets. It also contended that two of the proposed projects were such as to fall outside the bureau's customary irrigation activities.

This is an example of a very different kind of conflict from those which emanate from the splitting of an organic operating system like the generation and transmission of power. If a power-marketing agency engages in irrigation analysis and advice simply because irrigation may furnish a good power load, there is no logical limit to the kind of activity which it might undertake or to its encroachment upon the work of other agencies in the interest of power sales. The secretary of the interior recognized this when he ordered (1) that the administrator of the BPA advise the bureau's regional director at Boise and the commissioner at Washington thirty days in advance of beginning any proposed investigation involving irrigation; (2) that the bureau and not BPA should make the investigation into any proposed irrigation development which, if found feasible, would be financed and built by the bureau; and (3) that if the BPA should make the investigation its findings must be submitted to the regional director of the bureau and the commissioner, and might not be released without their prior approval. This ruling illustrates an essential function of departmental coordination for which need is likely to arise no matter how carefully the jurisdiction of activities may be distributed between operat-

ing agencies. It might have been unnecessary in this instance had there been a representative of the secretary stationed in the region who could have forestalled the conflict by resolving the problem before it reached the acute stage; but in the absence of such an officer the secretary's intervention was indispensable.

BPA AND THE RURAL ELECTRIFICATION ADMINISTRATION

The Rural Electrification Administration has been of less importance in the Pacific Northwest than in the Tennessee Valley. In the state of Washington the principal units for bringing electricity to rural customers are the Public Utility Districts, *ad hoc* governmental agencies which are usually county-wide. These bodies have the power to tax as well as to borrow, and have frequently been financed quite independently of REA, which, however, has in recent years increased its financing of PUD line extensions. Since the Oregon law attaches more stringent conditions to the organization of utility districts, the PUDs have played a much less important part there than in Washington, and some rural electrification coöperatives have been organized to fill the void. In Montana and Idaho, which do not provide for PUDs, the principal instruments for rural electric service are coöperatives financed by REA. Inasmuch as the BPA's distribution system has penetrated only into northern Idaho the principal relationships between BPA and REA occur in Oregon and Washington.

The Bonneville Power Administration has been very anxious to speed up the organization of public utility districts and coöperatives in its system area. This is a natural ambition for a marketing agency. Its services to the REA-financed coöperatives as an advisor on marketing problems are practically identical with those it has furnished for the PUDs. It has made rate studies for the coöperatives and helped them work out their system-development plans for area coverage, particularly for new extensions. Occasionally Administrator Raver, by interceding with the Washington offices of REA, has helped straighten out certain legal jurisdictional tangles which impeded the servicing of coöperatives by Bonneville Power. In this connection it will be useful to quote Administrator Raver's statement of policy concerning such assistance: "Under the Bonneville Act and Departmental orders it is our policy when we are requested to do so, to lend technical assistance to local public agencies that desire to utilize our power and to representatives of groups of such agencies."

REA's relationships with these customers, or potential customers, are important to BPA because REA may retard or expedite the effort of a coöperative to set up or expand its business, thus affecting the sale of electric energy by BPA. Like the coöperatives, BPA is eager to start operations while REA as a lending agency must be sure of the safety of its invest-

ment and of the observance of all legal requirements, particularly as construed by the comptroller general.

Between agencies having these differing interests some tensions are inescapable. But two major problems have led to complaints and negotiations. The first grows out of REA's regional organization in the field and its effect upon the authority of REA to settle quickly questions of finance, engineering, and operations. REA's setup involves a roving field staff for each of the four functional divisions into which the Washington headquarters is divided. These field people report directly to their division chiefs at Washington. No field man is authorized to deal with any matter lying within the jurisdiction of another division, unless specifically requested to do so by the other division. The field personnel in the various divisions is quite limited in number and particularly is felt to be too small to handle the region consisting of the eleven Western states, which contains the Columbia Valley. While each of REA's four principal divisions is grouped into ten regional units, these are simply divisions of the Washington headquarters. The field offices of REA are merely places for its field inspectorate to write reports, receive mail, and initiate and end travel status. The special REA representative in Portland, who is presumed to act as liaison and clearing agent for matters affecting BPA, has no authority to make decisions on major problems. It is felt by many of the cooperative officials and by the BPA staff that because of the centralized organization pattern the REA is unduly slow in granting approval on problems arising among its financed distributors, particularly with regard to line extensions servicing new areas. The alleged result is that the private-power companies often build spite lines to skim the cream of rural territory and that they have engaged in active effort to break up the cooperatives by exploiting REA's delays.

This is illustrated by the situation at Tillamook where in September, 1945, the PUD asked REA for a loan to build an extension in a rural area. Money was tentatively allocated but the actual grant was repeatedly delayed, while the REA sought detailed information. In the meantime, the principal private-power company in the area began the construction of twenty miles of spite line and started service in two of the best parts of the territory concerned. Ten days after the newspapers announced that REA was contingently allocating money for the PUD's extension, the private company began setting poles. In February, 1946, the money was still not forthcoming even though the grant had finally been made. There was great perturbation locally and within Bonneville lest the private company win over PUD customers by promising earlier delivery of power.

Delays in the approval of the borrower's choice of engineers and in their resale-rate schedule to customers have been the subject of constant com-

plaint by the BPA district staff. The Klickitat PUD, for example, waited more than four months for final approval of the engineer whom it had proposed. Resale-rate approvals have been so slow as to threaten vital improvements by some of the distributors. When the Benton County coöperative was planning to extend its service to the Roza reclamation project, to several small irrigation districts and to an Indian Service project, it submitted its proposed resale-rate schedule to REA for approval. Despite the fact that this was a very competitive situation and prompt action was important in obtaining the load, months went by with no action by REA. Administrator Raver has unsuccessfully urged REA to place someone in the Pacific Northwest with authority to speak for all divisions and obtain greater expedition in the making of decisions at the Washington headquarters.

The other major problem which influences relations between BPA and REA is the difference of emphasis which they place on the movement for public ownership of distribution systems. REA is set up to finance both public and private agencies in the building of rural lines, although it too is told to give preference to the public agencies. BPA is more closely tied in with the public-ownership movement. It has as yet not worked out any permanent program for selling firm power to private utilities. Its influence has been steadily lent to the public-ownership movement, and it is consequently the target for the heaviest artillery and the best strategy of the private utilities. It naturally wishes, therefore, that REA would not sit on the fence in this kind of a conflict. The leadership of REA is fundamentally opposed to a decentralization program, which it regards as incompatible with its observation of all the legal requirements in its lending work and as too expensive for an agency with so small a staff. It has, therefore, turned a deaf ear to Administrator Raver's suggestions for regionalizing its work in the Pacific Northwest. However, it has indicated its intention to rely more heavily upon the regional representative of the USDA solicitor's office on legal problems that arise out of its lending activities in the Columbia Valley.

As one looks back on the story of the Bonneville Power Administration certain problems confronting this agency stand out. It is carrying the responsibility of finding the revenues from which to repay costs not only of its own transmission facilities, but of the construction and operation of the generating machines built at the dams by the bureau and the Corps of Engineers; other power and joint-power dam-construction charges; and the heavy subsidy to irrigation on the Columbia Basin project. Its revenues will be increasingly obligated to the new high-cost irrigation projects being planned for the region.

Over these major construction costs, as well as the operating expenses at the dams, it has no control. They are determined by two construction organizations entirely independent of BPA. The design, purchase, and installation of the generators are also beyond its control, though it may request, advise, complain, and exhort. It must meet the market demand, present and prospective, yet it cannot control the kind of power producing instruments for that purpose, their timing or the cost of their installation. It cannot determine the rates for which the power is sold. When the rates are finally approved by the Federal Power Commission long delay may have robbed particular rates of utility.

As a result of events of the past decade the Bonneville Power Administration has become the chief supplier of electric power for two of the most heavily populated states of the Pacific Northwest and for important sections of three others. Private-power installations have virtually ceased since the launching of Bonneville and Grand Coulee dams by the federal government and the creation of a federally owned and operated regional transmission grid, essential to private- and public-distribution agencies alike. This federal leadership places a peculiar obligation upon the United States government, and its marketing agent, to meet promptly not only the current energy shortage but the growth in future demand. But the BPA cannot promise its customers the acceptance of this obligation. It has no control over the rate or volume of new construction, either of hydroelectric installations or of transmission facilities. Even its resources for meeting emergency situations, which may involve the sudden replacement of costly equipment, are limited to a total of \$500,000. BPA's ability to maintain its facilities in good working condition and to perform its operating tasks promptly and efficiently is not fully assured because it is wholly dependent upon annual appropriations and cannot use its revenues for such purposes. This dependence upon the annual appropriating process may suddenly halt its system development program and disintegrate its operating and construction organization for months before Congress finally decides how much money it will allow for the next year and for what purposes. A single member of the three-membered national legislative process can by use of the appropriation veto suddenly reverse not only the construction but the operating program.

The federal responsibility in the Pacific Northwest inherent in the national policy affirmed during the past fifteen years cannot be turned on and off with each shift in party control of Congress without doing great damage to the economic and social needs of the region. If there is to be a general reversal of national policy in favor of private-utility transmission and distribution of hydroelectric energy produced at federal multiple-purpose dams, its application to the Pacific Northwest at this late date

would be sheer insanity. The great regional high-tension transmission grid built by Uncle Sam now links the generators at Bonneville and Grand Coulee, and is preparing to take power from the generators at Hungry Horse Dam in Montana, McNary Dam in eastern Oregon, and Detroit Dam in the lower Willamette Valley. This grid system not only interconnects the generators on all these river projects, but it links their output to the principal regional market centers—around Puget Sound (even to British Columbia), the lower and mid-Columbia valleys, the Willamette Valley, eastern Washington, and the great mining and lumber centers of the Idaho panhandle, and a part of western Montana. It is impossible to tear this system apart. To attempt it would do irreparable damage to the whole region, including the private utilities which now depend upon it.

Yet if this federal function is to go on, the agency which performs it should be an integral unit in the federal structure which plans the whole river development, programs the timing and kind of electric installations at the dams, and designs and builds them. It requires sufficient fiscal security and resources, independent of the annual appropriation acts, to maintain and operate the transmission and generating facilities and to meet the emergency situations for which such an enterprise must always be prepared. It needs the right to program its transmission lines and substations without the disruptions to a rational system development inherent in the present detailed item-by-item check now practiced by the Congressional appropriation committees. All of these relationships and needs are given the TVA for its power functions. They should be applied to the federal power program in the Pacific Northwest.

The Federal Power Commission and River Development

SO MANY of the public discussions over Federal Power Commission activities have centered on issues relating to the control of the private-power industry that few people are aware of its role in federal river development. Yet it shares with the U.S. Corps of Engineers and the Bureau of Reclamation the duty of investigating the use of the nation's water resources and of planning their appropriate development.¹ In passing upon applications for license to develop water-power sites upon the navigable waters and the public lands of the United States, the commission must consider the bearing of each proposed development upon navigation, flood control, irrigation, recreation, and other water uses. Recent flood-control and river-and-harbor legislation makes the commission responsible for approving the power facilities to be provided in structures built for flood-control and navigation purposes.²

To aid it in these river-planning functions the commission has established a field organization with offices at five regional centers in the United States, one of which is San Francisco. That field establishment has two sets of regional boundaries: (1) for its river-basin studies, all of the area west of the Rocky Mountain divide; (2) for its power-marketing and licensing functions, most of the area west of the Missouri River.

The regional force participates in only a part of the Federal Power Commission functions, namely, the engineering work of its Bureau of Power. The regional engineer who is in charge of the office reports to the commission through the chief engineer. His work is organized into four principal functional units: the river basin, electrical, licensed projects, and

¹ These authorities are contained in Sections 4*a* and 7*b* of the Federal Power Commission Act which direct it to make investigations of any region to be developed; and whenever, in its judgment, development of any water resources should be undertaken by the United States itself, to refuse any application for a project affecting such development. Instead it is to make examinations, surveys, reports, plans, and estimates of cost of the proposed development and submit its findings and recommendations to Congress.

² See Section 4 of the Flood Control Act of 1938 and Section 10 of the Flood Control Act of 1944.

project-costs divisions. An accountant stationed in the regional office reports directly to the chief of the Washington Bureau of Accounts, Finances and Rates. Through this field force the commission maintains intimate contact with the two district engineers and the divisional engineer of the army engineers who represent the War Department in the development of the Columbia and the other rivers of the Pacific Northwest; with the investigations and projects directed by the regional office of the Bureau of Reclamation at Boise; and with the Bonneville Power Administration's plans for transmission lines and generator requirements.

The commission's field staff may prepare its own river-basin reports as it did in 1942 for the Columbia River Basin. However, that report, like many of the commission's other basin reports, was primarily based upon data accumulated by the three action agencies just enumerated. Even though it used no new field surveys of its own, the Federal Power Commission engineers made an effort to meet the apparent pressing need of the rapidly mounting war demand for augmented power facilities on the Columbia River system. The Bonneville Regional Advisory Council, on which the Federal Power Commission has membership, had agreed that an appraisal of the relative economic desirability of all known power sites was urgently needed. The Federal Power Commission regional engineer accordingly assembled and digested the data in the files of the U.S. Army, the Bureau of Reclamation, and the Bonneville Power Administration. On the basis of this analysis it prepared a priority development program, including the completion of generator installations on existing partially developed sites. The priority list was based chiefly on factors of comparative cost. Though no new field inquiries were used the report was the first systematic and balanced attempt to pull together and evaluate the information possessed by the federal agencies concerning power opportunities from the standpoint of the whole river system. This example illustrates the need for basin-wide consideration in planning for hydroelectric power development which neither the army nor the Bureau of Reclamation had theretofore fulfilled. Since that time the bureau has adopted its basin-wide conception in reclamation planning (first expressed in the Sloan plan for the Missouri River) and the army engineers are taking the lead as noted in chapter ii for a comprehensive resurvey of the Columbia in all its potential water uses.

Basin-wide studies are needed not only for discharging the commission's responsibilities toward the other federal water-planning agencies. They are also essential to a considered review of applications by private or local agencies for the development of water-power sites. The potential results of a single development should be considered in the light of an entire river, or a major subdivision of a river system. Such studies were inaugurated by

the commission as early as 1934. However, its staff is insufficient to engage in the elaborate field studies that would be needed were it to take over the full responsibility implied in the planning powers granted to it by Congress. It therefore functions in these matters chiefly by checking and criticizing for the river-construction agencies, and primarily with reference to the power phases of river projects. Lack of funds may have saved it from an extravagant duplication of the field engineering staff of other agencies performing water-planning functions. Its disposition to embark on such field explorations was indicated a few years ago by the purchase of an expensive seismograph which it intended to use for making studies of dam sites at locations not studied by the army or the bureau. But because funds were not forthcoming for the operation of the instrument it was indefinitely loaned to the Geological Survey, which makes initial water-power sites surveys. The commission's power of review of army projects is more complete than for the Bureau of Reclamation because of certain statutory provisions requiring the commission's approval for army plans for penstocks and other power devices on flood-control projects. That means that during the field-planning stages the field officers of the two agencies get together even before any report is prepared by the district engineer for transmission to the division engineer. When the report is completed and ready for the division engineer, a copy is always sent to the regional engineer of the Federal Power Commission. The regional director of the Bureau of Reclamation follows a similar practice so as to obtain criticism on the power phases of his reports prior to their dispatch to the bureau's chief engineer at Denver.

The criticisms made by the commission's field engineering staff are not confined to the design features or other engineering assumptions or proposals. The engineers also review the economic assumptions and calculations relating to power costs and to the feasibility of each project. In this reviewing process the commission's engineers are often able to assist the other agencies with comparable data taken from private-power developments because of the commission's complete file of such information obtained from all major private systems in the country. The latter are required under one or another phase of the law regulating them to file economic and other information not obtainable at any other single governmental center.

The federal river-construction agencies also take advantage of the commission's field facilities for making power-market studies. That function within the Pacific Northwest region has, since the creation of the Bonneville Power Administration, gravitated largely to that agency. Nevertheless, the commission's regional staff is also engaged in collecting data on the same market problems although it is unable to do much new field work.

It relies largely on information submitted by other agencies or private organizations, upon occasional consulting services, and on a final check before it completes a power-market report. These reports are very wide in scope, including analyses of the economy of a given market area, its trends in population, industry, agriculture, and a forecast of future demands. As an illustration of this commission activity in the Pacific Northwest it should be noted that the commission's regional office made an independent check of the market study prepared by the Bonneville Power Administration for the army's comprehensive review report of the Columbia River.

We have noted above the duty of the Federal Power Commission to allocate the power costs of Bonneville Dam as a basis for rate-making, and its further function of approving Bonneville Power Administration rates for energy from that project. The same duties have been given the commission for all new power projects built by the army since the Flood Control Act of 1944. However, the field force of the commission plays a minor role in cost and rate determinations, merely serving the chief engineer at Washington as he may request. In the Columbia River Valley, however, where the Bonneville Power Administration has been made the marketing agency for all army-built dams, the membership of the commission's regional engineer on the Bonneville Advisory Board gives that officer an advance opportunity to consider power-rate proposals before they reach his superior in Washington. Had there not been substantial harmony between the rate philosophy of the Federal Power Commission and the Bonneville Power Administration, this rate-making function of the commission might have become the source of considerable friction. Actually the commission has entertained the same objectives of regional development as have been stressed in the policies thus far implied in the rates of Bonneville Power Administration.³

One phase of the regulatory work of the Federal Power Commission over private electric utilities affects the federal resource agencies in the Pacific Northwest. That is the issuance of permits and licenses for the construction of hydroelectric projects and their appurtenant facilities, such as transmission lines, on streams or lakes under Congressional jurisdiction or on land belonging to the United States with the exception of national parks. In reviewing applications for permits or licenses the commission's regional engineering staff investigates whether or not the proposed project would fit into the best plan for comprehensive development of the stream or basin. To this end, studies are made not only of stream flow, power heads, reservoir sites and the like, but of the uses to which the waters should be put and the need for stream control for various purposes. This

³ See the address of Chairman Olds to the Western State Engineers on November 14, 1944, at Denver.

requires the coöperation of the Bureau of Reclamation, the Corps of Engineers, the Fish and Wildlife Service, and other federal and state agencies interested in the water resources or in the land on which structures would be built. Elaborate provisions are incorporated in the standard license form for the protection of the interests of the land-management agency (usually the Forest Service) controlling the particular land on which the project is to be located.

Illustrative of these specifications, the licensee is required to clear and maintain free of all inflammable material or obstructions the transmission right of way across the public land; to refrain from burning waste except with the prior consent of the Forest Service officer; to pay for timber destroyed in the course of operations or construction; to dispose of slash as directed; and to protect the radio or other communication facilities of the Forest Service from inductive interference caused by the transmission lines. Once a license has been issued and a project built, the Federal Power Commission may make periodic inspections to see that facilities are maintained and operated in a safe manner. For this purpose it frequently makes use of the field officers of the Forest Service and the Geological Survey, the Corps of Engineers and other federal agencies.

The commission has also used the army engineers to aid it in determining whether or not a stream is navigable and thus within its jurisdiction for license purposes. But it is not limited by army-engineer definitions. Since the New River case it is clear that many streams which the army has regarded as nonnavigable meet the constitutional definition of navigability and are thus within the jurisdiction of the commission as the agent of Congress. There are no written standards to guide the regional engineer in making these original navigability examinations. He makes a careful search of the historical records to see if the stream has ever been used for navigation. He also examines the influence which the proposed project—by producing surges of water flow—might have upon the water flow of that part of the stream which is navigable. If there is a measurable effect the project comes under the licensing jurisdiction of the commission.

The commission may therefore bring pressure to bear upon a licensee to complete its development and utilize the full power potentialities of the licensed site. The license theory carries the assumption that no company has the right to "sit on the site" and not to make the energy available if there is public need for it. The commission has joined the Bonneville Power Administration's effort to persuade the Puget Sound Power and Light Company to install additional generator units at the company's Rock Island site on the upper Columbia, so as to help meet the post-war power shortage. That company has recently made application for the installation of new generators.

The relation of the Federal Power Commission to the whole problem of federal water-development agencies is examined below but it will be useful here to point to two important problems connected with its rate-making and cost-allocation duties as they have been exercised in the Columbia River Valley. As mentioned above, the commission has jurisdiction over rates for energy produced at Bonneville Dam for which it also made the power-cost allocations. But it has no jurisdiction over rates for Grand Coulee power or for any other Bureau of Reclamation project (such as Anderson Ranch and Hungry Horse dams) which may become a part of the bureau's multiple-purpose programs. It had nothing to do with determining the cost allocations for power and other purposes of the Grand Coulee project. That was done by the Bureau of Reclamation and Bonneville Power Administration with the consent of the secretary of the interior. Yet the commission will continue to make the cost allocations and fix the energy rates for army-built projects. McNary, Foster Creek, the Willamette Valley, and the Lower Snake River dams have already been given to the army and others may be thrown to it by Congress.

All of the Columbia River dams, by whichever agency constructed, should be tied into a common grid-transmission system. It makes little economic or administrative sense to divide the rate and cost-allocation jurisdiction over a physically integrated system upon the basis of the agencies which build its constituent units. It is obvious that, given the rate policy enjoined by Congress in the Bonneville Act for servicing the whole region with low-cost power, the rates for power from every dam in the system must be identical. Yet the commission in its cost-allocation task must treat each army-built project separately and go through the make-believe of finding its particular share in the cost of the whole transmission system.

A similar situation exists in trying to allocate accurately the operating cost of the transmission system as between the several generating plants which pour their energy into the grid. It is difficult enough to try to distinguish between the costs of power, navigation, flood control, and other purposes served by a common multiple-purpose river structure. But to require the further distinction between the respective shares of army- and bureau-built projects (not even as a group but each as a separate entity) in a common transmission system is a completely wasteful process and the height of accounting absurdity. Rate-making cannot proceed solely upon the basis of costs however soundly determined. It must also take cognizance of market demand, actual and potential.

The market-analysis function is likewise split between the Federal Power Commission, the Bonneville Power Administration, and the Bureau of Reclamation. (The army could also engage in this activity but has been using the commission and the Bonneville Power Administration for esti-

mating power demands in its recent projects.) Until recently only the Bonneville Power Administration was equipped with a staff to undertake elaborate field market inquiries. During 1946 the Bureau of Reclamation augmented its staff for such studies. It carried the major responsibility for the field work in a joint Bureau of Reclamation-BPA market study for the southern Idaho area. Even if the commission had been invited to participate in that study, it could probably not have accepted because it had no field staff adequate for that kind of a job. This is an organizational situation that obviously needs rationalizing.

CHAPTER VI

The Bureau of Land Management

Origin and Organization of the Agency

A FUNDAMENTAL change occurred in May, 1946, in the design for handling public-domain land within the Department of the Interior. The president's reorganization plan No. 3 sent that month to Congress created the "Bureau of Land Management" made up of the many fragments of the old General Land Office (GLO) and of the new Grazing Service established in 1933. The General Land Office was the oldest resource-custodial agency in the federal government, having been established in 1812 as a bureau in the Treasury Department, and transferred to the newly created Department of the Interior in 1849 where it has continued to function as the central real-estate agency of the federal government. The 1946 order abolished it and the Grazing Service, together with the top jobs in each, plus the registers of the district land offices, of whom twenty-two survived since the days when land offices boomed. The new organization is headed by a director and an associate director, both appointed under the classified civil service by the secretary of the interior.

The presidential press release which gave public announcement of the reorganization justified the consolidation of the two agencies declaring it permitted unification of organizations whose duties overlapped and whose policies required a large degree of uniformity. The release claimed that integration would make possible greater and more economical use of expert skills in range administration, eliminate the dual classification examination of land within grazing districts for use for nongrazing purposes, effect economies in legal procedures and administrative details as well as in such major undertakings as fire protection, range improvement, and the management of public lands under agreement with other agencies.

The field services of the GLO were long overdue for change. They comprised a series of special field activities, each reporting to its own Washington chief despite the fact that in order to secure a proper performance a great deal of coördination in the field was essential. This field structure in the Pacific Northwest included the following group of "splinters": field offices of the land-surveys division, one office of the range-development

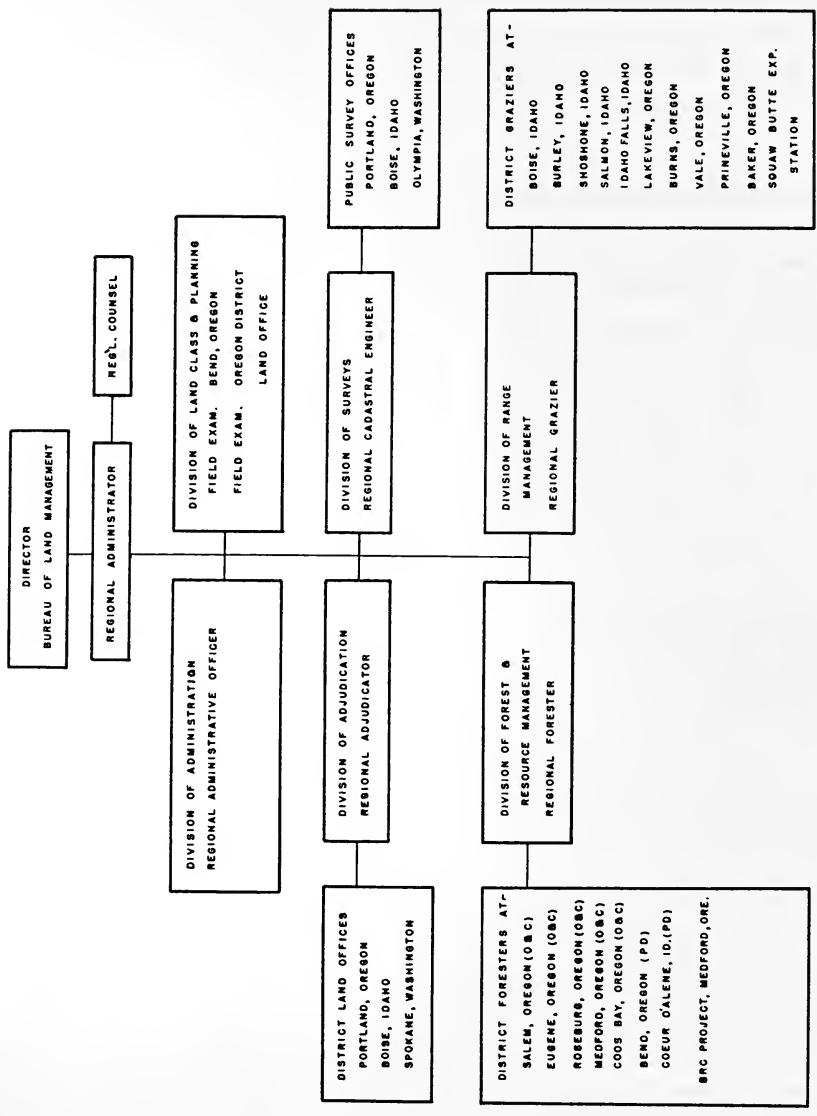
service, a regional representative of the forestry division (which had recently been created to begin the job of bringing scattered public-domain remnants of forest land under some kind of management), the division of field examination (which from San Francisco and Salt Lake City had carried on the multifarious inspections necessitated by the laws under which the GLO operated), the Oregon and California Revested Land Grant Administration (which was unique to Oregon), and the Grazing Service. The latter had been administered from a central office at Salt Lake City and regional offices at Burns (Oregon), Boise (Idaho), and, for the eastern part of the Pacific Northwest, from the Billings and Cheyenne regional offices.

It is remarkable that this disintegrated field setup had survived so long. It was able to function only while the GLO conceived its job primarily as a recording and adjudicating rather than a management task. As soon as land and resource management began to be of concern, as it did slowly after 1933, a drastic change in field structure became inevitable. Main outlines of the change are fairly clear, and most of the intended delegations of responsibility to the field establishment are also known. While the latter will doubtless undergo further modifications, the ultimate pattern is likely to be in the direction of increased decentralization.¹

Field Functions of the BLM

The Portland office of the regional administrator (region 1) whose areal jurisdiction covers field activities in Washington, Oregon, and Idaho has five functional divisions: range management, timber and resource management, land classification and management, engineering and construction,

¹ The study of the field functions in the Pacific Northwest, of the General Land Office and of the Grazing Service, was begun by the writer in 1945. When the research on this project was discontinued in the spring of 1948 the dissolution of the old structures and the recombination which was begun on paper in May, 1946, were not yet complete in living fact. They are still incomplete, but great strides were made and many of them have been taken since spring 1948. While an effort has been made to suggest by postdated footnotes some of the more important modifications in the function and practice, it is well to call attention here to the fact that the dynamic results of new and yeasty leadership are not yet complete. Evidence is clear that a transformation into a genuine management organization is getting under way in this region. This is shown by (1) the steps taken toward making the field-office areas into land-management units and reducing the regional office to staff and supervising functions; (2) the creation of a land-planning division to head up the preparation of a long-range management plan for the region; (3) constructive innovations in planning its annual timber sales for Oregon and California ("O-and-C") lands; (4) its challenge to the hoary but inadequate laws governing the establishment and the scope of mineral claims; and (5) the spirit of initiative in seeking interagency cooperation on problems of joint concern. If these efforts persist and are not thwarted by Western pressure groups linked to the old General Land Office and Grazing Service functions traditionally antagonistic to resource conservation, the decline in values of the federal public-domain lands should at least be arrested and restoration should begin. (November, 1949.)



Bureau of Land Management: Regional Organization Chart.

and adjudication.² This regional staff of the Bureau of Land Management's office in Portland supervises the activities of 22 local field offices established in the public-domain areas, principally in Oregon and Idaho. While each local office is organized and staffed for the primary work to be done in its particular area, it is also expected to deal with a considerable variety of land problems.

The present organization presents some confusion as between local office functions so that some matters may have to be referred from one office not specializing in a particular problem to another local office which does. This reflects both the geographical specialization of land problems and the imperfect amalgamation of the former specialized field structure of the GLO. The head of each local office is technically responsible to the regional division chief having primary interest in the work of his particular area while his administrative responsibility runs directly to the regional director.

Although the president's reorganization plan No. 3 abolished the district land registers, the holders of those positions have been retained and retitled "managers." It was the expectation of the reorganization plan that these hoary political jobs would at last be brought into the regular classified service. This expectation has been delayed, primarily because of the problem of classifying these positions. Most of them cannot be properly classified at levels high enough to warrant the rates of pay which Congress has heretofore so generously provided them. This would be true even with the enlarged field adjudication functions which are ultimately expected to be transferred from Washington and centered in the district offices. This delay afforded an opportunity for Senator McCarran of Nevada to introduce a bill for restoring these positions and their occupants to their former patronage status, but his bill failed to pass.³

The adjudication work has always been concentrated in Washington where routines and distance have created unconscionable delays in settlement; rarely are land exchanges with private parties perfected in less than two years.

² The titles of two divisions have been changed to land classification and planning, and engineering. The latter performs simply the cadastral and engineering functions. (November, 1949.)

³ The situation with reference to the district land registers has been greatly changed since early 1948. These positions are now under the classified service. The land offices are the centers not only for the older land-record work but for the new field adjudication activities and for general informational purposes of the bureau in the locality. They are also being used as the centers for cadastral-survey headquarters and for a good deal of the mineral-claims-examining work, though in these functions direction is furnished by regional chiefs for each function. The general program of organization is directed toward the ultimate objective of an area office responsible for operating all bureau programs. (November, 1949.)

It is impossible to recite here the many kinds of questions that give rise to the adjudication functions of the Bureau of Land Management. They grow out of some 5,000 Congressional statutes affecting the distribution or sale of public lands including the homestead laws; legislation covering exchanges of Taylor grazing-district land and national-forest land or timber for private lands; the authorizations for the locations of mineral claims on public lands; and the provisions for the leasing of deposits of coal, phosphate, sodium, oil, oil shale, gas, and other minerals. Another source of adjudication issues is the authority given the president to make withdrawals of public land for various special purposes, such as water-power sites, irrigation, and classification. All these measures are sources of rights or restrictions with respect to the alienation or use of public-domain lands that may require adjudication, heretofore performed in Washington by the GLO.

There can be no doubt of the urgent need for complete revamping of the inherited adjudicatory procedure. The building of a general regionalized structure within the new Bureau of Land Management logically refutes most of the old arguments for centralizing this important but routine work. All basic land records are made and retained in the field.

The inspection work is inherently a field task despite the fact that Washington long held to the expensive and time-consuming process of sending men out from the capital or from field stations at remote distances from the site of the land to be inspected. With the creation of regional offices, centrally located for the areas served, and manned with high-grade career directors and staff, including a few experienced adjudicators, the bureau made plans for decentralizing its adjudication job. As will be explained later these plans were interrupted by an appropriation rider belatedly attached to funds for 1948.⁴

Closely related to this work is that of surveying lands. The surveys date from preconstitutional times and stem directly from the ordinance of 1787, a product of the mind of Thomas Jefferson, which established the basic scheme for public-land surveys. In public-land states like those of the Pacific Northwest all private land titles originate in these public cadastral surveys. Surveys began in the Oregon Territory (including what is now Washington) long before they were started in other Western states, and even before the Coast and Geodetic Survey had moved inland from the seacoast. In addition to locating township, section, and quarter-section lines, the sur-

⁴ In the months since the above situation was described the decentralization of adjudication from Washington has gone on apace. Close to 80 per cent of all adjudication has been transferred to the field, and additional delegations will follow. This work is centered chiefly in the district land offices, though the district range managers and the district foresters care for some types of adjudication under the staff guidance of a regional reviewing officer. (November, 1949.)

veys give topographic features and stream locations. From the field notes the engineers prepare plats, sending copies to Washington and to the district land registers.⁵

Large areas within the national forests and the unreserved public domain have never been surveyed. In addition to making original surveys, there is a huge task of resurvey of public and private lands on which either the original monuments have been obliterated or where the original surveys were incomplete or inaccurate. The instruments used in the early surveys did not have the precision essential for accuracy. Thus in running the southern boundary of Oregon which was supposed to follow the 42d degree of latitude the survey line frequently swings to the south or north of the parallel.

For many years the surveying was done by private engineers working under government contract. Too frequently this resulted in careless and sometimes fraudulent work. In the latter instances the "surveys" were made by pencil, paper, and imagination without benefit of actual field work. Although this contract system was abolished in 1910 when Congress finally authorized the organization of a government-paid engineering staff, it is still used for delineation of mining claims. These are surveyed by private engineers who are designated by the supervisor of surveys, but who work for the claimant on a *per diem* basis. While their surveys have to be approved by the bureau engineer who issues the order for the survey and prepares the plat, quite often the private engineer is tempted to favor the claimant by including in the survey more land than is legal.

The activities of numerous federal administrative agencies also furnish a great deal of work for the bureau's cadastral engineers. Thus sales of O-and-C land and Forest Service timber necessitate new or corrected surveys. Land purchases and public-domain withdrawals initiated by the National Park Service, and reclamation-project subdivisions add to the duties of the Bureau of Land Management. These tasks have not been the exclusive function of the Bureau of Land Management engineers. Formerly the Forest Service employed its own engineers for land surveys as did the Bureau of Reclamation for its intensive study of the Columbia Basin. These practices, while heretofore justified because of inadequate appropriations and staff for the cadastral engineering unit of the General Land Office, are wasteful of federal funds, for the only legal surveys are those performed by the Bureau of Land Management. Surveys by other agencies will have to be redone sooner or later by that agency.

The intermingled and checkerboard character of ownerships in the

⁵ The three former district land offices in Oregon were consolidated in May, 1948. There is now a single office in each of the three states in region 1: at Portland (Oregon), Boise (Idaho), and Spokane (Washington). (November, 1949.)

national forests, and on the grazing districts on the O-and-C land-grant area, due chiefly to the railway land grant, and related land-exchange policies, makes a need for surveys much greater than it would have been if these public reservations had been compact units of federally owned land. As a consequence of these needs the survey job in the Pacific Northwest is many years behind.

The survey activity dovetails with another function of the Bureau of Land Management, namely, with the inventorying and classification of public lands. While something over a million acres of land within the Taylor grazing districts has been given a preliminary inventory as to forest resources, the balance of the public-domain lands within the region awaits inventory as a prerequisite for the application of a program of sustained-yield management. For the administration of the O-and-C land-grant areas the rather sketchy inventory made by the Forest Service for timberlands in western Oregon was available in 1937. This was later partly corrected by sample checks carried out by the Oregon and California Revested Land Grant Administration.

An inventory really adequate for the management of even the O-and-C lands has yet to be compiled. Until Uncle Sam knows what his landed estate consists of and possesses accurate maps of that estate it will be impossible to make a proper classification of differing land areas as a basis for deciding the best use to which they should be put.

It should be noted that at no single center in the region or elsewhere can a map be found which shows all federal land ownerships. The cadastral engineers make plats, not maps. Some of the federal agencies have maps of their own ownerships but others, including the GLO, do not. An unsuccessful effort was made to obtain for this study a map of all federal ownerships in the region. The National Resources Committee recognized the need for a complete map of federal ownerships and in the late 'thirties sponsored a WPA project to prepare one for the Pacific Northwest. After a year of work founded on the plats filed in the district land offices, the National Resources Committee ran out of sponsoring funds and the GLO was persuaded to take the project over. However, WPA folded up before the project was completed. The Oregon and Idaho maps were the most nearly complete and were taken over by the Oregon and California Revested Land Grant Administration and finished during the war in a conscientious-objector camp. One of the cadastral engineers who had a good deal to do with this work states that these maps are marred by numerous errors due to lack of careful checking. Yet even had the maps been most meticulously done, they would now be unreliable for management purposes because of the many ownership changes that have taken place since they were compiled.

This is one of those undramatic but basic activities for which steady Congressional support has been difficult to obtain. But without these elementary data no management program can be developed without running the risk of grave errors. If a thorough program is not authorized, data will have to be obtained to meet special urgent problems on an unsystematic catch-as-catch-can basis. Despite Congressional failure to provide adequate funds for this work, the Congress has charged the Bureau of Land Management with the classification of all public lands according to their highest use.⁶ The federal government was very late in realizing that the classification required systematic ground examination by competent specialists. For lack of appropriations little careful classification work had been done until the presidency of the first Roosevelt.

In addition to the GLO the Geological Survey was drawn into this task through its topographic mapping work and more particularly as a result of special duties given to it by Congress to classify public lands by their mineral characteristics and their value for water power and water storage. The studies and recommendations of the Geological Survey play an important part in the decisions of the Bureau of Land Management, but are not sufficiently comprehensive to meet all management needs.⁷

Timber Management and the BLM

At the present time a distinctly inadequate inventory of the forest resources on the 2,500,000 acres of land granted to the Oregon and California Railroad and the Coos Bay Wagon Road (which, through breach of grant conditions, reverted to the federal government in 1916) is the starting point for management activities on those important western Oregon lands. The inventory includes the interspersed lands, following the alternate section pattern of the original railroad grants. Any management plan will have to pay attention to these interspersed lands because of the need for exchanges or purchases to block the federal land into more compact units. For the nonfederally owned sections data on timber volume and characteristics are essential to lay the foundation for planning sustained-yield units under the cooperative program which Congress has authorized.

When the new Bureau of Land Management was formed the programs of the Oregon and California Revested Land Grant Administration continued without significant change. The Congressional statute of August, 1937, which established that administration, had authorized the sustained-yield management of those lands. They lie scattered in parcels varying from a few acres up to oversized sections in checkerboard fashion from

⁶ 43 U.S. Code 3115 f.

⁷ See chap. xi for a fuller statement of Geological Survey activities.

the Columbia River along both sides of the Willamette Valley up into the Cascades and Coast Range, and down across the Siskiyou to the California border. Their area approximates 2,590,000 acres. Intermingled with them are other sections and parcels of public-domain land, national forests, state, county, and private land totaling an additional 6,000,000 acres. It is estimated that the O-and-C revested lands contain approximately 50,000,000 board feet of timber, chiefly Douglas fir.

In the southern part of Oregon about 150,000 acres covered largely with oak and chaparral are primarily useful for grazing. Except for that area this revested grant contains the very best remaining Douglas-fir stands in Oregon. They lie on lower foothills and mountain slopes, for the most part below the national forests, and on more fertile and accessible sites, though there is some intermingling with national-forest areas. The story of Congressional policy between 1916 and 1937 concerning these revested land grants is one of continued indifference to conservation and proper land use.

Before the organization of the Oregon and California Revested Land Grant Administration, the O-and-C timber was being sold to the highest bidder as demand developed without regard to a sustained-yield objective. It was the purpose of the 1937 statute to end that liquidation policy and instead (1) to make immediate sales only where warranted by reference to a continuous-yield program; (2) to make a proper land-classification plan and (3) to work out programs for long-term sustained-yield forest management, which, in combination with O-and-C and other land, would provide for integrated management units. Under this purpose the major goal was to assure that the annual cut plus timber loss from fire and other causes would approximate the annual timber growth, that cutting methods would provide for natural reseedling, and that an adequate set of practices would be followed to minimize and suppress fires and insects. In the words of the act of 1937, the new plan was to be that of "providing a permanent source of timber supply, protecting watersheds, regulating stream flow, contributing to the economic stability of local communities and industries and providing recreational facilities."

The organization created in 1938, altered but slightly until its incorporation in 1946 into the Bureau of Land Management, began the basic inventory and other management tasks. It soon had located district foresters in five convenient towns where they continue today to carry on estimates and appraisals for timber sales, supervise logging operations, report on fire-protection needs and measures (actual suppression is contracted to the Forest Service and to the state and private protective associations), and negotiate grazing and other special uses.

The chief forester's headquarters in Portland has now been absorbed into the regional administrator's office of the Bureau of Land Management. The local district foresters have received a few additional duties incident to land-office tasks within their areas. Their activities are similar to those of the rangers and supervisors in the Forest Service on comparable national forests, except that their fire-suppression and recreational functions are relatively not extensive. These latter differences are the result of the "contracting out" of the fire-suppression job and the failure to give the recreational potentialities on these lands due emphasis.⁸

In addition to the basic inventory job this organization at once started reclassifying its whole landed estate so as to correct the many errors in the early classifications. They had erroneously attributed agricultural utility to most of the area. The reclassification studies indicate that only 19,000 of the 2,590,000 acres are suitable for agriculture and nonforest uses, and that an additional area of 125,000 acres of forest land is not commercially valuable.

The major task, however, for managing these revested and intermingled lands has been the development of sustained-yield forest units as soon as essential data have been compiled. Plans have been made for 110 such units, each large enough to support on a permanent basis if properly managed, the continuous operation of one average-sized Western sawmill. Such a unit combines all public and private timber resources of a given watershed. Further recombinations have been made of these 110 units into twelve master units, each grouped around a local marketing area. It is intended that the timber shall be processed into lumber or other products within that area. Thus the plan of master units is directed toward the economic stabilization of existing logging and milling communities in the western part of Oregon.⁹ The first detailed master plan for the Siuslaw River master unit was released for local public discussion in August, 1945. This unit includes the major part of the drainage of the Siuslaw River (which flows from the Coast Range into the Pacific Ocean near Florence) and extends eastward across the low mountains down into the Willamette Valley. It lies largely in Lane County but includes a small slice of northern Douglas County, and is estimated to contain 18 per cent of the commercial forest timber in Lane County and 1 per cent of that in Douglas County. The fifteen communities in the market area to be supported by this master-unit plan extend from Eugene in the Willamette Valley to Florence at the mouth of the Siuslaw. Except for Eugene these are quite small communities

⁸ Both programs are now receiving greater emphasis. (November, 1949.)

⁹ See *Forever Timber*, a pamphlet by the Oregon and California Revested Land Grant Administration, Portland, Oregon.

that have depended upon an economy of lumbering, or farming and lumbering.¹⁰

By May, 1948, eleven other master units had been established. They have been designed in such a way as to pour the timber resources they contain ultimately into designated marketing areas so as to stabilize the local communities whose existence is menaced by the approaching depletion of the forests. These plans will necessitate some reductions in the volume of current milling and logging but they promise on that reduced scale perpetual opportunities for work in the woods and mills and in the dependent commercial and service establishments. They would in addition stabilize the market for much local agricultural produce.

It would have been possible to map a sustained-yield program on a different geographic hypothesis; namely, a market area as big as the entire region of western Oregon, and a limit on cutting operations not unit by unit but simply for the area as a whole. But the administration chose the subregional dependent-community policy, thus partly harmonizing its general objective with a policy toward which the Forest Service had been striving in its sale of national-forest timber but, because of legal handicaps, with indifferent success.

The basic instrument for establishing sustained yield and community support is a standard contract between the private, state, and local timber owners and the secretary of the interior, which will provide "coordinated administration with respect to time, rate and method of cutting and sustained yield of land" within each forest unit. The original contract, proposed and tentatively negotiated with one company, was subjected at a public hearing to severe criticism by the smaller operators, particularly by those without substantial timber ownership, as well as by representatives of the CIO and the AFL timber-workers unions, the grange, the farmers union, and the sportsmen's groups. Their principal complaints were that it would squeeze out the little fellow and foster monopoly and company ownership of towns.

On June 2, 1948, the assistant secretary of the interior announced the department's decision (1) to proceed with coöperative agreements with "owners of intermingled private lands for the purpose of providing economic stability to communities dependent upon timber for their livelihood"; (2) to withhold execution of the proposed agreement with the first company until that agreement should be revised; and (3) to delay setting

¹⁰ See the *Brief Discussion of the Proposed Siuslaw Master Unit* prepared by the Oregon and California Revested Land Grant Administration (Portland, Oregon: August, 1945), a duplicated pamphlet. See also a statement presented by Walter H. Horning at the public hearing held in Eugene on December 1, 1945, concerning the Siuslaw master unit: *Cooperative Management Program for the Proposed Siuslaw Master Unit of the O and C Lands*.

up the first sustained-yield unit until an acceptable agreement should be worked out. The department further instructed the Bureau of Land Management to make important modifications in its program.

The principal elements in the present plan are:

1. The advisory board, created to help plan the administration of the re-vested lands, is to be enlarged to include representatives of labor, agriculture, recreation, and other interests. A similar board to be set up in each of the five administrative districts is to be consulted in plans for administering each master sustained-yield unit. Where a community is affected by a proposed coöperative agreement a local advisory committee may be formed for consultation during the formulation of plans.

2. With the aid of the district boards the bureau is to plan for administering O-and-C timber in master units and subunits. Boundaries and management plans will not be final until public hearings have been held.

3. It is the intention, where harvesting is to be through coöperative agreements, to bring as much private land under management practices as is contributed by the federal government, though private owners will be given time to make the necessary acquisitions during the first 25 years of the life of the agreement. Community employment and prosperity are to be furthered by the requirement that the coöperator arrange for full utilization of the timber through secondary manufacturing processes.

4. To prevent monopoly and "freeze-out" situations in coöperative units, small owners will be assisted in pooling their facilities and holdings so they may qualify to become coöperators.

5. The bureau will determine conservation methods to be used by the cooperator on both public and private land, and may inspect his records and his facilities.

6. In the interest of permanent economic stability the agreement is to specify those communities to be stabilized by the primary manufacturing of the timber harvests in any unit. To protect against undue plant expansion, restrictions are to be placed on the total amount of timber to be processed in the mills of co-operators, and the amount of logs that may be procured from outside the unit area.

7. The length of the agreement is to be the normal rotation period needed for managing the kind of forests concerned, but the contract is subject to review by the bureau every 25 years, when it may be cancelled or renewed for another 25 years.

8. Agreements are to commit both public and private land to suitable recreational use and to safeguard recreational values.

9. To meet the criticism of monopoly and to assist smaller owners to coöperate, the timber on certain units of O-and-C land is to become available for competitive bidding by coöperators who meet the requirements relating to increased utilization and improved forestry practices. Also, the bureau is to construct access roads to land now inaccessible and to allow their use to only those operators who will reciprocate by permitting use of their own roads for transportation of O-and-C timber to a highway.

10. The bureau is to study the existing credit facilities for timber-acquisition programs and integrated manufacturing facilities and, if suitable credit cannot

be found, is to cooperate with the Forest Service in preparing legislation for this purpose. It also promises to seek funds for technical staff to aid loggers and mill operators to utilize fully "each tree and log."

If this proposed pattern of organization and binding relationships is promptly accepted by private parties and by state and local agencies, a genuine start will have been made toward a stable forest industry program for western Oregon.

Before 1946 the job of timber management on the public-domain lands supervised by the General Land Office, other than O-and-C revested lands, had been completely neglected. The scattered location of timbered areas on such lands whether in the Taylor grazing districts or on other tracts had made it rather difficult to create a management organization for that one purpose. About the only timber-management function assumed by the GLO had been some fire-suppression work.

With the coming of the Taylor Grazing Act and the organization of grazing districts on the unreserved domain a fire-control program supervised by the Grazing Administration developed during the past few years. In that work presuppression activity has consisted chiefly of the preparation of fire breaks and enlisting the cooperation of state and other agencies in educating the public against the hazards of fire. Because the fire problem on grazing-district lands is chiefly centered in the Pacific Northwest region with its dry summer season, Congressional funds for this program have been spent principally within this area.

In 1946 the GLO set up a special unit in the Pacific Northwest intended to launch a program of sustained-yield management for the commercial timber on the unreserved public domain. The first step in this new effort was to learn the location, kind, and amount of the timber. The GLO staff relied for this purpose chiefly on data developed by the Forest Service in its comprehensive forest survey of some years ago. It discovered within the four states of Idaho, Montana, Oregon, and Washington a body of timber wealth totaling approximately 2,650,000,000 board feet. The management of these neglected timber tracts on a sustained-yield basis has been facilitated by two statutes. The first enacted in March, 1944, authorized the secretaries of agriculture and the interior to enter (separately) into cooperative agreements with private forest-land owners for the coordinated management of federal lands within the jurisdictions of the secretaries. Such agreements would waive the requirement for competitive bids for the purchase of federal timber, a provision which had for many years handicapped the Forest Service in its efforts to inaugurate sustained-yield cooperative management programs and which would have blocked any similar Interior Department program for public-domain timber.¹¹ The

¹¹ *Public Law No. 273, 78th Cong., 2d sess.*

second legal change is contained in a 1947 act.¹² This for the first time allows sale of timber generally from the public-domain lands without selling the land as well. The timber programs thus permitted on these lands are duties of the Bureau of Land Management. Its regional office in Portland, through its branch of timber and resource management, has planned to establish local timber-management offices in Bend (Oregon) and Spokane (Washington) to push this work ahead. Drastic cuts in bureau funds for the fiscal year 1948 however made that impossible.¹³

The Grazing Resource of the Public Domain

The vacant public lands in the states of the Pacific Northwest which still remain in federal ownership constitute a sizable estate despite a century of alienation of federal title incident to the settlement of the West, and even after the establishment of Indian reservations, national parks and the other withdrawals for such purposes as irrigation and water-power sites. As of June, 1944, this area was estimated for the four states of Idaho, Oregon, Montana, and Washington to total nearly 36,500,000 acres of which approximately 32,600,000 acres have been incorporated into Taylor grazing districts.¹⁴ The other more than 4,000,000 acres lie in scattered tracts of varying sizes in widely dispersed locations throughout the region. All these lands are primarily useful for grazing, wildlife, and watershed protection, being too arid for dry farming, too thinly vegetated with grass, browse or timber, or too remote to have been attractive to private parties for homesteads or timber claims. Moreover, because of the complete absence of management by the GLO their grazing values have been appropriated free of charge by the adjacent livestock owners or by bands of roving herdsmen having no private land right of any sort. This "ruggedly individualistic" attitude toward public domain has existed from the earliest period of Western livestock production. Its survival down to 1934 had led a few of the larger operators, particularly in the Southwest, to fence large tracts of land for their own private use. Secretary Ickes' threat to seek indictments of these stockmen is said to have been one of the reasons why some of them swung into line behind the Taylor grazing proposal, in the administration of which they have had an important voice as will later be indicated. The condition of this picked-over residue of the public domain in the eleven Western states at the time of the Taylor Grazing Act

¹² *Public Law* No. 291, 80th Cong., 1st sess.

¹³ More generous Congressional action for the fiscal year 1949 has permitted the establishment of these offices. (November, 1949.)

¹⁴ These figures are taken from a pamphlet *Vacant Public Lands* released by the GLO (January, 1945).

was described by the director of the Rocky Mountain Forest and Range Experiment Station at the time as follows:

The public domain of the West is made up of remnants left after careful culling by many agencies. The homestead, desert homestead, and grazing homestead laws eliminated much of the best of the natural range area. State, railroad, and other grants, with their provision for lieu selection of indemnity land, still further reduced the average quality. The national forests, Indian Reservations, reclamation withdrawals, and so forth, each have absorbed grazing land better than that which remained. Clearly the residue of 165,695,479 acres consists of the least desirable of the original 1,442,220,320 acres.

Not only is the land poor in quality but its geographic distribution often makes administration difficult. Except those semi-desert, or extremely low-value areas where there was little demand for the land, it is scattered in units too small to administer separately and badly intermingled with other ownerships. As has already been emphasized, absolute lack of proprietorship on the public domain resulted in the worst kind of abuse through overgrazing and use during improper seasons. Wherever there is any public domain used as open range, it is in virtually every instance in a more advanced state of depletion than similar land under any other form of ownership.

Along with forage depletion has gone, more often than not, the top soil, and along with it the soil fertility. The forage and soil resource is generally so badly deteriorated that the land has lost not only its grazing values but also its ability to regulate run-off and prevent erosion.¹⁵

The administration of this residue of Western public grazing land was placed by the Taylor Grazing Act of 1934 under charge of the secretary of the interior. To understand the current problems of administering this statute with its amendments—problems arising in part from the catastrophic budget cuts which began in 1946 for the fiscal year 1947 and the less drastic reductions continued for 1948—it is important to know some of the essential provisions of the act and the history of its administration.

The opening sentence of the law clearly implies that the federal administration of these public-domain lands under the new district program is to be temporary, and that the historic policy of disposal to private parties is to be resumed. This clause was undoubtedly a concession to obtain the support of Western livestock interests and their Congressional friends to the placing of Western public lands under some public-management program. Despite the numerous official reports, beginning with that of President Theodore Roosevelt's Public Land Commission of 1903, which had advocated a federal-management program, the livestock interests had always successfully blocked such plans. This initial clause indicates also the basic desire and intent of many livestock men to possess these public lands in effect if not in law. This attitude is the major reason for the disaster

¹⁵ Lyle F. Watts, "Unsuitable Land Policy" in the *Report on the Western Range by the Forest Service*, Sen. Doc. 199, 74th Cong., 2d sess., p. 236.

which has overtaken the Grazing Service and for renewed efforts to obtain legislation for transferring the public domain and Forest Service grazing lands to the states and thus ultimately to private owners.¹⁶

The secretary of the interior is authorized to establish grazing districts out of the unreserved public land, except from lands already in national parks, national forests, or Indian reservations. He is enjoined to make provision for the protection, administration, regulation, and improvement of such grazing districts "and to adopt regulations and make cooperative agreements" to insure the object of such grazing districts, namely, "to regulate their occupancy and use, to preserve the land and its resources from destruction or unnecessary injury, to provide for the orderly use, improvement and development of the range." He is further ordered "to continue the study of erosion and flood control and to perform such work as may be necessary amply to protect and rehabilitate the areas subject to the provisions of this Act through such funds as may be available for that purpose." The right to ease the financial burden of the stockmen is granted to the secretary by the words: "during periods of range depletion due to severe drought or other natural causes or in case of a general epidemic or disease during the life of a permit, the Secretary of Interior is hereby authorized in his discretion to remit, reduce, refund, in whole or in part or authorize postponement of payment of grazing fees for such depletion period so long as the emergency exists."

In issuing permits to graze livestock on the districts, the secretary is required to give preference to "those within or near a district who are land-owners engaged in the livestock business, bona fide occupants or settlers, or owners of water or water rights, as may be necessary to permit the proper use of lands, water, or water rights owned, occupied or leased by them." Another clause assures the renewal of a permit if the permittee complies with the regulations of the secretary whenever a denial "will impair the value of the grazing unit of the permittee when such unit is pledged as security for any bona fide loan." Permits run for not more than ten years with a preference right of renewal.

¹⁶ The United States Chamber of Commerce, as a result of proposals by a committee chaired by former Governor Carr of Colorado and submitted to referendum, adopted a recommendation that "espoused the cause of the large livestock operators and called for a public land policy which would re-establish private ownership as the ultimate objective in government land policy." In this action (later softened) it was following the lead of the National Wool Growers Association and the American National Livestock Association which in 1946 approved a joint committee report that advocated the right of existing permittees to purchase federal grazing lands and, after the expiration of a period of fifteen years, the deeding of the residue to the states. Senator Robertson and Congressman Barrett, both of Wyoming, introduced bills in 1946 to further these objectives.

The foregoing provisions indicate the general intent of the act to make this temporary administration of the public domain by means of the grazing district serve the interest of both range rehabilitation and the stabilization of the existing livestock industry. Excluded from the benefits of this last objective were the Basque and Mexican sheep men who frequently had not taken out citizenship papers; a clause forbade the granting of permits to aliens.

The Forest Service had criticized the permittee clauses severely at the time the act was passed, on the ground that they would tend to perpetuate the monopoly of the large livestock operators who, by the lease or purchase of state land or of water rights, had been able to get possession of the principal watering holes necessary to the use of much of the rangeland. Forest Service officers warned that the act might thus legally confirm "the old practice of controlling large areas of public domain by the ownership of a few acres of land strategically located."¹⁷

Alarm was shown also over the required renewal of permits whenever the permittee's unit had been made a security for debt. It was asserted that the universal use of livestock for bank loans would mean that no renewal could be refused.

The fact that the public-domain lands were not in solid blocks but were intermingled with private, state, and county land created a clear need for exchanges of property between the federal government and other owners. The chances for constructive district management were contingent upon changing this crazy quilt pattern of ownerships so as to bring adjoining range tracts under common control. That was made possible by Section 8, the use of which has been of great importance in working out more nearly manageable ownership patterns for all parties to such agreements and particularly for handling grazing-district lands.

The ownership pattern in the grazing areas of eastern Montana may have been somewhat more complicated than that of the range areas in the Pacific Northwest, but the complications were of the same kind. President Renne of Montana State College, then a member of the Montana State Experiment Station, conducted a careful study of this situation and gave the following description of grazing-land ownership at the time the Taylor Grazing Act was adopted.

Thousands of tracts owned by individuals residing all over the United States; thousands of small farm units interspersed among grazing areas and other ownerships; a large portion of the remaining public domain occurring in isolated, disconnected tracts; state holdings scattered, usually including the sixteenth and thirty-sixth sections of each township; thousands of acres of county land, taken through continued delinquency, and occurring haphazardly in

¹⁷ *The Western Range*, Sen. Doc. 199, 74th Cong., 2d sess., pp. 292 ff.

small units; railroad lands making a checkerboard effect in some areas, being much more scattered in others; insurance company lands scattered thinly here and there; investment and mortgage company holdings strung out in a disorderly fashion, representing parcels out of larger blocks not yet sold; lands foreclosed by land banks and commercial banks occurring at random here and there . . . such is the pattern of ownership established under a policy of "laissez faire," free individualism, and planless settlement.

One provision in the Taylor Grazing Act implied a close association of the administration of the new districts by the Department of the Interior with the local livestock and state interests. It required the secretary to cooperate with "local associations of stockmen, state land officials and official state agencies engaged in the conservation or propagation of wild life interests in the use of the grazing districts." The same section also ordered the secretary to provide by regulations for "local hearings on appeals from the decisions of the administrative officer in charge in a manner similar to the process used in the Land Department."

The first director of grazing made these clauses the basis for a system of advisory boards, which, as will be noted below, have played a leading part in district administration. A further tie with local livestock interests was created by the authorization to the secretary to accept contributions "toward the administration, protection, and improvement of the district." Largely as a result of such contributions during the fiscal year 1947 the work of the districts was kept going after appropriations were slashed.

The act originally pledged 25 per cent of the grazing fees received for the use of public-domain land to the department for constructing, purchasing, or maintaining range improvements, subject to specific Congressional appropriations. The act instructed the secretary of the treasury to return to each state 50 per cent of the receipts from its grazing land within its borders to be used for the benefit of the counties in which the land is situated. This provision was of great importance in financing a range-improvement program, because all but two of the states of the West have turned this refund money over to the state advisory boards for expenditure through the district advisory boards on grazing-district improvements.

Amendments to the Taylor Grazing Act adopted on August 6, 1947, changed the legal situation as to fees by breaking the charges to the permittees into two segments, one called a "grazing fee" and the other a "range-improvement fee." The small increased charge assessed against the users by Secretary Krug after a long battle between Secretary Ickes and Director Forsling and the livestock associations (which is described below) was thus technically a grazing fee of five cents and an improvement fee of three cents. Other changes made by the 1947 amendment modified the distribution of revenues to the states for reallocation among the livestock advisory boards. The allocation for this purpose was reduced from 25 to 12½ per

cent of the grazing fee, but 50 per cent of the money taken from lands leased under Section 15 was added to this state share.¹⁸

In addition to setting up the district program, the Taylor Grazing Act also attempted to start some management operations on the scattered tracts lying outside the districts. It empowered the secretary to lease these lands but required him to give preference to "owners, homesteaders, settlers or other lawful occupants of contiguous land." Whenever such rangeland comprises 760 acres or less, it was ordered to go to the contiguous-land owner or lessee if he should so elect.

To tie the administration of the Taylor Grazing Act as closely as possible to the Western livestock interests, its final section not only made the director of grazing a political appointee, subject to confirmation by the Senate, but instructed the Civil Service Commission when considering the nominees of the secretary of the interior for assistant directors and for graziers, to "give consideration to the practical range experience in public land states" of such persons. The final sentence of the act read: "No Director of Grazing, Assistant Director, or Grazier shall be appointed who at the time of appointment or selection has not been for one year a bona fide citizen or resident of the state or one of the states in which such Director, Assistant Director or Grazier is to serve."

At the time of its amalgamation with the Bureau of Land Management the Grazing Service was operating from a national headquarters at Salt Lake City and from nine regional offices, three of which had jurisdiction over districts in the Pacific Northwest. There were no districts in Washington, where the area of public lands is too small and too dispersed to warrant their organization. But in Oregon were seven, in Idaho five, and in western Montana, one. Under the 1946 reorganization the Oregon and Idaho districts (now reduced to ten) were placed under the jurisdiction of the regional director. These twelve districts include approximately 26,000,000 acres of federal rangeland plus 15,000,000 acres of intermingled state, county, and private lands. About five thousand stockmen graze 500,000 cattle, 50,000 horses and from 1,500,000 to 2,500,000 sheep under licenses or permits for these district lands.

Although the administration of district land has been subject to severe budget curtailment since July, 1946, because of drastic cuts in appropriated funds, it will still be useful to think of the job of operating a Taylor grazing district as that was carried on during the fiscal year, 1946, the last year of the Taylor grazing administration. District no. 5, with headquarters at Prineville, Oregon, extended to the Ochoco National Forest on the north, and met the northern boundaries of district no. 1 on the south. Within this large area, the greatest intermingling of state, county, and private land

¹⁸ See *Public Law* No. 376, 80th Cong., 1st sess., chap. 507.

with public domain had occurred on the east and northwestern parts. Consequently one of the first and continuing jobs of the district grazier was to initiate land exchanges in order to consolidate federal holdings. In order to complete such exchanges it was necessary for the Grazing Service to obtain agreement on valuation figures submitted by the district grazier with the inspectors of the branch of field examination of the General Land Office, and also to obtain final approval on title from the Washington office of the GLO. That process was time-consuming and has meant that to complete an exchange required from six months, in unusually speedy cases, to a year and a half or two years after an agreement had been reached between the Grazing Service and the other party to the exchange. In the Prineville district most of the blockings in the eastern section were just about completed by spring 1946. But a large and difficult unresolved blocking problem remained in the northwestern section, particularly in the territory adjacent to the Redmond irrigation project. Much of the public land, reserved years ago for the Redmond project, will not be used for irrigation. It is now being cut back by the state of Oregon in numerous small tracts the location of which will probably defy any consistent blocking program. (The states were formerly allowed to reserve public domain for irrigation purposes.) Consequently with no funds available for land-exchange work it appears that it will be impossible in that area to work out a satisfactory fencing program between private and federal holdings, for better management of the range.

Another problem of land exchange on the Prineville district grows out of minor errors in drawing the boundaries between the national forests and the grazing district. For example a number of tracts of commercial timber along the north side of the grazing district should have been included in the Ochoco National Forest, and within the forest are patches of grazing land free of timber that should have been given to the district. If these two federal programs are to remain in the care of different agencies, each with its own responsibility, these boundaries should be rectified so that fences for management purposes may be properly located and each resource given the technical management skills possessed by the agency set up for that job.

The biggest initial problem in district work was the adjudication of claims to the public-domain rangelands. As the Taylor Grazing Act has been construed, the right to use the range was based upon prior use during the period 1929-1934. It was an onerous task to discover who had used the range and how many animals each user had pastured. The most valuable sources of data were the mortgage records of the county, the loan data of banks, loan companies, and insurance companies, and the permittee records of the Forest Service. The work of digging out this information

was until 1946 a principal preoccupation of the district grazier. He then presented it to his district advisory board which in fact made the determinations of the average numbers of stock grazed. Since the district grazier at Prineville has had no help in his office other than a stenographer-clerk, such research was seriously handicapped.

The law and the federal range code promulgated by the secretary of the interior require that no more stock may be allowed a licensee or permittee than can be safely grazed on the public land and maintained by him on his base land during those parts of the year when livestock is not on the federal range. To make this determination it has been necessary to survey the grazing and feed resources on both grazing-district land and on the private land. Because the district is so large and the staff so small, intensive surveys have not been practicable. The district grazier has also had to resurvey periodically the feed-resource situation on the commensurate private lands of each permittee, because rapid changes in ownership or leases make surveys obsolete in a few years.

The Portland regional office of the Bureau of Land Management estimates that nearly 21,250,000 acres of district rangeland in Idaho and over 10,000,000 in Oregon require new surveys in order to carry out proper sustained-yield management of grazing resources. It reports that no surveys have been made since 1946. In addition it asserts that annual supplementary inventories of district lands in the form of utilization checks are also needed and that periodic rechecking on five thousand ranches should be performed.

The district grazier must also watch the operations of licensees during the grazing seasons, to guard against improper use and violation of the license conditions, but the size of the district make a careful supervision impossible. He perforce has given most attention to the worst spots in the district where he has made frequent spot checks. For the other land he must rely largely on complaints of disadvantaged stockmen and on the self-interest of the licensees not to overgraze and abuse the resources. It is assumed that interest is elicited because under the law each permittee is allocated a specific tract of land, which he regards in effect as his own.¹⁹

The job of supervision has also been extended within the district to some of the state and county intermingled lands which under a supplementary

¹⁹ In the Prineville district as of late spring 1946 annual licenses only had been granted pending the blocking up of ownerships into compact units. However, it was intended to convert the annual licenses into ten-year permits, which in effect give perpetual possession unless the permittee should violate the law and the code. In the light of depleted conditions of the overwhelming proportion of private ranges at the time the Taylor Grazing Act was passed the district grazier would appear to be somewhat overoptimistic as to private interest's furtherance of good range management.

measure known as the Pierce Act have been leased by the Grazing Service.

For some years the Prineville grazing district administered approximately 1,000,000 acres of state and county land, under Pierce Act leases, which had formerly gone without any public management. In recent years the state of Oregon, through exchange of use with districts, has set up solid blocks which it is now leasing directly to private users. This arrangement will probably prepare the way ultimately for exchanges of ownership with the Bureau of Land Management.

Because of individual possession of district land by the licensee little need appears to exist for the creation of livestock associations for joint range management, similar to those used on national-forest ranges. For the most part each Prineville district licensee looks after his own salting, fence repairing, and watering facilities. Only in one small section of the district, where the land-ownership pattern has not yet been straightened out, is there an association of livestock operators jointly performing these management tasks.

Whenever a licensee abuses his allocated land by improper management or violates the other terms of his license his right may be revoked. The district grazier is authorized to take the initiative on such cancellations. After notifying the licensee and affording him an opportunity to show cause why such action should not be taken the district grazier may cancel the license or permit, subject to an appeal conducted by a special examiner appointed by the chief examiner of the service; from that decision a final appeal may be made to the secretary of the interior. In view of the close relation between the district grazier and the advisory board, to be explained below, a district grazier must be very circumspect in exercising such authority. If he cannot carry his board with him he will be "out on a limb."

During the fire season the district grazier supervises, with the aid of an assistant stationed for that period in his office, a skeleton suppression organization. Summer fire guards are stationed at strategic locations and are equipped with obsolete or inadequate caches of fire-fighting tools. An annual fire school is held for the training of these guards, and for as many volunteer fire fighters drawn from the ranchers and their hired hands as can be persuaded to attend. Each guard is given a crew of volunteer fighters on whom he can call in case of fire. Lookout service is furnished under a cooperative agreement with the Forest Service, whose lookout stations completely cover the Prineville grazing district. No funds for fire prevention work have been allocated. The area annually burned has been somewhat reduced since the beginning of the fire program on the Prineville district, but the fire work is so underequipped and understaffed on this and other

Oregon districts that the regional office is greatly dissatisfied with the whole fire program.²⁰

Each year some range improvements have been undertaken under the district grazier's supervision. These consist chiefly of fencing, the improvement of springs, the digging of wells, building of reservoirs, and the reseed- ing of range. In the Prineville district the water improvements have been chiefly reservoirs and springs. Only 2,000 acres have been reseeded, al- though much more of that work could be profitably done, were funds avail- able, particularly on areas subject to erosion. During the CCC days a dist- rict camp constructed a large amount of fencing and made a number of water developments. It was the policy up to 1946 for the district to purchase fence material while the permittee did the actual construction work.

Funds for these improvements have come from three sources: (1) a fund established by the act from 25 per cent of all fees collected; (2) money taken from 50 per cent refund of fees that goes to the states; they in turn have reallocated this money to the district advisory boards; and (3) about \$2,000 from a special soil- and moisture-improvement fund appropriated by Con- gress to the Department of the Interior when it took over from the SCS all soil conservation work on Interior Department lands; some of this amount is allocated to the Grazing Service.

The first director of grazing, who organized the system of district ad- visory boards, gave to them paramount influence in district administration. This was formally avowed in the 1935 report of the secretary of the interior which said: "They [the district advisory board members] will take the regular oath of office of a federal official and will be the local governing agency as to all matters of range regulatory in nature concerning their district. The Interior Department will exercise necessary supervision and provide basic technical criteria for the conservation of natural resources."²¹ Despite the promise of the first director to allow the stockmen's board primacy in local administration, the livestock organizations demanded a change of the Taylor Grazing Act to fix the system definitely within the law. Consequently an amendment in 1938 gave the district advisory boards full statutory recognition. The original bill for this purpose, introduced by Senator McCarran of Nevada, was modified in the course of its passage through the Congress so as to place the boards on an advisory and recom- mendatory status. Nevertheless, the expectation of the stockmen, aroused

²⁰ This dissatisfaction still exists (November, 1949) notwithstanding the fact that since 1946 a regional fire supervisor has been employed to help the district graziers with their fire plans, and to take charge of the big fires. Even though the base appropriation was increased during the fiscal year 1949 and an unlimited deficiency for fire suppression was authorized, the organization is still not prepared to do a first-rate job.

²¹ *Annual Report of the Secretary of the Interior for the Fiscal Year Ending June 30, 1935*, p. 16.

by the first director's pronouncements and promises that they would regulate themselves through the district boards, have not ceased to interfere with the administrative responsibility of the district graziers.

An elaborate code of election regulations now governs the composition and choice of the advisory boards. The licensees or permittees of each district select by secret ballot from their own number boards of not less than five nor more than twelve, one of whom must be a "free use" licensee chosen by that group of stockmen. Representation, to be worked out by the regional grazer, is given to the different classes of stockmen. An additional wildlife representative on each board is chosen by the secretary of the interior. Board members are elected for three-year terms, one-third being renewed annually. The duties of the district board as set forth in the federal range code are to advise or make recommendations on:

- (1) The carrying capacity of the federal range in the district.
- (2) Applications for grazing licenses or permits.
- (3) Proper rules of fair range practice.
- (4) Allotments of range by classes of livestock or for community or individual use.
- (5) Seasonal use of the federal range or any part of it.
- (6) Applications for the construction or maintenance of improvements on the federal range.
- (7) Any recommendations made by local associations of stockmen in this district.
- (8) Reservation of carrying capacity of federal range for wild game animals and agreements in this connection with state or federal wildlife agencies.
- (9) Special rules for the district within the meaning of Section 15.
- (10) Any other matter which they may desire to bring to the attention of the secretary of the interior, or on which he may request their advice.

In the Prineville district the board customarily meets about three times a year. Should problems arise between meetings affecting a particular area in the district, the district grazer usually consults with the board members from that area.

Flanking the regional chief of the range management branch of the Bureau of Land Management are state advisory boards composed of two elected representatives from each district board. The state boards have been used particularly in reallocating the 50 per cent money returned to the states by the U.S. Treasury, for use in the counties of the grazing districts. This money belongs to the states rather than to the Bureau of Land Management. Consequently when it is reallocated by the state board to the district advisory boards, it is completely under the jurisdiction of those boards who in its expenditure act as full-fledged state administrative agencies. They, and not the district grazer, determine how the money shall be spent.

At the apex of this board system is a National Advisory Board Council whose members are chosen by the state boards. This council considers with the director of the Bureau of Land Management (formerly with the director of the Grazing Service) important over-all policy questions. It was to this body that the last director, C. L. Forsling, presented his plan for raising grazing fees, a plan from which it vigorously dissented and which it helped to kill.

Entirely outside the district grazing system is another range-management function, also authorized by Section 15 of the Taylor Grazing Act. This, as was noted above, is the job of managing by means of leases to adjoining owners the scattered lands outside the districts. Before its amalgamation under the Bureau of Land Management this work was split between the district land register, the field-examination division, and a special unit set up in 1940 called the range-development service—all in the General Land Office. Washington makes leases for these tracts which run for terms of from two to ten years. The field program has included (1) the inspection of lessee use of lands to determine if the agreed conservation practices are being followed; (2) the construction of range improvements on leased lands under a coöperative agreement which binds the lessee to maintain the improvement; (3) the construction of range improvements on other public land outside of the grazing districts for the advantage of livestock management generally, such as water facilities on stock driveways or improved water supplies on public water reserves for groups of ranchers; (4) the building of soil-erosion structures on the rough elevated areas where erosion threatens to damage grazing land below. Because of the large areas to be covered with small staff and limited funds, only a beginning has been made toward achieving the purposes of this program.²² Real progress requires much greater appropriations.

One other grazing program in the Bureau of Land Management, deals with those sections of O-and-C revested lands which are suited primarily for livestock use. These are found particularly in southern Oregon where they are intermingled with units of unreserved public-domain lands of a similar character. Management of the revested and intermingled lands is accomplished by a policy of 5- to 10-year leases for fees varying with the character of the forage. The lease provisions encourage such permanent improvements as fences and reseeding. No advisory boards have been established under this grazing program except insofar as one livestock man has been appointed to sit on the over-all advisory board for the entire program of the Oregon and California Revested Land Grant Administration. Recently the O-and-C advisory-board program has extended recognition of

²² Since spring 1948 supervision of grazing on "Section 15" land has been amalgamated with that of the grazing districts. (November, 1949.)

the grazing interest by adding to each district board a grazing representative.

In closing this discussion of the grazing functions of the Bureau of Land Management it is necessary to notice the problem of grazing fees that has arisen in the Taylor grazing districts and its influence upon the present situation confronting that program. The Taylor Grazing Act gave the secretary of the interior the duty of fixing reasonable annual fees, which he might change from time to time, for grazing permits. The original grazing fee thus fixed was five cents per head of cattle or horses per month for the grazing period and one cent for each sheep or goat. This fee remained unaltered throughout the entire life of the Grazing Service. It is not clear why this low fee was named in view of the much higher price charged even during depression years by the Forest Service and for the lease of comparable state and private land, or why it was not varied in accordance with the quality of the range as soon as surveys of the public range were completed. As the depression receded the House Committee on Appropriations, through its subcommittee in charge of the Department of the Interior appropriation bill, exerted increased pressure upon the secretary of the interior to increase the fees. Late in the 'thirties Secretary Ickes raised the issue with Grazing Service officials who discussed it with their advisory boards during 1939. It was then the consensus that the matter should be deferred pending further study by the Grazing Service. That study was undertaken in 1940 and 1941 under the direction of Mont H. Saunderson, a senior economist loaned by the Forest Service; it resulted in a recommendation for a new fee schedule which would have trebled the charges and would have tied subsequent annual adjustments on a sliding scale to prices for beef and lambs. This report was the subject of special inquiry by the Senate Committee on Public Lands and Surveys of which Senator McCarran was Chairman. McCarran had opposed the original Taylor Grazing Act. He had introduced the amendment of 1938 which made the advisory board system a legal requirement and has continued to be the champion of the organized livestock interests of the mountain states.

As a result of the heat generated by the hearings held by the Senate committee in Western livestock centers the director of the Grazing Service at a meeting with his National Advisory Board Council on January 5, 1942 announced that "any adjustment of fees would be deferred until the emergency has passed." The council then agreed that at the end of the emergency it would "sit down with the Grazing Service and give their full assistance in determining and applying a reasonable fee for the use of the federal range." The director's statement at that time, which he subsequently repeated, was construed by the stockmen as a promise that nothing would be done about increasing fees during the war.

However, with the appointment of C. L. Forsling as director in 1944 the matter was reopened in November of that year. Pressure from the House Appropriation subcommittee and the apparent ability of the livestock industry to pay a higher fee because of war meat prices led to a proposal by Director Forsling for an interim schedule of new fees which, while varying slightly from state to state, would have produced an average price of fifteen cents per animal-month and would have made annual adjustments thereafter keyed to the price of beef and lambs for the preceding year. This interim basic schedule was to have been revised after a more complete and accurate study of inherent differences in the value of the grazing resource as between ranges.

Forsling's proposal met with unanimous opposition from the National Advisory Board Council. Its objections were based on two chief assumptions: (1) that the increase would violate an assurance given to the livestock men by Secretary Ickes at the time of the enactment of the Taylor Grazing Act that he "had no intention of making the Act a revenue producer at all"; and (2) that to raise fees at this time would be to repudiate the repeated promises made by the Department of the Interior that the fees would not be raised during the war emergency. The council further took the position that it would consider the fee question only after completion of a study of the cost of administering grazing lands for grazing purposes only. It believed that the fee should be used solely for such grazing work and not for range improvements, which the users instead should finance themselves. From this time forth a war was waged by the National Advisory Board Council and the two major stockmen's associations (with the Oregon and Idaho groups dissenting) not only against Director Forsling's fee proposal but against Grazing Service appropriations. They were assisted by Senator McCarran's committee and the House Appropriations subcommittee on the Interior Department bill led by Congressman Jed Johnson of Oklahoma. The latter, although a Western man, has appeared to play the role of those alleged "Easterners" who demand that the cost of administration of the service shall be fully recouped from fee revenues, and therefore have insisted either upon drastic increase in fees or reduction in administration appropriations. Senator McCarran on the other hand has repeatedly denounced the plan to increase the fees as ruinous to the livestock industry.²³ McCarran's committee produced a report in spring 1946 which not only found that no fee increase was justified but insisted that fees should be based solely on the cost of grazing administration without reference to the forage values on the public land, as Director Forsling

²³ See the report of his subcommittee on grazing district fees, 1946, 79th Cong., 2nd sess. for the case of the livestock interests against Director Forsling and the secretary of the interior.

had contended. It further held that the costs instead of being held to the minimum, as Secretary Ickes had promised in 1934, had been greatly inflated as a result of unnecessary bureaucratic growth. The report recommended that the views of the livestock associations as expressed in the recommendation of the National Advisory Board Council should be accepted.

During the months when this report of the Senate committee was in preparation, Secretary Ickes began a retreat on Director Forsling's fee proposal. He first agreed to postpone further consideration until the summer of 1945. After McCarran's committee had held a series of "field day" hearings in the West during that summer and fall at which Director Forsling's proposals were the center of loud and prolonged attack by all the livestock interests, Ickes capitulated on January 25, 1946. He wrote Senator Hatch that no further action on Forsling's proposals would be taken until the federal subsidy payments adopted as a war emergency for the production of beef and lambs should be discontinued.

Director Forsling and the Grazing Service were finally caught in this squeeze play in the late spring 1946 when the House subcommittee on Interior Department appropriations recommended a reduction of Grazing Service appropriations which more than cut in two the fund for administration. In so doing it had the hearty support of the Western livestock lobby which hoped thus to forestall the revival of increased fee proposals and, by gutting the administration, to increase its dependence upon the organized permittees. Congress accepted this drastic curtailment.

Almost at the same time President Truman's reorganization plan No. 3 was given to Congress. It included a program by which the Grazing Service would be absorbed into the new Bureau of Land Management. By the beginning of the new fiscal year, July, 1946, the scalp of Director Forsling was hanging from the belt of the council. He was relieved of any duties in the new bureau and transferred to departmental staff service.

The administration of the grazing districts during the fiscal year 1947 was much curtailed but an almost complete dissolution was prevented by two expedients. The first was the bureau's solicitation from the state advisory boards of the allocation of the 50 per cent refund money to administrative expenses instead of to range improvements to which it had before been exclusively devoted. In response the district advisory boards signed over not only a good part of the refund for 1947 but some of the unspent accumulations of prior years. The second expedient was to shift to the grazing-district improvement work a much larger part of the special soil and moisture appropriations made to the Department of the Interior. Despite these devices two district grazing offices in Oregon were closed during the year and the district staff generally was further skeletonized.

One result of inferior administration has been an increase in the friction between licensees of the districts because of increased opportunity for the "rugged individualist" licensee to abuse his privilege at the expense of other stockmen. The district grazer has not been so readily available to discover and settle cases of trespass, excess stocking, and other abuses of permit requirements.

On February 14, 1947, Secretary of the Interior Krug announced that for the coming grazing season the fee would be increased to eight cents per animal-month. Despite this tardy response to its demand for increased fees, the House subcommittee on Interior Department appropriations chaired under the new Republican regime by Congressman Jones of Ohio, repeated in the departmental appropriation bill for 1948 the cut of the previous year for administrative services by reducing the Bureau of the Budget's figure of \$980,419 to \$373,000; it drastically reduced the fire-control fund (most of which is spent in the Pacific Northwest region), and forestalled help from the department by eliminating altogether the departmental soil and moisture fund.

This cutting of the grazing program was accepted by the Senate, and the administrative organization seemed headed for liquidation. Suddenly, at the close of the session, an item was inserted in a deficiency appropriation bill which restored \$300,000 to the grazing services. This passed within a couple of days after the Congress had enacted the regular appropriation bill. The reversal of attitude probably grew out of the telegrams and letters of protest that poured in from the small livestock men and their associations when they learned about the impending dissolution of the services, and from conservation groups aroused by the news and particularly stirred by a special article in the July 26, 1947, issue of *Collier's*, entitled, "They Kicked Us Off Our Land," by the associate editor, Lester Velie.

The interweaving of administration of federal field-resource services with private pressure-group interests is a basic administrative fact. But in the Grazing Service (and its successor the Bureau of Land Management) and the administration of the public domain, it became so vital a part of the administrative situation that a further examination of pressure-group-administrative relationships is essential. The principal pressure groups are the American National Livestock Association, which speaks for the cattle men, and the National Wool Growers Association, which represents the Western sheep industry. In each state are also state associations of these two range industries and, in some states, of the horse breeders. These are the organizations chiefly concerned with the Western range. Interestingly enough the state associations are not always in full harmony with the actions of the national conventions and their officials. Yet the

voice heard in Congress concerning the fee and the subsequent appropriation controversy was the voice of the two big national groups.

When the Taylor Grazing Act was put through Congress there can be little doubt that the Department of the Interior both grossly underestimated the cost of its administration and played down the revenue-producing features of the fee. It also said little about administration for watershed protection or wildlife conservation, despite the fact that these purposes are just as real as that of stabilizing the existing livestock industry. The livestock spokesmen and their mouthpieces in the Senate and House, such as Senator McCarran of Nevada, have refused to admit that these other purposes carry any measurable weight when appropriations for administrative services are under consideration. There is strong reason to believe that they do not even want good grazing-conservation practices incorporated in federal administration. Some of the larger operators, particularly in the Southwest, were induced to support the original Taylor Grazing Act by the fear that Secretary Ickes might stop their use of the public domain; and those who had fenced areas of public land for their exclusive use, feared Ickes might secure their criminal indictment. This situation is indicated in the March, 1944, issue of the *American Cattle Producer*, the organ of the American Livestock Association, which contained a laudatory account of the 1944 president of the association, A. D. Brownfield. According to this story, that gentleman had been president of the New Mexico Cattle Growers Association; had been a member of the advisory board for New Mexico and was then also a member of the National Advisory Board Council—the latter two bodies integral parts of the Grazing Service administrative machinery. He had played a leading part in securing the amendment to the Taylor Grazing Act in 1938 which nailed the district-advisory-board system into the law and the administration. Brownfield's relation to the administration of the federal range is illuminated by the following statement: "When Secretary Ickes put the heat on by ordering indictments drawn against every rancher in New Mexico having public domain under fence, he [Brownfield] began the movement for a southwestern New Mexico Grazing District . . . so as to sidestep these indictments for *himself and friends*." (Italics mine.)

Even in its fattest years with its maximum staff the grazing districts were generally too understaffed to give as much attention to the restoration of the range as was necessary for a systematic and steady recovery from its state of serious depletion in 1934. There was undoubtedly a measurable continuance of trespass and of excessive stocking in violation of permit terms, which could not be caught by the district graziers. That the improvement of the range has accordingly been very slow is indicated by the statement in the 1946 annual report of the secretary of the interior

to the effect that the federal range is not now "more than 50 per cent efficient for its purposes."

Coupled with the incomplete acceptance by the stockmen of emphasis on conservation and sustained yield, has gone an attitude of private possession of the grazing land, which is implicit in the livestock associations' insistence that the grazing fee should bear no relation to the value of the federally owned forage but should be determined solely by the cost of a minimum administrative setup. That view assumes that this public resource belongs to the stockmen merely for the price of a more orderly way of dividing it among them, for moderating the more abusive range practices, and for making such improvements as increase the availability to them of the total resource. Whether their champion, Senator McCarran, really believes even in that limited objective is doubtful because of his repeated introduction of a bill²⁴ to permit an easy dissolution of Taylor grazing districts at the option of the licensees who would decide by a vote whether or not the districts should continue. The fact that McCarran does not press this bill may mean that he has brought it forward simply as a threat over the Department of the Interior to compel administration as the stockmen wish, "or else." The ultimate intention of the stockmen as avowed in a number of bills recently introduced, is to turn the federal range back to the states for sale or lease to the stockmen. This idea has been officially endorsed by a number of livestock associations. The attitude behind this move is well illustrated by the statements of a prominent member of the Wyoming Wool Growers Association at their convention in September, 1943. In supporting this proposal he criticized the Taylor Grazing Act because of its expense and its failure to guarantee continuous possession to the stockmen. He also said: "The Act precludes the idea that the users have a right to the public domain but implies that they are merely entitled to use it as a personal privilege."²⁵

In the Pacific Northwest this point of view has not been so generally accepted. This is indicated by the fact that the state wool-growers' associations for both Oregon and Idaho in the recent conventions have gone on record as opposing the return of federal range to the states. The state legislature of Idaho has also memorialized Congress not to accept this plan for the withdrawal of federal ownership or administration. Idaho and some of the other Western states fear not only the new cost of state administration, if the lands are returned, but the loss of substantial grant-in-aid moneys for highways which are in part measured by federal public-land ownerships within the states.

This guild attitude toward a public function is also exemplified in the

²⁴ 79th Cong., 1st sess., S. 1402.

²⁵ Reported in the *National Wool Grower*, October, 1943.

assumption by the big national livestock associations of their right to control the administration. Brief reference has already been made to the official policy in the early days of the Grazing Service to look upon the district advisory board as "the local governing agency." There can be no doubt that the first director of the Grazing Service gave the stockmen the understanding that the program was theirs and that his organization was ready and willing to do what the livestock men wanted. While that position could not continue in any federal department, the organized stockmen have exerted persistent effort to make it a reality and have vented their displeasure when thwarted. The statutory authority which they originally proposed for the district boards would have made them the actual deciding administrative agencies in each district. Although Congress changed the language to give the boards only advisory and recommendatory power, their original powers were actually not greatly altered.

The dependence of the district graziers for most of the improvements in their districts upon the largesse of the state and district advisory boards in spending the 50 per cent money cannot help but place the administrative staff under a special obligation to the stockmen. The substitution of these funds for Congressional appropriations to pay administrative salaries and expenses during the fiscal year 1947 of course increased that dependence. Moreover an adverse decision by a district grazier concerning a licensee was made subject to two appeal levels before final action can be taken—a situation not likely to encourage an independent administrative point of view on his part.

Forsling's nomination by Secretary Ickes for the directorship of the service was considered by the Senate Public Lands Committee which Senator McCarran then dominated. In the hearing before that committee Forsling was asked point-blank by its members whether or not if he were confirmed he would follow the recommendations of the advisory boards. His reply must have been acceptable to the committee for it recommended his confirmation. An editorial in the *National Wool Grower* for June, 1944, includes the following: "A statement by Senator Hatch indicated that Mr. Forsling specifically questioned at two meetings of the Public Lands Committee had given assurances that he intended to administer the grazing resources of the public lands along democratic lines." But in reporting favorably on the nomination, Senator McCarran on behalf of the committee "criticized the Department of Interior for not consulting with the advisory boards of the Taylor Grazing Districts before recommending a successor to former Director R. H. Rutledge." The committee, he said, believed that in the future it would be "for the best interest of the public domain of nearly one billion acres of land if the Department of Interior in keeping with the democratic spirit which we believe should prevail in

its administration would consult with those who are interested in the use of the open public domain from the standpoint of producing food and wool for the nation.”²⁶

In the fight over fees which Forsling precipitated in 1944 and in the counter attack against the appropriations for the Grazing Service the two big associations set up a “Joint Livestock Committee on Public Lands” to spearhead their strategy. That group virtually absorbed the official advisory group created by the Rutledge administration to advise the director, namely the National Advisory Board Council.²⁷ This is clearly shown during the May, 1947, hearings of the House subcommittee on appropriations which was considering the appropriation bill for the Department of the Interior for the fiscal year 1948. At that time J. M. Jones, secretary of the National Wool Growers Association, appeared before the committee to testify. In introducing himself he said: “I am attempting to substitute for the Chairman of the National Advisory Board Council of the Grazing Service and the Vice Chairman of the Joint Livestock Committee on Public Land.” He then read a joint statement on behalf of those two gentlemen, Gordon Griswold, president of the council, and J. Elmer Brown, vice-chairman of the committee. That statement supported the Congressional cut in appropriations for the grazing administration made the year before as well as a proposed cut for the coming fiscal year. It asserted that the council and the joint committee, during the preceding year, had been negotiating with Rex Nicholson, a special assistant to the secretary of the interior, over the problem of the reorganization of the grazing administration within the new Bureau of Land Management and the question of an increase of grazing fees to eight cents. As a *quid pro quo* for its support of these matters, the statement asserts: “It was agreed that the western livestock interest through their two national associations and the National Livestock Advisory Board Council would be consulted and every consideration given to their recommendations for the individual to be named as Director of the Bureau of Land Management and the Chief of the Division of Grazing,” and that the Department of the Interior would recommend an amendment to the Taylor Grazing Act regarding fees which would accept the contention of the stockmen that fees should be correlated with the “reasonable cost of administration of the public domain for grazing.” The statement further averred that on the basis of the understanding that Secretary Krug would carry out Nicholson’s commit-

²⁶ *National Wool Grower*, June, 1944.

²⁷ During the spring 1945 Director Forsling asked the National Advisory Board Council to meet in Washington with himself and Secretary Ickes to discuss the fee changes which Forsling had proposed. The council however refused to attend such a meeting until after Senator McCarran’s committee should have held hearings on this subject throughout the West during the summer 1945.

ments the livestock joint committee and council "went down the line to sell the users of the public domain back home on the proposition." It continues: "The two national associations together with the National Advisory Board Council and the Joint Land Committee named Dan H. Hughes of Montrose, Colorado, the then and now chairman of the Joint Land Committee and a member of the National Advisory Board for the director of the Bureau of Land Management and Ed Kavanaugh, former Assistant Director of the Grazing Service then head of the Soil Conservation, for the Chief of Range Development. It was understood that when the matter of appointments would be taken up by Secretary Krug, we would be advised. It was thoroughly discussed that Fred W. Johnson, then head of the Land Office, and Mr. Wolfsohn were not acceptable to the livestock interests for the appointment to these positions or either of them. . . . The several Senators from the Western Land states recommended the appointments as agreed to."

The statement then complained of a double cross by the Department of the Interior which rejected Hughes for the head of the new bureau and named Johnson and Wolfsohn. "We have no information as to what was done concerning the request that Mr. Kavanaugh be appointed as Chief of Range Management. Certainly we were not consulted when Mr. Robinson of Utah was appointed."

Regardless of the truth or falsity of the facts alleged in this remarkable statement it is of great significance for the administration of Western public-domain land that the organized sheep and cattle men through their national associations and their official and unofficial committee connections with the grazing administration should take it for granted and publicly avow that they should name the officers to direct the Bureau of Land Management and the grazing functions of the Department of the Interior.

Interagency Relations of the BLM

BLM AND THE FOREST SERVICE

The Bureau of Land Management's most important single interagency tie is with the Forest Service. The management of grazing and forest lands now so important a feature of the bureau's work brings the two agencies into continual association. This is due not only to the fact of frequent joining of the physical boundaries between their respective estates, but also because of the need for common technical information and policies in managing these resources. We have already noted that when the Oregon and California Revested Land Grant Administration was constituted, it

at once drew upon the forest inventory of its lands made by the Forest Service as a necessary basis for organizing its work. The research information for timber cutting and other timber-management problems and practices has likewise come from the Pacific Northwest Forest and Range Experiment Station of the Forest Service. Foresters of the Bureau of Land Management in region 1 will necessarily continue to draw upon this and the two other research centers at Ogden and Missoula where the Forest Service has for years been accumulating data on the characteristics and problems of timber and range. Whenever the program for managing the forests on the other public-domain lands is resumed, similar dependence will doubtless be placed upon the research data of the Forest Service. No move has been made to set up duplicating research facilities within the Bureau of Land Management. This restraint may have been due to the belief that sooner or later the Forest Service would be taken into the Department of the Interior—a program which former Secretary Ickes vigorously promoted.

One of the most obvious needs for joint action in the Pacific Northwest region relates to the program of sustained-yield coöperative units recently launched for the O-and-C revested lands. As has been noted those forested lands are intermingled with the national forests in western Oregon. The first master unit, prepared for the Siuslaw drainage area, included within its boundaries nearly 30,000 acres of national-forest timber. Obviously the analysis of dependent community relationships and of other factors essential to the development of such a program is of immediate concern to the Forest Service as well as to the Bureau of Land Management. The Forest Service has for a good many years been engaged in studies looking toward a similar program of coöperative sustained-yield operations but until 1944 it was without legislative authority to work out the essential arrangements. Now that it has been given the green light by Congress the similar programs of the two agencies should be articulated.²⁸

The Bureau of Land Management has not created a forest-fire control organization but continues the GLO practice of contracting out this function to the Forest Service for those lands lying within national-forest boundaries. These contracts are worked out by the regional administrators of the two agencies.

On grazing problems even more intensive coöperation seems indicated. Numerous grazing districts butt up against the boundaries of the national

²⁸ During the past year and a half much closer working relationships between the Forest Service and the Bureau of Land Management have developed in the Pacific Northwest (as well as in Washington). In this region the regional administrator of the bureau and the regional forester (region 6) carry on a constant interchange of technical and policy discussion. (November, 1949.)

forests, or, as in most of Idaho and part of Oregon, their boundaries are so intermingled that the forest supervisory staff and the district graziers cannot move from one part of their respective territories to another without traversing the territory of the other agency. Thus the Salmon River National Forest contains two long islands of mountain-ridge land that stand in the midst of the valley lands of the Lemhi grazing district along the Salmon and Challis rivers.

Again, the Ochoco National Forest includes a detached ridge area that lies almost in the center of the Prineville grazing district. Generally, in the Pacific Northwest, the national forests occupy the high elevations and contain the summer pastures while the grazing districts are in the valleys and on the lower slopes where spring and fall pasturing are appropriate. It is clear that the total federal grazing resources ought to be so managed as to complement each other as well as the private-range and winter-feeding facilities of the stockmen. In many instances the permittees on the Ochoco National Forest hold licenses on grazing district no. 5. The joint planning of the programs of these identical permittees is inescapable and such coöperation between local offices of the two services seems to have been fairly generally practiced. While the systematic exchange of lists of permittees does not always take place there is nevertheless a regular habit of collaboration in figuring out the "commensurability" of joint permittees and in reviewing the right of the permittee to graze the requested number of stock on the forest and district lands. Each officer must include in his calculation the permittee grazing license on the land of the other agency. While the methods of the two organizations for making these calculations of commensurability are not identical, the results are said to be approximately the same.²⁹

Some basic differences in policy of the two agencies as to eligibility to permits or licenses result from the terms of the Taylor Grazing Act. That act, and the range code developed in pursuance of it, based preference in use of district lands on use of the land before the adoption of the law. The user does not have to be an owner of land. If he leased land or owned water rights necessary to the proper use of leased or privately owned grazing land he was entitled to a prior preference. Even though land situated adjacent to the district land and economically dependent upon its resources might be owned or leased by an applicant he must wait for a permit until all those dependent "by use," regardless of location, should be satisfied. Thus where

²⁹ "Commensurability" is the term used to indicate the ownership or possession through leases or permits of supplementary grazing or feed resources sufficient to carry through the balance of the feeding year the number of livestock to be grazed under permit or license on the district or the national forests.

livestock operators living miles away from the district established their prior use, they are entitled to licenses or permits ahead of owners or operators adjacent to and economically dependent on the district land.

Because the history of the contest for control over public grazing resources among livestock men in many parts of the West has been primarily a struggle for the control of watering places, without which ownership or control of land was useless for grazing, outfits that succeeded in getting and keeping the water often ruled large areas of public and private grazing land. On the whole, it was the big operators who succeeded. Hence this feature of the law, as well as its equating of leasing with ownership, has worked in favor of the large livestock operators.

The Forest Service on the other hand, not restricted by such legislation, has policies which favor the family-size owner-operators. Accordingly no permittee may run more than 400 head of cattle on national-forest pastures except where a number of members of the same family, each of whom independently owns cattle, are joined together for operating purposes. The consequence of this difference in policy is that frequently the commensurable resources of a joint permittee exceed the total number of livestock allowed to one person on the national forests. On the Ochoco Forest in the spring of 1946 in over three-fourths of the instances the number of animals permitted was considerably smaller than the number for which the permittee possessed commensurable resources. A good many of these were joint permittees. Ownership, rather than control through leasing, is the basic condition for priority in obtaining grazing permits on national forests.

The Forest Service also follows a policy of reducing the number of livestock allowed a permittee whenever he sells his base land or his stock or both, and desires to assign his permit to the purchasers. The customary reduction is 10 per cent of the number in sales involving both land and stock, or 20 per cent if the sale covers only the land or only the stock. No such reduction policy is followed in the administration of grazing districts.

One of the continuing situations that has compelled joint planning is the seasonal fluctuation in the dates suitable for beginning and ending the grazing period. If there has been an extra snowfall on the mountain meadows or if cold weather in the spring has delayed vegetation, Forest Service officials will need to postpone the entrance of livestock onto forest pastures. That in turn means that the grazing districts will either have to carry the stock for a longer period or else in turn postpone the time when the stock may enter on district land. However, the latter policy may not be indicated if the grass and browse on the districts is in good condition for use at the usual spring date. But since the permittee cannot ordinarily be expected to find another source of range feed to keep his stock during the hiatus between the end of grazing on the district pastures and the entry

upon the forests, some adjustment has to be made between the seasonal dates of the two agencies. It frequently happens that they split the difference and the district allows the stock to stay a week or so longer while the forest supervisor permits a somewhat earlier entrance than is best from the standpoint of available feed and the protection of the grazing resource.

Similar problems may recur at the end of the summer, if the forest pastures dry up more rapidly than usual because of moisture or weather conditions, and require an earlier termination of forest grazing than was anticipated. Once again the district lands, which are customarily used for late fall as well as spring pasture, will have to take an earlier load of cropping than had been counted on. Adjustments will have to be made between the two agency programs or else the stockmen must make provision for additional winter feed or reduce their numbers.

When their boundaries join, both agencies are interested in joint fences in order to manage the grazing. A good deal of joint fencing has been constructed. In the Prineville district, for example, this happened during the CCC-camp days when the Grazing Service furnished the CCC labor and the Forest Service furnished the fence material. This fencing problem is linked with the complication, noted earlier, that the boundaries between the forest and district often do not mark the best dividing line between the summer and fall pastures. Even though the district and national forests should be placed under single management it would still be desirable in most situations in the Pacific Northwest to fence off the summer-pasture areas from those that should be used in spring and fall. However, the precise location of such fences would undoubtedly be considerably different from the locations on which they are now being built.

The technical information about the management of grazing land within the districts and the national forests, and to a considerable extent of private rangelands, has been the product of research in the Forest Service experiment stations. The use of the Forest Service as the center of range research began in 1915. Before that time the Bureau of Plant Industry in the Department of Agriculture had undertaken some work in this field. The Grazing Service, from time to time, sought authority to inaugurate its own range-research program, but that was opposed by the Department of Agriculture and was disapproved by the Bureau of the Budget. After Forsling was made director of the Grazing Service that agency was given an effective voice in selecting the items to be prosecuted by the Forest Service experiment stations in their range-research programs.

The Ogden experiment station has been the principal center of information on this subject for the Pacific Northwest, having been given the lead in such research some years ago by the Forest Service. While the Grazing Service and the Oregon State College experiment station jointly finance

an experiment program on grazing problems at Squaw Butte, Oregon, not much data have yet come from it to help in the day-to-day problems of range improvement and management.³⁰ On the other hand, the Ogden research center together with its experimental tract subcenters near Boise and elsewhere has been the chief source of information on range- or grass-reseeding problems and techniques, the control of noxious or useless species, the controlled burning or eradication of sagebrush, the problems of erosion prevention on the upper watershed of the arid intermountain country, and other problems. A second major source of information likely to prove increasingly important to the districts and their permittees but of which as yet not much advantage has been taken, is the experimental work carried on by the Soil Conservation Service at Pullman and at its two Idaho nursery locations under the direction of the chief of its regional nursery division in region 1.

On numerous reseeding projects undertaken on grazing districts, Forest Service technicians have been called in for advice and for the checking of results.

The standards for surveying grazing resources on rangeland are now identical as between these two and the other grazing agencies. This was not so in the beginning of the Grazing Service, but as a result of the Western range survey financed by AAA and conducted in 1937 in this region under the supervision of Forest Service technicians, all the federal agencies performing grazing tasks collaborated (with the aid of state experiment stations) in a standard set of survey definitions, criteria, and procedures. This was based upon an agreement signed in Washington in March, 1937, and supplemented by a meeting of representatives of all agencies in Salt Lake City in April of that year, at which instructions for making grazing surveys were jointly prepared.³¹

Had there been funds or staff for watershed-protection work on grazing districts of sufficient size to warrant a major program, another close tie with the Forest Service would have been clearly indicated. The latter has been the principal center of information, interest, and action on watershed problems in the arid sections of the Pacific Northwest. If this interest should expand, as it ought to under the Bureau of Land Management, continuing cooperation both in research and administration will be needed.

The relationships between the Forest Service and the grazing and timber-

³⁰ The 81st Congress appropriated a 50-per-cent increase of funds for the Squaw Butte station for the fiscal year 1950. Consequently the experimental program has been completely reorganized and will tie much more closely to operating problems. A single director represents both the college and the bureau, and he has been given additional personnel. (November, 1949.)

³¹ This information is taken from a manuscript by Carl Ewing, supervisor of the survey in Oregon and Washington, dated September 16, 1937.

management branches of the Bureau of Land Management will not be understood unless certain key facts are kept in mind which relate to the history of the establishment of the Grazing Service and of the Oregon and California Revested Land Grant Administration. The Forest Service expected and wanted both these jobs. Years before the Taylor Grazing Act was passed, the Forest Service had become a multiple-purpose agency concerned not only with timber protection but with grazing, watershed management for soil protection and stream flow, wildlife management, and recreation. It had not only collected systematic information for many years on grazing problems within national forests but had also become the chief source of information about the entire Western range resource. These data clearly showed serious depletion of that resource on federal domain land through failure of the federal government to apply a system of management comparable to that developed for the national forests; the data also indicated widespread damage to watersheds, the soil cover, and the water of streams and lakes. It was therefore to be expected that the Forest Service officers would conclude that they should be given the duty of managing this unreserved public domain in the West. That view was shared by some Western congressmen, one of whom in the early 'thirties introduced legislation to turn the management of the public rangelands over to the Forest Service. His proposal was the predecessor to the Taylor Bill but before it was favorably considered he was defeated for reelection and the Taylor Bill became the final legislative product. This turned the job of administering the grazing districts over to the Department of the Interior rather than to the Forest Service.

Not content to relinquish its claim at once, the Forest Service at the instance of a Senate resolution introduced by the late Senator Norris summarized and amplified the information it had been accumulating about the rangelands, public and private, and in 1937 sent it to the Senate as a 600-page report: *The Western Range*. This was the most complete picture of the subject ever presented, but its technical and historical information was supplemented by vigorous criticism of the Taylor Grazing Act as well as by a flat-footed recommendation that the Department of Agriculture and the Forest Service should be given the job of administering the public-domain lands.

Secretary Wallace wrote in his covering letter to the president of the Senate: "A third line of action is to put jurisdiction over publicly owned land on a sound basis. Unquestioningly the only plan which can be defended is to concentrate responsibility for the administration of federal lands in a single department to avoid unnecessary duplications, excessive expenditures and fundamental differences in policies and to obtain the highest efficiency in administration and the maximum service to users.

Since the administration of the range resources and its use is agricultural and since the administration of federally owned range should be used as an affirmative means in the rehabilitation of western agriculture the grazing districts and the public domain should be transferred to the Department of Agriculture."

But the criticism of the Taylor Grazing Act undoubtedly arrayed most livestock men against the report because it took sharp issue with the implication of that law that ultimately these public rangelands should be transferred to private ownership. It insisted that they could not be restored to productivity or safeguarded for watershed or related values unless they were retained permanently under federal ownership and control.

BLM AND THE OTHER USDA AGENCIES

Closely tied to grazing management is the problem of credit for livestock operators who use the public domain and forest pastures. At an increasing rate during the past fifteen years those institutions which come under the general supervision of the Farm Credit Administration have become the sources of livestock credit. The lending policies of the production credit associations and of the other facilities in the farm credit system have needed to be harmonized with sound grazing management on both public and private lands. That has been particularly true of Taylor grazing land because the statute gives a perpetual claim on those lands to permittees whose grazing units may be "pledged to security for any bona fide loan." The pressure for over-grazing of all kinds of rangeland has very frequently come from the lending institutions and creditors.

In trying to reduce the overgrazing consequent upon the expansion of livestock operations during the First World War the Forest Service continually found its program for restoring its grazing resources slowed down by the failure of banks and other credit institutions to appreciate the relation of their policies to a sustained-yield program. This task of educating public and private loan agencies to the use of lending policies which take full cognizance of the permanent economic importance of a restored and continuously high-yielding resource for livestock is another joint enterprise for the four principal federal agencies which deal with this phase of agriculture, namely the Bureau of Land Management, the Forest Service, Production and Marketing Administration, and Soil Conservation Service. Their sister federal agency in this credit field is the Farm Credit Administration which since 1938 has been a part of the Department of Agriculture. Its policies are now said to be substantially in harmony with the conservation programs of these land-management organizations.

Within the Pacific Northwest the SCS acts as manager of large tracts of land formerly and unsuccessfully used for dry wheat farming. These lands

were repurchased during the 'thirties as submarginal farms by the Resettlement Administration. Most of them were at that time denuded of native grasses suitable for livestock grazing and have consequently been turned over to the SCS (which calls them "land-utilization projects") for restoration as grazing pastures. Three of these projects in the Pacific Northwest present special problems of coöperation with the Bureau of Land Management because of intermingled lands. Thus the central Oregon project, north of Redmond, contains within its boundaries about 4,700 acres of public-domain land (but outside the limits of grazing district no. 5). Ft. Rock project in Lake County, Oregon, contains about 100,000 acres interspersed with a large area of grazing-district land, and a smaller additional block of land under more intensive development for restoration purposes administered in conjunction with 20,000 acres of district land. The south Idaho project in Oneida and Cassia counties was set up before the grazing district was established but it is at present generally intermingled with district land.

A land trade was attempted between the Departments of Agriculture and the Interior a few years ago which proposed to turn the Ft. Rock project over to the Grazing Service, to divide the Idaho project into two units, one for the SCS and one for the Grazing Service, and to give the public-domain land in the central Oregon project to SCS. This, however, struck a snag in Washington. Consequently local methods of working out management coöperation for these intermingled areas have been resorted to. At Ft. Rock the district grazer and the district conservationist have agreed upon a division of the whole area into a group of large tracts and have allocated to each other the full administrative management over particular tracts (regardless of ownerships) in accordance with the "predominant nature of the program in each locality."

This agreement was embodied in a written document dated May 19, 1944, and was to remain in effect until canceled by either party after six months' notice. Delegation under the agreement includes the responsibility for determining permissible use, allocation of use privileges, maintenance of compliance with regulations, collection of fees, and similar administrative matters.

On the south Idaho project a systematic reseeding program has been undertaken by the SCS. To make this feasible from the management standpoint blocks of 3,000-4,000 acres of land are seeded at one time and then fenced. These blocks have included lands of both agencies. All unfenced land has also been pooled. The SCS manages the land as it is seeded while the district grazer handles the unfenced areas.³²

³² As a result of a presidential executive order (No. 10046) issued during 1949, the Ft. Rock project was transferred to the Bureau of Land Management. The south Idaho and

Officers in the SCS express the wish that ultimately these project areas be turned over to the administration of the Bureau of Land Management, but they feel that pending (1) the restoration of the land to grasses and (2) the acceptance by the stockmen and ranchers of the intensive management program upon which the success of the renewed pastures is being built and (3) the acceptance of the social policies attached by the SCS to the right to use these pasture lands, administration should be retained in the SCS.³³

BLM AND OTHER INTERIOR DEPARTMENT AGENCIES

Like all range-management agencies, the Bureau of Land Management occasionally needs the assistance of the predator-control skills and facilities of the Fish and Wildlife Service. Infestations of prairie dogs, gophers, and other forage-destroying animals from time to time require campaigns of eradication which the Fish and Wildlife Service conducts or supervises. Some predators, wolves and coyotes in particular, kill sheep and other livestock and sometimes spread diseases among them. The Fish and Wildlife Service maintains a district agent and staff in each state to give aid in this predator and rodent-control work. Because of lack of funds, it is at times unable to perform predator- or rodent-control work. Consequently an urgent problem may have to be financed by funds from the Bureau of Land Management. The FWS is also used occasionally for advice and assistance on fish-and-game-management problems on the public-domain lands, and it would doubtless have been more frequently called upon had the Bureau of Land Management been able to give greater attention to the wildlife resources of the public domain.

A minor need for coöperation between these two agencies occurs in connection with the management of wildlife refuges operated by the Fish and

central Oregon projects have also undergone marked changes in management status. They have been leased to local livestock associations for management, under SCS supervision. (November, 1949.)

³³ The new spirit of coöperation and dynamic management which has resulted from the new leadership in the Bureau of Land Management and the continued steps toward the completion of an alert, decentralized organization is well illustrated by two steps taken by the regional administrator. He has signed a coöperative agreement with the Siuslaw soil-conservation district for "joint participation in a sand blow control project at the mouth of the Siuslaw River." (Press release of November 1, 1949, from regional administrator.) Under this agreement the bureau pools its resources with those of the district, the Forest Service, the Port of Florence, and Lane County in the effort—through a revegetation program—to stabilize the drifting sand dunes that now menace navigation, drainage, and the use of adjacent lands. The second action has been the solicitation by letter of the aid of all local soil-conservation districts in the region in reporting soil erosion or rehabilitation problems on the 3,600,000 acres of public-domain lands (under jurisdiction of the bureau) located within the districts. This aid is sought as a basis for starting plans for corrective action by the bureau. (November, 1949.)

Wildlife Service but located in or adjacent to grazing districts. In the Pacific Northwest the only refuges of any size coming within grazing-district areas are Hart Mountain with 266,891 acres reserved chiefly for antelope, and the Malheur refuge with 174,366 acres for wild creatures. Joint management of these areas poses some problems; for example, at Hart Mountain a good deal of forage not needed by the wild game is made available to stockmen for their flocks on the basis of a permit system. Since some of these users are also licensees on the grazing districts, the local manager of the refuge must work out his program with the district grazer at Lakeview.

On the smaller Minidoka wildlife refuge (25,332 acres), which is jointly administered by the Fish and Wildlife Service, the Bureau of Reclamation, and the Boise project board of control, the Bureau of Land Management takes a definite interest. This centers on the need of access to water by the livestock grazed on the surrounding land of the grazing district, and the presence of erosion problems on adjoining lands.

Since the Grazing Service was established, lands withdrawn for entry because of their potential use for irrigation by the Bureau of Reclamation have been placed under the interim management of the grazing district wherever they lie within a district and are suitable for grazing purposes.³⁴ There has been a good deal of such land. Formerly it was either leased to private parties or neglected. Until 1942 earnings received from such lands under district management were turned back to the Bureau of Reclamation. Since that date revenues derived on such land subsequently withdrawn for reclamation projects go to the Bureau of Land Management.

Another potential relation of the work of the Bureau of Reclamation and the grazing functions of the Bureau of Land Management grows out of the effects of reclamation projects on grazing-district permittees. When land is purchased or withdrawn for irrigation purposes, one immediate consequence is to displace the owners or lessees of these private or public rangelands. Such losses have been the subject of concern to the district graziers because they may mean loss of a part or all of the permittee's base property. It has been a part of Grazing Service policy to attempt to find for such a dispossessed permittee other base property in order that he will not lose his district license. This suggests a more fundamental potential relationship with Bureau of Reclamation projects, if the Bureau of Land Management were free in law to develop appropriate policies. This problem relates to the best use of the newly irrigated areas, if they were planned in conjunction with the surrounding grazing-district land. Had the Grazing Service been free to consider the part which its district resources might

³⁴ Recently the Bureau of Land Management, as the administering agency for public-domain withdrawals, was authorized by Secretary Krug (order No. 2323 of September 7, 1949) to sell timber on such lands. (November, 1949.)

play in establishing the most stable family-sized agriculture, its program of permits on district land would undoubtedly have been vitally concerned with the use of irrigation-project lands for hay and winter feed as complementary to its own range program. But the Taylor Grazing Act, and the pressure groups behind its administration, have pretty completely inhibited such potential articulation between agricultural objectives of the Bureau of Reclamation and the administration of the grazing resources of the public domain.

CHAPTER VII

The Forest Service: A Multiple-Purpose Land Agency

THE FOREST SERVICE was born in 1905.¹ Before that time the forestry work of the federal government had been divided between four separate units: The Bureau of Forestry of the Department of Agriculture, the forestry division of the Department of the Interior, the Geological Survey, and a group of special agents for the protection of the forests employed by the General Land Office. The ancestor which furnished the leadership and drive for the new agency of 1905 was unquestionably the division of forestry of the Department of Agriculture, headed since 1898 by Gifford Pinchot. That organization, however, had had nothing to do with the management of federal forest land but was a technical organization set up in 1878 to study the extent and culture of American tree resources.

Before 1891 the management of our publicly owned forest land was completely neglected. The principal and not too successful effort of the General Land Office toward protection of this public resource had been to prevent its theft. That job had been the function of a group of GLO special agents who continued to operate for the protection of timber on all public lands after the establishment of forest reserves by President Harrison in 1891. Even though Presidents Harrison and Cleveland placed in the forest reserves a large acreage of forested land, no organization for managing them was created until Congress made available a very small sum of money for that purpose in 1898. Soon thereafter the Department of the Interior established a forestry division under a trained forester to supervise the reserves, then divided into eleven districts. Agitation for the proper management of public timberland really stemmed from the division of forestry of the Department of Agriculture.

One of the earliest outlines of what should be done and how to do it was proposed in the 1887 report of Chief B. H. Fernow of that division. A second landmark in the movement was the May, 1897, report of an Academy of Sciences committee which expressed in large part the ideas of Gifford

¹ 33 *Stat.*, 861,872, act of March 3, 1905.

Pinchot, one of its members, who, during that same time, had been one of a small group of special agents employed by Secretary of the Interior E. A. Hitchcock. In March, 1898, Pinchot prepared a report to Secretary Hitchcock urging the creation of a forest service of technically trained and competent personnel to manage the reserves. About the same time he joined the Department of Agriculture as chief of the division of forestry, while continuing to advise the secretary of the interior on forest-reserve management. In fact in 1900 Secretary Hitchcock obtained the assignment of Pinchot and F. V. Colville to investigate the troublesome problem of grazing on the reserves. Pinchot's influence was undoubtedly responsible for the suggestion in the 1901 annual report of the secretary of the interior on the government of the forest reserves. The following declaration of policy, which the secretary announced, indicate some of the significant provisions of that program:

Each forest reserve and each part of a reserve should be dealt with on its own merit. The present system of uniform rule for diverse conditions is simply destructive. . . . The chief weight should hereafter be laid on field work in contradistinction to the present plan which administers the reserves purely on the basis of papers and reports from the office point of view with little reference to the work in the field. . . . Field and office work should be brought into closer contact and every unnecessary step should be removed. The office of the Superintendent should gradually be dispensed with and the necessary supervision over supervisors and rangers should be reached through the medium of inspectors familiar with the woods. . . . Local questions relating to grazing should be decided on local grounds and on their merits in each separate case.

These statements reflect the fact that before 1905 the modest organization for the management of the public reserves was highly centralized, involving inordinate delays in the transaction of business and poor adjustment to conditions on the ground.

In the division of forestry in the Department of Agriculture Pinchot's influence soon set in motion a new program of assistance to private forest owners which, when the time should be ripe, could be readily extended to the management of the public reserves. This new program was designed to induce private operators to adopt conservation methods and to train their employees to practice good forestry administration. The division offered its expert advice, particularly in the preparation of forest working plans. The timber owners immediately responded in large numbers with applications for assistance. Similar aid on technical matters was extended to the War Department, then in charge of timber in the Philippines, to the Indian Service, and to the Department of the Interior which also asked for working plans on several of its national-forest reserves, beginning in 1900 with the Black Hills reserve. Pinchot's division had grown from 11

employees in 1898 to 821 when the new Forest Service was established in 1905.²

On the day the 1905 law became effective the secretary of agriculture (undoubtedly reflecting Pinchot's views) issued the following instructions for administering the 63,000,000 acres of public-forest reserves just transferred to his department:

In the administration of the forest reserves it must be clearly borne in mind that all land is to be devoted to its most productive use for the temporary benefit of individuals or companies. All the resources of forest reserves are for use and this use must be brought about . . . under such restrictions only as will assure the permanence of these resources. . . . The permanence of the resources of the reserves is therefore indispensable to continued prosperity and the policy of this Department for the production and use will invariably be guided by this fact . . . You will see to it that the water, wood and forage of the reserves are conserved and wisely used for the benefit of the home builder first of all upon whom depends the permanent use of land and resources alike. . . . In the management of each reserve local questions will be decided upon local grounds; the dominant industry will be decided first but with as little restrictions to minor industries as may be possible; sudden changes in industrial conditions will be avoided by gradual adjustment after due notice; and where conflicting interests must be reconciled the question will always be decided from the standpoint of the greatest good of the greatest number in the long run.

These general principles will govern in the protection and use of the water supply, in the disposal of timber and wood, in the use of the range, and in all other matters connected with the management of the reserves. They can be successfully applied only when the administration of each reserve is left very largely in the hands of the local officers under the eye of thoroughly trained and competent inspectors.

Upon the basis of these principles the new organization began its work. One of the earliest applications was Pinchot's reorganization plan of 1908—a landmark in the history not only of the Forest Service but of the field organization of all federal services. Under it all national forests were grouped into six districts, each controlling from twenty to thirty forests. The district foresters were clothed with greatly expanded field authority over timber sales, grazing, trespass, special uses, and fire control. The revolution in field power is illustrated by the procedure for fire control. Before 1908 it had been necessary to telegraph Washington for authority to hire men or buy tools or food supplies for suppression of any fire estimated to cost more than \$300. As a result fires had been largely suppressed by voluntary help in long and arduous campaigns after the delay had allowed them to spread over a large area.

² The foregoing historical summary is taken largely from the monograph by D. H. Smith: *The Forest Service, Its History, Activities and Organization* (Washington D.C.: Brookings Institution, 1930); and from a manuscript compiled from the files of the Forest Service by Miss M. A. Bell. See also Gifford Pinchot's autobiography, *Breaking New Ground* (New York: Harcourt Brace and Co., 1947).

Another example was the district forester's new authority to sell timber. Formerly any sale in excess of \$100 had to be approved by Washington. The 1908 decentralization plan gave the district forester discretion to sell timber up to 25,000,000 feet. While the inexperience of the local organization and certain special circumstances resulted in some temporary restrictions on the powers of district foresters,³ it can be said that Pinchot's decentralized administrative program of 1908 has not only persisted, but has been markedly extended.

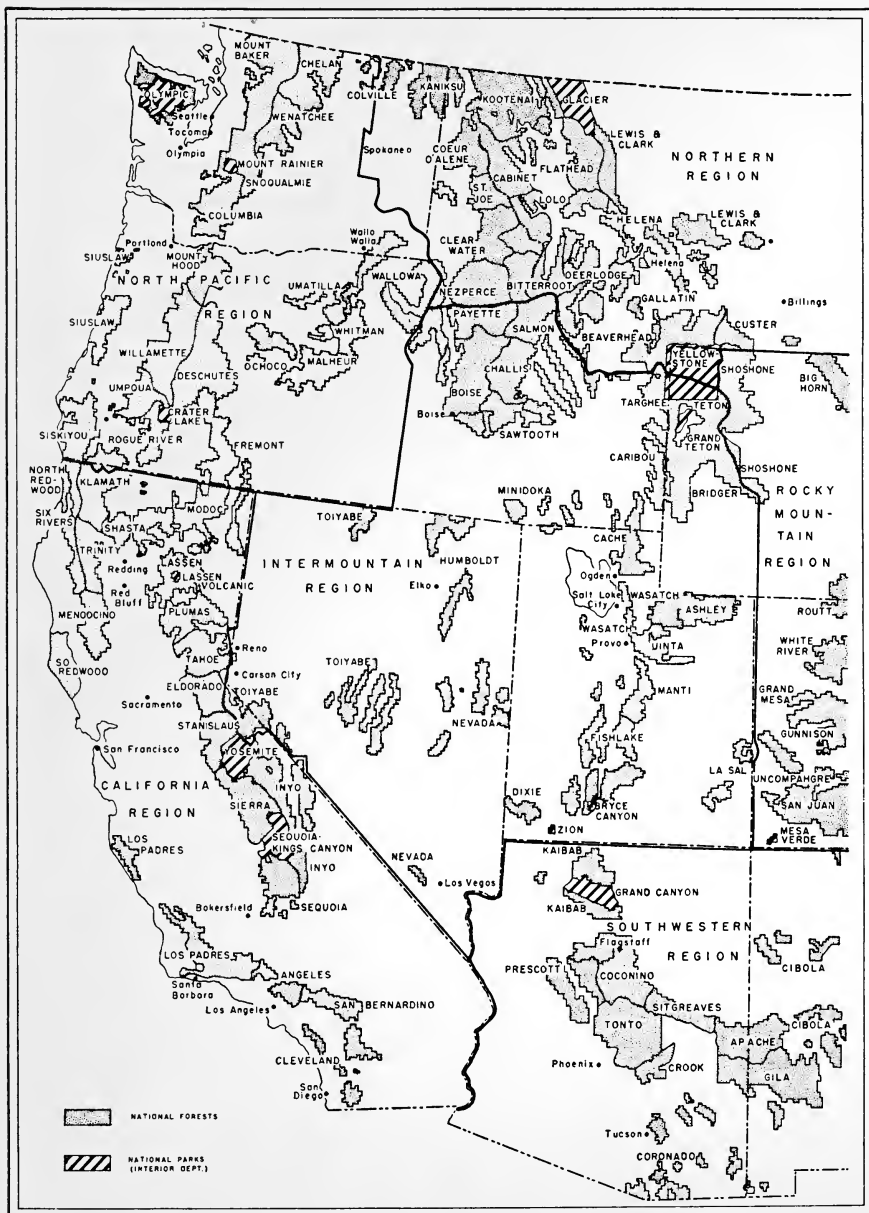
It is not the purpose of this account to analyze the policies and procedures which may make decentralized field administration effective and compatible with over-all national policy control. It is important, however, to notice that the management policy of the Forest Service gives discretion to the regional forester on most of the questions arising in his region; that the supervisor of a national forest is similarly clothed with power to handle the requirements of his own forest; and that even the district ranger, as the manager of his area, for the most part, does not have to wait for higher authority to meet the day-to-day issues arising in the district.

The Forest Service in the Pacific Northwest

The Pacific Northwest is split between three forest regions and three forest and range experiment stations, and the areal boundaries for the regions and the stations coincide. The administrative regions are as follows: Region 6, with its center at Portland, includes all of Oregon and all of Washington except a small part of its northeastern corner; region 3 is headquartered at Missoula, Montana, and supervises the Forest Service program in northern Idaho, all of Montana, northeastern Washington, and a corner of northwestern South Dakota; region 1, centered in Ogden, Utah, has jurisdiction in southern Idaho, western Wyoming, and all of Utah and Nevada. Within the national forests in region 6 is to be found more than half of the saw timber that now grows in all national forests; nearly one-third of the privately and state-owned saw timber of the country is found in that region. The account of the Forest Service programs and interagency relationships which follows in this chapter is based upon a study of the field establishment in region 6.

Here, as in the other regions, the field organization has two major units reporting independently to the chief forester at Washington, D.C.: first, the regional forester's organization, which is the administrative arm of the service; and second, the Pacific Northwest Forest and Range Experiment Station, also headquartered at Portland, which is the field research

³ The districts were later renamed "regions" and the officer in charge is now the regional forester.



National Forests, National Parks, and Regional Boundaries of the U.S. Forest Service.

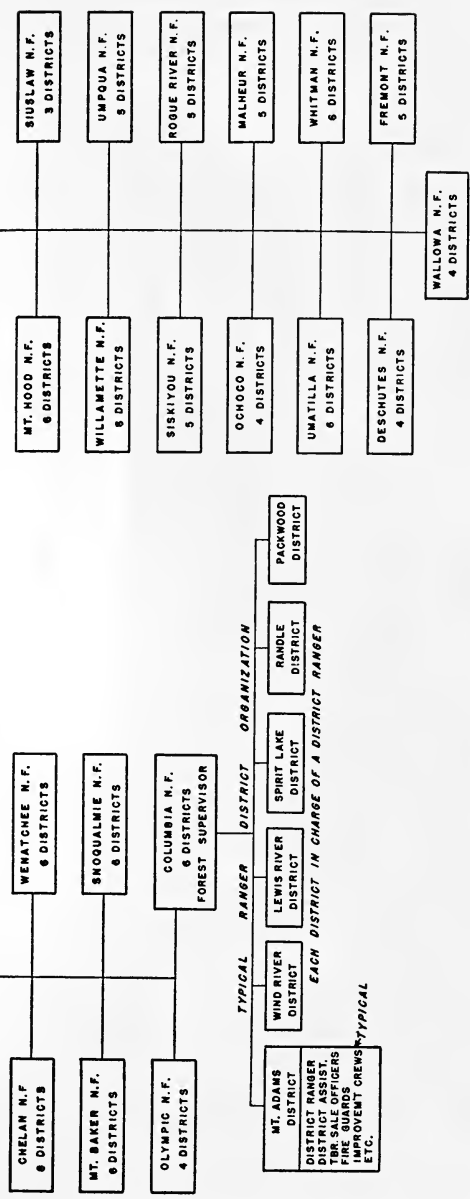
Source: Adapted from a map prepared by the U.S. Forest Service, 1948.

REGIONAL FORESTER
Region 6

- DIVISIONS OF PERSONNEL MGMT.
- INFOR. & EDUC.
- FISCAL CONTROL
- ENGINEERING
- OPERATION

- DIVISIONS OF FIRE CONTROL
- TIMBER MGMT.
- WILDLIFE & RANGE MGMT.
- REGR. & LANDS
- STATE & PRIVATE FORESTRY

WASHINGTON NAT'L FORESTS OREGON NAT'L FORESTS



U.S. Forest Service: Organization Chart, Region 6.

arm of the service. Under the regional forester are nineteen national forests each in charge of a forest supervisor and each divided into ranger districts (averaging about five in number) over which a district ranger exercises district field management. The regional forester operates through a series of functional divisions. Because he and his top staff must spend a great amount of time in the field and in tours of duty in Washington, D.C., each division head serves a term every year as acting regional forester. This practice undoubtedly tends to foster a "generalist" point of view on the part of the several division chiefs.

The customary business-administrative services are performed by the divisions of operations, personnel management, and fiscal control. Because widespread public education is crucially important in preventing forest fires as well as on problems of forest conservation, the division of information and education plays an especially important role in the Forest Service regional establishment. The functional divisions deal with timber management, range and wildlife management, recreation and land, fire control, engineering, and state and private forestry. The first five provide the technical services and supervision for managing the several programs on the national forests. The state and private forestry division is directed toward solving the problems of private, state, and local forests.

Fire-Control Activities

For many years, fire control has been the Forest Service job most familiar to the public. Not until after 1910, when a series of disastrous fires in the national forests took the lives of seventy-eight fire fighters and destroyed \$25,000,000 worth of timber, was the crucial fire-control program of the Forest Service given proper financial support and an adequate organization for the job.⁴ The fire-control program begins each year with a plan prepared by each district ranger for his area. The ranger's plans are reviewed and unified each year by the forest supervisor for all districts on his forest. A completed fire-control plan, at each level, recognizes three main aspects of this job: (1) a program of prevention, (2) presuppression arrangements for man power, tools, and equipment, and (3) a suppression plan. The planning phase of fire control is illustrated by the following summary of major items used in preparation for the 1949 fire season on the Gifford Pinchot Forest and one of its ranger districts:

PREVENTION (THE PACKWOOD RANGER DISTRICT)

The major objective in prevention is to reduce the man-made fires. The 10-year statistical analysis of fires shows 29 such fires in this district. Be-

⁴ See the summary in Smith, *op. cit.*, pp. 42-46.

cause nearly 70 per cent of these were due to careless smokers and campers, special stress is laid on these two groups. There is also the special hazard of slash resulting from the increase in cutting operations in the Packwood district. These slash locations and the past locations of camper, smoker, and slash fires are shown on maps. A program of special action is mapped out for each type of hazard. For example, to reduce "smoker" fires the action called for includes: posting and maintaining prevention signs on all roads, trails, industrial operations, and at favorable business locations; keeping a recreation guard at the most heavily used campground during the fire season; cautioning each person to whom a campfire or closure permit is issued; getting help of businessmen and concessionaires in distribution of literature and in developing a fire-prevention attitude. Similar appropriate special effort is programmed for prevention of fires by campers, loggers, and others. A precise list of contacts to be made, and the items to be checked is a part of this prevention plan.

PRESUPPRESSION AND SUPPRESSION

The principal administrative tool used both by the supervisor and by each of the rangers is a compilation called *Forest Dispatcher Notes*. This contains a complete list of regular forest personnel and their locations (including telephone numbers), the cooperating public officials (such as state forest inspector, county sheriff, state fire wardens), individual local coöperators and their skills (for example, dozer operator, cook, packer, truck driver, smoke chaser), and how they may be reached. It lists the organized crews of loggers and mill workers, how many men may be counted on from each, through whom their help may be obtained, and the number of machines (dozers, trucks, pickups) available from each coöperator. It indicates each man who is to occupy a key position—and which position—if fire should break out. The compilation also lists establishments from which food supplies may be obtained.

The general standards of suppression action and the supervisory responsibilities are also an essential part of this special handbook material. These repeat the service standing rule that "suppression of going fires should take precedence over all other activities" and the need unhesitatingly to shift assignments where men are most fitted and needed. The personal supervision of the ranger or his district guard is required on every class-B or larger fire. The suppression objective is to obtain control as early as possible on the day the fire is discovered, but not later than 10:00 A.M. of the following morning, when humidity falls and breezes spring up. Standards of action when the fire is reached include: locate the fire line so as to minimize construction and maximize resistance; backfire material inside the fire line; use bulldozers for line construction and power saws for

falling wherever practicable; maximize use of power pumps and, on mop-up, of back pumps; encourage night fighting and begin day's work by 4:00 A.M. If the fire is not quickly extinguished, organize crews into 10-hour shifts, and program relief crews.

To help in organizing the suppression forces for each fire, a chart called "Strength of Force Plan" is made for each district. This not only spells out what each member of the regular force of the district is to do, but the equipment and number of men for each type of fire. The variations in equipment and staff are indicated, arranged according to the eight burning index classes, classes 8, 9, and 10 being treated as one for suppression purposes. Hazard-area maps are also standard requirement and are useful both in prevention and suppression plans.

Basic to these annual plans are accumulated fire studies, research as well as administrative, which guide all phases of the work. A network of detection facilities has, of course, also been developed over the years and is known in map form to every ranger-district office and to some extent in every lookout and fire-guard station.

Each district ranger has as constant working apparatus for fire-control management such devices as (1) a half-inch base map of his forest showing the differing zones of hazard and risk; (2) a half-inch mounted base map with a peg at each detection point holding a plastacele disk coinciding with the area visible from that point; (3) plastacele disks on the same maps indicating five-, seven-, and fifteen-mile visibility coverage; (4) maps showing logical fire-line locations, fire breaks already constructed, water for pump and gravity systems, other water supplies, camp sites for fire fighters, green-timber areas as contrasted with higher-hazard vegetation; also roads, trails, and topographic features important in handling fire suppression.

In addition to the forest and ranger equipment, structures, and advance plans, the regional office prepares its own fire-suppression plan to assist the forests on the larger fires which require resources from outside their areas. Thus the regional plan sets up an organization within the regional staff for employing fire fighters and dispatching them to a particular forest. The speed and efficiency with which men can be found, hired, and sent to a large fire depends upon advance planning by the regional establishment. To the regional staff are also referred special problems of prevention which cannot be handled by the local forest officers alone. A considerable part of that activity is carried by the division of education and information because effectual prevention rests on the public's awareness of its part in preventing fires. The regional office also supplies to each forest supervisor a list of men specially trained and experienced for the important posts in fighting large fires—men who are available from the other forests of the region.

Until the recent shift in lumbering operations demanded increased access to national-forest timber to keep mills operating, the planning of roads and trails within the national forests was largely determined by the needs of fire control. Transportation facilities received a great fillip during the mid-'thirties as the result of the CCC and WPA programs. In developing comprehensive transportation plans for each forest, the division of engineering needed data concerning the locations of fires during the preceding fifteen years, the character of the timber cover, such special risk factors as lightning, intensity of human use, and the records of time from detection to suppression of fires. Because most forests are separated from one another by an imaginary boundary line, the road and trail plans had also to be conceived in terms of interforest needs. This program of the 'thirties designed and partly built a network of roads and trails to make every part of the forest accessible to the fire-suppression crews. This transportation program is now being extended for the purpose of timber sales.

Integral to the fire-control program is the training of the fire guards and lookouts who join the Forest Service for the fire and recreation season. While this training began long ago it was greatly refined and intensified as the result of a new emphasis on personnel management in the early 'thirties and of the CCC program which presented a golden new opportunity for training large suppression crews. An intensive three-day fire-training school is held in every forest each spring before the lookouts and fire guards are sent to their posts. This school program is today thoroughly standardized on the basis of years of evaluation of training results. The instructors are selected as the most competent men in the forest for handling particular phases of the fire-suppression and fire-detection program and are given an advance training in teaching techniques. The record of each former summer employee will have been analyzed by the ranger for whom he worked, and who outlines a program to fill in the gaps in his knowledge. Upon the basis of this analysis of individual training needs, each school is divided into homogeneous small classes, providing each student an opportunity to demonstrate that he not merely has listened to but has understood the training information and can put it into practice. By demonstrations of fire suppression the school tries to bridge the gap between information and ideas, and the ability to put them into effect in an actual fire situation. After the lookouts and guards have been dispatched to their stations, the ranger and his district guard continue the training program. By frequent use of the telephone and radio and by personal visits to the lookout and guard stations they give continuous instruction, admonition, and advice to the summer-guard staff.

Despite the fact that the Forest Service has made great advances in the techniques of detection and suppression of fire and has devised mechanical

tools of great service in suppression, the major dependence of this program must, after all, be upon the competence of the men who do the fire work. For years the building of highly trained fire-fighting crews was greatly handicapped by the brief employment period for the summer-guard staff—even for its key members. The big harvesting program on national forests since 1940 has greatly eased but not solved that problem. Today the district ranger is aided by professional forester assistants and by other staff used through either the whole or a large part of the year. In addition each forest now has a highly trained suppression crew of 5–15 members who are available for any district in case of need (particularly for fires where mechanical equipment cannot be used) and whose members can function as trained nuclei for the expanded crews necessary for big fires. This specialist fire-fighter development is the result of nearly ten years of experimentation, study, and training. One of these trained men can do the work of three untrained fighters, thus reducing not only payroll costs but all the supporting supply services. Along with the perfection of their training and organization have gone numerous improvements in hand tools and light camp equipment for use on the fire line.

Technical and scientific equipment plays an increasingly important part in fire suppression. Great improvements in such tools are due to the experiments of the regional equipment laboratory and to ideas contributed by the operating personnel. Thus the “brush smasher” and the Deschutes fire plow, first developed in the Deschutes Forest, were perfected in the regional equipment station. Then came the fire plow for digging trenches. Because its utility was reduced in brush areas not already swamped out by the hand crews, a mechanical brush remover was contrived to clear the way for the plow. These devices were superseded by a disk-dozer mounted on a bulldozer frame of a tractor that clears away brush, logs, and debris, and constructs the fire line all in one operation. The use of airplanes during the last decade has been of enormous advantage in fire suppression and in restricting the size of burns.

Many mechanical improvements came out of the war. High-and-low pressure fog-making equipment now makes one gallon of water do the work of twenty in fire suppression. Aluminum tankers transport much greater quantities of water in arid forest areas than was formerly possible. Four-wheel-drive jeeps and trucks haul men, equipment, and water up terrain formerly too steep for mechanical transport. Power saws for making fire-breaks and for felling inflammable snags, have been of extraordinary help. A specialist group of twenty power-saw operators for snag fires is maintained on the Columbia Forest for regional use.⁵ The trail “beetle” and

⁵ In November, 1949 at a special dedication ceremony, the Columbia National Forest was renamed “Gifford Pinchot Forest.”

trail "mule" developed at the regional laboratory will eliminate much costly pack-horse transport as soon as the trails are widened.

In 1937 the region began the experimental use of aircraft and parachutes for dropping supplies to fire crews in the rough back country. Today the parachute service drops hot meals to the men on these remote fire lines, thus obviating the expensive transport and servicing of kitchen facilities on the ground. "Smoke jumping" crews have been increasingly relied upon since 1939 for fires in difficult terrain. Region 6 now maintains two parachute jumper crews, one on the Chelan Forest and one on the rugged Siskiyou. The Missoula region also has a large "smoke jumper" unit. Special padded suits, helmets, and body guards (developed by the Forest Service from American football equipment) reduce the danger of parachuting in rough timber-covered country. These specialized units are brought into operation by the use of two types of aircraft: first light observation planes have replaced stationary lookouts in many remote areas. They make daily observation trips over the rough inaccessible country. When one of these planes spots a fire, it radios back to headquarters where a second six-passenger plane is ready. The "smoke jumpers," in numbers suited to the size of the fire, are flown to the fire and parachuted to the ground, along with essential equipment for suppression. As many as 104 men have been thus landed for a single fire. Some of these men were army paratroopers loaned for the occasion. Region 6 has a paratrooper crew of about 50. If needed it may borrow from region 3 or region 5 or both.

Despite elaborate safety precautions "smoke jumping" is a hazardous technique whose supersession is already promised by the incipient use of the helicopter. In the 1947 season the experimental use of two helicopters for flying men and equipment to back-country fires in the mountains of California was highly successful. Region 6 began their use in 1948. When perfected, helicopters will probably be used not only to land men and equipment at remote fires quickly, but to retrieve the supply parachutes and other expensive fire-suppression equipment. It will also become the most efficient means for accurately spotting small beginning fires.

Early in the history of the radio, the Forest Service developed a two-way portable set which proved very valuable for fire-suppression work. It has recently adopted FM radio equipment, which is already reducing dependence on the telephone and bids fair to make further inroads on the older and less flexible communication system. Science has also come to the aid of the fire-control program through work done by the forest range and experiment station which perfected the Byram haze meter, a valuable device for measuring visibility distance and thus for managing lookout detection. In the late 'thirties the experiment stations developed a method of classifying ground cover into fuel types with reference to fire hazard and the

rate of fire spread, which is now fundamental to fire control. The fire danger-rating board first developed by the forest and range experiment station at Missoula, Montana, provides a useful scientific tool to help the ranger estimate the facilities and crew he will need in dealing with a particular fire. This device combines each factor of fire danger—fuel moisture content, relative humidity, wind velocity, herbaceous stage, visibility, and inception danger—into ten class-of-day ratings, each of which has an indicated organization essential to suppression. This danger-rating board does not supplant judgment but greatly aids its exercise.

It is a fundamental fire-suppression policy of the Forest Service to dispatch sufficient force to extinguish the fire by 10 A.M. of the morning following its discovery. This organization objective, while not always realized, does give the key to the entire suppression program. It implies that factors of cost which might deter a private timber organization are accepted by the Forest Service. Because of its national scope and the magnitude of its operations, it can afford the additional costs which such a policy involves for a few fires, since most fires can be suppressed under the rule without excessive expense. This highly organized and technically buttressed program of prevention, presuppression, and suppression held the annual fire losses on national forests to less than 0.1 per cent of the national-forest area.

Whether the remarkable recent record of small loss and low cost can be maintained, as the national forests harvest their sustained-yield quotas is uncertain. More cutting means more acres of slash and of cut-over land where fire hazards are high. Already as a result of the wartime cut hundreds of thousands of such acres were created, which were formerly covered with green, slow-burning timber. Here the problem of forest fires is tied in with the development of greater utilization, which would leave on the ground as potential fuel only a small part of the waste incident to most current cutting practices. A few firms now take out the small parts of the tree and leave the ground relatively free from fire hazard; but only a small proportion of the forests are at present so treated.

Closely related to the fire job in the national forests is the grant-in-aid program supervised by the Forest Service to protect state and private timberland. That program was inaugurated under the Weeks Act of 1911 and greatly expanded by the Clark-McNary Act of 1924.⁶ The national government has a double incentive to assist private and state owners of timber: first, fire is no respecter of ownership. Because many fires originating on state and private land have spread to national forests, Congress has been legitimately concerned with the quality of the fire-control programs on private and state land. The second, and perhaps more fundamental reason,

⁶ 43 Stat., 653.

has been the menace to the basic timber resources of the country presented by the failure of owners of private and state timber to adopt universally effective fire-control methods. The major part of the nation's saw-timber resources are on the lands of the private owners. The failure to prevent or control fire has been one of the deterrents to the adoption by private owners of sustained-yield operating plans. Serious danger of loss by fire reduces the incentives to regard timber as a permanent crop.

Under the Clark-McNary Act, formal agreements are made between the Department of Agriculture and the states by which the federal government makes contributions for approved fire-control activities. The conditions in the act are quite generous, leaving to the states a large amount of freedom to develop their control systems. In Oregon and Washington state laws require that private timber owners must either furnish adequate protective systems of their own, join in private protective associations, or pay the state forester to assume direction of protection activities. In addition to the protection furnished by organized protection agencies, a few large operators, such as the Weyerhaeuser Company, Rayonier, Inc., and Crown Willamette Pulp and Paper Company, finance an extra level of protection for their own lands which they feel is justified by their large investments. In Oregon nine private protective associations furnish fire protection on large blocks of private land, and six units are protected by the state foresters' organization. The wardens employed by the private associations for supervising fire-control work must be approved by the state forester. This mixed state and private system is supervised by the protection division of the state forester's office which breaks the state into three areas with supervisors, district wardens, and inspectors, who supervise and direct the control system and check on the observance of slash-disposal requirements.

Partly as a result of increased Clark-McNary grants, the state organization has grown greatly in size and efficiency in recent years. But so has the job to be done. The war gave rise in Oregon to a great many new timber operations, so that today over 5,000 private concerns have to be checked and advised. There has been a prodigious increase in slash left unburned, which presents a widespread fire hazard and creates difficult problems of protection for the state forester. The state has taken over the vast Tillamook-burn ghost-forest area which is a special and major fire-and-reforestation problem. Until the state's recent rigid slash-disposal program salvage operations on the burn, stimulated by war prices and continued during the postwar inflation, greatly increased the danger of recurrent fires.

The state and association system of staffing, training, detection, and suppression for fire control parallels that used by the Forest Service for its timber. There was substantial advance in state physical facilities such as

lookout stations, telephone systems, trails and truck trails, during the CCC days, because CCC camps were made available to the state and to private protective associations on practically the same terms as to the Forest Service.

The state and the private associations protect almost as large an acreage of timberland as is contained within the national forests in Oregon. In some respects, their work is more difficult than that of the Forest Service because their timber is further down the mountain slopes and so in closer contact with population centers. It contains many more private timber operations which occupy the piedmont sections on the fringes of the thickly settled valleys. The private timberlands are beribboned by roads which permit the easy entrance of farmers, loggers, fishermen, and recreationists in large numbers. Fire hazard created by such frequent human use is of course much greater than that on national forests though this is rapidly changing as cutting operations shift to the latter.⁷ The Forest Service relationships to this state and private system are expressed in a number of explicit agreements. These are supervised for the Forest Service by two members of the regional staff who act as liaison officers to make the cooperative interest of the Clark-McNary Act work. They encourage the improvement of state and private preventive organization by channeling the latest technical information to the states, helping on training programs, sitting in each season on the planning of fire control, and lending advice when fires are under way. They also sit on the annual meetings of the protective associations when the budget and other important policies are discussed. These officers have the power to recommend the withholding of quarterly payments from the Clark-McNary appropriations if the situation in the state should warrant such drastic action. This, however, has never been done in Oregon or Washington.

Protective information is freely interchanged between the adjacent guards of the Forest Service and these state systems. They also cooperate in suppression of fires that break out near their contiguous borders. Special contractual agreements give the Forest Service responsibility for fire control on private land lying within the boundaries of the national forests or adjacent to the boundaries in such locations as to be more easily protected by the Forest Service. Running in the opposite direction are contracts by which the state or the private associations protect such strips of national-forest timber as can be handled most conveniently from stations of the state and private system. Joint protection is given for a common zone extending one mile on either side of a common boundary. The private associations in Oregon are financed by assessments on the lands of their members, but may also under certain conditions draw on a reserve fund

⁷ Lightning fires are much more frequent on the mountain elevations occupied by the national forests.

of the state (now \$375,000) in the event of need. Even so, a series of big fires may bring disaster to an association, as is illustrated by the bankruptcy of two associations since 1945.

In the state of Washington the basic features of the relationships between the Forest Service and the state are about the same. Some differences exist, however, in the state and local organization. Until the 1947 season state and private land in Washington west of the Cascades, outside of national forests or not protected by the owner directly, was protected jointly by the state and a single private association. In 1947 the state forester refused to renew the contract with the association for the protection of private lands assessed under fire-patrol tax, so that now the state provides a "blanket" level of protection on all state and private lands. East of the Cascades the state forester protects all land because on that side private ownerships are not sufficiently strong to provide their own fire protection.

One of the significant conclusions warranted by the experience under the Clark-McNary system is that the organization of protection under private auspices even though supervised and financially assisted from state and federal sources suffers from certain inherent handicaps. This is true even though it is reported that the level of prevention, presuppression, and initial action now being supplied by the private associations is entirely adequate. Nevertheless, there is a limit on the expenditures for suppression which the private organization can economically make. The acreage tax which their members pay into the association fund for protection must not rise so sharply as to threaten the bankruptcy of members or cut seriously into profits. Private timber operators must always consider the cost of suppressing a fire, especially after it has spread to large proportions. They cannot, therefore, employ the 10 A.M. rule of the Forest Service.

In the past private groups have been inclined to gamble with the weather, which in the areas west of the Cascades frequently will solve the problem. If, however, the gamble was lost, as occasionally happened, then not only were their holdings swept away but the economic foundation for whole towns and counties was destroyed. The great Tillamook burn was a striking illustration of these facts. It is said that twice during the earlier stages of that catastrophe, the fire could have been suppressed had the private timber operators felt financially able to pursue the policy of the Forest Service.

The Timber-Management Function

During the 'thirties, when lumber markets were depressed, private timber owners decried the sale of national-forest timber as unfair competition. Moreover the great Tillamook fire in 1933 damaged a virgin stand of

11,000,000,000 feet, and it was important to encourage liquidation of the salvageable material. So the Forest Service held back its timber and limited its sales to noncompetitive areas. But as the economic situation, under the stimulus of world preparation for war, began to revive the timber industries toward the end of the decade, national-forest timber in the Pacific Northwest took on new commercial importance. The shrinkage of private saw-timber resources in western Washington and northwestern Oregon and in the ponderosa-pine belts east of the Cascades, brought the timber of the national forests increasingly into commercial demand. Private timber owners now importuned the Forest Service to harvest its mature timber for market operations. This change in attitude became a revolution as the United States entered the war, as is indicated by the unprecedented total in 1947 of nearly 1,670,000,000 board feet of timber sales from the national forests in region 6. With "production" the national slogan, small mills, without timber of their own, multiplied, and many older operators ran out of stumpage. The service policy changed and the region has been trying to move as quickly as possible toward its allowable annual cut of 2,250,000,000 feet. Timber management has thus been catapulted into a position of first importance in the Forest Service job in this region. The demand for timber has placed new emphasis on timber management even on those east-Cascade forests where the range-management program has heretofore made the greatest single demand on field-officer time. To illustrate: In 1947 the income from timber sales in the Ochoco Forest rose to more than thirty times the receipts from grazing fees; the work-load plan of 1946 for the district ranger's staff distributed an estimated total of 25,099 man-hours of which timber management was programed for 9,425 and the range management for 3,000. For the region as a whole the situation is illustrated by the change in the relative importance of revenues from grazing fees and timber sales. In the fiscal year 1940 returns from grazing charges in region 6 were \$127,000.94 and timber sales that year netted \$1,241,870.48. In the fiscal year 1947 the returns from grazing were \$187,065.64, while \$6,300,926.58 was received for timber. It seems probable that this war-induced change will continue because in many parts of the region, as pointed out in chapter i, the end of private stumpage for saw timber is drawing near.

The effect of this new demand for national-forest timber has been to throw a much heavier work load on the district rangers with a consequent increase of ranger staff. It has necessitated the speeding up of cutting plans and timber marking and a program of road development to reach the timber. To the ranger has gravitated most of the timber appraisal, the marking of trees, supervision of logging, slash disposal, and other activities incident to sales and timber harvesting. This increased preoccupation with timber

management has coincided, in many places, with an increased public use of the forests for recreation, so that the district ranger's job is today much more onerous than it was even ten years ago. As a consequence his status has risen and his working force has grown. Where formerly he was customarily without professional forester assistance and had to rely largely on short-term summer staff, he is now regularly given a trained assistant ranger, junior foresters for timber-sales work, a full-time clerk (in most districts), and a nonprofessional crew which frequently works long beyond the fire and recreation season in the summer.

The elemental step in the national-forest timber program is the preparation of timber-management plans for the "working circles" into which each forest is divided. Each such plan covers a natural watershed area and includes an analysis of the essential physical and economic facts and of the timber resources of the watershed. The timber data are compiled so as to indicate the merchantable timber available, the area to be included in the first cutting cycle, any areas not suited to commercial timber production, the condition of the various timber stands, a sample tally of the classes of trees, site classifications, and data indicating the rate of tree growth. The economic data reveal the general market situation, the accessibility of the timber to market, the labor supply for forest industries, existing operating mills together with any additional private stumpage for them, and the employment needs of the dependent population. The heart of a working-circle plan consists of a program of the silvicultural practices, calculation of sustained allowable cut, management and timber-sales policies, and a definite and detailed program for harvesting the timber, disposing of slash, reseeding, and related reproduction needs. The timber analysis also includes the private timber within or adjacent to the forest which ought to be harvested in conjunction with national-forest sales.

Under the leadership of the late Chief Forester F. A. Silox, the Forest Service adopted a policy of working toward sustained-yield coöperative arrangements with private owners so as to bring to bear the use of all timber resources of the working circle for the dependent communities. This was before Congress had adopted the 1914 statute which authorizes the sale of timber on a coöperative sustained-yield basis. By its example of sustained yield, selective cutting, and other good cropping practices on national forests, and by persuasion, the Forest Service was able to obtain in the ponderosa-pine region a good deal of improvement in silvicultural methods on private lands that are integral to sustained-yield operation. In a few instances it aided private operators promising to improve and stabilize timber-dependent communities by opening up blocks of national-forest timber for sale where the lack of alternative access roads or railroads make it unlikely that other bidders could successfully compete. Until the close

of the 'thirties logging by "cat" and truck had not appreciably developed, so that the big operators with logging railroads were frequently in a monopoly position in bidding for national-forest timber.

Yet down to 1944 the development of a sustained-yield program on private lands was almost precluded because of a number of unfavorable factors. Mention has already been made of the impediment presented by undue fire hazard on private timber lands. The pressure of taxation and of local government financial need, which the depression of the 'thirties had increased, also slowed the acceptance of this program.

Another difficulty is the diffused ownership pattern of private and state timberland. Even such large owners as the Weyerhaeuser Company do not have all their lands blocked into compact units. Interspersed among their holdings are a multitude of small tracts owned by the state, the counties, and many private owners. While the fragmentation of ownership undoubtedly necessitates a cooperative method of working toward sustained yield, it nevertheless greatly increases the number of individual consents to be obtained in perfecting a sustained-yield agreement. This is usually an uncertain, time-consuming, and difficult process.

The 1944 law authorized the secretaries of agriculture and the interior to undertake two kinds of sustained-yield programs: (1) agreements with private owners, single or several, "for the coordinated management of such private forest land and federally owned or administrated forest lands within the sustained-yield unit involved," and (2) the creation solely from federal timberlands of sustained-yield units to be harvested without competitive bidding for the benefit of the dependent communities specified in the plan. In either type of unit, agreement might be made with other federal, state, or local agencies for the inclusion of timberlands under their control as part of a given program.⁸

It seems clear that the intent of Congress was to provide for two different forest situations: one, where a sufficient body of private timber remains so that, when it is combined with federal timber, continuous production could be maintained, even though at reduced levels; the other, where private timber resources are in an advanced state of depletion, and the federal timber is the principal basis for community stability.

For some years before the act of 1944 the regional forester had discussed with the Simpson Logging Company of Shelton, Washington, the possibility of a cooperative sustained-yield program. The act allowed the consummation of that negotiation into the first and only (as of June, 1948) agreement perfected and in operation in region 6 or the nation.⁹ By the

⁸ See *Public Law No. 273*, 78th Cong., 2d sess., Sections 2-4.

⁹ Overtures toward a second agreement have been made. This would involve the Rayonier Corporation, also operating on the Olympic Peninsula. However, though

agreement the Forest Service commits to the Simpson Company's use the timber from 111,466 acres of the Olympic National Forest, while the company pools 158,760 acres of its own. The Forest Service contributes the lion's share of the merchantable timber, however, with 4,356,548,000 board feet as against 973,344,000 feet from the private land. The agreement runs for 100 years, or until December 31, 2046, during which time the rate of cutting is not to exceed the sustained-yield capacity of the coöperative unit, except during the initial 10-year adjustment period when the annual allowable cut is fixed at 100,000,000 board feet.

Just before the end of the first ten years, and at each succeeding decade, the Forest Service "in collaboration" with the company will recalculate the annual cutting rate by means of a formula based upon factors of volume of available mature timber, rotation period of 100 years, and net growth. In addition to fixing maximum cutting budgets for consecutive decades, the agreement binds the company to cutting methods and other silvicultural practices, under plans prepared jointly by the regional forester and the company, to assure "the early and complete re-establishment of a stand of desirable forest trees on areas cut over, and to bring about conditions favorable to their optimum growth."¹⁰ The company binds itself not to allow practices on any of the lands which are incompatible with the "objective of growing the maximum volume of forest trees to sizes suitable for conversion to salable forest products in the shortest possible time." Both parties agree to carry out a full-fledged fire-protection program, with the company binding itself to a standard similar to that currently employed on the national-forest lands within the unit. A similar covenant governs insect and disease control. Detailed provisions assure attention to reforestation—by artificial means if such become necessary.

Community protection is limited to the towns of Shelton and McCleary "or within a ten mile radius thereof" where the company is required to maintain and operate sufficient primary manufacturing-plant capacity to use at least 80 per cent of the timber taken from the sustained-yield unit. The company also agrees to increase employment opportunities by working toward the establishment of an integrated and balanced forest-products industry within the Shelton-McCleary area. It is to recruit its workers from the local communities and to plan its operations so as to afford continuous employment "so far as it is practical and economic to do so." Housing facilities for employees in company camps must meet the standards prescribed for similar facilities on national-forest timber sales.

Each party is bound to include under the agreement any additional land

permission to start negotiations was requested by the regional forester, only casual study has yet been given to this prospect. (November, 1949.)

¹⁰ *Information Concerning Shelton Coöperative Sustained Yield Unit and Coöperative Agreement*. U.S. Department of Agriculture, Forest Service (Portland: August 19, 1946).

it may acquire within the unit area. The Forest Service reserves the right to set aside tracts along streams and roadsides where it considers recreational or aesthetic values are paramount. It may also reserve tracts from logging which might result in severe erosion. The company is bound to give access to its records to the Forest Service on a confidential basis. Complaints against acts or negligence by Forest Service officers in the fulfillment of the agreement may be carried up the hierarchy to the Secretary of Agriculture.

At the time of the public hearing at Shelton, as required by the act, the proposal was supported by the local representatives of the two towns of Shelton and McCleary and by local unions, CIO and AFL. It was opposed by spokesmen of towns that would lose timber, by the small operators who lacked timber to keep their mills running, and regional representatives of the CIO who objected to the "monopolistic" favors to the big operator. On the basis of the security afforded by the agreement, the Simpson Company has built a large fiber-board plant to utilize its mill waste. This plant will afford a marked increase in employment.

Thus far no application of the federal-unit type of sustained yield has been made, although discussion has been started with the representatives of the industry and towns in the depleted Grays Harbor area. If sufficient local interest is shown, the Forest Service might be expected to dedicate an adjacent tract in the national forest to be harvested on a sustained-yield basis, for the benefit of timber-industry operations within certain designated communities of Grays Harbor. The milling capacity there is already much greater than could possibly be supported by national-forest timber and the small remaining stands of private timber. Therefore, the problem of maximizing the use of federal timber is tied up with some method of distributing timber sales to those processors offering the greatest opportunities for employment through remanufacture and through the greater utilization of wood waste. It is too early to know how that issue will be resolved.¹¹

¹¹ The Grays Harbor situation ripened rapidly, so that on November 2, 1949 the first federal unit in the Pacific Northwest was established. The issue of utilization was met by a policy of requiring community utilization above the regional average. The situation will be reviewed again within a few years to judge results. If utilization remains satisfactory, the arrangement may then be renewed for a longer period of time. It was thought unwise to exact a particular standard of use for individual operators as a condition precedent to bidding on Forest Service timber because so many operators take the timber through one or two stages of manufacture and then turn it over to another local processing plant for further fabrication. There is a good deal of integration in manufacturing use in the community but not necessarily by the firms who buy and first use the raw timber material from the forest.

A hearing for a federal sustained-yield unit has been held on the Modoc Forest at Alturas, California (region 5) and another will probably be scheduled soon for the town of Lakeview on the Fremont Forest. (November, 1949.)

There has been no great rush by private operators to avail themselves of the new law. Among the applications that have been made for consideration in a coöperative unit are a number with resources too slender to qualify. Forest Service policy has determined that to be considered for a coöperative unit, the private coöperator must own 20 per cent of the available supply of merchantable timber in the unit, and at least one-third of the productive capacity of the forest lands. It is probable that so long as the unprecedentedly high lumber prices continue, the inducements to liquidation, even of large holdings, will be too great to be resisted. The sense of "trusteeship" of any resource, timber, grass, or soil, in private ownership is still so faintly developed that interest in coöperation under this program is likely to be largely confined to those operators who have scant resources to contribute to the combined timber pool and to a few big companies.

In the pine-timber belt the slow growth of trees, and the great length of the cutting cycle essential to sustained yield, makes the investment term so long as to block private interest in coöperation. The prospects are that east of the Cascades nothing better than the federal-unit type of partial support for local community timber processing will result. West of the mountains there may be enough private timber to cover perhaps as high as 25 per cent of national-forest timber under coöperative agreements, but any figure is a guess at present.

One of the most important but unspectacular aspects of timber management is the control of forest diseases and pests. These have taken a heavy toll on certain forests in the Pacific Northwest. The estimated annual loss from insects and diseases on all the nation's timberlands for the decade 1934-1943 was about 50 per cent greater than the estimated annual fire losses.¹² There is always a certain normal, or endemic, loss by insects or disease—particularly the heart-rot fungi. This is a part of nature's continual struggle in the forest. But from time to time outbreaks either of insect pests or diseases play particular havoc with timber. In the ponderosa-pine forest of Idaho, during the early 'twenties the pine butterfly killed an estimated 25 per cent of the stand and wreaked lesser damage on the white pine. The fir tussock moth in 1945 defoliated an estimated 350,000 acres of fir timber east of Moscow, Idaho. Since 1927 an epidemic in the Western white pine of blister rust has been attacking the younger trees, which it either kills or renders stagnant. In the forests of Oregon and Washington the Western pine beetle became an epidemic in 1917, but its greatest destruction was wrought in the desiccating 'thirties. By 1943 the beetle had killed over 25,000,000,000 board feet, a loss about equal to the total cut of that species during that 26-year period. Following the Tillamook burn

¹² "Protection against Forest Insects and Diseases in the United States," *Report No. 5 from a Reappraisal of the Forest Situation*, USDA, Forest Service (1947), p. 3.

of 1933 have come a series of infestations of the Douglas-fir beetle which destroyed 200,000,000 board feet in 1935, another 100,000,000 in 1938¹³ and is still on the rampage. This is only a part of the catalogue of unusual losses from pest epidemics.¹⁴

One of the major tasks of timber management is to reduce these losses to the endemic level. But the basis for such programs is (1) scientific research to reveal the life history of the insects and other biological facts and (2) the invention of control methods which are effective, practical, and not too costly. The regional forester's organization must lean heavily on the research talent of the Bureau of Entomology and Plant Quarantine, the Bureau of Plant Industry, Soils and Agricultural Engineering, and the Forest and Range Experiment Station for these essential services. For many years technicians of the two sister bureaus have occupied offices adjacent to those of the forest experiment station and the regional forester, so that their research and technical advice could be kept in intimate daily contact with the Forest Service problems. As a matter of fact these entomologists and plant pathologists of the two other bureaus are such integral parts of the Forest Service organization that inquiries concerning pest or pathological conditions coming from the forest supervisors are sent directly to these scientists who also transmit their replies without formal routing through the regional offices of the Forest Service. While occasionally a direct attack upon an infestation can be made successfully (as in the eradication of the plants that act as hosts to the white-pine blister rust) the best present judgment is that "in the long run healthy, growing forests, well-suited to the site and able to resist attack will be the best defense against most insects and diseases, and more attention should be given to testing and applying the indirect methods of control."¹⁵ It has in recent years been well demonstrated, for example, that light selective cuttings in ponderosa pine provide effective control of the beetle infestations that heretofore produced such havoc. In the Douglas-fir forests, recognition of the external signs of incipient heart rot and the knowledge now available on the increase of decay with advancing age of mature trees make it possible by harvesting practices and cutting schedules to prevent undue losses from these pathological causes. Silvicultural practices at the time young stands are being established, or thinning methods providing not only density control but species arrangement, composition, and age distribution appear to be the basic tools for bringing down losses from insects and diseases.

But precisely what to do is a question that can be answered only by careful silvicultural and management research. These programs, through want

¹³ *Ibid.*, table no. 5. These figures include California as well as the Pacific Northwest.

¹⁴ During the past year or so a spruce bud-worm infestation has spread to alarming proportions and is now the most threatening pest to the Douglas fir and related species. (November, 1949.)

¹⁵ "Protection against Forest Insects . . .," p. 10.

of sufficient appropriations, are seriously in arrears in region 6. The actual control jobs involved in eradicating the Western-pine beetle, blister rust, or other pests and diseases on national forests are the function of the regional forester's establishment.

Under the guidance of the timber-management specialists of the two regional offices, some experimental activities in silviculture have been carried on, as for example on the thinning projects on second-growth fir of the Olympic National Forest. Again in one ponderosa-pine forest where a large area has been thickly restocked, selective spot thinning has been practiced. Timber sales also permit the application of the scientific information developed by the experiment-station researchers to improve the growth of the remaining timber stands. For many years contracts for the sale of ponderosa pine have required that selective logging be practiced and that only from 40 to 50 per cent of the timber (by volume) shall be taken out. This policy has without doubt considerably accelerated the growth of the remaining timber.

Other timber-management problems in national forests call for scientific assistance from the Fish and Wildlife Service. The Forest Service undertakes extensive replanting of cut-over land, particularly on areas most likely to be productive or where erosion hazards should be controlled by replanting. The destruction of young seedlings by rodents is often a considerable hazard to the success of such reforestation. The Fish and Wildlife Service assists in the necessary rodent-control programs by furnishing technical assistance and poison.

Range Management

East of the crest of the Cascades all national forests of the Pacific Northwest are used for livestock grazing. The character of timber and other vegetation and the agricultural economy make grazing on those forests a matter of great economic importance. In 1933 work-load analysis prepared for district rangers on the Umatilla and Malheur forests indicated that range management required more time than any other program. On ten of the eleven ranger districts it was programed for more man-hours than fire control, which was the second most onerous duty. While that situation has changed, as noted earlier, and timber management now takes top rank due to sales of national-forest timber, the grazing functions are still important. In some places the summer ranges in the national forests are practically the only sources of summer feed supply, so that their unavailability to the adjacent stockmen would seriously damage the local livestock industry.

Each national-forest supervisor, with the aid of his staff and district

rangers, prepares in advance of the grazing season a general plan for managing the grazing resources of his forest. The number of livestock to be grazed is determined on the basis of the number each range will safely carry over a series of years without injury to the range or soil. The supervisor determines this grazing capacity, with the aid of range inventories, by correlating past-use history with present condition and with the trend of the forage on the range, and by comparing the past season's utilization with the actual stocking on the range. The supervisor and his district rangers maintain records of actual use by livestock on the forest and the districts, data concerning the condition of the various range activities needed for controlling rodents and poisonous plants, and of the general management requirements for all range allotments to permittees. The district ranger and often the supervisor meet each spring with associations of livestock users made up of forest permittees, to plan range improvements and management activities for the associations. These include such activities as salting, fence repair and construction, water development, cattle distribution, the use of bulls, the employment of manager or line riders. The ranger ordinarily prepares the agenda for the meetings and acts as secretary and adviser, and it is the ranger who applies the final grazing plan. This consists of the stipulations contained in each permit with detailed maps showing the area to be used by each permittee, the sequence and date of area use, and also of the association's program of activities. The associations are obliged to suppress small fires, to report larger ones promptly, and to respond to fire calls if necessary. The ranger furnishes them with fire-fighting equipment.

At the end of the First World War, public and private ranges were generally badly overstocked because of the expansion in livestock production induced by the war. Consequently, national forests were seriously overgrazed and required special attention to restore forage resources. It was difficult, however, to obtain quick reductions in grazing numbers because of the acute financial crisis affecting livestock and other farmers after the sudden drop of prices in 1919. Financial commitments to banks and other lending agencies placed great pressure upon the Forest Service to allow permittees to continue to carry the maximum number of animals. Nevertheless, by taking advantage of favorable opportunities, after 1922 a slow but steady reduction was achieved. In region 6 the permitted number of sheep declined from 857,638 in 1922, to 462,869 in 1942; the number of cattle and horses from 177,626 to 88,645. Some reduction had been obtained by demonstrating to the stockmen a higher net income through reduction of herds. By a policy of forfeiture for nonuse of the forest for periods of three or more years and by reducing numbers at time of ownership transfer, some forest pastures have been markedly improved. Yet even as late as 1938 a region-wide inspection by the chief forester's office found that a large

number of allotments (including two entire forests) were in poor condition.

Pasture depletion had been due not only to prolonged overstocking but to bad management and poor distribution of the livestock. But a proper management program would require much more man power than either the livestock owners or the Forest Service had provided. The Second World War made this situation still more difficult. During that period herders became scarce and those who remained were likely to quit if they were prodded too hard about exercising care in managing the herds. While sheep have no antipathy to moving back into timbered areas, their herders do. This need for man power to manage forest grazing is due largely to the feeding habits of cattle, which like to stay in the open patches near the water holes and on smooth ground. They have literally to be forced back into the timber in order to use up the considerable quantities of grass and browse in the timbered areas. Moreover while some of the most nutritious grasses grow in the wooded shade they are not as palatable to cattle as grasses grown in the sun. Consequently, until the open spaces are denuded of grass, cattle will not voluntarily move back into the woods. In the Rocky Mountain forests, where aridity and steep topography are characteristic of much forest land, it would appear that the danger of overgrazing will remain until allotments are divided into units for rotational and deferred grazing, more riders employed, and some of the open places fenced so as to bring them under more complete control. In addition, the percentage of forage which, according to the research by the several forest and range experiment stations, must be left each season on different types of pasture in order to continue the reproduction essential to sustained good forage yield must be observed by permittees if overgrazing is to be prevented.

In managing the grazing resources the Forest Service has for many years worked with advisory boards of permittees chosen by the members of the livestock group utilizing a particular forest area. Whenever a grazing allotment is released or some new pasture area is made available, the district ranger recommends to the board the names of applicants to be considered. The board in turn indicates its preferences and, if possible, an agreement is reached as to who has the best claim. But the forest supervisor makes the final decision. If he feels that reductions must be made, the problem is discussed with the board or the entire association, but he can overrule their objections.

The Forest Service also helps finance range improvements by setting aside a part of the grazing fees derived from a given association, and the association often assesses its members to supplement that fund and to pay such costs as salting and line riding. In this way the improvement program has been accelerated. In many forests it has not been possible to assign a given pasture area to a single operator. Consequently there is acute need

for associations to help in joint management where a number of permittees graze their livestock over a common area. That practice also raises the issues of rotational grazing which in the judgment of most grazing technicians should be practiced in such instances. While many associations have been reluctant to adopt a rotational grazing program, its slow development is chiefly due to lack of Forest Service funds for fences and other improvements needed for rotational management.

The employment of the association's line riders or range managers is of vital importance to the district ranger because they become in effect members of his staff. He therefore is consulted in their selection and issues instructions to them as the season starts, emphasizing those activities most essential to good range management. They are required to keep records of salting, distribution of the stock, and numbers counted on and off the pastures; they turn over these records to the ranger at the end of the season.

Wildlife Management in the National Forests

Closely related to the grazing use of the forests is the program of wildlife management. A number of national forests, at the request of state game agencies, have set aside refuge areas in which hunting is prohibited, but this practice is not encouraged. When the population of deer, elk, or other big game becomes so numerous that the starving animals seriously deplete the native forage, conflicts develop between the grazing of domestic livestock in the national forests and the protection of wildlife which call for adjustments. Legal control over hunting and fishing in national forests is exercised by the states which close areas seasonally if their agencies decide this is essential to the game. Years ago, acting under authority of the act of Congress of June 4, 1897, the Forest Service asserted its legal right to determine the rules for the harvesting of wildlife in national-forest lands. Regulation G-20A promulgated by the secretary of agriculture declared that when the secretary determined "that the regulation or the prohibition for a specified period of hunting or fishing upon any National Forest or portion thereof is necessary [he might] designate such National Forests or portions thereof, establish hunting and fishing seasons therefore, fix bag and creel limits, specify the size of animals to be killed, fix the fees to be paid for permits, designate the authorized official to whom application for permits shall be made and describe the terms and conditions under which hunting and fishing shall be conducted with a view of carrying out the purpose of this regulation."

In view of the fact that all national forests contain considerable areas of private land which would still come under the jurisdiction of state law, it is clear that any effort to enforce this alleged federal right might lead to

a chaotic situation unless the state law about the taking of game on these private lands was the same as federal regulations. Consequently regulation G-20A has been superseded by regulation W-2, which, without abdicating Forest Service responsibility for proper use of the forests, provides a policy of coöperative management of wildlife resources with the various states and the protection of forest resources from damage due to overpopulation of game. The Forest Service has never attempted to exercise power of regulation in region 6, so that whenever the deer or elk multiply to the point of depleting the browse the state agencies or legislatures must furnish relief. A number of forest areas have been badly depleted of browse by overpopulation of deer and elk. Long after these facts were known it was still difficult to obtain modification in hunting regulations so as to obtain a proper balance of the game population with feed resources. The area adjacent to Murderer's Creek in the Malheur Forest is a case in point. There the mule-deer population became so great that browse and even the grass (which the deer eat only as a last resort) were badly depleted. In winter the starving deer moved down to the valleys and ate the feed supply of the domestic livestock on private lands. The depletion of the forage started serious erosion problems in certain forest areas. After a great deal of agitation and complaint the state game commission revised its regulations to allow limited killing of female deer.

Another phase of the wildlife program carries positive values for grazing resources. The protection of beaver helps to conserve the moisture on the forest meadows because their dams spread the mountain snow-melt rivulets and streams over larger areas, creating natural irrigated mountain pastures. A double service can be done by removing the beaver from irrigated farms down in the valleys. The state game agencies carry on a program of trapping troublesome beaver, and transplanting them to mountain meadows in the forests.

In wildlife management, particularly of big game, coöperation with the Bureau of Land Management is necessary. Because a number of the best winter big-game ranges are on the grazing districts it would be futile for the Forest Service to apply game regulations without agreement with the Bureau of Land Management. The winter-feeding areas (many of which are also in private ownership) rather than the feed resources of the national forests ought to determine the number of game animals permitted. Otherwise artificial feeding during the winter must be practiced or the game will starve.

On the fisheries side of the wildlife program the Forest Service depends upon sportsmen's clubs and the state game commissions to determine needed stocking programs. If diseases develop among the trout the Forest

Service turns to the state commission's biologists for assistance. Local Forest Service officers are required to report violations of hunting and fishing regulations to state and local officers and to use their facilities to assist these officers in their police duties.

Recreation Activity

During the hunting season the national forests are the scene of great activity. Forest camping facilities are provided for the hunters to the very limited extent allowed by the budgets for such recreational activities. In some areas the Forest Service checks hunters in and out, thus helping state and federal game officials to keep an account of the harvest taken.

With the coming of the automobile the national forests became recreational centers with increasing demand for facilities. The entrance of the Forest Service into a recreational program came via the backdoor of sanitation. The Forest Service welcomed campers to its lands, but as their numbers multiplied the litter of cans and other debris compelled the district rangers to try to clean up. Further, the need for toilet and water facilities for the increasing volume of campers and fishermen compelled the service to begin building such structures.

An unplanned public use thus forced the acceptance of a new forest program. From the early mistakes when facilities were built without adequate information or planning, there evolved during the mid-'twenties a systematic procedure for planning forest recreational development before physical structures were installed. This procedure involved the location and study of the special areas along lakes and streams suited to intensive recreational use. An example of a recreational-unit plan is Odell Lake which lies in the Deschutes Forest just east of the Cascade crest and is convenient by road and rail to summer vacationists. By 1925 its use had so increased that a complete recreational design seemed necessary. The plan then prepared required a topographic survey of all land bordering the lake and reaching some distance back into the forest. The shore line was divided into seven use zones: public camping grounds, private summer homes, small organization sites, large organization sites, commercial resorts, natural-wood scenic strips, and administrative sites. Each of these zones was then studied in detail and development maps and plans prepared which included landscaping and architectural treatment. Plans were drafted for the location of service roads for the entire lake. A program was suggested for the quantity and the quality of projected recreation uses.

The recreational plan for an entire forest would include a number of such units. It might also include primitive areas of considerable size within

which no roads would be constructed and physical improvements would be kept at a minimum. Such plans are essential not only for the continuous development of recreational facilities but as guides for reconciling that purpose with timber management and grazing programs.

The recent rise of interest in winter sports on the Atlantic and Pacific coasts and in the mountain areas of the West has created a new and unprecedented popular use of the national forests. Every population center has a growing quota of winter-sports enthusiasts who demand that national-forest areas be provided with skiing and other facilities to satisfy their interest. This has required the creation of new forest facilities to care for the crowds which come by car on holidays and Sundays and weekends to enjoy the skiing and winter fun. Some units within the forest have been set aside primarily for winter-sports purposes. The service has found it necessary to have staff and facilities available to help care for accidents, to rescue lost skiers and others, and to serve the many human needs of large crowds. With the end of the war, the removal of gasoline restrictions, the increase in private automobiles, and the amazing increase in population in Oregon and Washington, the pressure for winter sports as well as for other recreational use of the national forests in the region has reached an all-time high. This is placing new demands upon the public-relations capacities of many district rangers.

Some sections of the national forest, such as the Yakima and Wenatchee watersheds of the eastern Cascade slope, have become such important sources of water supply for municipal and irrigation purposes and so heavily used for recreation that their continued use for grazing purposes is gravely questioned. The time seems approaching when conflicts between the several purposes served by national forests may require the elimination of some uses in favor of others of higher priority. In other areas there is no comparable incompatibility between recreation, water supply, and grazing. Thus on the Mt. Hood Forest which has generally a heavy recreational use, grazing may also continue. In fact the "pruning" of the huckleberry bushes by the sheep increases the huckleberry yield, a resource of considerable importance to recreationists as well as to the Indians of the adjacent reservation who pick for commercial sales. These situations are interesting illustrations of the fact that the concept of "multiple use" is not always easy to apply and in a given situation may have to be modified in the direction of limited or occasionally single use.

During the 'thirties forest recreational structures were much improved by the labor power made available by CCC and WPA. At present, however, there appears to be great need for the renovation of and additions to forest camp structures to care for the increased demand which has developed since the termination of the war.

Mineral Policy

One of the minor activities performed by the Forest Service is the checking of mineral entry claims in national forests. The statutes give private parties the right to enter upon national-forest land for mineral purposes and to make claims for such materials as sand, gravel, pumice, as well as for the garden variety of minerals. All such claims have to be reviewed by the regional forest office and reported to the Bureau of Land Management. Private rights which may be exercised under the mineral laws are very broad but claimants constantly tend to try to expand them under the guise of mineral claims because, if validated, they give the right to use the surface of the ground above the mineral. Many claimants are primarily motivated by the desire to get possession of important recreational sites. Special claims of this character have been filed against some of the best recreational sites along the Rogue River—and by some of the “best people.” Where fraud is discovered, the Forest Service must refer the matter to the Department of Justice, the Bureau of Land Management, or the solicitor’s office of the Department of Agriculture for prosecution.

One interesting example of troubles caused by these mineral rights relates to Lava Butte south of Bend. This volcanic mountain was taken by the Forest Service in exchange for other land. The former owner immediately slapped on a mineral claim to the Butte for cinders which he proposed to sell to the state highway commission. Through the protest of the Forest Service the General Land Office disallowed the claim and the matter was dropped.

Purchase and Exchange of Land

Land exchanges and purchases are also important to the national-forest program because of the desirability of unifying national-forest area ownership for better administrative control and to insure that land primarily valuable for timber production and watershed protection will be so used. For this purpose small areas in private ownership lying within the forest or adjacent to its boundaries which should be managed along with the federal forest lands are the subject of a forest-acquisition program. Congress permits the Forest Service to exchange land for land or to exchange stumpage rights in national forests for private land. It is possible to provide cash for the vendor of land by giving him a substitution right on a going timber sale. A few outright purchase projects under the Weeks Act have been carried through in the Pacific Northwest. Illustrations are the watershed of the municipal water system of Corvallis and an area on

the Ochoco which, incidentally, helped to keep the Ochoco Timber Company from going bankrupt and to improve its forest practices on its own land. Purchase authority ought to be expanded in the Pacific Northwest in order to acquire those small spots on watershed outside of national forests which contribute to local floods and accelerated erosion. Generally throughout the Pacific Northwest, except for southern Idaho, major watersheds are included either in national forests or some other federal ownership. But a few places, as illustrated by the watershed above Heppner, Oregon, and a number of areas on the tributaries of the upper Snake River, ought to be acquired by the Forest Service or the Bureau of Land Management for watershed protection. Less difficulty is likely to arise if these places are acquired by purchase rather than exchange. Forest-land purchases must be approved not only by the National Forest Reservation Commission but by the state and the counties in which they are located. Moreover purchases are financed by direct appropriations of Congress, while exchanges utilize timber in place of appropriations. Because the counties receive 25 per cent of gross timber-sale revenues from national-forest timber, acquisition by exchange compels the county to invest its 25 per cent interest along with the federal 75 per cent interest. The counties will ultimately receive their 25 per cent from the revenues on the land acquired. An administrative advantage in the use of the purchase method is that purchases do not have to be cleared through the Bureau of Land Management and thus are free from the long delays in perfecting title which have been so commonly experienced in land exchanges.

Watershed Protection

The management of watersheds, while in large part a by-product of the fire control, grazing, and timber-management programs, calls for some separate consideration in its own right. We noted in chapter i that this is especially true for those areas that produce the water so indispensable for the arid and semiarid parts of the region. The information on which to base assured management practices is still scant. It is the function of the forest and range experiment stations to conduct the forest-influence studies that might tell what to do and what to avoid. But thus far practically no research of this character has been carried on by either the Portland or the Missoula station because of lack of appropriations for the purpose. The Ogden station has done considerable work especially on the mud-rock flood problem. But in the Pacific Northwest the whole field of research on this sector is still largely unexplored, and until it has been prosecuted more thoroughly and widely we shall not know the potentialities and limitations of scientific watershed management or what bearing it might have upon

the utility of river structures, particularly on the tributaries of the mid- and upper-Columbia and of the Snake.

Influence on Private Activity

It should be clear from the discussion of fire control and sustained-yield forestry that the Forest Service is not only concerned with national-forest management but must also give attention to the problems on nonnational forest land. A special unit was created some years ago to take the leadership on such matters in the regional forester's office. This is the division of state and private forestry. Its job is to help to carry the technical forestry information and ideas accumulated by the Forest Service into the everyday practices of private timber-and-mill owners, and to the states and counties owning timber lands. A promotional organization, it attempts to educate private and public groups in better forestry practices, especially those that look toward sustained-yield timber management. The division of state and private forestry has paid special attention to those forest communities approaching a crisis situation because of the failure of private operators to adopt sustained-yield practices. In cooperation with the staff of the forest and range experiment station, it prepared special studies of these areas intended to help the people and the timber owners see the problems that lie ahead and the steps that might be taken to stabilize their communities.

Upon every favorable opportunity, effort has been made to persuade timber operators to improve their cutting programs. Such persuasion can at times be helpfully combined with timber sales policy. Forest roads can also be built in such a manner as to assist an operator interested in buying national-forest timber to conduct his operations properly. For example, a small operator in one of the Washington forests had a mill which consumed about 15,000,000 board feet of logs a year. To encourage him to pursue proper cutting and silvicultural practices the Forest Service found it practicable to open up and offer for sale a block of timber about 18 miles from his mill. Because of his favorable location, he was able to obtain the timber as the highest bidder. He could log the Forest Service land cheaply over a low-cost private truck trail, thus escaping gasoline taxes and truck licenses. By combining the Forest Service timber with his own further down in the valley and by slightly reducing his cost, it was possible for him to operate his mill ten months of the year, thus stabilizing employment and markedly extending the life of his own timber.

A related promotional activity serving private industry has been the study of the conversion of the raw timber into more and more refined products. This program was begun by the old division of forestry long before the Forest Service was created. Its usefulness was greatly increased by the

establishment of the forest-products laboratory at Madison in 1910, which launched research studies in timber mechanics, wood preservation, timber physics, kiln drying, pulp and paper, plastics, and many other problems basic to better and wider use of timber products. The regional forester obtains assistance from the Madison laboratory on utilization problems for timber in this region. In recent years that program has markedly expanded as a result of the employment by the Portland Forest and Range Experiment Station of utilization technicians to carry on still further research in coöperation with the Madison laboratory on various utilization problems, but particularly on wood wastes. Such services have been of particular use to the smaller operators because the big companies, like Weyerhaeuser and Crown Willamette, have their own experimental laboratories.

The secretary of agriculture has given the Forest Service full responsibility for the farm-forestry program in coöperation with the states authorized by the Norris Doxey Act.¹⁶ Federal and state funds are united to employ technically trained foresters who usually work out of the county agent's office. Three such foresters are now engaged in Washington, one each in Cowlitz, Clark, and Thurston counties; and four in Oregon for the Willamette Valley fringe areas. The farm forester does a case-work job of guiding farmers in the management of their wood lots and in obtaining fair prices for their timber; he advises on fire control, thinning, and marketing; finds loggers who will cut the timber in the approved manner; helps the farmer mark his trees or teaches him how to do it himself; encourages custom-sawing outfits to furnish the wood-lot owner with cheap lumber for his farmstead and gives him information about curing lumber to minimize waste. This program squares with the new emphasis along the whole state and private forestry front on helping the little fellow who, without such technical assistance, is in no position to compete with the larger timber operator.

In those counties where soil-conservation districts have been created and a farm forester assigned, he takes over the wood-lot phase of farm planning from the SCS technician. Heretofore the regional forester has employed and directed the farm foresters in those states (like Oregon) where the federal government has furnished the larger share of total funds for this program. Since July, 1948, however, all farm foresters are under either the state forestry department or the extension service, which the federal government reimburses for its share. In any event the whole program is supervised by the division of state and private forestry of the regional forester's office.

¹⁶ *Public Law No. 95, 75th Cong. (May 18, 1937).*

Research

We have already mentioned incidentally some of the research activities of the forest and range experiment stations situated at the three regional Forest Service centers in the Pacific Northwest. These research stations are expected to develop the basic information needed for long-time good forestry in all its major programs rather than to meet the day-to-day service problems about which the administrative staff needs technical information. The areas of research activity parallel in a general way the functional programs which we have already discussed. Thus, for example, the experiment stations have done the detailed studies on fire control. When their results reach the state of application they are incorporated in the management plans of the administrative people. A common fundamental program for each station is the maintenance of a current inventory of forest resources, on private as well as public land, which was first taken during the early 'thirties. This job is called the forest survey. It is basic to all appraisals of trends and of plans for sales and sustained yield. In the Portland station it is planned to make each decade a field reinventory of the region's timber including estimates of growth and mortality. This information is used by all public-forest agencies and many private parties.

The Portland station also pays special attention to economic aspects of forest industries, including such problems as the effect of taxation on timber liquidation and forest ownership, factors affecting lumber production, financial problems of lumber production, and the life expectancy of the plywood mills. Because of the importance of commercial timber in region 6, and the new demands for commercial use of national-forest timber in Oregon and Washington, the research programs in wood utilization and timber management have been assigned to help forest industries work on the elimination or utilization of forest and mill wastes. Already the conversion of mill wastes (slabs and edgings) into small articles like handles, venetian blinds, furniture, and glued cores has been vigorously pushed in this area. The high price of lumber makes relogging or salvage logging practicable provided proper methods and equipment are used. The technicians have been promoting these practices. Some of the laboratory problems developed may be diverted to the new laboratory at Oregon State College or to the research men at the University of Washington; but many of them will be channeled to the forest-products laboratory at Madison. Two experimental alcohol plants have been in operation: (1) at Bellingham where sulfite-waste liquor from the pulp mills is now making alcohol at low cost, and (2) at Springfield, Oregon, where an experimental plant (now closed) used logging and mill waste to make alcohol, high-protein feed yeast from

the spent beer, and sugar from the hydrolysis of wood waste. The laboratory processes for these plants have been developed and improved by the Madison laboratory technicians, but the experiment-station staff work with the operators and act as liaison with the Madison laboratory on all technical difficulties. The results of both these experimental plants hold great promise for making highly economic use of timber materials heretofore left on the ground to catch fire, or burned at the mills, or dumped into the rivers and bays. If the promise is fulfilled an important corner will have been turned in conserving the basic timber resource of the region and stabilizing the industry.

Assured knowledge of how to manage differing stands of Douglas fir and other leading species in this primarily commercial timber region is yet scant. With the prospect of sustained yield heightened since 1944, and the sudden rush to the national forests for commercial supplies, it seems urgent to overcome the delay on this front. Accordingly the Portland station has recently been seeking funds for additional staff in timber management. While a comprehensive management research program is still in the planning stage, some evidence is now at hand throwing doubt on the efficacy of some of the management practices in Douglas-fir areas. Selective cutting in Douglas-fir stands of mature virgin timber now appears unsuccessful for stimulating growth of the remaining trees. How to improve seeding and planting for use on non-restocking lands (which cover a large area) is another important research challenge. A closely related need is the discovery, testing, and production of superior strains of Douglas fir and other high-quality species. With the great reduction of virgin timber on private lands the management problems of second growth now loom up with special importance. These present many research "musts" if sound management is to be practiced.

All three stations in the Pacific Northwest are now engaged in range research, but the station at Ogden has for years been the primary center of basic information in that field for this intermountain region. Nor has it been able to confine its studies to the mountain ranges in the national forest because (1) of some similar problems on the lower ranges and (2) of the intimate bearing which scantness or lushness of feed supplies on the lower levels has upon pressure to use forest ranges. The Ogden station has taken the lead in the development of appraisal techniques, and in measuring trends in range conditions; in recent years it has emphasized research on problems of reseeding and the restoration of sagebrush land to grazing pastures by sage removal and reseeding. The implications of this last group of studies hold high promise for the livestock industry of the West and for restoring the grass cover in the whole intermountain area, including much of southern Idaho. We called attention in chapter i to

this station's great contribution to knowledge of watershed management in the arid parts of the region. That work continues as a major phase of the Ogden station's current programs.

The research programs for each experiment station are decided partly by assignment from Washington, D.C., in the light of over-all service research needs. But a good deal of the work is determined regionally—or by the special interest of some strategically placed congressman from the area who has a penchant for a particular problem, and who therefore persuades his confreres to appropriate money for a particular job to a particular station. The regional phases of the program are customarily worked out in joint conference between the station's technical leaders and the program leaders in the regional forester's organization. So long as the complete administrative separation between field research and the regional forester's organization is maintained, this "buckle" device is important in keeping research effort keyed to the utilitarian purposes of which the regional forester must be acutely conscious.

Multiple-Purpose Traits of the National Forests

It should be clear from the foregoing exposition of Forest Service programs that the national forests serve many different uses in addition to providing timber for lumber and pulp. This multiple-purpose objective is one of the major emphases in Forest Service policy. This "ideology" has been well stated by the late Chief Forester Silcox in a memorandum to the service dated June 21, 1938:

(1) Various resources,—land and soil, forest, forage, watershed, wildlife, recreation, etc., the objective for which is to make all of the constituent resources fully productive or to make them render full service. The objective is also to correlate or integrate the management of all these resources in accordance with the multiple use principle as fully as ownership and other complicating factors permit.

(2) The ultimate objective of making these resources a social and economic benefit, or in other words to make the forest resources contribute to the fullest possible extent to the permanent solution of our ever changing social and economic problems, and to permanent human welfare and security.

But the application of the multiple-purpose idea is in no sense an automatic one. The reconciliation of the various uses of the national forests to obtain the maximum result in social benefit is a matter partly of mastering the physical facts concerning the resources and their potential use, but partly also of social policy and of judgment. The possession of so many potential uses by the forests brings the interests of many different groups to play upon forest administration. These groups participate from time to time in the development and the reconciliation of conflicts but the

combination of group interests is rarely the same on any two forests. As a consequence some freedom is left to the Forest Service officers to make adjustment and accommodations which tend to soften the discontents of groups which may feel that their interests are, in a given instance, not fully appreciated.

There can be little doubt that this multiple-group situation increases the opportunity for Forest Service officers to pursue the "public interest" by finding adjustments between the divergent group purposes which tend to maximize the total utility of the forest resources. No one interest is sufficiently strong, taking the region as a whole, to menace administrative responsibility as seriously as was the case with some of the single-purpose agencies, such as the now superseded Grazing Service.

Of course extraregional group pressures also play a part in determining what may happen in the region by influencing appropriations and legislation affecting the functions of the Forest Service. In the origin of the national-forest reserves, Eastern groups interested in conserving the forests and the public-land resources undoubtedly played a part of primary importance. For many years Western sentiment tended to be predominantly hostile or suspicious of the Forest Service. Pinchot was clearly aware of that when he dispatched his district foresters from Washington in the winter of 1908. He laid it down as one of the basic policies that the district and field staff were to undertake to acquaint the West with its real interest in proper forest management and to win as much support locally as possible without jeopardizing the basic conservation program. He therefore stressed the conception of the use of the forests by the local population and of trusteeship by the Forest Service. This is clearly indicated in his instructions contained in the 1907 edition of the handbook entitled *The Use of the National Forests*, which read (pp. 25-26):

National Forests are made for and owned by the people. They should also be managed by the people. They are made not to give the officers in charge of them a chance to work out theories but to give the people who use them or those who are affected by their use a chance to work out their own best profit. This means that if the National Forests are going to accomplish anything worthwhile the people must know all about them and must take a very active part in their management. The officers are paid by the people to act as their agents and to see that all the resources of the Forests are used in the best interest of everyone concerned.

The stress of popular management was overdone for it was incompatible with trusteeship. It survives in part in the form of advisory livestock-association boards and in their participation in grazing management. The stress on *use* has furnished a continuous clue to program development, but the public which reaps the benefit today is much wider and more diversified

than the Western public which in 1908 greeted with skeptical eyes the arrival in the field of Pinchot's zealous young foresters.

Interagency Relations of the Forest Service

THE FOREST SERVICE AND USDA AGENCIES

We have mentioned in our account of the problems of insect and disease control that one of the closest connections between federal agencies is that between the Forest Service and the Bureau of Entomology and Plant Quarantine. For many years a group of entomologists of the Bureau of Entomology and Plant Quarantine has been working on insect pests in offices adjacent to the Portland Forest and Range Experiment Station. While their activity has not been confined to the Forest Service, since many of the same insect problems are found on the timberland managed by the Park Service and the reservations under the Indian Service, the larger share of it has been on national-forest land of Oregon and Washington. During the mid-'thirties the Bureau of Entomology and Plant Quarantine began annual survey reports summarizing the status of insect outbreaks, the data on control campaigns for eradicating them, and the estimates of their damage to the forest. It also helped in the early 'thirties to prepare an account of insect habits and life histories, and the control methods to be used. This account was incorporated in the *Forest Insect Handbook* issued in April, 1943, by the regional forester's office in Portland for the use of his management staff. The annual insect reports were based on coöperative arrangements between the Bureau of Entomology and Plant Quarantine and the Forest Service, Park Service, Indian Service, and certain state and private protective agencies. The plots for these intensive studies made by the entomologists were situated on the national forests and were cared for by the forest rangers who also gave general assistance to the scientists. In 1934, taking advantage of the presence of CCC man power, a systematic survey of the Western pine beetle in the ponderosa-pine region was conducted on the national forests and the Indian reservations. Nearly 89,000 acres divided into some 228 sample plots were intensively studied. In addition extensive areas surrounding these plots were examined for evidence of infestation conditions. It was the function of the entomologists to train the CCC crews and to lay out the plans for the survey. The concentration on the Western pine beetle was due to the fact that its outbreaks during the 'thirties were of alarming extent. Had they continued, the prospect of any sustained-yield program for the ponderosa-pine areas would have been wiped out. Out of this study, the chief entomologist in the Portland station developed a system of tree classification which the Forest Service subse-

quently adopted displacing its older classification scheme, for timber-management purposes.

The entomologists have also been concerned with general insect studies on national forests because the knowledge of insect life and habits has important bearing on timber management. It gives clues to the types of trees most susceptible to infestation as well as to resistant types. After the first great Tillamook fire (in 1933), the Portland experiment station undertook a study of the problems of salvaging the timber from the burn. It soon developed that data would be required on the rate of destruction of injured timber by insects. Again the Bureau of Entomology and Plant Quarantine was brought in and discovered that the chief cause of timber deterioration was a beetle infestation.

In April, 1937, the Bureau of Entomology and Plant Quarantine and the Forest Service adopted a coöperative agreement covering the control of blister rust in the Western-white-pine and sugar-pine regions. The bureau was to act as general leader in the control of blister rust throughout the United States. It was to take the initiative in planning, developing, and applying control measures on forest land of all types of ownership, public and private. The Forest Service bound itself to take protective measures against blister rust in areas occupied by the Western-white-pine and sugar-pine stands. As funds are made available field parties are organized and directed under this coöperative arrangement for carrying on the fight against this disease.

The plant-pathology division of the Bureau of Plant Industry, Soils and Agricultural Engineering was also involved in the Tillamook-burn study. It, too, has a suite adjacent to the Portland regional forester's office where its plant pathologist serves chiefly the needs of the Forest Service. Among the major control problems in which his work has been an integral factor is that of the parasite mistletoe. His technical aid has also been used to study the disposal of slash because of the relation of the rates of slash decay to the fire hazard. The control of fungus diseases by cutting methods, the injury to trees left by selective cutting, and other problems call for intimate association between the plant pathologists and the forester.

The grazing functions of the Forest Service have brought it into intimate association with the Bureau of Animal Industry (BAI) in the eradication of animal diseases from the range livestock. As the result of an agreement between the two agencies, sheep and cattle infected with scabies and horses afflicted with glanders have now been practically eliminated from national-forest ranges, and thus the danger of contaminating big game with these diseases is removed. In areas where the BAI (or the state) requires inspection and health certification, the Forest Service issues grazing permits only to owners of stock having such certificates of health. This has

been required not only of the permittees using the national forests but of all stockmen driving their stock across the forests en route to their own private pastures or to pastures on other public lands. A similar arrangement has been followed in the endeavor to free cattle of Bang's disease.

During the days when the Soil Conservation Service was operating so many CCC camps, a few of them were located conveniently to the national forests and used by the Forest Service on its conservation programs. They built water spreaders on eroded stream channels so as to stop erosion and to irrigate the mountain meadows. They also constructed experimental pasture enclosures and tried out reseeding tests on soils in different stages of erosion for which different cultural methods might be needed. Technicians from the SCS have also aided the Forest Service officers in checking national-forest erosion conditions and in advising on the appropriate structural or cultural methods to be practiced to overcome erosion difficulties. This relationship still continues from time to time as these services are needed.

Forest Service officers make winter snow measurements on their forests and report their data to the SCS clearance office at Boise. With the resumption of watershed-flood-control investigations the technicians in the forest and range experiment stations will be called upon to assist on those studies for which SCS is given the leadership; and similarly wherever the Forest Service takes the lead (as it has done on the Boise watershed), the regional SCS technical men will assist. Present projects are limited to the completion of the two studies launched before the war. The time will doubtless return, however, when these flood-control investigations must be resumed and perhaps watershed-control programs may someday be a joint activity.¹⁷

Before the forest and range experiment stations took over range research, the Bureau of Plant Industry was the center of information on grazing matters. While its technicians still give aid on special problems when needed, the chief centers of information which guide Forest Service administrative officers in handling grazing on the forests of the Pacific Northwest are the forest and range experiment stations and the SCS nursery technicians, whose outstanding work in the discovery, selection, and improvement of grasses for feed and forage we have already noted.

The state Extension Service through its county agents has also been help-

¹⁷ During the last year and a half the flood-survey program has been markedly expanded, and a new survey unit for the Forest Service has been organized at the Portland experiment station. The two agencies now divide leadership in this work as follows: The Forest Service is generally responsible for the Columbia River watershed as a whole, but the Soil Conservation Service directs the studies on that part of the Snake River and its tributaries below Lewiston, on the tributaries flowing into the main Columbia between the mouth of the Yakima River and Bonneville Dam, and the small watershed of Moses Coulee-Douglas Creek in eastern Washington. (November, 1949.)

ful in educating the users of the forest ranges to better range practices. Frequently, the county agent serves as secretary of or as an active participant in the county livestock associations, a strategic place from which to spread scientific information about the use of the range. Whether or not the county agent renders such coöperation depends on his personal disposition. While no uniform coöperative educational program has been undertaken by the Extension Service to help the Forest Service with its range problems, its agents are reported to have given their assistance to livestock permittees and to local forest officials whenever so requested.

We have referred above to the coöperative grazing survey in 1937 which resulted in the adoption of common survey standards by all federal grazing agencies. That enterprise grew out of the needs of the AAA which accordingly furnished the funds to make it possible. The Forest Service played a big part in the formulation of the standards because of its experience as the oldest grazing-management agency. Coincidentally, the Forest Service organized and directed for the AAA a survey of range areas included in its new program of agricultural conservation payments to livestock men for approved grazing practices. The Forest Service chief of range management in region 6 organized and directed a crew which examined 10,000,000 acres in twenty Oregon and eighteen Washington counties. The objects were to determine the carrying capacity of the range (calculated in number of acres per animal unit per year), to decide which practices of those approved by the secretary of agriculture for the Oregon and Washington AAA dockets gave the best promise of providing maximum range conservation; and to help the county committees to determine the grazing capacities to be assigned to individual ranching units eligible for range-conservation payments. The survey also was used to determine the range-building practices which the county committee should approve. It was thus of prime importance in launching the AAA range-conservation program.

THE FOREST SERVICE AND INTERIOR DEPARTMENT AGENCIES

Four years before the Bureau of Biological Survey was transferred from the Department of Agriculture to the Interior Department (where it was later amalgamated into the Fish and Wildlife Service) a formal coöperative agreement was signed between the chief of the Forest Service and the chief of the Biological Survey which divided the responsibilities of their respective agencies in the field of wildlife conservation. That agreement confined the work of the Forest Service staff on national forests to administrative responsibility while all research on wildlife problems would be conducted by the Biological Survey. The Forest Service promised within the limit of its resources to assist the Survey's research work if Survey funds were insufficient. This agreement, amended in considerable detail in 1938, still

holds, notwithstanding the transfer of the Biological Survey to the Interior Department. In its present incarnation as FWS it is called upon to undertake the wildlife studies needed for better forest management. For example, a research man stationed at its Missoula experiment station spends most of his time on big-game problems in the national forests. For a number of years a biologist was associated with the Portland experiment station who paid attention primarily to the part played by mice in silvicultural problems.

Another coöperative agreement was also entered into in March, 1935, between the Forest Service and the Bureau of Fisheries (the other major element incorporated in 1939 in the Fish and Wildlife Service). Under that agreement, all research functions necessary to fish management are performed by the FWS, while the Forest Service takes responsibility for administering the management plans for the fish on the lakes and streams within the national forests. The agreement called for surveys of all important waters to determine the "physical, chemical and biological conditions and to develop the principles upon which fishery management should be based." The Fish and Wildlife Service was bound to provide the fish needed either from its own hatcheries or from rearing ponds to be built by the Forest Service. It agreed to develop a planting and distribution plan for each forest and to furnish the Forest Service with instructions essential to handling the planting and to the building of the rearing ponds, holding pools, and so forth. The Forest Service also undertook to perform all planting work under the supervision of the FWS.

Supplementing the 1935 agency-wide agreement, a special agreement was signed in the summer of 1937 between the regional forester and representatives of the Bureau of Fisheries for the conduct of stream and lake surveys on the national-forest land in region 6. The Bureau of Fisheries agreed to conduct the surveys using its own funds as far as they were available. If its funds were not sufficient, the Forest Service agreed to carry the financial burden. The surveys were to go forward simultaneously in Oregon and Washington, following a priority schedule incorporated in the agreement. The Forest Service in coöperation with other agencies assumed responsibility for the installation of necessary physical improvements in the streams and lakes. If the biological problems involved required them, it would employ trained technicians to supervise that work. The agreement listed an investigation program for both sides of the Cascade Range and agreed upon the installation and operation of four experimental streams and four test lakes for research directed toward proper fish management. This program was actually started during the 1937 season.¹⁸

¹⁸ The above account is confined to coöperation among federal agencies. It is of course true that in the Pacific Northwest the chief burden of fish management in national

One of the most common problems shared by the two agencies has been the control of rodents and predators on the forests. The destruction of young trees and forage by gophers, squirrels, and other rodents (including porcupines) is a matter of great concern to the Forest Service. It calls upon the FWS to reduce the rodent population to reasonable numbers and to handle the predator work which is directed particularly against coyotes. The two agencies also join in the transplanting of beaver from the heavily populated to the underpopulated areas. The cost of such work is usually shared on a fifty-fifty basis, with the FWS furnishing technical guidance and the trapping personnel. Both agencies have made a general effort to build up the fur-bearing population in the forests. For many years the agencies have coöperated along with the state game departments in making an annual census of big game and in enforcing the hunters' observance of the game laws with regard to elk hunting.

It should be noted parenthetically that these relationships of FWS to the Forest Service as a land-management agency are not unique. They are part of a pattern which is repeated in connection with the work of the Indian Service, the Bureau of Land Management, and other land-management agencies.

Because of the common boundaries between national forests and most of the Indian reservations in the Pacific Northwest, a general coöperative relationship between them in the matter of fire control has been essential. On all national forests the district rangers are instructed to work out interchange arrangements with Indian Office personnel for fire information during the fire season. Mutual assistance in times of fire is also given whenever the location of a fire can be most expeditiously reached by the other agency or whenever the size of the fire requires joint effort. The Indian Service has allowed certain reservation lands to be grazed by the permittees on the national-forest land. This calls for joint planning between local officers of the respective agencies. This is well illustrated by the arrangements between the Yakima Indian reservation and the Gifford Pinchot Forest where it has been customary for a good many years for the local staff to decide on grazing permits in the light of the total pasturage available. The Indian Service has experienced some difficulty in this matter because the federal statutes compel it to award grazing permits to the highest bidder. The Forest Service, on the other hand, is not bound by such a requirement and may thus take into consideration the social and economic consequence of its permit policy.

Similar to the relationships with the Indian Service are those between forests is carried by the state fish and game agencies with which the Forest Service is in continuous coöperative contact.

the Forest Service and the Park Service on the matter of fire control along adjoining borders of national-park and national-forest areas. Again there is mutual assistance, and at times the two agencies join in training programs for fire guards. There has also been a good deal of need to cooperate on common recreational interests despite the bitter disputes which developed some years ago between the agencies over the Olympic National Monument (later changed to the Olympic National Park), and over the proposal of the Park Service that it take over all scenic Cascade peaks.¹⁹ The national forests surround the national parks. The Forest Service has therefore undertaken to protect park entrances from uses detrimental to the park program.²⁰ This may be illustrated by an exchange program under which the Forest Service acquired a strip of private timber adjacent to the entrance to Crater Lake National Park so the timber could not be cut off and thus damage the beauty of the approach to the park. Reciprocal cooperation by the superintendent of that park made available funds for the construction of a forest camp on a site under Forest Service administration convenient for visitors to the Oregon Caves operated by the Park Service. Similar arrangements have been made near the entrances to other national parks by the Forest Service organizations in the Missoula- and Ogden-centered regions 1 and 4.

A number of joint problems for the Forest Service and the Bureau of Reclamation have arisen, which were connected with the bureau withdrawals of national-forest land for its irrigation projects. Such withdrawals have usually included more land than is actually required for the reservoirs. This was particularly true on the upper Deschutes and the Klickitat where jurisdictional disputes generated irritation for many years. This has at last been resolved, it is believed, by a written agreement signed by the chiefs of the two agencies in January, 1948. Prior to this agreement the bureau claimed jurisdiction over all withdrawn lands, while the Forest Service asserted right to manage those not used for reservoir purposes, and to retain the revenues from them. It is unnecessary to enumerate the many small conflicts this situation encouraged, since they are not likely to recur. The recent agreement provides that the Bureau of Reclamation will administer on such withdrawn lands only those activities that are essential to reclamation programs, leaving all other activities to the Forest Service.

¹⁹ See chapter ix for a more complete statement of these tensions.

²⁰ On his own initiative the regional forester in 1946 determined not to permit clear-cut timber sales so near the boundaries of the national parks as to present a fire hazard. Accordingly he instructed his supervisors to survey the park boundaries in their forests and submit maps of suggested "no-cutting zones." These were reviewed in the regional forester's office and zones finally established which will provide a green-timber fire break between the forest and the park.

Receipts from lands actually needed for reclamation will go to the bureau, while the Forest Service will retain receipts from other lands. To this instrument for harmony is added a recommendation consistently made by the National Park Service technicians, in their reservoir-recreation studies for the Bureau of Reclamation (described in chapter ix, below). This recommendation says that where reservoirs are built by the bureau in national-forest areas, the recreational developments should be managed by the Forest Service.

The close tie between Forest Service grazing functions and the administration of the grazing districts under the Bureau of Land Management has been explained in chapter vi. An account was also given of the general administrative relationships with the Oregon and California Revested Land Grant Administration. However, a further question, concerning the coöperative sustained-yield forest programs of the two agencies, merits notice. The Bureau of Land Management at first chose to develop its program under the 1937 statute which created the Oregon and California Revested Land Grant Administration. Its initial program for coöperative units therefore diverged in a number of important particulars from that being simultaneously offered to timber owners by the Forest Service. The instructions by the assistant secretary of the Department of the Interior to the Bureau of Land Management bring the basic principles of the two agencies for this highly important resource program into reasonable harmony. Their efforts to deal with the monopoly problem, through competitive bidding reservations and through road policies, are essentially similar.

Of course the road issue and its relation to monopoly is not confined in either agency to sustained-yield coöperative agreements. The predominant checkerboard pattern of O-and-C forest ownership, and the occasional checkerboard nature of national-forest ownership pose problems in connection with timber sales that center on road rights of way. Favorably situated private owners are normally inclined to use their strategic situation to keep out competitive bidders if they can. This is a constant problem for each agency.

The utilization objectives are alike and will be sought through comparable arrangements. The provisions for the duration of the agreements, and their periodic revision, while differently stated, are also in general harmony.

One element of difference may result in "shopping around" by private operators: namely, the minimum ownership requirements for potential coöperators. The Bureau of Land Management requires a higher percentage of cutting from the private land, during the initial years of the agreement, than does the Forest Service, and it also requires a somewhat higher

percentage of the total productive forest area to be in the coöperator's possession.²¹ The bureau will also place limitations on the amount of O-and-C timber that any one purchaser may acquire; the Forest Service has no similar restriction.

Perhaps a more basic issue is the competition within the same forest areas between the two agencies for "coöperators" and the potential development of two different unit areas and plans. The first master unit announced by the bureau included parts of the Siuslaw National Forest, but the Forest Service promptly served notice that it could not dedicate its timber to mills in as large an area as that included in the proposed master unit. It refused to be included. Moreover, had a watershed area been designed to serve both O-and-C and national-forest timber, its boundaries would in all probability have extended much higher up on the watershed because the bulk of national-forest timber occupies the higher elevations.

Among other reasons given by the Forest Service officials for inability to coöperate with the Bureau of Land Management in these programs is the difference in the basic statutes under which the two agencies operate. The Forest Service is confined to the act of 1944, whereas the bureau may use either its statute of 1937 or that of 1944. The requirements on the act of 1944 are not identical with those of the earlier law.

Despite the present indications of agency harmony and coöperation in this effort to secure community stability in western Oregon through sustained-yield timber management, the presence of two administrative entities in the same area with overlapping physical-resource boundaries, holding out separate programs for private timber owners, mill operators, and communities can never make administrative sense.

Another tension problem is the claim to nearly 500,000 acres of timberland inside the national forests, which Secretary Ickes and the chief forester of the Oregon and California Revested Land Grant Administration raised two years after this new unit in the Department of the Interior began its program of timber management. These claims have been given strong backing by the eighteen Oregon counties which stand to profit if the Bureau of Land Management takes these lands from the Forest Service, and by some private timber operators in this area who for more obscure reasons appear to prefer the administration of the former agency. Without attempting to state the legal issues raised, or the history of these disputed lands, it can be said that the attorney general in 1940 and again in 1943 declined to rule that the law required the transfer of these lands to the Department of the Interior and that Congress has as yet likewise refused to order the transfer. But pressure in which Guy Cordon before his appointment to the Senate played a leading part as the attorney for the

²¹ See above, chap. vi, p. 247, for the detailed stipulations for O-and-C coöperators.

interested counties, continues to be exerted for Congressional action in favor of the Bureau of Land Management. The political situation which keeps the jurisdictional conflict alive is undoubtedly the result of the provision for payment to the eighteen counties, in lieu of taxes, of 50 per cent of the gross receipts from the sale of O-and-C timber. That percentage will rise to 75 when the debt to the Treasury for the railroad equity in the O-and-C lands has been paid, as compared with the 25 per cent of gross receipts which counties receive from national-forest timber revenues. In other words, the county governments already receive twice as much per unit of gross revenue from the Bureau of Land Management as from the Forest Service and will in the future get three times as much.²²

So long as such differences in Congressional policy governing the allocation of in-lieu tax funds to local governments are allowed to stand and to be linked to the administrative management of two different agencies, jurisdictional aggressions and conflict are inevitable. Administration in the field, as at the center, will often be incited to persistent or even exaggerated claims if it feels the support of strong, active, and aggressive local groups with an important monetary stake in its claims. This will be even more probable if, as in this instance, two agencies in the same area divide a common functional program between them.

Ever since the Bonneville Power Administration began transmission-line construction a decade ago, it has had to obtain a special-use permit for those lines which traversed national-forest land. As its program expanded and it continued to require new high-tension lines through national forests, it has taken for its rights of way extensive acreages of forest land. Its requirement, heretofore, for such purposes has been a strip of land 300 feet wide. When the line runs through commercial-timber sections of the national forests, as they do in crossing the Cascade region and the Coast Range in Oregon, this means the cutting of many millions of feet of timber.

Numerous are the problems of how to get the most out of this resource on what are in effect long ribbon sales areas traversing rough terrain. It is also necessary to locate the lines in such a way as to avoid recreational and other-use areas on the forests which would suffer from their proximity. The agencies must get together in planning the location of access roads to the right of way, both for construction and maintenance purposes for Bonneville Power Administration and for the needs of the Forest Service.

When the BPA contractor clears the land it is important to the Forest Service that his operations conform to standard requirements by all operators on national forests to minimize erosion.

²² See H. H. Chapman, "The Cure for the O. and C. Situation," *Journal of Forestry* (August, 1945). See also for an opposite interpretation, H. J. Cox, "On the Other Side of Certain Public Lands," *Journal of Forestry*, (May, 1945).

Problems have arisen connected with the terminal dates for clearing that are the consequence of fixed energization dates. Unless sufficient time in advance of winter snows in the high Cascades can be given the Forest Service, its officers contend that they cannot make the timber cruises that must precede clearing operations, without delaying progress when the spring season opens. On the other hand BPA never knows, before the Congressional appropriation act for the Department of the Interior is passed, just what lines it will be able to construct. Its administrator therefore finds it difficult or impossible to give sufficient advance notice to the Forest Service.

Relationships do not cease when lines have been built. Maintenance activities impose continuing matters of joint concern. The use of national-forest roads by BPA heavy motor equipment when roads are soft may cause undue road deterioration and rehabilitation costs. The brushing of the right of way creates slash and fire hazards which necessitate coöperative action. The susceptibility of high-tension lines to "shorting" if gases from heavy forest-fire smoke invades the right of way area is another matter of mutual interest. All these relationships are new to both agencies, and the problems are in many respects new. It is an interagency situation calling for mutual education and tolerance until they are met. Prospects for that seem bright.

Unfamiliarity of some of the officers of Bonneville Power Administration with these requirements when specifying the conditions in their clearing contracts has led to a few difficulties on the Mt. Hood and Willamette forests in connection with the transmission right of way for the Maupin-Detroit line. These were ironed out satisfactorily.²³

Outside of the Departments of the Interior and Agriculture are two other federal agencies whose work involves a continuing need for close association with the Forest Service. One of these is the Public Roads Administration in the Federal Works Agency which before its transfer from USDA had long been the agent for constructing forest highways. That highway program is jointly planned in the field by the division engineer (Public Roads Administration), by the regional forester (Forest Service), and by the state highway engineer (state Highway Commission) of the state in which the particular projects are located. The program thus developed is sent to Washington and, upon its approval by the Forest Service, the Public Roads Administration, and the secretary of agriculture, becomes the basis for forest highway construction.

At the request of the Forest Service, the Public Roads Administration

²³ In recent months joint discussions between the regional forester and the Bonneville Power Administrator, with their respective technical staffs, have been initiated for canvassing in detail the entire right-of-way situation. (November, 1949.)

makes the surveys, lets contracts, and supervises the construction for the timber access roads necessitated by the expansion of national-forest timber sales. These are not classed as highways but are a part of the forest-development road system. In the states of Oregon and Washington alone, that program will probably involve expenditures of \$127,000,000. Local officers suggest that about \$65,000,000 of that amount should come from appropriations or a special road fund. The balance of the road program would be financed through the requirements for road construction contained in timber sales contracts. Of course such a method merely reduces the net return to the federal government from its timber and thus is an indirect way of federal construction of roads. During recent years \$10,000,000 or more have annually been spent for road purposes from timber sales requirements.

Construction will be done largely by contract. The Public Roads Administration has the technical data and staff for design of highways and the experience in letting contracts and their supervision so that it can do this work more satisfactorily than the Forest Service itself. The Forest Service will determine the preliminary locations, decide the general standards to be observed, and give its final approval to the design after the Public Roads Administration engineers have made the detailed surveys and plans. In the forests, the supervisor helps the engineers of the Public Roads Administration make their locations and work out the rights of way.

Past experience would indicate that this interagency relationship will be highly satisfactory so long as joint problems in the prosecution of the new program are handled at the regional level. That authority has been allowed in the past and has avoided the delays which would be inevitable if the field men of the two agencies had to wait for engineering approval from their respective Washington offices.

The second independent agency connection is with the Federal Power Commission. Before its creation in 1920, the secretary of agriculture issued annual permits for the use of water-power sites in national forests. When the FPC took over that function, it continued for a number of years to utilize Forest Service engineers to investigate applications for licenses. Since the establishment of its own field engineering staff, the Federal Power Commission has taken over that work, save for projects involving less than one hundred horsepower, which are still investigated by the engineers of the regional forester. Most of them are for very small installations of a few horsepower to be used for a residence, resort, or camp. They are a headache for the Forest Service personnel because of the rapid turnover among the licensees, many of whom are elderly men who enter this kind of business after retiring from an active career. Because they die off rapidly and their heirs fail to observe the renewal requirements, much difficulty has arisen in

the handling of these small power uses. It is difficult to see why it is necessary for the Federal Power Commission to concern itself with these minute installations.

The Forest Service reviews the application for the larger projects located on the national forests solely from the standpoint of protecting Forest Service administrative operations, coordinating land use, and preserving scenic and recreational values. For example, a recent application for a site on the Umpqua River which involved a large structure and the diversion of water for the turbines was investigated to see whether the scenic effects of the falls would be impaired. The Federal Power Commission also licenses private primary transmission lines (that is, lines taking power directly from the generator) which cross national forests; the Forest Service issues permits on secondary lines.

At present, the planning and construction of dams for flood control, power, and other purposes by the Corps of Engineers, involves a considerable amount of contact and cooperation with the Forest Service field officials of the Pacific Northwest. These relationships deal with such matters as the utilization and disposition of timber removed in reservoir-clearing operations, fire control, the preservation and replacement of recreational facilities, and the replacement of highways, roads, trails, communication facilities, and ranger stations flooded or partly destroyed by dam construction. Some information is exchanged to aid the Forest Service as leader in watershed flood-control studies and surveys, but this will not become extensive until the USDA watershed flood-survey work is markedly accelerated.

CONCLUDING COMMENT ON INTERAGENCY RELATIONS

A number of occasional cooperative activities exist between the Forest Service and other federal agencies. There are even a few other persisting interdependent activities, such as the arrangements with the Weather Bureau on weather reports during the fire season. But the preponderant relationships tie either with the other public wild-land management agencies, most of which reside within the Department of the Interior, or with the scientific technical and land-managing agencies in the Department of Agriculture. If the wood-utilization program increases in importance, a new relationship with the Department of Commerce is foreseeable, provided the recent initiation of technical consulting service for small business by that department survives the current hysteria about "federal bureaucracy."

Even if at some future time a new program directed toward the regulation of timber practices on private land should be added to the duties of the Forest Service, these major interagency ties will undoubtedly continue.

Such a program would probably imply an intensification of use of the same internal and external facilities now utilized for its current programs. If in addition the farm-forestry funds are greatly increased while simultaneously the soil-conservation districts expand until they blanket the region, more of the same kind of relationships with the Soil Conservation Service already established will be called for. We should bear these conclusions in mind when we later consider the over-all issues of departmental organization at which we shall have to look before the problem of field coordination and integration at the regional and lower levels can be properly examined.

CHAPTER VIII

The Soil Conservation Service and Its Programs

THE SECRETARY OF AGRICULTURE was authorized by Congress in 1935 to establish the Soil Conservation Service as an operating agency for attaining the general purposes expressed in the preamble of the statute which were to further the "control and prevention of soil erosion and thereby to preserve natural resources, control floods, prevent impairment of reservoirs and maintain the navigability of rivers and harbors, protect health, public land and relieve unemployment . . ." ¹ The Soil Erosion Service, which had been functioning for about one year as a small unit in the Department of the Interior, was transferred to the Department of Agriculture, reorganized, and expanded into the Soil Conservation Service. It was the original intention of the directors of the new service to increase its limited knowledge of the factors of erosion and its control by intensive research. The directors intended to use a limited number of demonstrations not only for their educative effect upon farmers and the interested public but chiefly to further trial application of control techniques.

The assignment of some 500 CCC units to the SCS in 1935, even before it got well under way, necessitated a drastic change in program in order to keep these thousands of young men occupied. Consequently, the service, while continuing to carry on research on a small scale, swung the major part of its effort toward the development of work projects on small watersheds. That is why it launched its nation-wide demonstration program, intended to show farmers not only the deleterious effects of erosion and the waste of soil fertility but to point the way for overcoming these evils by concrete changes in farm methods of managing the land. That program was based upon an offer of technical aid, of Conservation Corps camp labor, and of some materials, and (where necessary) the use of expensive mechanical equipment; in return for this assistance the farmer was to furnish his own labor and that of his teams or tractors, to purchase materials and seed, and to agree to follow a five-year farm-management plan. Demon-

¹ *Public Law No. 46, 74th Cong. (April 27, 1935).*

stration farms and projects were soon operating in every region of the country including the Pacific Northwest.

A "demonstration" farm was one located in an erosion-problem area where the tasks confronted would be typical of that area and whose owner would not only accept the obligation of following the program developed by the technicians but would allow his neighbors to observe the results. To illustrate this activity, we cite the case of a 1,400-acre farm near Heppner, Oregon, in the dry wheat plateau south of the Columbia. That farm produced livestock as well as wheat and thus involved range and pasture problems. The farm was first subjected to a complete soil survey, and all erosion and soil problems were mapped and analyzed. The range and hay land were inventoried for feed resources, and the number and kind of livestock suited to these resources determined. The farm was divided into appropriate fields, and the practices and rotations suited to each agreed upon. Gullies had developed on some of the land so that dams to plug them would be needed. A small stream flowing through the ranch had eroded its bed and required straightening and bank control through re-seeding, tree planting, and fencing.

The Soil Conservation Service agreed in the coöperative contract to furnish the labor for the gully structures, the stream control, and the fencing. It also agreed to furnish the appropriate grass and legume seed for various cultural improvements. The rancher agreed to furnish other labor and materials and to follow a crop-rotation program, specified in the contract, for each field, and to adopt conserving tillage practices such as contour plowing. Under this agreement land with a slope of 15 per cent grade or higher was to be taken out of crops and reseeded to permanent grass. The summer fallow land was to be so plowed as to leave a cloddy surface and the stubble trash protruding to catch the soil particles that otherwise wind or water might carry away.

In other parts of the region different practices—such as strip cropping, terracing, contour tillage and seeding, tree plantings, and grassed waterways—might have been required, depending on the climate, soil, nature of crops needed for farm livelihood, scale of farm operations, and other factors.

The soil-erosion demonstration work was not confined to farms. Soil Conservation Service made agreements with other federal agencies and with state and local governments for the conduct of demonstrations. Thus, for example, Clatsop County, Oregon, coöperated in a demonstration project to stabilize the sand dunes near Seaside; and Pocatello, Idaho, in its desire to prevent the recurrence of mud-rock flows, which had on a number of occasions invaded the residential areas of the city, agreed to a program of prevention on the mountains behind the town.

As the demonstration contracts drew to a close, the soil-conservation program shifted from a demonstration to a general service job. It was intended that any farm in the country might be eligible. This work was to be performed through state-authorized soil-conservation districts, and today every state in the Pacific Northwest has authorized the formation of these districts. (This new unit of local government was "invented" and first promoted by the Department of Agriculture in 1937.) In each state a committee, a majority of which is ordinarily composed of officers of the state college and experiment station, reviews requests made by local farmers to organize a soil-conservation district, and may authorize such a group to go ahead and take the necessary steps. The county agent has been the key figure in this local organizing effort so that even when the state committee is willing to give the nod of approval he may, if he is opposed, block the local movement.

Once the district is organized, its board of supervisors, of whom a majority is locally chosen, may ask the Soil Conservation Service to make a survey of the entire district including complete data on slopes, soil types, prevailing land-use practices, and the current erosion and fertility conditions. This becomes the basis for the conservation-district program and guides the supervisors in the selection of those practices to be emphasized or avoided.

Since the district has no taxing power, it depended at first for staff and equipment almost wholly upon the willingness and facilities of the Soil Conservation Service or of other agencies in the Department of Agriculture or the state colleges to make a conservation program possible. The district financed the operation of this borrowed equipment (such as bulldozers, drag lines, levelers, drills) by an hourly or *per diem* charge to the farmers who rented it, a charge high enough to pay for the operation, maintenance, and capital replacement. A few of the states made small appropriations available to the districts to help them get under way, but for the most part they were, in the early years, largely dependent on equipment loaned either by the Soil Conservation Service or the county or some other government agency.

As the work of the districts has become accepted by their local communities, self-help has tended to displace their early dependency. Even without taxation, the districts have been able to negotiate bank loans for the purchase of their own machines. With the improvement in farmer incomes after the outbreak of the Second World War, they have been able to charge the farmers, who used the equipment, fees high enough to meet their obligations; some districts were even able to build up an extensive equipment plant.

The technical aid in farm planning and other district work is furnished

by the Soil Conservation Service, which locates in the district a work-unit conservationist and such other technical, subprofessional, and clerical help as the work program may justify or as funds permit. Additional technical aid may be given by the staff of the state experiment station or state college and by SCS regional specialists in agronomy, range, forestry, biology, and engineering who operate on an assignment basis to aid those districts needing and requesting their specialized assistance.

The basic tools for obtaining these changes in agricultural practice required to prevent erosion and conserve soil fertility are the conservation farm plan and the agreement between the district and the farmers. Before planning the farm, the technicians make a complete and detailed survey of the soil, determine its slopes, and classify the land according to its "capability."² Knowing the climate, the kind of crops suited to the area for income purposes, and the land-adjustment needs indicated, the technicians in consultation with the farmer develop a plan for the entire farm. This plan includes a rotation program for each field (to last for five or more years depending on rotation needs). The required physical structures, changes in field division, and new practices are listed and time-programed.

As an example, let us take Clarence Carlson's irrigated farm in the

²In the course of its experience the Soil Conservation Service has developed a new system of land classification to suit its program. The traditional classification used by the technicians of the Bureau of Plant Industry and the state experiment stations was based upon differences of structure, color, and related taxonomic qualities. The Soil Conservation Service soil technicians have become dissatisfied with these criteria because their primary concern has become, "What can the soil do and how should it be used?" Fertility and moisture relationships become of great importance for this purpose, as does slope. It is not intended to recite here the quarrel that has arisen among the technicians within the several agencies of the Department of Agriculture over this question. But it is important to understand that the district and farm-plan surveys use what is called a "land capability" system of classification. That means a scale of distinctions based on the suitability of the land for particular uses. Eight classes in this scale are officially described in relation to the dangers of erosion as follows:

Suitable for safe cultivation with:

I. No special practices.

II. Simple practices.

III. Intensive practices.

Suitable for occasional or limited cultivation with:

IV. Limited use and intensive practices.

Not suitable for cultivation but suitable for permanent vegetation with:

V. No special restrictions or special uses.

VI. Moderate restrictions in use.

VII. Severe restrictions in use.

Not suitable for cultivation, grazing, or forestry:

VIII. Ordinarily extremely rough, sandy, wet, or arid land not suitable for cultivation, grazing, or forestry, but land that may have value for recreation and for wildlife.

R. D. Hockensmith and J. G. Steele, "Classifying Land for Conservation Farming," *Farmers' Bulletin* No. 1853, U.S. Department of Agriculture (February, 1943).

Kititas soil-conservation district. This is a sample case, developed by that district for educating its farmers. A plan and agreement were completed for the 1944 season: Carlson's 160-acre farm was divided into nine fields to be used for row crops, grains, hay, irrigated pasture, and dry pasture. Needed physical improvements included better drainage structures, some new structures in his irrigation system, a considerable amount of land leveling so as to obtain a better spread of water with much less waste and greater production of crops, the reseeding of certain pastures, the clipping of pasture weeds, rotational grazing on the pastures, and the spread of animal droppings.

Carlson's copy of the farm plan, designed for wall mounting to make reference use easy, included a complete list of heavy machinery which he could rent from the district, a supplementary engineering statement of some of his engineering and drainage problems, a full list of the grasses and legumes recommended in that district by the state-college specialists for irrigated pasture and for hay, recommended cereal varieties for both irrigated and nonirrigated land, and practice suggestions for the establishment of irrigated pasture and crop rotations. The aerial photo copy of his farm (included in his plan) has his nine fields colored to show at a glance those on which he must observe either simple or intensive conservation practices in order to retain the soil and its fertility.

It is thus clear that the job of preventing soil erosion and conserving fertility has led the Soil Conservation Service into a complete design for total farming operations, a design fitted to the peculiarities of climate, topography, soil, and income potential for each district and each farm. In a timbered district such as the eastern part of Snohomish County, Washington, a farm is likely to include some timberland, which must be considered in making the farm plan, for it may become, as it is already in parts of that county, an item of major economic importance to the farmer. The technical assistance afforded by the Soil Conservation Service, or by some other agency working with it, must therefore include competence in forestry.

From the district program in Snohomish County has developed an interesting and successful coöperative forestry association which has become one of the chief instruments for improved farm timber-cutting practices as well as for increased income to the farmers, a factor of importance in making good timber practices attractive.

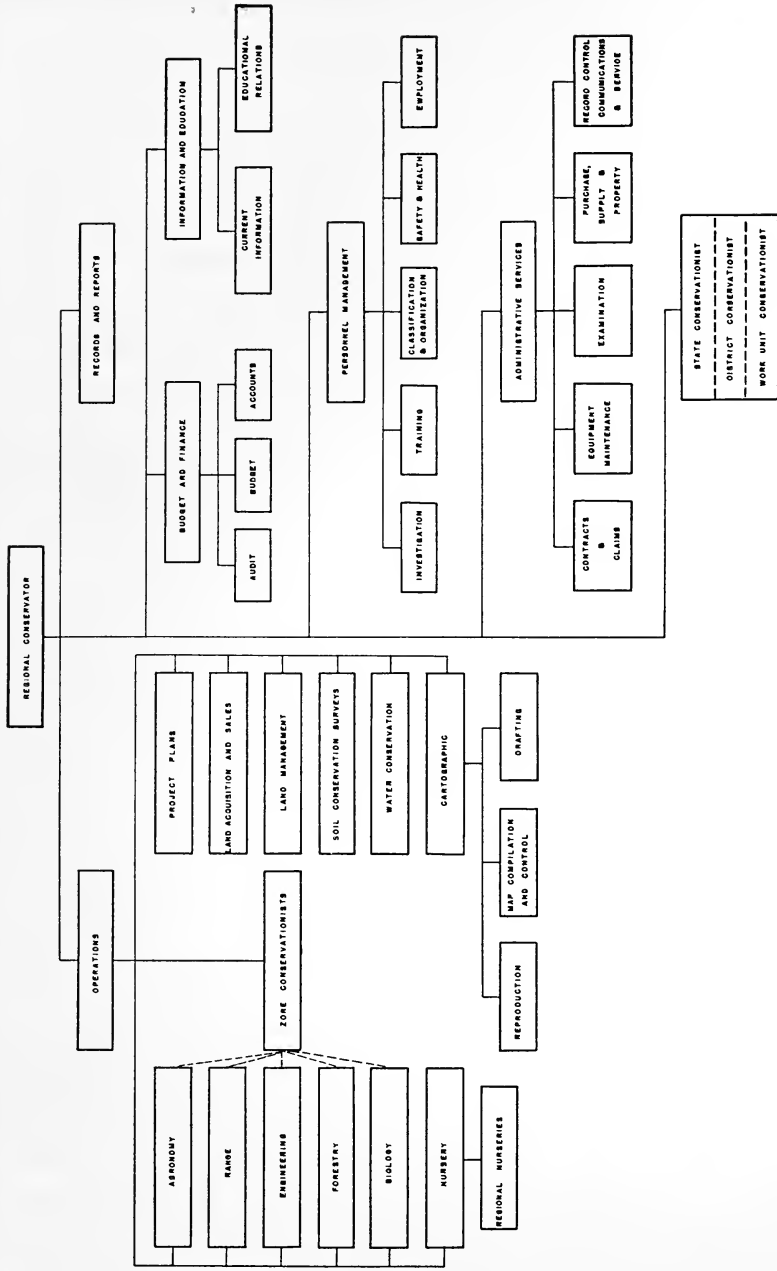
In the range areas of the region (which cover a large part of the Pacific Northwest east of the crest of the Cascade Mountains), farm plans must pay close attention to range problems not only on the lands owned by the farmer but also on public lands which may be used to supplement his private feed and forage resources. The general overgrazed condition on

both private and public rangeland demands a total view of all the resources of a given farmer, including his grazing rights on national forests or on grazing-district land or on the public-domain tracts leased under Section 15. If by proper planning and reorganization of his private land operations he can increase his feed supply (as, for example, by flood irrigation or by planting poor wheat land to permanent grass) and improve his spring rangeland, he may be able to defer grazing on the high summer pasture in the national forests so as to allow its recovery from an overgrazed condition; or he may be able to reduce the load on the spring and fall grazing land he uses as a licensee of the grazing district and consequently to increase its sustained carrying capacity.

As soil-conservation districts spread—and they have developed with remarkable speed since their birth—the work of their technical planning staff in the range and irrigation areas will continually be jostling that of the district grazer (if he ever receives sufficient help to do the potential management job that awaits him) and of the forest supervisor. The districts ought also, as noted elsewhere, to articulate their programs with the operation of the irrigation projects built and run by the Bureau of Reclamation. How close that relation may be will depend on the extent to which the bureau either directly or through the Extension Service gets into the job of helping irrigation farmers lay out their farm distribution systems and manage their soil.

The field organization used by the Soil Conservation Service for its several programs consists of a regional conservator and staff (located at Portland); a state conservationist for each state (who is usually headquartered at the state college); district conservationists, each of whom supervises a number of Soil Conservation Service work units that assist districts; and work-unit conservationists, each directly attached to a single district. The states of the Pacific Northwest fall into two soil-conservation regions, with Washington, Oregon, and Idaho included in the Portland-centered region (along with California, Nevada, Alaska, and Hawaii³); western Montana and Wyoming are under the supervision of the regional office at Lincoln, Nebraska. In addition to providing for the administrative services essential to the operation of a large field staff, the regional office employs a considerable array of technical talent for servicing the many and variant needs of district and work-unit technicians. These technicians are specialized in agronomy, biology, range, forestry, engineering, land management, farm management, conservation soil surveys, nursery methods, water conservation, and cartography. While some of these specialists

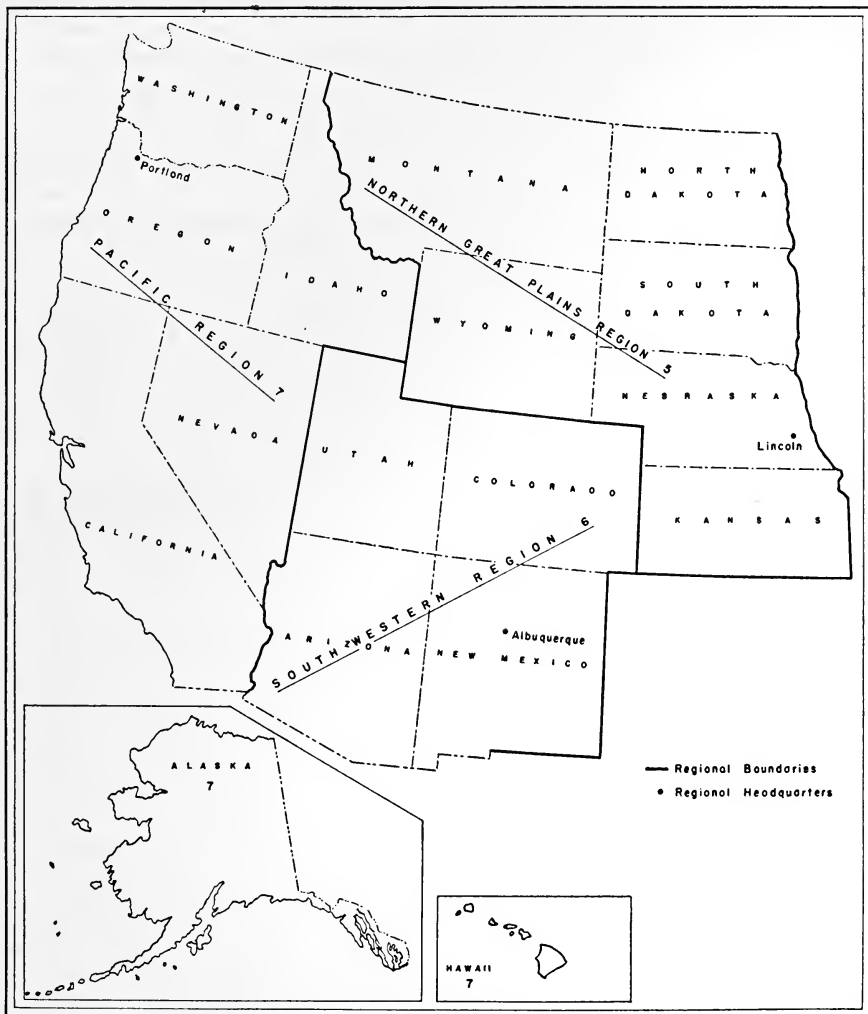
³ The 1947 Alaska and Hawaii territorial legislatures adopted soil-conservation-district laws. That makes possible the beginning of soil-conservation programs which are urgently needed at several locations.



Soil Conservation Service: Organization Chart, Region 7.

also have direct operating tasks, their principal role is to give technical advice to and review the work of the many local field officers. Such advice is normally communicated to the men on the ground through zone conservationists working in teams of two; they are perpetually in the field coördinating and communicating the specialist impulses that emanate from the regional office. The state conservationist gives administrative supervision to the field personnel and keeps up the flow of interchange with the technicians of the state college and experiment stations for the benefit of the local SCS staff and the supervisors of the soil-conservation districts. He not only sees that the latest technical information is made available to districts, but carries unsolved problems from the districts to the college specialists for attention. The districts are also used to try out the practices developed by the experiment stations and to aid in the perfection of grasses, legume, and tree selection in which the regional nursery of the Soil Conservation Service is continually engaged.

The research branch of the service has personnel located at Pullman and Prosser (Washington), Boise and St. Anthony (Idaho), and Corvallis and Medford (Oregon). These men are not under the regional establishment. Officially they report directly to Washington, D.C., but actually their findings are in use by operations field men as quickly as their reports reach Washington. At Prosser and Corvallis, the studies are pointed specifically toward better, safer, and less wasteful application of water to irrigated lands, while at Medford and Boise, the service representative is developing a procedure for improving the prediction of the coming year's supply of water for irrigation for different localities in the region. The Pendleton station centers on the development and improvement of farm machinery for achieving conservation practices. At Pullman and St. Anthony the investigations are very much alike but are being made under different climatic, topographic, and soil conditions. The experiments at the soil-conservation experiment station at Pullman, where the most intensive research has been done, have been of enormous value to the farmers in the wheat-growing Palouse region. They have built the foundation for determining farm practices and tillage tools essential to soil conservation in that large and rich farm belt. The Pullman station, a farm of 200 acres of dune-shaped Palouse hills, is owned and furnished to the service by the state college of Washington. Here (and on the experiment farm of the University of Idaho at Moscow, a few miles away) are experimental plots which since 1930 have been under careful observation and measurement to record the quantities of surface runoff and erosion that occur under differing conditions of slope, vegetation, and crop rotation. On other parts of these experiment farms the problems have been submitted to field tests more closely resembling actual farming conditions. Other long-term ex-



Soil Conservation Service: Regional Boundaries and Headquarters in the West.
 Source: Soil Conservation Service.

periments with tree, shrub, and grass plantings as erosion-control devices for the north-slope hilltops, throughout the Palouse farming country, have become so greatly endangered from the runoff of the spring snow melt. The conclusions of this phase of the research work are now available to the farmers in this extensive farming area for controlling profitably the most accelerated erosion spots.

It is well to emphasize at this point that the preferred mode of attack

upon soil erosion in farming operations is the modification of cropping and tillage practices. That means not only the use of permanent cover crops of timber or perennial grasses for tying down the soil on the most dangerous slopes, but also a pattern of crop rotations which builds a better soil that will resist erosion. It also means the use of tillage tools and methods that encourage water infiltration and discourage the loss of the topsoil by the action of wind and water, while still affording suitable opportunity for planting and harvesting. The possibility of rendering sloping soil relatively safe by using rotating crops depends upon a great many variable factors (for example soil characteristics, climate, topography, scale of farming operations) that differ in nearly every farming area. The object of these researches is to help reveal more clearly just what combinations in rotation may be safely used in the different parts of the Pacific Northwest. The following official summary of some of the conclusions and recommendations of the Pullman station for the Palouse country will make this more concrete:

The concentration of precipitation in the winter months when evaporation is at a low rate results in heavy run-off and soil losses during the months of December, January, February and March. Erosion during the balance of the year is relatively slight (for the humid part of the area). Therefore the major part of the erosion occurs when plants are dormant and when no tillage operations are being performed. The vegetal cover on cultivated lands must be provided by crop residues because the climatic conditions are not suitable for the growth of winter cover crops and the cover provided by winter wheat during the erosion season is usually inadequate. The severe winter and early spring erosion is caused by continued precipitation falling on wet or saturated soil, melting snow with or without rain on frozen soil, or run-off flow across lower slopes and bottom land caused by the melting of snowdrifts on steep north slopes. . . . The maintenance of an adequate vegetal cover during the winter months is one of the most effective means of reducing run-off and soil losses. A satisfactory cover is generally provided by established stands of grass, alfalfa grass, or sweet-clover grass mixtures, or standing winter wheat stubble. . . . Land seeded to winter wheat and not protected by a crop residue mulch is subject to very severe erosion. Summer-fallow land is more erodible than fall-plowed croppd land because of its finer tilth and higher soil-moisture content.

The utilization of crop residues so that a portion is left on the surface as a mulch is very effective erosion-control practice, especially on land seeded to winter wheat. . . .

Significant differences in erodibility as affected by the soil organic-matter content indicate that the maintenance of organic matter is one of the basic features in an effective erosion control program. . . .

In the drier sections of the Palouse, the common cropping system consists of winter wheat and summer fallow. The critical erosion period is the winter season following the seeding of the winter wheat. A satisfactory method of control is the utilization of crop residues so that an effective stubble mulch is present after the winter wheat has been seeded. . . .

A modified system of strip cropping may be applied to the Palouse region by dividing the fields into two or more parts on the basis of topography and land use capability. The eroded hill-tops and adjacent steep north slopes should be cropped to grass, alfalfa, or trees, or to long-term rotations in which grass and alfalfa are the dominant crops. This practice furnishes effective erosion control on such land and reduces the run-off across other parts of the field.

The regular cultivated crops should be grown in rotation on the more gently sloping and less eroded land.⁴

At the Pullman station experiments have also been under way to perfect or adapt tillage tools that minimize erosion, such as the subsurface sweep, the rod weeder, and the mold boardless plow—substitutes for the traditional plow. The perfection of such devices is directed toward their commercial production at prices which will attract farmers to buy.

The research workers at the Pullman station have needed close contact with similar work under way in the northern Great Plains because many of the problems, as, for example, that of stubble mulch,⁵ are so nearly the same that the discoveries of the staff in one region may have important values for the other.

The cuts in appropriations for the Soil Conservation Service meted out by Congress for the fiscal year 1948 so drastically reduced funds for research that the Pullman experimental work was scheduled for termination. At that point Washington State College stepped into the breach with its own funds in order to maintain the studies that are so fundamental for developing the knowledge and the skills necessary for grappling with this "number one" farm problem of the Pacific Northwest.

Closely related to these erosion studies is the work of the nursery division of the regional office. At Pullman, Bellingham, and Lind (Washington), at Astoria, Moro, Pendleton, and Union (Oregon) and at Aberdeen, Sandpoint, and Tetonia (Idaho) these nurseries are experimenting in the selection and production of the many types of grasses, legumes, shrubs, and trees that are of particular value for holding the soil and for increasing the economic returns of adjacent and similar farming areas.

The Pullman nursery concentrates largely on grasses which it has brought from all parts of the world, although most of them have been discovered in a wild state within the Pacific Northwest. The researchers of the nursery have made an intensive study of the grasses as to their specific

⁴ Glenn M. Horner, A. G. McCall, and F. G. Bell, "Investigations in Erosion Control and the Reclamation of Eroded Land at the Palouse Experiment Station, Pullman, Washington." *Technical Bulletin No. 860*, U.S. Department of Agriculture (Washington, D.C.: 1931-1942), pp. 56-58.

⁵ Stubble mulch (trashy fallow) refers to those processes of tillage that leave the crop residue on the surface of the ground in such condition that it may serve the multiple purpose of protection from erosion, particularly wind, moisture conservation, seedbed protection, and retention of organic matter and fertility.

traits, their adaptability for use in conservation planning, their use as new farm crops, their cultural requirements, and their nutritional values. The more promising strains are taken by plant-breeding specialists of the Bureau of Plant Industry (situated at Pullman for that purpose) and of the Washington agricultural experiment station, who develop them by hybridization and by selection to obtain the most desired plant characteristics. These new plants are then tried out under varying conditions to test their specific stability, their quality of seed production and root growth, their effects on soil and its structure, and for their adaptation to particular uses. When these qualities are proved acceptable and durable, the plants are ready for trial under actual farming conditions by a selected group of coöperators of the soil-conservation districts. If the results are satisfactory, the new plants are ready for "foundation seed stock production" and then for the certified seed producers from whom farmers generally obtain the new seed supply.

This nursery work has resulted in the selection of over 1,200 kinds of plants, 70 per cent of which are grasses and legumes. About half of the grasses are native to the Pacific Northwest, and many of them have turned out to have traits of extraordinary value about which little or nothing was known to scientists before this work started. This is of particular importance because the climate of the Pacific Northwest is of Mediterranean type, while the other regions of the United States are continental in character. Perennial plants cannot be readily moved from one basic climate to another. As static organisms, they tend to respond most completely to their native local environment.

The relations of the Soil Conservation Service to the districts has already changed markedly as the local farmers have become more fully and unitedly conscious of the need for an organized and continuous attack on soil and fertility losses and correspondingly aware of the possibilities of stabilizing or even increasing yields through proper management. There are already signs that many district boards of supervisors are taking more initiative in running district programs and are depending less and less upon the field officials of the Soil Conservation Service for nontechnical functions. A number of districts are assuming responsibility for performing nontechnical administrative services and for defraying their costs; these they charge in turn to the individual farmers on whose farms the districts perform such conservation services as leveling, ditching, terracing, seeding, and brush plowing. Using a more accurate calculation of costs, which in turn are incorporated in the rental charge for equipment, some districts are able to employ clerical and even subprofessional staff for which the Soil Conservation Service has heretofore been paying. This economy permits the latter to use its funds for additional highly trained personnel

to give more complete and adequate technical advisory services in farm planning and in counseling the supervisors and farmers.

If these district developments continue and become widespread, the time will come when the functions of the Soil Conservation Service in this program will be restricted to the giving of technical advice and the lending of those expensive or special machines not likely to be locally available.

It should be pointed out that in many districts the county governments have loaned their heavy equipment or leased it at cost for conservation operations on the farms. Where the program of the district has become generally understood and locally supported, such coöperative arrangements are common. Recently a few districts have arranged with private contractors to undertake conservation jobs which call for the use of bulldozers, scrapers, drag lines, and comparable machines at reasonable fees. High prices received by farmers for their crops have made such arrangements attractive to many who are anxious to improve their soil stability, fertility, and long-time crop yields. If there should be a drastic fall in prices and consequently in farm incomes, such private arrangements probably will be discontinued or greatly reduced.

The Soil Conservation Service has as yet not given technical help to the districts in the regulation of land use—a power with which the districts are legally endowed.

Thus far in the Pacific Northwest, interest in soil conservation has not induced the district boards to move beyond the farm-planning program. But in many areas, if the soils of the region are to be saved from progressive deterioration, individual farm-planning programs must either be more widely and rapidly accepted and adhered to, or else the compulsions inherent in land-use regulations will become essential. Recently land-use regulations have been placed in force by the Warrenton Dune district to stabilize a sand-dune area near Warrenton, Oregon. Oregon is the only state in the Pacific Northwest in which rural land-use control has thus far been practiced, and there only one district has adopted land-use regulations.

Land-Utilization Projects

The administrative changes of the late 'thirties which metamorphosed the Resettlement Administration into the Farm Security Administration led to the transfer to the Soil Conservation Service of the submarginal land-purchase projects carried through by those two agencies. The Farm Tenant Act of 1937, title iii, enjoined the secretary of agriculture in developing a program of land conservation to retire submarginal land not primarily suitable for cultivation in order to correct maladjustments in land use.

This duty has been delegated to the Soil Conservation Service. We have noted earlier that the Soil Conservation Service took over three such purchase projects in the Pacific Northwest region; namely, the central Oregon, Fort Rock, and south Idaho projects. Since the inheritance of these purchases in 1938, the Soil Conservation Service has bought approximately 36,000 additional acres in various parcels. Some of these recent purchases have been transferred to the Forest Service, as, for example, a sand-dune area lying inside the boundaries of the Siuslaw National Forest which the private owner refused to manage coöperatively in connection with a sand-dune stabilization project. Under the law only land not suitable primarily for cultivation but which is part of an area where farming has been attempted may be bought.

The only exceptions to this limitation are tracts which, as integral parts of a larger submarginal farming area, should be acquired in order to give proper management to the larger area. The authority may also be used to buy up tracts of land lying within farming areas, which, because of their condition, ought to be retired but which the soil-conservation district cannot compel to be withdrawn from cultivation. These tracts include badly eroded land virtually destroyed by gulying or sheet erosion which constitute a source of silt or debris for land downstream or which menace adjoining land as a result of wind or water erosion. The Soil Conservation Service is permitted to buy and protect such lands or turn them over to other federal agencies or to soil-conservation districts to manage. Thus far, no land in the Pacific Northwest has been transferred to the districts for management.

The character of the work involved in their management may be illustrated by a description of the central Oregon project in Jefferson County between Redmond and Madras, formerly the center of a wheat farming area that was dried out by seven successive crop failures. The project lands (consisting of about 107,000 acres) lie in a huge U-shaped tract with the eastern arm near the Ochoco Forest and the hollow part bordering the new Deschutes irrigation project. About 40 per cent of this project had been plowed up by farmers for the raising of wheat. The rest of the area has been badly overgrazed so that sagebrush, grease wood, and other nonnutritious shrubs and grasses had taken over. The original bunch grasses had been destroyed. The Soil Conservation Service has plowed and reseeded the former wheat acreage to crested wheat grass and fenced it to obtain control. A large number of springs have been improved with pipe and troughs, and some wells have been drilled. Such improvements are of great importance in properly managing the grazing of the pastures and in obtaining full utilization of the grass. Most of the area not suited to reseeding has also been fenced as an essential means for

reestablishing the native grasses which, if given an opportunity, will often gradually return and crowd out the sage and weeds. Controlled rotation grazing of livestock owned by the farmers in the adjacent area is practiced during the spring and early summer, and in the fall after the autumn rains have revived the grass and softened its texture. Except for a small number of cattle belonging to a few small farmers unable to provide other summer pasture, the livestock moves up to the summer pastures of the adjacent national forests or is pastured on the irrigated land owned by the permittees. Correct management must carefully time the admission of stock to the pastures in the spring and remove them in time to allow a sufficient amount of natural reseeding, and to preserve enough of the plant structure for rapid recovery and growth for fall feed. On the nonreseeded intervening scabland, a program of rest and restoration has brought back the native grasses to nearly the original state. On the best of these lands the grass is killing out the sagebrush which, as a shallow-rooted plant, cannot compete with crested wheat and the native grasses if the latter have not been too greatly depleted and are given time to recover. The useless rabbit brush still constitutes a problem even on the reseeded areas, and further research and experimentation will be necessary to find a way to stop its encroachments on the palatable forage. Like other successful managers of rangeland, the project manager has found it necessary to locate salt away from the watering places to induce the stock to consume the forage evenly throughout the area instead of overgrazing around the springs and wells.

Participating in the management of the project is an association of livestock permittees organized on lines similar to those which share in range management on national forests.⁶ The social policy adopted by the Soil Conservation Service land-use projects is centered on the objective of stabilizing the farm operations of the small stockmen who live nearest the project. The Handbook specifies that the distribution of use privileges to qualified applicants will in general be based on (a) the need of the applicant for use privileges in order to maintain a ranch large enough to produce an adequate income when operated in such a manner as to safe-

⁶ See chapter vii for full account of these livestock advisory boards as they operate on the national forests in connection with grazing management. The comparable Soil Conservation Service policy concerning such association is officially outlined in Section 44732 in the Handbook as follows: "(c) *Managing through district or grazing associations.* By placing responsibility for a large part of the details of management in local organizations, it is possible to obtain better and more complete integration of the use of Title III lands with private and other public land. In addition, the application of the broad principles laid down by the Service for the administration of Title III lands so as to fit local conditions is more readily obtained through a local organization. Accordingly, it is the policy of the Service to place responsibility for the management of Title III lands wherever practicable in the hands of local organizations of users."

guard the land resources from depletion and destruction, (b) the farmer's dependence upon available use privileges because of his location or his previous use of the grazing facilities involved, and (c) the principle of equitable distribution of privileges and the prevention of monopoly.

In applying these guides priority is given to ranchers living within geographic preference areas; that is, an area immediately surrounding the project which is delineated by a boundary line drawn not far from the project perimeter. The highest claims are from those ranchers who can expand their operations to 100 animal units (here, as in the grazing district and national forest, one beef cattle equals five sheep), if they are granted a permit on the project. Equal preference is given to the very small operators who have made prior grazing use of project lands. The class-B-preference group is composed of ranchers owning at least 100 animals but not more than 250. Any further unallocated resources should go next to other stockmen who live within the preference area. The intention is to make the A and B permittees continuing clients on the projects so long as their conditions do not change and they observe permit requirements. This does not mean that a permit is a perpetual lease. On the contrary, it is granted under specific limitations of time; is conditioned upon the observance of a number of explicit conditions; and does not carry with it any exclusive rights of possession. It seems clear that the central Oregon project has already greatly aided the livestock operations of several hundred small stockmen who otherwise would probably have gone to the wall.

The prospective development of the adjacent Deschutes irrigation project postponed the issuance of formal permits on the central Oregon project until the spring of 1946. One-fourth of the project pasture resources had been reserved to help the new 70- to 80-acre irrigated farms which are being carved out of the big dry wheat farms as rapidly as water comes to the land. These will undoubtedly grow much new hay and feed for livestock, and their owners will be granted preference permits on the reserved 25 per cent of the central Oregon project pastures.

Because many of the project licensees have also been permittees of the summer pastures in the national forests, the development and management of this project has involved close relations with the Forest Service and a regular and systematic exchange of information on all joint permittees. The improvement of project lands has also been greatly aided by the loan of heavy mechanical equipment and trucks belonging to the adjacent national forests. In addition to these connections, technical grazing information has been freely flowing back and forth between interested officials.

The fruits of these Soil Conservation Service land-use projects have been

a greatly improved production from the restored forage and progress in watershed control. The restoration of forage has been reflected in the increased charge for grazing privileges. The standard fee in 1948 was 35 cents per animal per month as against comparable national-forest fees of 16 cents and the recently liked grazing-district fee of 8 cents. Because the land was for the most part in private farms before its purchase by the government, no one could cry out to his congressman that he had always grazed his stock there and so must be assured of its continued possession in order to stay in business. The higher fee is amply warranted by the additional weight which animals acquire on project pastures, generally far exceeding the gains of those from grazing-district or national-forest pastures. For instance, the owner of a certain band of 4,500 sheep on the south Idaho project was persuaded to cut the number to 1,500 as a means of restoring the forage. The resulting restoration of grass increased the market weight of his lambs for August sale to 100 pounds as against a former weight of 80 pounds.

Even more striking are the statistics of meat production on the central Oregon project where the regular practice of weighing the stock in and out on scales installed for that purpose shows the startling fact that for the three-year period two-year-old steers have increased their average weight by two pounds per day for the entire period that they were grazing on project pastures; cows with calf have gained an average of three pounds per day. With the current price of beef at approximately 25 cents per pound, this represents a gross profit, after paying the grazing fee, of \$14.65 per animal-month per steer and \$22.15 per animal-month per cow and calf.

Top officials of the Soil Conservation Service avow their desire to get rid of the project management function as soon as project lands and forage have been restored to their reasonable potentialities. It would, however, be a mistake to turn these lands over to the Bureau of Land Management for operation under the grazing-district setup until such time as that organization is properly staffed to maintain the level of management to which the project lands are being so rapidly developed. It would be even more questionable to sell the lands to private owners, as is contemplated under a pending amendment to the Farm Tenant Act (introduced by Senator Butler) even though conditions designed to prevent the abuse of the land might be incorporated in the deeds.⁷

We are still too far from a general acceptance by Western livestock men of the practice (as against some lip service to the idea) of sustained-yield management to make this a safe policy. Should it be followed in the near future, much of this restored land will quite certainly again become as depleted as is a large proportion of private and state rangeland today; and

⁷ See 80th Cong., 1st sess., S. 498.

so a considerable expenditure of federal money incurred in this restoration program would have been wasted.

Water-Conservation and -Development Programs

By order of the secretary of agriculture in 1944, the Soil Conservation Service was made the official water-planning agency of that department.⁸ Consequently, it is now the chief depository of water data, and takes leadership in two programs: (1) flood-control studies relating to water-flow retardation and erosion control on watersheds (as authorized under the omnibus Flood Control Act of 1936 which divides the flood-control job between the USDA and the army); and (2) Wheeler-Case irrigation projects.⁹ Seven years ago the Soil Conservation Service and the Forest Service, acting as project leaders, launched a flood-control study of the Boise River watershed, whose objective was to formulate a plan of watershed changes to reduce flood hazards. In order to discover the probable kinds of damage from flood and sedimentation and the relation of hydrological conditions of the watershed to stream traits, a field investigation was undertaken of damages on the flood plain; damages to the watershed above the plain as a result of runoff; the production of silt; the relations of plant cover, soil, erosion, slopes, and physical conditions of the stream channels to the runoff and to flood damage. To carry out a program of this sort would also require studies of infiltration rates as affected by different kinds of cover, soil, and slope; the rates of deposits of sediment in channels and elsewhere; and the effects of precipitation, temperatures, and incidence of storms on stream characteristics. It would be necessary, also, to examine the general economic use of the watershed, the livestock and farming enterprises, lumbering operations, and other institutional factors in the area affecting the use of the watershed and the possibilities for preventive action.

The Boise study was discontinued before completion but was reactivated in 1946, and may be available for public use shortly. It is already known that the remedial measures likely to be involved in plans for such an area would include drastic modifications in the practices of timber cutting on private forest land on the upper slopes, improvements in grazing management on the rangelands which comprise a large part of the watershed, bet-

⁸ Formerly the Soil Conservation Service was the chief construction agency in the water-facilities program, sharing in that program with the Farm Security Administration and the Bureau of Agricultural Economics. After 1941, FSA took over the entire task although the nature of the program was changed so that today it is restricted chiefly to providing farmstead water only. Occasionally the Soil Conservation Service is asked for technical advice.

⁹ 80th Cong., 1st sess., S. 498.

ter provision for fire prevention and control, and probably the construction of many minor engineering structures. How important in preventing accelerated runoff and floods from this area a program of restoration and protection of the vegetation cover might become, will not be known until the data and conclusions are made available. However, flood hazards can be greatly limited if timber and grazing-management programs are markedly improved, because the major cause of floods on this kind of watershed is the rapid melting of mountain snows in the spring.

In 1941 a second such study, led by the Soil Conservation Service and shared by the Forest Service, was undertaken for the Walla Walla River watershed. It, too, was interrupted by the war but resumed early in 1947. Though that watershed contains some forest and rangeland in the high elevations, it is primarily wheat and wheat-pea summer-fallow. Erosion of the farmlands is an important problem. While the results of the study have not yet been published, it is known that any watershed plan to be effective in retarding floods in the Walla Walla country will require widespread and important changes in cropping practices on the farms as well as better range and forest management of private and public lands.

A third study has recently been launched for Willow Creek in Oregon. Undoubtedly many more watershed investigations in the Pacific Northwest are long overdue, particularly in the arid and semiarid parts of the region. Even if the conclusions developed thereby indicate, as seems probable, that no changes in watershed practices would stop a major flood on the main streams, they are likely to demonstrate the possibility of preventing important flood damages on the minor tributaries as well as of conserving values important to a permanent agriculture, by preventing accelerated erosion and the loss of forage. Reduced appropriations will prevent new studies until Congress changes that fiscal policy.

The one Wheeler-Case irrigation project in the Pacific Northwest is at Post Falls, Idaho—a short distance east of Spokane. Its purpose is to obtain water for land included under an earlier private irrigation enterprise and consisting of small farm units. The Bureau of Reclamation planned and built the pumping plant and all of the publicly owned improvements, and the Department of Agriculture selected the settlers, purchased the land for them, made the farm-distribution improvements, and sold the irrigated tracts to the settlers. All fifteen farm units are now under contract.

These contracts of sale contain clauses (as do the current leases for land not yet sold) which bind the users to follow the farm-conservation plans prepared by the local soil-conservation district. Legally, the failure of the buyer to follow the plans voids the contract. This is the only type of situation where sanctions for the fulfillment of soil-conservation plans are exercised by the federal government.

Management of the Post Falls project is under the district conservationist of the Soil Conservation Service situated in that area. When all the land is disposed of, he will continue to collect for the Treasury the payments as they fall due.

Owing to the disapproval by the Bureau of the Budget of the necessary funds, the Post Falls project is only partly finished. This project was launched by the Farm Security Administration, which relinquished control when the Soil Conservation Service was designated as the department's agent in 1945.

The failure to continue the Wheeler-Case program is said to be due to the unwillingness of the Bureau of Reclamation to go ahead with such projects. The bureau argued the projects were intended as relief enterprises, and with the end of federal relief funds there was no longer any basis for their construction.¹⁰ Congress, however, has continued to make appropriations for new projects.¹¹

The practical cessation of these special development programs directed by the regional office of the Soil Conservation Service should not obscure the fact that in the regular soil-conservation district work a great deal of water planning and development is going forward directed toward the improved drainage of farmland and the provision of supplementary irrigation and of better distribution systems on irrigated land. The Sauvie Island and Puget Island districts in the lower Columbia River Valley have made great strides toward increasing the productivity of land by means of improved drainage systems and main drainage canals for district farms. Considerable bodies of formerly little used or unused land have also been brought under cultivation through district programs. The districts in the irrigated areas of the region are planning farm-distribution systems for new farms and replanning them for old farms; frequently the districts are also laying out or rehabilitating systems for groups of farms in nonfederal enterprises when problems of soil and water conservation are involved. The sprinkler-irrigation distribution system which is rapidly displacing older methods particularly on some of the Yakima project farms has been promoted by the soil-conservation district.

The Soil Conservation Service acts as a central clearing agency for a coöperative snow-survey and water-prediction service for the Columbia Basin. This task lies outside the regional conservator's organization and is handled by two special field offices (one at Medford, Oregon, and one at

¹⁰ During the past year the interagency atmosphere has improved and new Case-Wheeler projects are now being initiated. (November, 1949).

¹¹ The significance of the Wheeler-Case experience for a jurisdictional realignment between the Bureau of Reclamation and the Department of Agriculture over irrigation is discussed in chapter xvii below.

Boise, Idaho) of the irrigation division of the research branch of the service. Under this program, snow measurements are made by a group of federal and other agencies including the Forest Service, on national forests; the army engineers (who also put up additional cash for the Soil Conservation Service to measure certain courses); the Washington Water Power Company (which measures courses on the Spokane and Okanogan watersheds); the Eastern Light and Power Company (which reports on areas near Baker, Oregon); and the Soil Conservation Service, which takes responsibility for other watersheds. The Weather Bureau makes no course surveys, but it does furnish snow reports from each of its established stations. All of the states, nine irrigation districts, and a few other power companies contribute money for this snow-measurement work. Two departments of the province of British Columbia furnish snow reports for the upper Columbia. At stated intervals each coöperator sends reports for each course and location to Boise, where the Soil Conservation Service officer assembles and tabulates them for the Columbia River watershed. Beginning January 1 each year and at regular monthly intervals thereafter through April 1, the Boise office issues a bulletin summarizing this information.¹² Its tabulations compare the snow and precipitation situation at the time of the bulletin's publication with the normal experience as based on past history for each station at that time of year. The snow data are translated into water terms, and tentative conclusions are suggested in each bulletin concerning the water probabilities for the coming year. About the middle of April all coöperators and other interested parties attend conferences in Portland where they present oral reports concerning the probable water supply on the various divisions of the entire watershed for the coming season, and the significance of that water supply for irrigation, power, and other purposes. These groups are known as the Columbia River Basin Interstate Water Forecast Committee. Their information and judgment become the basis for water-control operations of federal, state, and municipal agencies, irrigation districts, and the private companies whose businesses depend upon the supply of water from various watersheds. No jurisdictional jealousies or ideological barriers relating to "free enterprise" or "socialism" appear to interfere with this integrated, wholehearted, co-operative program.

Interagency Relations of the SCS

Some of the principal relationships between Soil Conservation Service and other federal agencies that engage in resource management have been

¹² As a result of the great 1948 flood, the Boise office is now authorized to issue bulletins, after April 1, if flood danger impends. (November, 1949.)

pointed out in earlier chapters and in the preceding pages. However, a few additional important relationships must be mentioned.

SCS AND THE FOREST SERVICE

Because the Forest Service and the Soil Conservation Service divide between them leadership in watershed-control studies, they must continually share in all research information of common interest. When the original tripartite joint-agency method of making flood-control surveys was jettisoned (the Bureau of Agricultural Economics, the Forest Service, and the Soil Conservation Service), leadership in flood control was thrown to the Soil Conservation Service for those watersheds which were primarily agricultural and to the Forest Service for predominantly forested areas. To reduce the danger of conflict further the secretary of agriculture classified all watersheds in the Pacific Northwest with respect to each leadership. He has given to Soil Conservation Service the middle-Columbia tributaries (including the Deschutes, the John Day, Willow Creek, Klickitat), and to the Forest Service all the rest. Under the established practice, the lead agency on a job is furnished with staff specialists by the other, and those specialists work as responsible survey crew members under the leader's control.

The "forest influence" research programs of the forest experiment stations are the chief sources of data concerning the relation of forest cover to runoff and related problems. Unquestionably, the remedial measures to which the flood-control surveys will point will in every case involve forest as well as range management. Any coördinated plan of prevention will undoubtedly call for an intermeshed program of management by these two operating agencies, and, in many cases, by the Bureau of Land Management. Success can crown such remedial programs only if a continuing relationship of coöperation from the planning through the operating stages of work exists.

Also, when the foresters on the Soil Conservation Service staff are confronted with unusual problems in planning farms with wood lots or in dealing with other programs which involve the use of trees, these SCS officials must frequently turn to the lore accumulated by the Forest Service. Many of the foresters in the SCS were formerly employed by the Forest Service.

As commercial timber operations reduce the available timber supply for lumber, piling, and other uses, products of the farm wood lot will become increasingly valuable; and the program of farm planning will undoubtedly pay much more attention to wood-lot management. Technical ties between the two field establishments ought, therefore, to become more frequent. This may particularly apply to marketing and utilizing timber

production as the farm-forestry projects (now under the Forest Service) include greater emphasis upon those aspects of timber management than it is possible for Soil Conservation Service to give under district programs at present. Similarly, range experimental work at Ogden and Missoula stations have been exceedingly helpful to the Soil Conservation Service not only in managing its three large pasture projects but also for the district programs concerned with the problems of livestock farmers in the range country. The experiences which the districts and the projects develop also throw light on research problems and thus set up a counter flow back to the Forest Service technicians.

SCS AND THE CORPS OF ENGINEERS

The concentration in the Soil Conservation Service of water-planning leadership for the USDA has required it to build up hydrological and related watershed information in part by tapping other available sources of data. That has meant a fairly heavy draft upon the files and reports of the district engineers of the U.S. Army and a continuing contact relationship between the agencies. In return, the Soil Conservation Service may be expected to accumulate data not possessed by the army or any other agency. As the soil-conservation districts continue to multiply until they cover most of the region (as may be anticipated), they will become the sources of a great volume of detailed information of high value to water planning, even of the kind undertaken by the Corps of Engineers, particularly since Congress, as explained in chapter ii, enlarged the army flood-control functions to include the construction of main drainage canals on the flood plain. The technical surveys for new districts always include an inventory of the water resource. Soil Conservation Service programs in the lowlands of the Columbia and along some of the other stream valleys increasingly emphasize the importance of drainage as a means of conserving soils. The best single center today for data on drainage areas and activities in this region is the one which has been built within the regional Soil Conservation Service headquarters from soil-conservation-district reports.

Certain particulars of the engineering works installed by the army for flood control (as on Sauvie Island and Puget Island) need to be designed with reference to fundamental agronomic facts which technicians of the soil-conservation district can furnish. Thus, in the Puget Island district the tide gates installed by the army when it built the levees did not allow a sufficient reduction of the water table via the island drainage system to free the roots of certain essential crops produced there. When the detrimental agricultural effects of this engineering oversight were called to the attention of the army engineers, a new gate allowing deeper drainage was substituted.

The new authority of the army to install main drainage canals and clear the channels of the tributaries for draining the flood plains will bring the army into a new relation to the activities of the soil-conservation districts. In our earlier review of this army program, we noted the gap between it and the provision of drainage facilities for farms above the army drainage works and the potential deterrent to the drainage of the hypothetically benefited area because of the fact that the farms in the bottom of the flood plain would be getting their land drained for little or nothing. This is a problem in which the soil-conservation district might well take the lead. If the army is concerned with maximizing the benefits of its expenditures, it should make every effort to utilize the districts, where they exist, for that purpose. That would mean bringing the districts into the program before the army's construction work actually starts. The soil-conservation district ought, also, to afford a continuing and responsible agency for the maintenance of these army-built works which otherwise, if past experience is a clue, will often be neglected until the local congressman asks the army engineers to rebuild or repair them.

SCS, AAA, AND EXTENSION SERVICE

No adequate appraisal on a nation- or region-wide basis has yet been published of the headway made under AAA¹³ legislation and administration toward the conservation of soil and its fertility. The shift in the legislative foundation of the AAA following the Supreme Court's invalidation of its original crop-control program in 1936 presumed to make soil conservation that agency's primary concern; yet, it never rid itself of the impulses, the personnel, and the organization structure conducive to its original objectives of balancing production with "specific demand" and of raising farm income. Had it been primarily concerned with soil conservation, an organic assimilation of its programs with those of the Soil Conservation Service would seem to have been indicated, and recognition of that as an ideal was accorded in the reorganization of the USDA initiated by Secretary Wickard in December, 1941. For a year or so, as a consequence, the top administration of the two agencies was amalgamated into what was called the "Agricultural Conservation and Adjustment Administration." But the marriage was sterile and was annulled before any issue was born showing the lineaments or characteristics of that parentage.

¹³ The writer has chosen to use the old initials under which the Agricultural Adjustment Administration became universally known, instead of PMA (Production and Marketing Administration) into which the AAA was amalgamated late in the war period. With the marketing activities of that hybrid structure the Soil Conservation Service has slight functional relation. Therefore the account under this heading centers only on those programs which originated under the Agricultural Adjustment Administration and which are still carried on at the local and state levels under administrative arrangements not essentially disturbed by the enlarged Production and Marketing Administration.

Beneath the top structure no essential change took place. When the misalliance was ended a year or so later, the field establishment of each agency remained essentially unaltered. Each resumed its operation as an independent entity without skipping a beat.

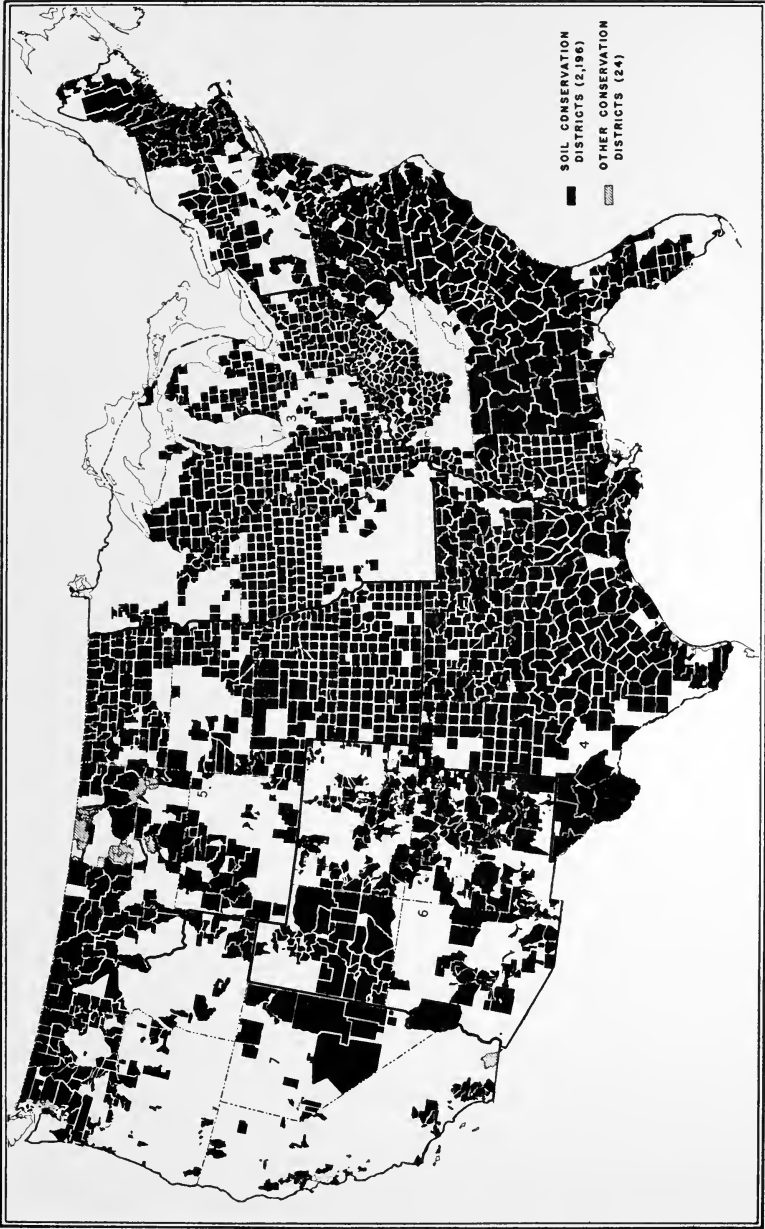
Out in the counties and the soil-conservation districts a compulsion to get together has developed. The AAA secretary and his committeemen and the Soil Conservation Service work-unit conservationists and the board of supervisors must deal with many of the same farmers. This has produced a good deal of actual coördination of programs and some joint administrative arrangements. The soil-building practices for which payments to farmers have been made by AAA could be jointly designed to reinforce the farm planning, technical, and other services of the Soil Conservation Service. When this occurred the formulation of the practices for each annual revision of the AAA docket has been made by the county AAA committee with the advice of the soil-conservation board of supervisors or the local Soil Conservation Service technical men or both. In some places, there have been "interlocking directorates" between the two local farmer boards. Yet, despite these local relations working toward integration, it has also transpired at times that the recommendations of the county AAA group concerning practices to be rewarded and restrictions to be attached to soil-depleting crops have been overruled at the state or regional or national levels in the AAA organization. In other counties relations may be friendly, but the AAA program not particularly useful for conservation in the type of agriculture practiced there. Such, for example, was the complaint of one orchardist, a soil-conservation-district supervisor, on one of the irrigation projects. He asserted that the AAA had been of no particular value, first, because the payments have been too "piddling" to constitute an incentive (to use tile in place of head ditches, for example) and, second, because they had been offered for practices not indicated by the best agricultural-college advice (such as phosphate applications on that district orchard land).

On the administrative front, frequent use is made by the AAA committees of the soil-conservation districts to check compliance on farms which are under district planning agreements. Thus, in Asotin County in southeastern Washington, the AAA committee has consistently required its participants to use the engineering services of the soil-conservation district for designing stock ponds (this is in the range country) and for checking compliance before it would make payments for this practice. This kind of administrative service by SCS technicians is frequently performed for those AAA coöperators who are also covered by district plans; but because AAA is ubiquitous and the district is as yet not nearly so widely extended and accepted, compliance for conservation payments on the majority of

AAA farms does not have a Soil Conservation Service check. Compliance on those farms is usually determined by another farmer, the community committeeman. There is widespread belief that such an arrangement leads to slipshod or inadequate or, in some instances, omitted conservation practices. There can be little doubt that if payments under the AAA system are to become primarily conservation-directed, they will have to be keyed into a complete farm plan, including a rotation program for a period of years (instead of on an annual basis as at present). They will have to be tailor-made for each farm, instead of being tied to a county- or state-wide formula of percentage reduction of "soil depleting" crops along with formulae of limited flexibility for the more positive conservation practices.

The Extension Service, as the educational channel for all of the USDA programs, includes, of course, those of the Soil Conservation Service. It plays an important part not only in facilitating the creation of districts but in the subsequent success of the conservation program. That is one of the many reasons why the state conservationists have their headquarters at the state colleges where they can be in close touch with the directors and staffs of the state Extension Service. The *ex-officio* membership of the state directors on the state committees which approve local requests for the formation of soil-conservation districts, and the director's influence over the county agent who can often make or break a district program, are matters of great importance for the effectiveness of the Soil Conservation Service job. The coöperation of the director's staff of specialists in rendering technical advice is also essential.

While the Extension Service is supported in large degree from federal grants-in-aid, dispensed through the secretary of agriculture, there is no assurance that either the state or county representative of that service will be genuinely sympathetic to a USDA program or, even if he is sympathetic, that effort will be diverted from other tasks to make an action program genuinely understood or valued by the farming communities. This is a situation with which the Soil Conservation Service has been confronted. With one exception it appears that good relations have been quite general with the directors of state Extension Service in the Columbia Valley states, which means that most of the county agents, who usually respond favorably to the state director's preferences, have accepted and are assisting the district program. There have been instances of noncoöperation and occasionally even of obstruction at the county-agent level, but these appear to have been rare.



Development of Soil-Conservation Districts.

Source: U.S. Soil Conservation Service, 1948.

Summary

Looking back over the distance traveled since the establishment in 1931 of the soil-erosion experimental work on the Palouse hills near Pullman, it is clear that much headway has been made within the Pacific Northwest in the work of determining what the soil situation is, and how to deal with it, and in arousing farmer and public interest in conservation problems. Much has also been accomplished in setting up an administrative structure at all levels for performing the jobs which need to be done. The headway gained in getting local programs under way before America's entrance into the Second World War was very promising. Undoubtedly the war arrested and to some extent pushed back that progress in some of the most critical erosion areas. How rapidly a forward movement in those regions may be resumed will largely depend upon a decline in the present prices of wheat and peas so as to restore incentives to conservation rotations and tillage methods. Yet even if such changes should come within the near future, there will remain obstacles of incomplete public and farmer understanding and acceptance, which will require long and imaginative work to overcome. In other parts of the region where the erosion problem is not so serious, a good deal of headway was made even during the war years. Here, the phases of the program which emphasize fertility, conservation, and full use of the soil resources through drainage, land clearance, pasture improvement, and better farm-management practices have caught the imagination of farmers and local businessmen. The spread of districts in those parts of the region has been notable and may be expected to continue. It is estimated that today more than two-thirds of the farms and farming land in Washington and about half of similar areas in Idaho are included within soil-conservation districts. The delay in district organization in Oregon, the most backward of the three states in getting the farm communities ready to practice conservation farm planning, has been overcome. Since November, 1944, eleven new districts in Oregon have been organized. There is every reason to expect that this expansion will continue.¹⁴

¹⁴ During the past year and a half the above statistics have changed in keeping with the continued growth of districts. Today (November, 1949) four-fifths of the farmlands in Washington, two-thirds of those in Idaho are included within district boundaries. In Oregon the number of districts organized since 1944 has grown to twenty-five.

CHAPTER IX

The National Park Service

JUDGED BY THE area of land which it manages, the National Park Service is not one of the region's major federal resource agencies.¹ Nevertheless, even by that standard it is in no sense a negligible service. The nine national parks and monuments lying chiefly within the Columbia River drainage which it operates total approximately 2,500,000 acres.

The acreage of the parks and monuments is as follows:

Crater of the Moon	48,183.64
Crater Lake	160,334.00
Franklin D. Roosevelt Lake (Grand Coulee)	91,000.00
Mt. Rainier	241,728.00
Olympic National Park	846,011.00
Oregon Caves	480.00
Whitman National Park	45.93
Glacier National Park	997,486.80
Jackson Hole Monument	173,064.62
	<hr/>
	2,561,333.99

Until recently the Park Service has managed Silver Creek Falls Demonstration Area with a total acreage of 18,340, but this has been handed over to the state of Oregon. Inclusion in the above tabulation of all of Glacier Park and Jackson Hole Monument constitutes an overstatement of area because a part of each of these parks is outside the Pacific Northwest due to the fact that they straddle the Continental Divide. Information is not at hand as to what part of the total area lies on the upper watersheds of other river systems than the Columbia.

As in the national forests, not all lands in national-park boundaries are owned by the federal government. Consequently there is need for a continuous and systematic land-acquisition program in order to perfect public control over the total resources of each park. For example, in Glacier National Park a large number of sites along the shore of Lake McDonald, which were privately owned, have recently been bought by the Izaak Walton League, which now holds them in trust until Congress

¹ This account omits the nonland-management services of this agency. Such services consist chiefly of aid and advice to private and local public agencies with reference to historic sites. Nor does it explore the aid given to the states in the planning of state park programs.

gives the NPS funds to acquire them. Park management is handicapped to a greater or less extent so long as any of the area within the park boundaries is not under unified park control.

Not long ago in Glacier National Park a large volume of beautiful pine timber on private land was cut because the Park Service had no funds with which to buy the holding. In that park a large block of state-owned timber is constantly threatened by similar liquidation. The requests of the National Park Service for budgeted funds for an acquisition program in 1946, backed by the Department of the Interior and the president, were refused by Congress largely because of the opposition of Western members of Congress to the resulting loss in tax base to local units of government. This tax loss could be made up were the National Park Service allowed to redistribute a part of its revenues (as are the Forest Service, and the Oregon and California Revested Land Grant Administration) to the counties in which the parks are situated.

It should be emphasized at the outset that the basic idea stressed in the statute of 1916 which established the NPS as a bureau in the Department of the Interior was that the service should promote and regulate the use of national parks and monuments so as "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."² The philosophy of the naturalist furnishes the ideology upon which rests that statute, as well as the departmental and service policies developed for the operation of the national parks and monuments. This means, among other things, that private use and exploitation of timber, grazing, mineral, and water resources cease in such areas. All resources (with a few exceptions dictated by war or other exigencies) are held solely for the enjoyment of the public. These areas are treated as outstanding scenic assets whose natural characteristics are to be perpetually maintained with the least possible disturbance to the balance which nature itself has established.

In the Jackson Hole Monument, created by the president March 15, 1939, the secretary of the interior authorized the continuance of livestock grazing based upon the character and extent of such use in 1942. The row over the executive establishment of this monument, raised chiefly by the stockmen because of the prospective withdrawal of grazing rights from private individuals, is still hotly brewing. Another deviation from the customary restrictions within national parks was the granting of special permission to mine tungsten within Yosemite National Park during the war. In establishing national parks, compromises with the "no exploitation policy" have also been made for limited periods. Thus in Mt. Rainier

² 39 *Stat.*, 535.

National Park, mining and the location of mineral claims were allowed from 1898 to 1908. After this date no further locations were permitted, although no interference was made with mining rights acquired prior to that date. Again, the law which created the Olympic National Park left certain designated areas open for mineral-location entry and patent for a period of five years. Likewise, in Glacier National Park, existing grazing permittees were allowed to continue.³

However, with few exceptions, the Park Service systematically pursues its basic policy of keeping all resources within these scenic reserves from private exploitation. Perhaps the only deliberate interference with nature's balance is the eradication programs instituted against pests or plant diseases which menace the timber or other flora.

It is important to pay attention to this basic policy and purpose because it accounted in considerable measure for a running conflict during the 'thirties and early 'forties between the NPS and the Forest Service in the state of Washington. Trouble arose there over the fixing of boundaries for the Olympic National Park, which took over large areas of timber formerly in the national forest. A second proposal by the Park Service in 1938 added further tension.⁴ It recommended the transfer of the chief volcanic peaks, with intervening forest areas along the crest of the Cascade Mountains. These all lie within the national forests. The natural reluctance of the Forest Service to lose these areas was reinforced by all those private groups which sensed danger to their interests in the Park Service policy of forbidding exploitation.

The philosophy of the Park Service makes a sharp distinction between the passive enjoyments which harmonize with its basic conservation objectives and the more common physical activities such as boating, swimming, hiking, or camping, which are of secondary interest to the Park Service. Hence it has developed a complementary policy of encouraging states, localities, or other federal agencies to take over the administration of recreational areas developed in association with federal multiple-purpose water projects. This orientation also explains its program of demonstration recreational areas like that at Silver Creek Falls in the foothills of the Cascades near Silverton, Oregon.

It is not necessary to describe in detail the functions associated with the management of the great scenic areas like Mt. Rainier, Glacier National Park, or Crater Lake. The increasing thousands of visitors who

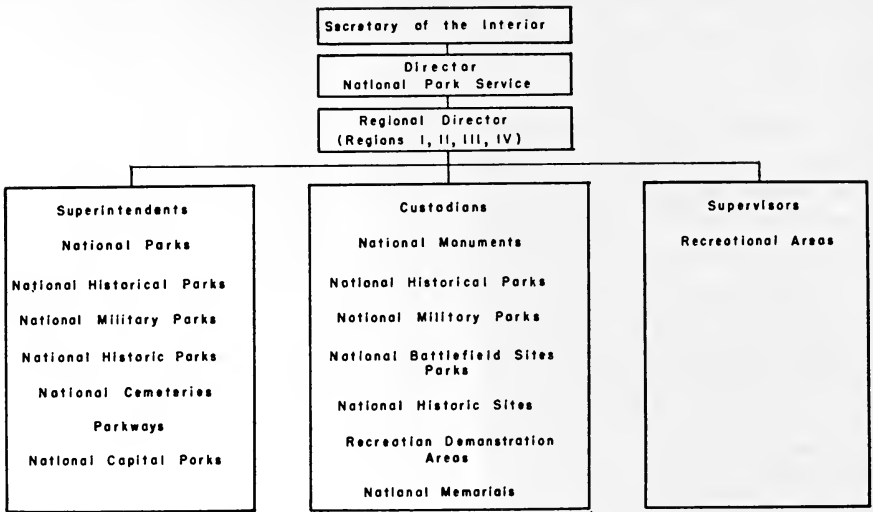
³ See the summary of exceptions in *Cascade Mountain Study*, Washington State Planning Council (1940), p. 17.

⁴ See "Recreational Use of Land in the U.S.," *Report on Land Planning, November 1934, by the National Park Service, to Land Planning Committee of National Resources Board, Part XI* (Washington, D.C.: 1938), p. 28.

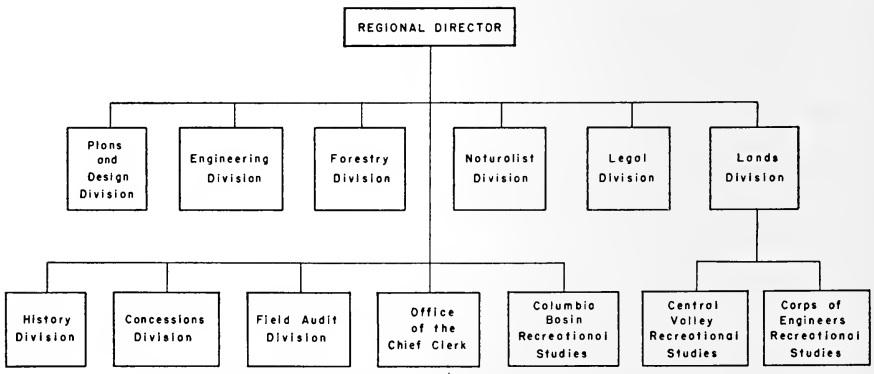
elect to spend vacations in these extraordinary surroundings have spread a wide appreciation of their matchless beauty.

The opportunity to experience these nature gifts of color and form, the intellectual joys of field botany, geology, or natural history, the thrills of whipping the mountain streams or the robust fun of hiking, camping, and skiing depend upon the planning, construction, and operation of roads, trails, camping facilities, cabins, hotels, and museums by the NPS. It depends upon the presence of professional civil servants who make available authentic and interesting information about the parks, their flora, fauna, and geology. It depends upon the facilities and personnel who protect the resources of the park from the menaces of fire, pest, vandalism, and trespass, and who regulate and service the park so that a few may not selfishly abuse their opportunities to the detriment of others. This requires an administrative organization.

Two regional offices share jurisdiction over the national parks and monuments in the Pacific Northwest. The major responsibility, however, centers in the organization headquartered in San Francisco (region 4), which supervises Park Service activities in Washington, Oregon, and Idaho, as well as California and Nevada (except Boulder Dam recreational area). Parts of western Montana and Wyoming lie in the Omaha-centered region, although, as will be explained later, the reservoir-planning studies for the entire Columbia River system have been made the special responsibility of a Portland suboffice of the San Francisco region. The regional director, using the customary fiscal, legal, and clerical-administrative aids, and working through the functional divisions of planning and design, engineering, forestry, naturalist activity, lands, history, and concessions, guides and supervises the operating officials who run the parks, monuments, and recreational areas. These local operating officers are called by three different titles; namely, superintendents (of national parks), custodians (of national monuments) and supervisors (of recreational areas). These distinctions are in part merely historical. In region 4, each of these local administrators reports directly to the regional director, although in some regions custodians of the national monuments operate under the supervision of the nearest park superintendent. The typical operating organization for a national park or monument includes an assistant superintendent, who gives chief attention to internal operations, while the superintendent, besides giving over-all direction, takes special responsibility for public relations and for Park Service contacts with outside agencies. At the local level, staff facilities also exist for engineering, maintenance and construction, protection, naturalist activities, and for clerical, fiscal, and related services. While the authority of the superintendents has never been completely spelled out in formal detail, it appears



National Park Service: Flow of Authority to the Field.



National Park Service: Organization Chart, Region 4.

Source: National Park Service.

to be ample, except on major policy matters for which reference to the regional office is required.

Despite the regionalization of the Park Service in the late 'thirties some direct interchange continues in both directions between the local park officials and the national director's office, the regional offices being simultaneously informed. This is undoubtedly a historical survival of the prerogionalization period and is most clearly manifest in the current practice of transmitting budget estimates directly from local offices to the director at Chicago, with the regional director performing a posttransmittal review. The basis of national-park improvements and ultimately of

operations is a master plan for each national park and monument. While regional office technicians, working with the superintendent's or custodian's local staff, play a major role in this planning, the plans and any alterations in them must ultimately be approved by the national office. The master plans are the basis for construction-budget recommendations and determinations which are made in the national director's office. The conception of a region-wide park and recreational plan has not as yet been used for Park Service planning work; instead, each project has been treated in terms of a national program, or of its own special problems and of service-area needs.

Interagency Relations of the National Park Service

COLUMBIA-RIVER-SYSTEM RESERVOIR STUDIES

In 1936, during the heyday of CCC activities, Congress authorized the NPS to coöperate with other federal and state agencies in the planning of recreational areas.⁵ The most important present use of that authorization in the Pacific Northwest region is being exercised through a special branch of the regional office recently established in Portland. It is engaged in recreational planning studies for the Bureau of Reclamation and similar work, as well as advisory and consulting tasks, for the Portland and Seattle district engineers of the U.S. Army. The reservoir studies for the Bureau of Reclamation rest upon a joint agreement between the San Francisco and Boise regional offices of the two agencies (with subsequent approval at Washington). In accordance with its terms, the bureau has transferred money and automobiles to the Park Service for recreational planning studies on a list of seventeen reservoirs. The studies include developmental plans, and cost and benefit estimates. This list will doubtless be revised and extended to keep pace with Bureau of Reclamation appropriations and additions to its reservoir program. The bureau fixes the completion dates for the studies and thus determines the priority of work. Included in the group are reservoirs on existing, as well as new projects. On many of the former, the bureau is now engaged in making refinancing studies and expects as a result of new Congressional policy to be allowed to include recreational benefits, when present, as a part of nonreimbursable costs. Reduction in charges to irrigationists may thus become possible to the extent of justifiable recreational development costs.

In conducting this work, the Park Service staff has found it necessary to work closely with the field staffs of the Forest, and Fish and Wildlife Services. The latter is authorized by Congress to study all federal river

⁵ See *Public Law No. 770½*, 74th Cong. (June 23, 1939).

projects with reference to their effects upon fish and wildlife. Because fish and wildlife resources are important recreational assets, the Park Service, in calculating recreational benefits, needs to interchange its information and ideas with the FWS and to work out formulae which will be consistent as between the two agencies. At present, there is some divergence of views concerning items which may be legitimately included within the concept of benefits. The Bureau of Reclamation is also concerned to see that the estimated benefits do not overlap and that the theoretical assumptions of the two agencies concerning benefits are consistent.

Timing the reports of the two services on the same reservoirs is another joint problem. Thus far, studies of the FWS have been completed much later than those of the Park Service. As a consequence, reëxamination of the Park Service data may be necessary. This is illustrated by the Owyhee Reservoir studies, where the Park Service report was ready in August, 1946, while the FWS investigation was not completed until the spring of 1947.

The necessity for the Fish and Wildlife Service to investigate not only the reservoir area but also adjacent upland game areas requires a longer period for its studies. It would appear, however, that from the standpoint of fully integrated plans, it would be advantageous for field parties of the two agencies to work simultaneously and together on the same reservoirs. That, however, would require that money and personnel be available at the proper time, and these may not have been provided by Congress or the national offices of the two services. Even with the best intent, regional directors of two field establishments cannot achieve close articulation in such joint enterprises unless sufficient funds are forthcoming at the right time. This situation illustrates the ever recurrent fact that coöperative goodwill developed in the field may face frustration as a consequence of a financial veto or impediments due to the Congress or central officials.

In connection with this reservoir and recreation planning work, it should be noted that the Bureau of Reclamation has no legal right to acquire for recreational purposes land not strictly needed for reservoir purposes. Unlike TVA, it has no general watershed-protection authority which may be used for such incidental purposes as recreation facilities. Consequently, the recreational plans developed by the Park Service must be limited to areas purchased for strictly reservoir needs. Because most of the bureau's reservoirs have thus far been situated in federally held public-land areas, this has not as yet been too great a handicap. However, should the Bureau of Reclamation extend its work westward into the valleys of the Willamette, the Rogue, or the coastal streams, the absence of adequate purchase authority will obstruct the attainment of the best

recreational by-products of bureau reservoir projects and will give to private parties, as unearned increment, some of the important values created by federal investment in river projects.

The situation is similar for reservoir projects developed by the Corps of Engineers of the U.S. Army. Until recently, it has been the view of the field officers of the Corps of Engineers and the Park Service that Congress, in its Flood Control Act of 1944, gave the army authority to purchase land in excess of strict reservoir needs where that would conserve important recreational values. However, a contrary interpretation has recently been announced by the office of the chief engineer of the U.S. Army.

A service-wide agreement exists between the Corps of Engineers and the NPS, by which the latter may be called upon to assist the engineers in recreational planning. The army also determines whether or not the Park Service shall do the general development or detailed recreational plans. Consequently, the actual tasks of the Park Service vary from district to district, depending upon the professional staffing within the office of the district engineer. Thus the Portland district office employs a recreational-planning specialist; the Seattle district does not. Consequently, under the interagency agreement, the National Park Service staff has been asked by the Seattle engineer to carry the burden of recreational planning for the Boundary project (which comes within its jurisdiction). It appears likely that the Park Service will be used at a later stage to work out a detailed developmental plan. The Park Service has already reviewed preliminary plans developed by the district engineer for the Willamette reservoirs, as well as for the lake above McNary Dam. It is also being used to check the detailed plans prepared by the staff of the Portland district engineer.

FIELD RELATIONS WITH THE FOREST SERVICE

In conducting its reservoir-planning studies, the Park Service officers report close and harmonious coöperation with the Forest Service staff. For reservoirs lying within a national forest, it is the policy of the Park Service to recommend that the recreational facilities when built shall be operated by the Forest Service, a sharp reversal of the policy pursued by Secretary of the Interior Ickes. It was the Ickes "line" to keep all such tasks away from the Forest Service, pending the time when his effort to absorb that agency into the Department of the Interior should be consummated. Acute tension between the two agencies was a continuing fact until Ickes resigned. This tension arose not only from Ickes' general objective for the Forest Service, but also as a consequence of the two special episodes to which we referred above. Bill H.R. 9351 in the Congress of 1939-1940 would have allowed the president to establish by proclamation recreational areas to be managed by the Park Service from "unreserved and un-

appropriated land owned by the United States." It would have allowed withdrawals of unspecified amounts of acreage from national forests. The move to expand the Mt. Olympus National Monument (created by presidential order upon the recommendation of the Forest Service in the early 'thirties) from the original 300,000 acres to approximately 728,000 acres and to change the monument into a national park, as was proposed by the first Wallgren Bill, led to acute tension with the Forest Service. All the land taken for the expanded park area was to have been subtracted from the Olympic National Forest. The enlarged tract contained about three billion feet of virgin timber, much of which was wanted for the sustained-yield program which the Forest Service had for many years been promoting. Despite the protest of the timber industry, the Forest Service, and the Washington State Planning Council (which, in a special report of December, 1939, proposed its own program for a national park enlarged to 360,000 acres), Congress passed a revised version of the Wallgren Bill in June, 1938. This created an Olympic National Park of 640,000 acres and provided for possible expansion by presidential order to a maximum of 898,000 acres. Two months after the act was adopted, Secretary Ickes announced that the National Park Service would maintain this new park essentially as a primitive area, free from hotels and other commercial establishments.

The objections of the Forest Service, the Washington State Planning Council, and the private timber organizations had been chiefly directed toward withdrawals from the national forest of heavily timbered areas on the west and south boundaries of the original monument. This timber, it was asserted by the Washington State Planning Council, would provide, if managed in combination with adjacent tracts of state forest land, "the best opportunity in the State of Washington for carrying out in a large way a program of sustained forest management." This opposition has not ceased. The Forest Service still regards the boundary settlement as damaging to a proper forest program. In 1946 the National Park Service and the Department of the Interior, in moving toward better relations with the Forest Service, gave endorsement to proposals before Congress which, if enacted, would have reduced the boundaries of the Olympic Park by 56,000 acres, a shrinkage chiefly along the southwest and northwest boundaries.

Wildlife enthusiasts have again raised a cry of alarm, particularly about the effect of the proposed modifications on feeding grounds for elk. However, as the Washington State Planning Council study reported, both the Park Service and the Forest Service officials agreed that cut-over land provides more ample supplies of browse on which elk feed than do natural forests. Moreover, there are no fences between the forest and park

boundaries so that elk may move back and forth from national park to national forest without hindrance, and under organized protection from each agency against human molestation.

Secretary Krug later reversed the department's endorsement of a reduced Olympic Park. The Department of the Interior is now holding for the present boundaries. The Cascade Mountain row between the Park Service and the Forest Service is today quiescent. There is no present disposition on the part of the Park Service officers to renew it.

However, conflicts may recur from time to time between these two agencies. There can be no doubt that national forests include areas not chiefly valuable for commercial timber, grazing, or mineral exploitation. This has been frankly recognized by the Forest Service in the establishment within national forests of special noncommercial-use areas variously called natural, primitive, wild, recreation, or wilderness areas. Some of these, such as the 800,000 acre Northern Cascade Primitive Area, are of very large extent, while others, like the Mt. Hood Wild Area, are quite restricted. The recreation area in the Mt. Hood National Forest also illustrates the designation of a special forest unit where recreation is the predominant use and all interfering commercial uses are restricted or eliminated. The character of activity there encouraged is very similar to that which predominates within the national parks. However, statutes do not allow the Forest Service to prohibit or restrict mining within national-forest boundaries if claims have been legitimately located and filed, except where such locations interfere with forest administration or are made in bad faith; then it may only file charges in the district land office.

Yet even in this process of restricting the use of national forests for wilderness and recreational purposes, the Forest Service ideology of multiple-purpose use contrasts sharply with the utilization policy adopted by the Park Service for the national parks. Thus when the secretary of agriculture set aside the Mather Memorial Parkway along the Naches Pass (which crosses the Cascade Mountains near the northeast shoulder of Mt. Rainier), the order stated:

A proper and orderly utilization of timber, forage, water power and other economic resources shall be allowed in the area but such utilization shall not be permitted to impair the scenic value of the area, nor its value for public camp grounds, municipal or health camps, sanatoria, club houses, hotels, summer homes, or public utilities requisite for the comfort and convenience of the people using the area for recreational purposes. The administration, development and use of this area shall be governed by the spirit of this order and no use shall be allowed or permitted that will interfere with the broad public purposes herein set forth.⁶

⁶ Quoted in *Cascade Mountain Study*, Washington State Planning Council (1940), p. 20.

In the setting aside of wilderness areas (which today constitute approximately 17,000,000 of the total 176,000,000 acres in national forests), tracts are chosen which not only embrace specially scenic mountain terrain but are also least productive of commercial timber because of high elevations or inaccessibility. The purpose of these reservations is certainly akin to that of many national parks. But the prohibitions on the man-impelled disturbances to the "balance of nature" are less complete. "Grazing of domestic livestock, development of water storage projects which do not involve road construction, and improvements necessary for fire protection may be permitted in wilderness areas, subject to such restrictions as the Chief of the Forest Service deems desirable."⁷

Fundamentally, the Forest Service administration of national forests is tied to a program and a social philosophy of multiple use, while the National Park Service is not only unifunctional but has heretofore construed its task as primarily one of serving the "naturalist" conception of recreation. As noted above, the Park Service stresses a conservation philosophy to protect unimpaired by human use the balance which nature has established. The recreational values which logically ensue from this basic attitude are more largely the intellectual enjoyments afforded the naturalist type of human interest, and the aesthetic experiences that come from spectacular scenery and the contemplation of the unique and varied beauties of flora and fauna. Despite the fact that in recent years the National Park Service has been moving over into the "garden" variety of outdoor recreational activities, these are still viewed as primarily temporary service duties, even though it expects to continue to function as planning, advisory, and demonstration agency for other federal, state, or local agencies. These contrasting basic assumptions of the two services are bound to enlist different supporting groups on behalf of competing jurisdictional objectives. Friction in their relations may therefore be expected to arise from time to time.

Yet despite these facts and expectations of episodic conflict, much close coöperative work and effort in the management of their respective national estates has continuously existed between the field officers of the National Park Service and the Forest Service. These are directed toward such joint interests as fire protection and control, and prevention of insect depredation. On these problems mutual aid is systematically exchanged in a thoroughly coöperative fashion between the Park Service operating staff and the Forest Service. They have been helpful to one another also in safeguarding other interests. We noted in an earlier chapter this coöperation in protecting the approaches to national parks and monuments which

⁷ *National Forest Wilderness Areas*, U.S. Forest Service (Washington, D.C.: 1941). Mimeographed release.

run through national forests, so that they will not be used in a manner calculated to mar the recreational functions of the parks; we also noted the practice of the forest supervisors in clearing with the Park Service all applications to develop resorts on national-forest land near park entrances. Also, the Forest Service customarily refers timber-purchase projects adjacent to Park Service property before approval to avoid diminishing park values. Winter-sport facilities on adjoining forest and park land have always been managed coöperatively. The prodigious growth in winter sports in the West has brought the two services close together in so planning facilities as to avoid duplication while giving adequate service.

The two services not only exchange information on fire control during fire season and assist one another in fire-training work, but they have a standing agreement that each will put out a forest fire on the other's land if its crew is nearer to the fire. The Forest Service has also been used by Park Service field officers to advise on technical problems connected with wild-life and grazing. During the Second World War, the Forest Service was asked to assist the Park Service in evaluating the significance of grazing resources within national parks from the standpoint of their contribution to meat production.

FIELD RELATIONS WITH OTHER FEDERAL AGENCIES

A program for the Grand Coulee Dam recreational area was established on December 18, 1946, by a special three-way agreement between the National Park Service, the Bureau of Reclamation, and the Indian Service. The area consists of the Franklin D. Roosevelt Lake and adjacent land owned by the Bureau of Reclamation and the Indians. The Indian Service is a party to the agreement because about one-quarter of the reservoir area touches Indian reservation lands. After setting aside a proportionate part of the reservoir for Indian hunting, fishing, and related purposes in Indian zones to be supervised by the Indian Service, the agreement turns over the rest of the reservoir to the National Park Service for planning, development, and management as a recreational area. However, the Bureau of Reclamation retains the management of a reclamation zone composed of the area around the dam and its appurtenant works, the town of Coulee Dam, and other lands needed for construction and operation activities. The bureau also retains complete control over the flow and use of water at Coulee Dam. While this agreement puts the Park Service into the position of a continuing operating agency for general recreational purposes, it contemplates that, following the TVA example, the Park Service may transfer to the state or local agencies suitable sites along this great man-made lake for development and operation of recreational facilities. This agreement gives Park Service "fundamentalism" special no-

tice in the following stipulation: "Undertaking to perform the necessary functions relating to the planning, development and management of the recreational area by the Service in no way implies that this area is a part of or intended to become a unit of the National Park system or that the basic preservation policies under which the National Parks and monuments are administered shall necessarily be applied in the planning, development and management of the recreation resources of the recreation area." Even before the agreement was signed, Roosevelt Lake had become increasingly a haven for motor boating and fishing. Beginning at its lower end in the desert around Grand Coulee Dam, its waters wash against timbered hills to the east, and reach up nearly three hundred miles across the mountainous Canadian border. The many drowned creek mouths have made beautiful coves for camping, fishing, and boating.

For years there has been a standing agreement between the National Park Service and the U.S. Public Health Service covering Park Service sanitary facilities. The Public Health Service prepares the sanitary phases of the master plan for each park. Public Health Service inspectors check sanitary facilities each year and report on their condition. There can be no doubt of the value to the public of this independent and expert review of park sanitation.

It is the practice of the National Park Service to rely on many scientific and specialized agencies throughout the federal administration for specialized assistance. Thus the Bureau of Entomology and Plant Quarantine regularly advises on insect problems and blister-rust control. The Bureau of Plant Industry furnishes aid on plant and tree diseases. The coast guard checks on the safety of boats used on the big lakes. The biological specialists of the Fish and Wildlife Service supplement the skills of the biologists of the Park Service on special fish and wildlife problems. The Geological Survey furnishes consulting service and makes special studies of the geological history and characteristics of park and monument areas. When, during the recent war, pressure built up to open the national parks for the production of strategic minerals, the Geological Survey was called in to determine whether sufficient mineral resources of this character were present to warrant the departure from the Park Service policy.

The Bureau of Land Management is called upon for boundary surveys, assistance in the exchange of public domain for private land within national-park areas, timber appraisals, handling of timber trespass, advice on grazing, and enforcing the law concerning nonvalid mineral claims within park areas. The financing of coöperative services is on many occasions provided by the other agency, but the Park Service is allowed to transfer funds for special service tasks.

There is a particularly close relationship between the Smithsonian

Institution and the National Park Service expressed in the standing agreement of 1945. This relates to their joint interests in archeological and paleontological problems, and was drawn in anticipation of the expansion in large river-development projects undertaken by the Corps of Engineers and the Bureau of Reclamation. Reservoir sites for several of these projects were known to include important archeological and paleontological remains. Before they should be flooded, it was important that they be examined and their cultural assets preserved. Consequently, it was agreed that the Park Service would keep the Smithsonian Institution informed about proposed reservoir boundaries and would make surveys for paleontological and archeological remains, while the Smithsonian Institution would advise in the conduct of the surveys and perform the actual excavations. The Park Service is to provide museums, laboratories, and exhibition rooms for the collections.

Like nearly all other federal resource-management agencies, the National Park Service uses the Public Roads Administration to locate, survey, design, and supervise the construction of major roads within national parks and monuments.

General Conclusions

There is no organic connection between the many national parks and monuments operated by the National Park Service within the Pacific Northwest which furnishes the opportunity for the kind of integrated planning that is so clearly possible and desirable for the projects of a river system. The units in the park system serve varying constituencies. The patronage of some is highly local, as, for example, the winter-sports usage of Mt. Rainier. Other units like Crater Lake and Glacier National Park, are situated in relatively sparsely populated regions and are sought by visitors from all over the United States. The summer consumption of Mt. Rainier's scenic assets is also nation-wide. A regional program for the National Park Service must, therefore, carefully calculate extraregional interests, as well as intraregional and local concern with national parks.

Yet in the day-to-day national-park management problems, as well as in connection with some specific plans and programs, articulation of the National Park Service's policies with the affected interests of adjoining federal land-management agencies will be constantly needed.

The extension of interest to outdoor recreational developments which the states and localities might administer, and to the reservoir recreational programs of the Bureau of Reclamation and the Corps of Engineers are concessions to popular demands for added recreational facilities that have slightly modified the preoccupation of service policy makers with national

parks and monuments, military and battlefield parks, historic sites, national memorials, national cemeteries, and the historic advisory services to private associations. Within the Pacific Northwest that expansion of recreational interest ought to be carried much further. The states of Oregon and Washington specially need to retain public access to the ocean-beach scenery but without federal development or federal encouragement to the state in the form of grants-in-aid, as well as planning, action is likely to come too late. The protection of roadsides, particularly from timber cutting along the many scenic stream and mountain routes, is also a major recreational desideratum which could be best attained through a grant-in-aid program administered by the Park Service.

CHAPTER X

The Fish and Wildlife Service: A Federal Amphibian Agency

ONE OF THE early fruits of the Reorganization Act of 1939 was the creation of the Fish and Wildlife Service by amalgamation of the Bureau of Fisheries of the Department of Commerce and the Bureau of Biological Survey of the Department of Agriculture.¹ This fusion took place in the Department of the Interior where the new agency now administers the programs that Congress had entrusted to the Bureau of Fisheries since 1871 and to the Biological Survey since 1887. For the most part those programs were concerned with research rather than with direct resource management. It must be born in mind that legal jurisdiction over the regulation of fishing and hunting within the continental United States belongs to the states. Until the adoption of the migratory-bird treaties with our neighbors to the north and south, and of the statutes which implement them, the federal government's use of regulatory techniques for conservation ends had been limited to some of the public land areas under direct federal management such as the national parks and a few of the national forests. There the conditions under which fish could be taken and animals killed have been determined by the directing federal agencies.

In Alaska the control of fishing is a federal function; the seasons, the gear, and the requirements for commercial fishing are determined by the Fish and Wildlife Service which maintains an Alaska field staff for enforcing its regulations. Since 1910 the management of the Pribilof Island fur-seal herds has also been entrusted to the federal fishing "bureaucrats" who restored this most valuable fur fishery in the world from a population of 18,000 animals in 1900 to 3,155,268 in 1945.²

The research programs of the Fish and Wildlife Service are, if possible, even more important than formerly in furnishing information to states,

¹ By the president's reorganization plan No. 2, the two bureaus were transferred to the Department of the Interior, as of July 1, 1939, but they were not consolidated until June 30, 1940, under plan No. 3.

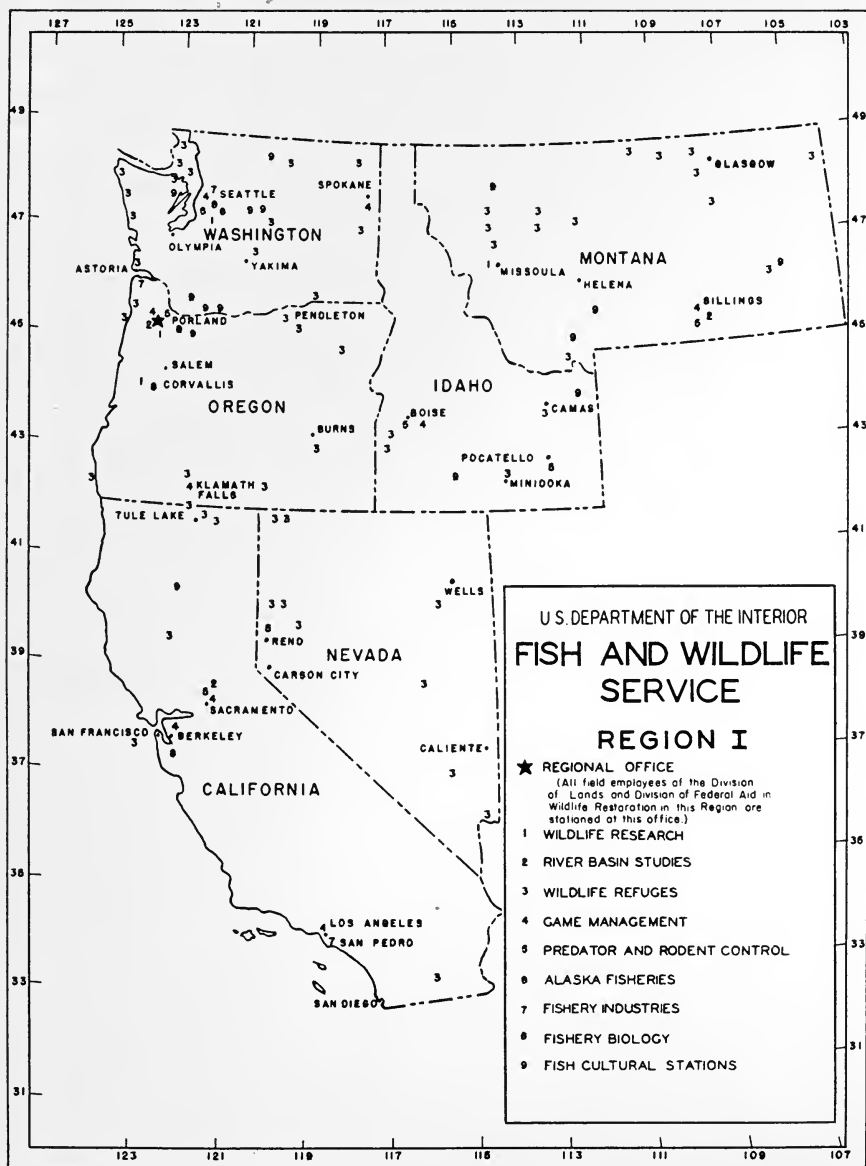
² *Annual Report of the Secretary of the Interior for 1946*, p. 303.

private groups, and other federal agencies for the proper management and conservation of wildlife resources. At the same time, the number and scope of its regulatory, management, and service tasks have so increased during the last two decades that the service has found it necessary to build a field organization to care for them. In so doing it has gone far toward "regionalizing" the administration of all except its research programs. The regional director headquartered in Portland has a real jurisdiction not only over the states of the Pacific Northwest (including all of Montana) but over California and Nevada also. The programs intrusted to his office are managed by six functional branches and two service or housekeeping divisions. The functional units are: game management, game fish and hatcheries, predator and rodent control, federal aid in wildlife restoration, wildlife refuges, and river-basin studies. Tucked into the regional director's organization for housekeeping purposes only (that is, fiscal, personnel, and property) are the field stations of four Washington-managed branches: wildlife research, fish biology, commercial fisheries and Alaska fisheries (the Pribilof fur-seal and fox-management stations only). There is no common subregional administrative unit through which the regional director and his assistants focus their program responsibilities. Each division has its own local administrative machinery.

The regulatory functions of the service center chiefly in the enforcement of the migratory-bird regulations passed in pursuance of treaty obligations. Department of the Interior regulations governing the hunting of migratory fowl and other related activities have superseded the old divergent state laws. Consequently it is the responsibility of the ten U.S. Game Management Agency stations in as many cities in region 1 (of whom five are in the Pacific Northwest) to check on violations of these regulations and statutes and to bring all cases of infraction before federal or state courts.³

Since the migratory game birds are hunted by more sportsmen than are any other wild fowl, enforcement of their control regulations is an important part of the program for maintaining wildlife populations at satisfactory levels. The game agents also check the enforcement of the law against selling game birds in the market and deal with violations of hunting and fishing regulations on the service's own wildlife refuges. They work in close cooperation with the state game authorities who, as is noted below, have direct interest in the protection of game birds by state refuges financed in considerable part by federal aid funds. The game-management division assigns a biologist to investigate the damage to farm crops occasionally caused by the protected fowl and to suggest methods of controlling it, sometimes issuing special permits to the crop owner to kill the offending

³ The use of state courts brings revenues to the states who receive the fines assessed. This helps to obtain state administrative cooperation on the enforcement front.



Fish and Wildlife Service: Region 1, Activity Centers.

Source: Fish and Wildlife Service, U.S. Department of the Interior.

animals. This staff coöperates with other interested state and federal officials in an annual nation-wide census of water fowl. The latest official report shows that the estimated numbers of migratory wild fowl on the

continent had risen from 27 million in 1934, the lowest point in recent history, to 125 million in 1945. During 1945 and 1946 another decline was in process, occasioning reimposition of severe restrictions on hunting of the more popular species, like the Canada goose, for the season 1946.

The wildlife-refuge program managed by another division is intended in part to supplement regulation. It is estimated that at least one out of every five ducks, geese, and swans in North America uses these refuges at some time during the year, finding in them protected nesting, feeding, and resting areas.⁴ This is an impressive record for a program which has been in existence for little more than a decade. Most of these refuge areas of land and water are set aside primarily for the benefit of ducks, geese, and other water fowl. However they also protect all forms of wildlife except the predatory species which are controlled by hunting and trapping. Along the Pacific shore are a number of small refuges created primarily for colonial seabirds. While most of the refuges in this region, including the very large ones at Tule and Malheur lakes, were established for migratory birds, it is felt that additional resting and feeding sanctuaries are needed along the Pacific coast flyways between Puget Sound and the California border. As the revenues received from the stamp tax on duck hunting increase, it will be possible, by additional purchases, to fill in these missing links in the refuge chain used by the birds in their seasonal journeys up and down the Pacific coast.

Besides the refuges for wild fowl there are also a number for large game—antelope, elk, deer, and bison. The Hart Mountain antelope refuge in southeast Oregon covers an area of more than 250,000 acres. The national bison range in western Montana protects the old master race of the range country.

The total refuge acreage in the Pacific Northwest is slightly less than 600,000. These lands and waters are managed by local refuge managers, though several adjacent refuges are administered by a single manager. The smallest units ordinarily have no resident staff, but are handled by occasional patrol and maintenance force. The work varies with the kind of refuge. On those reserved primarily for wild fowl, dykes and other water-control structures may need to be built and maintained. Increasingly, cereal crops are cultivated on refuge lands to supplement the natural aquatic and marsh plant seeds and browse. This helps to deter the birds from invading the cultivated crops of adjacent farms. On refuges where fur animals are protected, limited harvesting of furs is permitted under management supervision, and similar arrangements are made for big game where their numbers make this desirable. A good many animals have been given to state conservation agencies for restocking depleted state

⁴ *Op. cit.*, p. 278.

areas. A number of wildlife refuges in the eastern part of the Pacific Northwest are located on areas reserved and improved by the Bureau of Reclamation for its projects. There a coöperative arrangement prevails by which the bureau manages the reservoir area for irrigation, power, and related purposes while the Fish and Wildlife Service manages it for wildlife purposes. Two of the four refuges in Idaho are of this dual-purpose character.

Closely related to the federal refuge program is a system of grants-in-aid to the states for wildlife restoration inaugurated in 1937 and financed by a 10-per-cent ammunition and fire-arm tax.⁵ All of the states in the Pacific Northwest have accepted the statutory conditions which entitle their fish, game, and conservation departments to grants on a reimbursement basis for certain types of expenditure, chiefly land purchases, land development, and special investigations of wildlife-resource problems. The federal grant, which is apportioned to states on the basis of area and the number of hunting licenses, defrays 75 per cent of authorized project costs.

The regional director's staff acts in an advisory capacity for these grant-in-aid projects, giving assistance to the state agencies on problems of biological research, refuge development, and management programs for impounding and stabilizing water, the development of marshes for increasing aquatic foods, and the construction of physical water-control facilities. Similar assistance is given for research and development to increase upland birds and fur-bearing creatures. The regional director approves the personnel employed by the state for these grant-in-aid projects.

Quite a different purpose is served by the coöperative predator- and rodent-control program, also managed by a division under the regional director. The predator work is aimed at the reduction of wolves, and, to a lesser extent, of bobcats, mountain lions, and bears. The chief target, however, is the coyote, who preys on domestic livestock. Against him the service has developed such ingenious and effective methods as a small set-gun containing cyanimide (known as the "coyote getter") and the use of airplanes for hunting in the snow-covered back country and for the specific and restricted use of poison bait. There is also the powerful new "1080" poison designed chiefly as a rodenticide. Many of the livestock people have been insisting that it should be turned against the coyote but the service feels that it must be withheld from such use until it can be freed from danger to other animals and to people. Service policies relating to predator control have to steer between the desire of the farmers

⁵ This program is authorized by the Federal Aid to Wildlife Restoration Act of September 2, 1937. 50 *Stat.*, 197.

and stockmen on the one hand for extermination, and the alarm of the conservation societies on the other lest the predator animals, as significant specimens of nature, be unduly reduced or hurried on their way toward extinction.

Predator-control work on public lands managed by the Bureau of Land Management, the Forest Service, the Park Service, and the Soil Conservation Service is directed in each state by Fish and Wildlife Service district agents who have charge of a corps of hunters and other personnel. In addition this staff performs the rodent-control work, a considerable part of which also centers on public lands. This applies particularly to prairie dogs, ground squirrels, pocket gophers, jack rabbits, and porcupines. Federal land-management agencies frequently furnish the funds for both predator and rodent control on their several areas. The states, counties, livestock associations, and individuals also cooperate and supply in total much more money for these activities than does Congress through the Fish and Wildlife Service. The poisons and equipment for this work are prepared and dispatched from the supply depot at Pocatello.

Rodent control is of course not confined to wild-land areas but is also available to cities where the center of effort is rat extermination to reduce the hazards to health and to stored food supplies. Here the powerful "1080" compound (sodium fluoracetate) developed by the service has begun to rival in its efficiency against rats DDT's potency against insects.

During 1946 the regional office operated twenty fish hatcheries engaged in the rearing of trout and salmon, all but three of which were on the Columbia River system and the coastal streams of the Pacific Northwest. The fingerlings are used for stocking water on public lands, other streams, and lakes open to public fishing and private waters not used for commercial purposes. Most of the hatcheries are engaged in the production of salmon and in the study of problems connected with the Columbia River salmon fishery. The hatcheries at Leavenworth, Entiat, and Winthrop (Washington) are all working on the problem of saving the salmon runs now blocked by the Grand Coulee Dam. That program has directed the upper-river salmon runs to streams flowing into the Columbia from four Cascade watersheds below the dam. Here a program of research, obstruction, removal, and transplantation appears to have successfully transferred runs of salmon which, when the Coulee Dam was started, appeared doomed to extinction. In 1946 for the second consecutive year these salmon were allowed to pass up the river to spawn without trapping. It is reported that only a few strayed on to Coulee Dam; the vast majority returned to the new spawning grounds on the tributaries where they were planted as fingerlings. The apparent success of this transplantation program gives hope that if Congress makes funds available in time, and if the construc-

tion schedules for mid-Columbia and lower Snake River dams can be somewhat delayed, a part of these most valuable Columbia River salmon runs can be redirected to the lower tributaries; they would thus be saved from almost certain extinction when all the dams projected above Bonneville are in place.

It is the special function of a new "river basin" unit in the Portland regional office to analyze the consequences of all river-basin developments proposed by the Corps of U.S. Engineers and the Bureau of Reclamation. Since the amendment in the spring of 1946 of one of the basic statutes under which the Fish and Wildlife Service works, it must now be consulted by the two construction agencies (and by any private or public agency operating under a permit issued under the Federal Power Commission) concerning the effect of proposed river structures on fish and wildlife. The report of the Fish and Wildlife Service then becomes a part of the engineering agency's final report to Congress.⁶ When either of the construction agencies proposes a dam, a copy of its proposed plan is sent to the river-basin studies unit which examines it and may suggest modifications. The research men stationed at Seattle, Corvallis, or Stanford may be called in to help scrutinize the plans, work out modifications, and prepare the criticisms. Occasionally such a review requires a stream survey to discover spawning grounds, study water temperatures, or obtain other physical facts bearing on the fisheries problems presented by the proposed structure.

It is extremely unfortunate that research on artificial propagation has until recent years been almost completely neglected. The ill consequences have now become apparent as growing power demands in the Pacific Northwest call for several up-river dams within the next few years. It is also unfortunate that employment policies and pay schedules have staffed the hatcheries with men lacking in scientific training. The practical hatchery staff accept but slowly the research people's increased scientific knowledge of fish culture.

Although the regional director's organization has no jurisdiction over the divisional field stations of the research branch in the Pacific Northwest these stations play an important part in the solution of wildlife-resource problems and ultimately in the management techniques employed by the administrative staff. The division of commercial fisheries operates a technological laboratory at Seattle engaged principally in the investigation of improved commercial methods in the fishing industry including

⁶ *Public Law No. 732*, 79th Cong. This statute also allows the construction agency to transfer funds to the Fish and Wildlife Service for making its investigations. On the other hand it includes an incentive to the construction agencies by declaring the costs of a project allocable to fish and wildlife are not reimbursable.

the elimination of wastes and the utilization of by-products. It also collects data on the technological aspects of the industry. An office of this division, located at Seattle, operates a market news service for the fishing industry and conducts market surveys and economic studies. The division of wildlife research studies the feeding habits, life history, and nutrition of birds, mammals, and other vertebrates except fish; and oversees cooperative research projects carried on by the state agencies and educational institutions on a grant-in-aid basis within the same fields of research. The division of wildlife research pays close attention to problems of the wild water fowl which use the Pacific flyway, and studies the population trends among these creatures. It also investigates damages caused by wildlife and means of controlling predatory species which menace other wild creatures.

The most drama at present attaches to research conducted by the division of fishery biology which has two stations in the region, at Seattle and Corvallis. The latter is concentrating on culture problems for salmon in the Columbia and other Oregon and California streams. As noted earlier, hatchery methods have developed largely without benefit of science, so the present emphasis is intended to overcome years of neglect in that research area and is justified by the tremendous importance now attached to artificial propagation as the result of the successful experiments with the Grand Coulee salmon runs. One important incidental research project is the search for economic but nutritious food for hatchery fish, a matter of real consequence with the expansion of the artificial propagation program. Another major investigation is the effect on fish health of changed river water temperatures caused by impoundment of water behind the dams. The Seattle station is responsible for research on the Puget Sound and Alaska fisheries and on the protective problems relating to the Columbia River salmon: that is, overcoming natural and man-made obstacles to fish migration. Its scientists designed the ingenious system of locks and fish ladders installed at Bonneville and are now engaged in the problem of the mortality of downstream migrant fingerlings and ways to reduce fingerling losses over the dam.

The experimental studies conducted at Bonneville make information available for the first time on the migration habits of salmon fingerlings. This information refutes earlier theories and indicates the extreme difficulty of devising successful artificial aids for a safe downstream journey. If the statistical tabulations on the release experiments now being assembled show a measurable fingerling loss in seaward migration over the Bonneville Dam, the challenge to research ingenuity will be a very difficult one to meet. The even more difficult fish-passage problem of McNary Dam, now in the initial phases of construction, must be solved soon or

great danger will arise even for the transplanted upstream runs, which appear to be so successful.

Interagency Relations of the FWS

The exposition of agency programs in this and preceding chapters should make clear the wide service functions rendered by the Fish and Wildlife Service to all the federal public-land-management agencies. All of them use its scientific technical assistance. The relationships have been particularly intimate with the Forest Service because the national forests offer a very extensive and favorable habitat for a great variety of game and other wildlife. Second in importance are probably the grazing-district areas under the Bureau of Land Management. The antelope and the mule-tail deer undoubtedly profit from any improvement to the range which the work of the now defunct Grazing Service achieved. Every land-management program that improves the forage supply for domestic livestock simultaneously improves the feed and the survival of game and upland birds. On the land-creature side of its "amphibious" responsibility the Fish and Wildlife Service seems to have grown into very harmonious and coöperative relations with other federal agencies.

On the water-resource side, however, the story is more clouded. At present the most constant relationship problems arise in connection with the river programs of the Corps of Engineers. The latter's forward march up the Columbia and its tributaries is compelling attention to the salmon fisheries, for which the Fish and Wildlife Service has a special responsibility. When Bonneville Dam was launched, the research men from the service were brought in by the engineers to meet the outcry from the commercial-fishery people that the dam would ruin their industry. At great expense elevators and ladders were introduced into the design as insurance against such an untoward event. But McNary Dam and the four Snake River dams—now all authorized for army construction primarily for navigation and power purposes—raise fundamental problems of salmon survival. Hence the present relations between the two agencies each with a segmental loyalty attached to differing primary interests are sensitive if not strained.

In reviewing the plans prepared by the army engineers for McNary Dam, the proposed Dalles Dam, and the Snake River dams, the Portland regional office and the Seattle office of river-basin studies of the Fish and Wildlife Service reported in October, 1946, that if these dams were built before time was allowed to try to meet the hazards they present to the salmon they would "literally destroy the valuable Columbia River Salmon fishery." This judgment was based on the fact that plans for McNary and

The Dalles dams provided 50 per cent greater "head" than for Bonneville Dam, and the Snake River dams would be from 50 to 100 feet high. Moreover there is no known instance of successful maintenance of salmon runs above dams as high as those proposed. Even at Bonneville (only 50 feet high) some mortality to the adult fish, injured or exhausted in reaching the ladders, occurs. The report pointed out that 80 per cent of the present known population of Columbia salmon and steelhead spawn above the site of the proposed Dalles Dam. While the problems for a single dam might be partly solved, a succession of dams multiplies by more than their number the difficulty of preserving the runs. Fraser River studies show that if salmon are delayed as long as two weeks in their upstream migration they perish without spawning. Consequently if the fish are delayed three or four days negotiating each of the fishways in a series of dams en route to their spawning grounds, the whole fishery, in trying to pass over seven to ten dams, might be unable to spawn and thus perish in a single year.

This conflict of interest is not confined to relations with the army. Since the middle of 1946 the Bonneville Power Administration has been urging the accelerated construction of the McNary, Chief Joseph, and other upper-river dams to meet the greatly expanded power demand which it predicts within the next few years. In its role of chief advocate for more hydroelectric projects to be built at an accelerated rate the BPA has drawn the fire of the commercial-fishing industry and the criticism of the Fish and Wildlife Service.

Out of this complex of conflicting economic and agency interests has evolved the most important single program proposal yet made for the Columbia River salmon fisheries—the so-called lower-river program. This was first outlined during 1945 by the research people at the North Pacific laboratory at Seattle in coöperation with the field administrative officers as a means of salvaging and conserving the most valuable strains of Columbia River salmon regardless of the construction programs above Bonneville Dam, then being discussed by the army and the Bureau of Reclamation as possible war projects. Funds for this work were allocated to the Fish and Wildlife Service by the Corps of Army Engineers and the Bureau of Reclamation. The lower-river plan was offered as a kind of insurance, if upstream salvage operations should fail; it was aimed at preserving and improving existing runs in the lower tributaries and transplanting the more valuable upriver species to the lower streams. The term "lower river" was so defined as to embrace all of the tributaries flowing into the Columbia west of and including the Deschutes on the south bank and the Klickitat on the north. It proposed that on each tributary man-made and natural obstructions to the spawning of salmon be removed; that all water diversions be screened and improved fishways be installed

where necessary; that a great expansion in artificial propagation be undertaken and that exclusive fish refuges be established on a number of more promising streams. Since the plan was first broached further essential studies have been prosecuted by the Fish and Wildlife Service including surveys of most of the tributaries. These have located all the natural obstructions (falls too high for the salmon to negotiate), the log and beaver dams, unused splash dams, favorable spawning areas, and so forth. Because of the size of the transplantation program, many sites for new hatcheries have been investigated and locations chosen. The plan contemplates 17 hatcheries on Washington and 11 on Oregon tributaries. It has been estimated that the capital outlays required for this program will total \$20,000,000 and that the annual cost of operations will be \$1,000,000.

Much time is required to carry through the program and to get the the transplantation and propagation work under way, even after Congress shall have approved appropriations for its execution. Therefore, the Fish and Wildlife Service, backed by the other Interior Department agencies in the region and by the secretary, urged the support of the Columbia Basin Inter-Agency subcommittee for a change in construction schedules for the two Hell's Canyon dams and certain other upstream structures, thus making it possible to decelerate, if the power needs can be met otherwise, the building of the authorized dams across the lower Snake River and the proposed dam at The Dalles. This proposal ran directly counter to the demands for early completion of slack-water navigation to Lewiston, Idaho. A hearing to air the navigation-versus-fisheries controversy before the Columbia Basin Inter-Agency subcommittee in July, 1947, was scheduled by its Corps of Engineers chairman for Walla Walla—the center of upstream navigation pressure-group activity. Whether this was done deliberately or not, it was clear that the army was exceedingly reluctant to accede to the proposal of the Fish and Wildlife Service, even though officially backed by the Department of the Interior, for a construction schedule change. The failure of the final effort, before the Columbia Basin Inter-Agency Committee, to obtain agreement to modify the dam-construction schedules is told in detail below (see chapter xiv). The plan ran directly counter to the demands for early completion of slack-water navigation to Lewiston, as well as the urgent unanimous appeal from public and private power agencies for accelerated hydroelectric-generator installation. The Corps of Engineers, therefore, opposed the Interior Department's rescheduling plan and joined the other agencies in rejecting any schedule changes for authorized dams. However, since that rebuff to the salmon strategy of the Fish and Wildlife Service, the army has lent its aid in pushing for the other elements of the lower-river fishery program and has included in its appropriations request a sub-

stantial item for starting the removal of obstructions on the lower tributaries. The success of the lower-river plan hinges upon three immediate and almost simultaneous policy decisions which will have to be made in Washington: (1) Greatly accelerating the investigation authorization, (2) the accelerated construction of Hungry Horse and Foster Creek dams, and (3) the early appropriation of funds to build the hatcheries, remove the lower-tributary obstructions, and start the other fish improvements on those tributaries. Only by synchronizing all three decisions is it likely that the lower Snake River dams can be justifiably delayed and the fishery problem successfully worked out in time to salvage the upstream runs.

The U.S. Geological Survey: A Service Agency

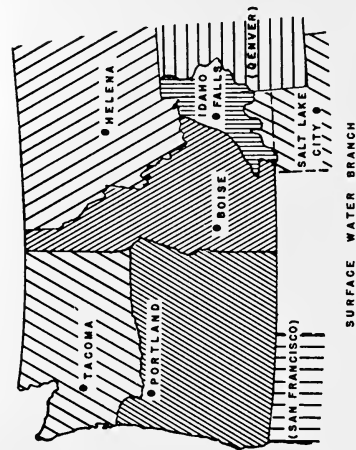
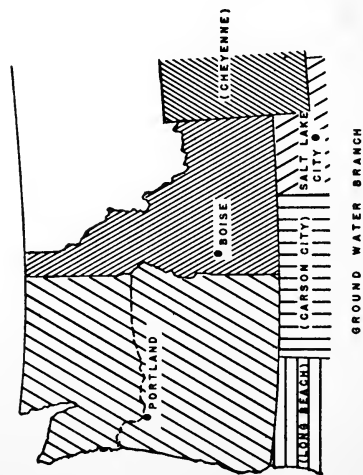
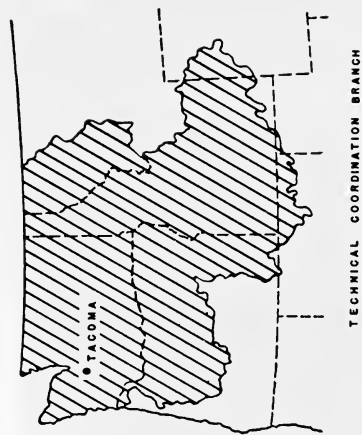
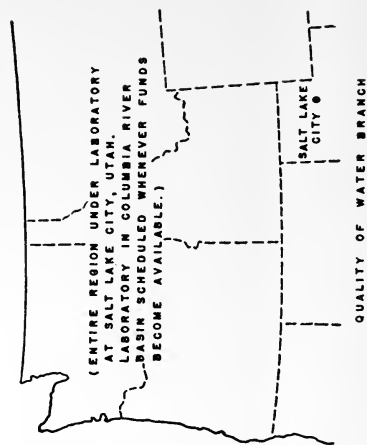
LIKE THE Fish and Wildlife Service the U.S. Geological Survey (USGS) despite its name is also amphibian in the scope of its programs. Its work may be broken into six chief categories: (1) water-resources fact finding, (2) mineral-resources fact finding, (3) topographic mapping, (4) land classification, (5) mineral-leasing administration, (6) general geological exploration and related scientific research. Historically the Geological Survey was an offshoot of the engineering and exploratory functions earlier performed by the Corps of Engineers. In time the Geological Survey gave birth to two other federal agencies, the Bureau of Reclamation and the Bureau of Mines. As an engineering and scientific agency its work has been highly specialized. Most of its geological work is centralized, being performed either in Washington or by special field parties directed from Washington with liaison offices in the field representing the chief of the geology branch by advising on work programs.

The engineering duties of the Geological Survey are largely handled through permanent field offices yet even these activities are "deconcentrated" rather than decentralized. The delegations of authority to these field officials are very limited; they are held in tight rein by the Washington division and branch chiefs. It is justifiable therefore to regard the Geological Survey as generally a centralized agency. In the Pacific Northwest, as a consequence of recent efforts by the secretary of the interior to establish regional integrating machinery for the department, a coördinator for the Geological Survey has been named.

Each of the four major functional units into which the work of the USGS has been divided, also has its independent field officers and areas. Within one of them, the conservation division, separate field offices for each of its four branches exercise jurisdiction over different geographic areas.¹ The several branches of the Geological Survey have twenty-nine

¹ On January 1, 1949 the Geological Survey reversed its former use of "branch" and "division," in accordance with a new standard prescribed for all federal agencies. To avoid confusion the new terminology is used in this chapter. (November, 1949.)

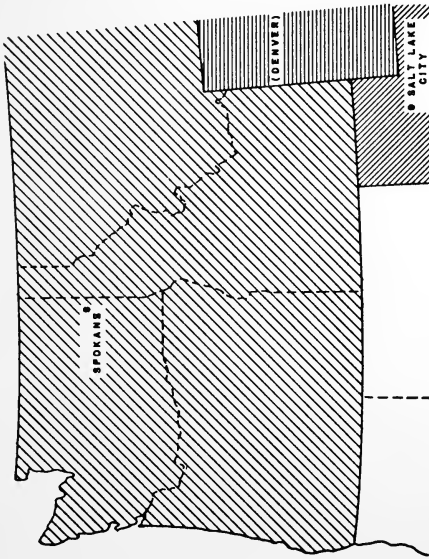
GEOLOGICAL SURVEY, WATER RESOURCES DIVISION



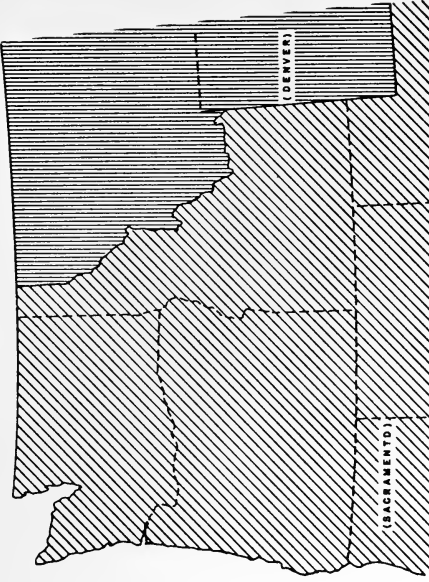
U.S. Geological Survey: Field Offices and Areas, I.

Source: U.S. Geological Survey, 1947.

GEOLOGICAL SURVEY, GEOLOGIC DIVISION



GEOLOGICAL SURVEY, TOPOGRAPHIC DIVISION



JURISDICTIONS OF FIELD LIASON OFFICES IN THE PACIFIC NORTHWEST

JURISDICTIONS OF FIELD DIVISION OFFICES IN THE PACIFIC NORTHWEST

U.S. Geological Survey: Field Offices and Areas, II.

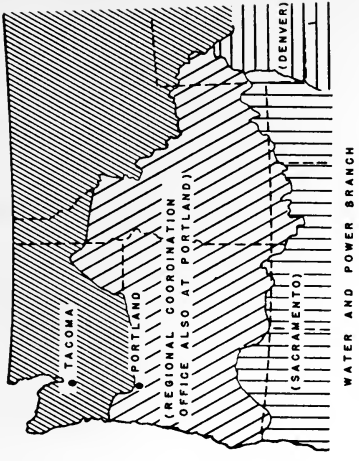
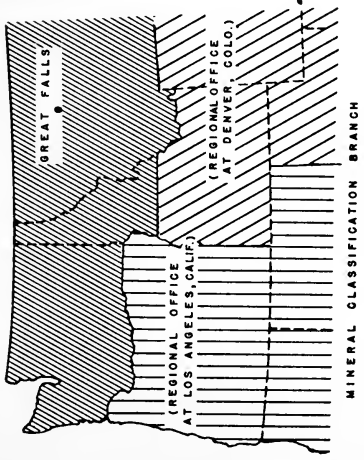
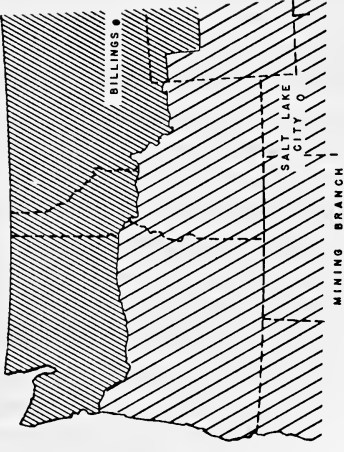
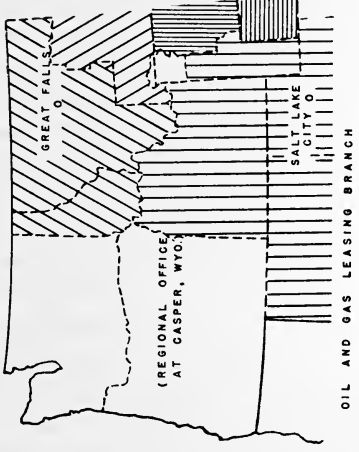
Source: U.S. Geological Survey, 1947.

separate field offices each with jurisdiction over a part or all of the Columbia Basin region. Twenty-five of these offices report directly to Washington. Whenever a special job requiring regional consideration must be undertaken (as during the preparation of a special study of water-resource problems for the Bureau of Reclamation's Columbia Basin report of 1947) a special committee of field men from the various branches or divisions is constituted to pull together the information and ideas from the several constituent parts of the organization into a single consolidated report.

Except for its mineral-leasing and supervision functions the activities of the Geological Survey are, basically, the collection and release, to other government agencies and to the public, of facts concerning water and land resources (subsurface as well as surface). Consequently the use of a highly fragmented distribution of field representation and of centrally directed programs may be a satisfactory mode of organizing for its work. This may be true so long as the information it collects need not be presented primarily region-wide. If, however, the water-and-land management and development agencies which it serves should in future carry on their development and operating upon a whole river system or regional basis the present field structure of the Geological Survey will in all probability require drastic overhauling. The appointment of a coördinator as the agency spokesman on the Department of the Interior Pacific Northwest Coördinating Committee may be the initial step in that direction.

Instructions given this coördinator by his bureau chief authorized him, subject to limitations on matters affecting bureau policy, to study and analyze the Geological Survey in relation to area needs and development and in relation to the activities of other governmental and private agencies, and to assist in the formulation of plans for the USGS in the area; to act as adviser for the chiefs of the several divisions of the agency in the area and as a coördinator of their work; to assist the division and branch representatives in the area in negotiating coöperative agreements with federal, state, and municipal agencies; and, as the designated representative of the Survey on the Pacific Northwest Coördinating Committee, to coördinate the objectives and work programs of the Survey with those of other agencies of the Department of the Interior.

But some more far-reaching adjustment to the work of resource planning and programing appears to be indispensable on the part of a technical fact-finding and mapping agency whose data are essential to that work. Whether that adjustment should be based upon the continuance of the Geological Survey essentially with its present duties or upon a redivision of its functions as part of a reallocation of present departmental activities (as discussed below in chapter xvii) is beside the present point. The real



U.S. Geological Survey: Field Offices and Areas, III.

Source: U.S. Geological Survey, 1947.

organization issue is one of closely relating a group of scientific and service activities to the planning, programing, and operating structure to which they minister.

Let us look at the Geological Survey programs functioning in the field in the Pacific Northwest. The topographic division prepares the standard quadrangle maps that are so important to all kinds of physical planning and management. Unfortunately despite the sharing of expense with the states and other federal agencies under coöperative financial arrangements, this mapping program has lagged far behind needs. Many of the old surveys were made by reconnaissance methods and are in urgent need of drastic revision or complete resurvey. In the Pacific Northwest the only areas mapped by modern methods and with cultural information current are located in southeast Idaho, in Oregon and Washington around the Willamette and Puget Sound valleys, and in a few scattered areas in eastern Oregon, eastern Washington, the Idaho panhandle, and western Montana. Southeastern Oregon is almost completely devoid of maps of any kind. In its current studies of the upper-Columbia tributaries the Corps of Engineers has been obliged to send out areal photographers and ground crews to map many of the watersheds in which it is interested because the Geological Survey mapping program is so far behind. This is a result of years of inadequate appropriations. This is true notwithstanding the fact that the army, the Bureau of Reclamation, and other federal agencies have intermittently transferred funds to the Geological Survey to finance their special mapping requirements. The bureau has, since January, 1947, entered into a firm agreement with the Geological Survey by which the latter is to perform areal photographic and topographic mapping for all areas in excess of twenty square miles provided it has the money and the personnel, or if it has the personnel but no money the bureau will transfer funds. If the USGS has no staff available then the bureau does this work itself, acting under the technical guidance of the Geological Survey.

The field organization of the topographic division which performs the map surveys is made up of four branches including two that bifurcate the Pacific Northwest. Western Montana and western Wyoming are handled by the Denver-centered office and the other three states lie within the province of the Sacramento, California, office.

The dependence of the Corps of Engineers and the Bureau of Reclamation on water data developed by the Geological Survey has already been indicated. Such information is collected by the water-resources division through its three operating branches—ground water, surface water, and quality of water. The surface-water program is the most advanced in the Columbia Valley region. Here as elsewhere this work is jointly financed by appropriations to the Geological Survey, by money contributed by the

states, counties, municipalities, other federal agencies, and by the licensees of the Federal Power Commission. Since July, 1946, the Bureau of Reclamation and the Geological Survey have formally agreed that all water-investigation needs by the bureau which do not exceed \$5,000 in cost will be performed by the Survey on a reimbursable basis. Arrangements for this may be made directly between the regional director of the bureau and the field officer of the USGS in charge of the district office by which the work is to be performed. For investigations costing in excess of \$5,000 plans may be worked out by the field officials of the two agencies, but these must be submitted to and approved by their respective bureau chiefs.

This agreement illustrates the tendency that seems to be set in train by the regionalization of one agency (in this case the Bureau of Reclamation) to force increased delegation of authority to the field offices of another if there are close functional ties between the two organizations. During 1946 about twice as much money for stream gauging was contributed for collecting surface-water data by these other organizations as was appropriated by Congress to the USGS for such work.²

In 1944, 523 gauging stations were in operation on the Columbia River and the tributaries under the supervision of the five district offices of the surface-water branch. At least 150 additional gauges are said to be necessary for the proper inventorying of surface water so that the construction and operating agencies, federal, state and local, and private, may know reliably the quantity of water for which to make plans. One of the reasons for numerous gauges on identical streams is the great variability in annual runoff from different watersheds as a result of the wide ranges in precipitation (which varies from 5 to 150 inches) and the marked differences in underlying geological structure. Two streams within the same subarea, like the Deschutes and the John Day, have completely divergent patterns of stream flow and require a good many gauging stations to record essential water facts. Gauging records are also needed over long periods of time because of climatic cycles. Yet frequently they are not installed until a river project is undergoing survey or has been authorized.

Closely correlated in use is the information concerning ground water, which another branch collects. The subsurface waters are important for irrigation pumping, for range livestock and for domestic and industrial use. In some sub-basins the ground-water supply is a major factor in maintaining the flow of the streams. This is true for example of the Deschutes and Spokane rivers. To date a mere beginning has been made in this inventorying task. Systematic studies are available only for the

² W. E. Wrather of the Geological Survey in *Annual Report of the Secretary of the Interior for 1946*, p. 220.

upper Snake, the middle Deschutes, the Willamette Valley, and the area adjacent to The Dalles, Oregon. A new program has been started in the Spokane Valley, the Kootenai, and the Columbia Basin project. Changes in the natural regimen of a stream by diversions for irrigation or storage for later regulated release are bound to affect the ground-water supplies. Any important new drains on the latter will react upon stream flow. How great these interacting effects will be and how quickly they will manifest themselves can only be determined after systematic and continuous inquiry. Lacking such a program costly errors and expensive ground-water development are almost bound to occur.

A striking example of the interrelationships between surface- and ground-water supplies is to be found in the Spokane Valley where the underground water resource is known to be very large. A large part of the dry-season flows of the Spokane River come from this underground reservoir. This breaks to the surface in springs near Spokane which furnish the municipal water supply for the city of Spokane and irrigation water for some adjacent land. Should excessive development of these ground waters be undertaken there would almost certainly be adverse effects upon the flow of the Spokane River and the output of the hydroelectric plants located on it. On the other hand the proposal for utilizing Pend Orielle Lake as a big storage reservoir may be realized; if so, it is probable that the raising of the level of that natural body of water (from which it is believed much of the underground supply of Spokane Valley derives) would increase the ground-water storage and therefore the dry-season flow of the Spokane River. In that event a marked increase of hydroelectric energy would be developed in the plants below Spokane, not only in the Spokane River but at Grand Coulee and the other generators on the lower main stem of the Columbia.

Studies of ground water in relation to the return flow to the streams of water which has been diverted higher up the valley; of the concentrations of vegetation-killing salts in re-used irrigation water; and of underground drainage problems, are of growing and vital importance as irrigation is expanded in the Pacific Northwest. Such tasks, if and when performed, will also widen the jurisdiction of the technicians of the ground-water and quality-of-water branches of the water-resources division of the Geological Survey.

The last-mentioned branch is engaged in the study of the chemical and other qualities of water, surface and ground. Very little of this kind of work has been undertaken in the Columbia Valley. The only comprehensive studies extant were made in 1910-1912 and were limited to a few streams in Oregon and Washington. Two recent studies of sediment

transportation on the Boise and Palouse rivers have been completed in coöperation with the Department of Agriculture but no systematic basin-wide inquiries of this problem have ever been undertaken. While it is believed that for the Columbia system as a whole the sediment problem is not nearly so acute as for some other western rivers there are parts of the basin where (as noted above) serious waterborn erosion occurs on irrigated and nonirrigated lands. There are also tributaries thick with the mud of mining operations. However, almost no records exist of the sediment burden in rivers except for some ancient studies at a few points on the Columbia. Without such information it is difficult to foresee or alleviate problems that may develop at river structures. Such data are also valuable for fisheries and for commercial and domestic use.

How to work out the best use of water resources by federal, state, and private interests is the special task of another unit in the same division of the Geological Survey, namely, the technical-coördination branch. This branch assembles, analyzes, and interprets the data collected by its sister branches. Studies of this character are ordinarily made as problems arise for which they are needed. Thus the technical-coördination branch has assisted the State Department and the Canadian-American International Joint Commission in dealing with problems relating to international streams and the lakes along the Canadian-American boundary. The technical-coördination branch was also called in to help make the determinations about backwater on the Columbia River caused by the Grand Coulee Dam, on the effects of diking along the Kootenai River and the impounding of Kootenai Lake and other international problems on Okanogan and Osayoos lakes.

One of the contemplated services of the technical-coördination branch will be of special value to the livestock industry in the arid part of the region where it will always be impracticable to use standard irrigation projects for watering fertile land. This service is aimed at the production of winter-forage crops on small bodies of good dry land. It is believed that small reservoirs could be located on washes that have a spring runoff but which are dry during other seasons. To make this possible there must be careful measurements of the runoff and of usable reservoir and dam sites. Sufficient examples of successful work of this kind already in operation in southwestern Idaho indicate the promise of similar developments elsewhere in the Columbia Valley.

Included in the water-resources-data services, but performed by the conservation division, is the survey and classification of water power and reservoir sites. This requires topographic surveys of stream valleys, some drilling and seismic testing for dam sites, and more detailed survey of

potential reservoir and dam sites. This work is done on federal public lands. When the field work is completed a classification is made which determines whether the surveyed areas shall be placed in the water-power site reserves. In cooperation with the water-resources division this unit also supervises the construction and operation of licensed power projects on public land.

On the land-resources front the Geological Survey has another classification job. While the original act of Congress creating the Geological Survey said it should have charge of the "classification of public lands," that function was administratively construed on a narrow basis, as not intended to aid the General Land Office in its disposal of the public lands but as primarily for general public information. Actually USGS classifications have been confined to special tasks given it from time to time and to the making of recommendations connected with proposed withdrawal from entry of mineral and water-power sites. The Geological Survey was given funds in 1917 to classify land for livestock, homestead, and other purposes relating to the livestock industry but it has not generally entered the field of land classification for agricultural purposes.³ At present its classification duties are confined to water-resource sites and mineral lands. Even though there is a long-range program of classifying public lands for mineral purposes, the bulk of that work, thus far performed, has consisted of a series of special mineral-classification jobs—such as coal or oil land—and the review of all applications made to the Bureau of Land Management for the purchase, entry, or exchange of public land. In this review function it is the job of the Geological Survey to see that the land to be alienated does not possess valuable minerals. It makes a finding on this matter before the Bureau of Land Management approves the proposed transaction, thus preventing the alienation of federal mineral land under inapplicable laws.

In the minerals field the USGS goes outside the purely fact-finding function. It negotiates mineral leases on public land and supervises private-company operations involved in the discovery, development, and production of oil, gas, coal, potash, lead, zinc, and several other minerals from public lands (including also Indian and naval petroleum reserves). This supervision is intended to insure proper production methods, the maintenance of accurate and honest records for royalty collection and mineral-resource inventory purposes, the observation of health and safety requirements on behalf of workmen, and the prevention of improper or illegal withdrawals. The Geological Survey also collects the royalty fees.

During the Second World War exploration for critical minerals was

³ For the evolution of this and other functions consult *The U.S. Geological Survey, Its History, Activities, and Organization*, The Institute for Government Research (1918).

accelerated by both the Geological Survey and the Bureau of Mines. The latter agency has withdrawn from this work, and the general exploration duties are now the sole province of the Geological Survey.

The scientific geological functions of the USGS are directed toward the discovery of the geological structure of the United States, showing area by area the "distribution, structural relations, mineralogic character, economic value, and geological history of the formations." This work has been approached from the standpoint of national needs and problems. As an essential tool it requires a geological mapping program. At present it is estimated that not more than 6 per cent of the United States has been geologically mapped on the scale needed to serve the discovery program which the national economy requires. While in general the mapping and discovery program, together with the basic scientific research that serves it, is very properly developed in terms of over-all national needs, it could undoubtedly also serve, were it sufficiently financed and speeded up, the incidental needs of planning for the best use of these resources for the region in which nature placed them.

Interagency Relations of the USGS

Nearly the entire cluster of programs of the Geological Survey serves the work of other agencies and the public generally. Certainly every resource agency is concerned with the production of topographic maps. Its water-resource programs are of special significance for the Corps of Engineers, the Bureau of Reclamation, the Federal Power Commission, the Fish and Wildlife Service, and to a lesser extent to the agricultural agencies. Its mineral and geological programs greatly influence the work of the Bureau of Mines, the Bonneville Power Administration, the power-marketing phases of the Bureau of Reclamation, and the power-development programs of the army. Its land-classification functions are tied closely to the adjudicatory duties of the Bureau of Land Management. One special organization issue may develop in the last connection whenever the Bureau of Land Management turns over to its regional field offices the determination of adjudications. Unless, in the meantime, the Geological Survey changes its own field structure, the regional director of the Bureau of Land Management will have to deal with three different offices of the mineral-classification branch and with three other field offices of the water and power branch. This statement presumes that the Geological Survey will allow direct field recommendations instead of, as at present, funneling these from the field to its Washington office before transmitting them to the Bureau of Land Management.

CHAPTER XII

The Bureau of Mines

THE BUREAU OF MINES was born in the Department of the Interior in 1910, largely as the result of pressure from the mining industry. Some of its duties had been performed by the U.S. Geological Survey, but its organic act greatly expanded these nuclear functions. By that statute the bureau was directed to:

conduct inquiries and scientific and technological investigations concerning mining, and the preparation, treatment and utilization of mineral substances with a view to improving health conditions, and increasing safety, efficiency, economic development, and conserving resources through the prevention of waste in mining, quarrying and metallurgical and other industries; to inquire into the economic conditions affecting these industries; to investigate explosives and peat; and on behalf of the Government to investigate the mineral fuels and unfinished mineral products belonging to or for the use of the United States, with a view to their most efficient mining, preparation, treatment and use; and to disseminate information concerning these subjects in such manner as will best carry out the purposes of this act.¹

It is apparent that the bureau was conceived as a research agency, chiefly to aid the mining industry and to reduce waste in extraction and processing of mineral resources. In 1915 it was given new duties in the realm of mining safety—to establish experiment stations for the study of safety methods and to locate in the several mining regions stations for mine rescue work and for safety investigations and education.

When the federal government adopted its leasing policy for minerals on public lands the Bureau of Mines became its agent for issuing prospecting permits and for making and supervising leases. But these management duties were taken from the bureau when it was transferred to the Department of Commerce in 1925. They were assigned to the Geological Survey, where they have remained despite the return of the Bureau of Mines to the Department of the Interior in 1934.

The bureau acquired another important mineral resource-management duty when in 1927 it was made the sole agent for the production of helium gas. This task now includes the acquisition of lands, drilling of wells, con-

¹ This is the language of the organic act as amended February 25, 1913. 37 *Stat.*, 681.

struction of pipe lines and other works, the operation of the industry, and the commercial sale of the gas. The private use of helium gas has increased extraordinarily since 1941.

To these basic duties Congress has from time to time added others. Thus the bureau administers the Federal Explosives Act (originally passed in 1917) which, through licensing, regulates the manufacture and sale of explosives in time of war. In anticipation of involvement in the Second World War, the Strategic Minerals Act of 1939 (amended in 1946) divided between the Bureau of Mines and the Geological Survey the prosecution of scientific, technological, and economic investigations in strategic minerals. These studies were made both on public and private lands, and were to establish the facts concerning the occurrence, mining, preparation, and utilization of strategic minerals, the inadequacies of domestic supplies, the development of new methods for treating and using lower-grade ores, the discovery of feasible substitutes, and the exploration of deposits of strategic minerals.² Other special tasks added during the last decade include (1) the establishment of a research laboratory for expanding the use of anthracite coal; (2) the inspection of coal mines for safety; and (3) research and pilot-plant operation for the production of synthetic liquid fuels from coal, lignite, and oil shale, including underground gasification of coal.

Programs in the Pacific Northwest

Not all these programs operate in the Pacific Northwest. Some of them are carried on at the bureau headquarters while others are situated where the occurrence of special minerals is most favorable to operating the programs. Nevertheless, the bureau has a number of field stations in the region. Its chief field concentration is at Albany, Oregon, where the mining and metallurgical branches have divisional offices and laboratories. Each branch field office there conducts or supervises all programs within its jurisdiction in Oregon, Washington, Idaho, and Montana.

Since the Second World War, the mining-branch office at Albany has organized exploration field parties to examine mineral occurrences and determine whether or not a systematic study may be fruitful. When the answer is "yes" there follows a systematic survey of quantities and qualities of minerals in the area designated. In choosing exploration areas, at present confined to lead-zinc properties except for one limestone area, the bureau relies on geological data developed by the Geological Survey as well as on its own preliminary examinations. Exploration operations consist chiefly of surface trenching, drilling, sinking of shafts, and tunnel-

² Public Law No. 520, Strategic Minerals Act of June 7, 1939 as amended July 23, 1946.

ing. These activities are usually performed by contractors under supervision of the bureau's engineers. The resulting reports are ordinarily distributed to the mining industry but occasionally confidential reports of tonnages, grades, costs, and methods of extraction and processing are specially prepared for the use of government agencies. Since the end of the Second World War the legal authorization for exploration work has been limited to the terms of the Stockpiling Act of 1946. Hence its scope is confined to items which the Army and Navy Munitions Board designate as strategic and critical.

The secretary of the Department of the Interior has decided that future mineral-exploration work, save that related to economic studies of the mining industry and of mining methods, shall be the function of the Geological Survey. However, since staff and facilities for this work were not transferred to the Geological Survey and that agency lacks sufficient qualified man power and equipment of its own, the Bureau of Mines is continuing its diamond-drilling operations to find sources of strategic minerals.³ It is also conducting explorations on the phosphate beds on the public lands of Idaho and Wyoming.

During the late war this exploration program led to the discovery of commercial grades of tungsten, antimony, cobalt, and zinc valued at approximately \$150,000,000. Explorations were made on both publicly and privately owned land. In the latter the results were confidential unless the owner consented to their publication. This situation illustrates one of the great difficulties in appraising the mineral resources of the region (or of the nation). The private ownership of much of the most valuable mineralized area makes it exceedingly difficult for public agencies (state geological departments as well as the bureau) to ascertain the quantity and quality of minerals. Nevertheless the bureau, through its mining branch and its several field stations, does compile and maintain an inventory of minerals, using not only the data which it has itself collected, but supplemental information from bulletins and papers released by the states and by private industry.

Attached to the Albany office is a group of mining engineers who serve the industry by studying improved techniques for mining, milling, and beneficiation, and by preparing special studies of mining costs. While this program, now some twenty years old as a bureau-wide activity, has been planned on a national, and even international scale, some of the studies

³ The Bureau of Mines has discontinued exploration, but it still carries on development work. The latter is not too readily distinguished in fact from exploration, though theoretically development is concerned with quantities and qualities of minerals discovered by the Geological Survey through its stratigraphic studies. Aside from its development of phosphates, the bureau's development activities are confined to strategic minerals not now profitable to exploit commercially. (November, 1949.)

are allocated to the several field stations, including those in the Pacific Northwest. They are intended to reveal, comparatively, the detailed mining methods and costs encountered under varying conditions of mining and of concentration. These studies have not only become standard text material in mining schools throughout the country, but are also generally used by mining companies for making preliminary engineering estimates. This program has recently been expanded to include problems of mineral markets. For conducting these studies as well as for carrying on explorations, a small subfield station of the mining branch is maintained at Spokane, Washington. This permits the bureau's technicians to maintain close contact with the principal active mining centers in the region.

From the Albany office a small group of engineers is also maintained in the Missouri Basin obtaining information for the Department of the Interior Missouri Basin committee concerning the potential demand by the mining industry for electric power.

The bureau's mining-industry service includes experimental work in mining development as well as in mining methods. Thus it undertakes the experimental mining of typical deposits in order to demonstrate the most effective methods for extracting hitherto unused ores. In this way it aids the industry to introduce innovations which may reduce costs as well as expand the effective mineral-resource base. However, the bureau has no experimental station in the region engaged in mining problems characteristic of the Pacific Northwest.

The metallurgical programs are centered on developing improved processes of treating ores and obtaining improved or new metallic products. For these purposes well-equipped laboratories and occasional pilot plants are indispensable. The bureau's Albany station provides (under supervision of its metallurgical branch's chief field officer) these facilities; in addition it operates minor laboratories at Pullman (on Washington State College campus) and Seattle (University of Washington) and maintains a small field office at Spokane. Some of the metallurgical work, such as testing (which involves mineral identification and chemical, spectrographic, petrographic, and X-ray analyses), constitutes a general service function to the industry. But the research program looks toward more diffused benefits and longer ranged objectives. It works on new metallurgical processes and improvements in established processes, not only to increase operating efficiency but to create new or improved metallurgical products.

Thus Albany research, already far advanced on zirconium, a metal exceedingly useful to chemical industries because of its acid-resistant properties, gives promise of greatly reducing its cost and thus expanding its use in many directions. The zircon ore is found in the beach sands of

the Oregon coast and in Idaho deposits. Its production, now in the pilot-plant stage, requires relatively large amounts of electricity and thus keys with the utilization of the major energy resource of the Pacific Northwest.

While the national office of the bureau (or Congress by special items in the appropriation act) determines what projects the Albany division shall undertake, there has been a growing inclination to include research studies in which electricity is a significant factor and which utilize minerals found in the Pacific Northwest. One such project well advanced in the branch laboratory at Pullman, Washington, is the production of magnesium from the large deposits of magnesite ores in eastern Washington. An electrothermal pilot plant, with a distillation unit, has been perfected and is in operation. In the Albany laboratories a good deal of study and experimentation has been centered on Columbia County, Oregon, ores whose high phosphorous content presents great obstacles to their use for iron and steel products. The discovery by the Oregon state geologist that these ores carried a high bauxite content has stimulated the Aluminum Company of America to conduct research on their use primarily for the production of alumina. Experiments with iron-nickel ores found in Kittitas County, Washington, using electric smelting methods have produced iron-nickel alloys and nickel-chromium cast iron.

Because of the occurrence of lead-zinc minerals in the Pacific Northwest the Albany laboratory has made extensive studies of the best electro-metallurgical methods for dealing with concentrates of these minerals. Special emphasis has been placed on the experiments for producing electrolytic zinc. Other studies such as those which use vacuum metallurgical processes, are of more national than regional importance.

At Seattle a metallurgical unit in the Northwest experiment station of the fuels and explosives branch (which operates under the supervision of the fuels section of the Washington office) has been studying and experimenting with clays, particularly for their use as refractories.

One of the clays studied is now used for producing high-heat-duty fire brick. A current project of much local interest relates to improvements in the refractory linings used for wood-pulp digestors. One of the large pulp companies is coöperating in this work by providing funds for equipment and technical library material.

As a service to the Alaska and Pacific Northwest coal industry the Seattle station also conducts work on coal and its utilization. It investigates methods of coal preparation and cleaning, the recovery of coal from mine and washery wastes, coal combustion, and physical and chemical properties of coal. The scope of the Seattle fuels laboratory is being expanded to cover the whole field of coal technology. Thus in coal utilization one

recently launched project centers on the use of local coals for electrodes to be used by the regional aluminum industry. Since pig-aluminum production consumes large supplies of carbon electrodes this project is of great potential regional interest.

A second field office at Seattle conducts the regional programs of the health and safety branch. Its work is chiefly confined to safety instruction and coal-mine inspection and involves a very small staff.

Organization

This description of its programs indicates that the Bureau of Mines is not organized on a fully developed pattern of regionalized management.⁴ As a research and engineering agency it shares many characteristics of the Geological Survey, with Washington-centered branches operating independent field stations within the same regional territory and for purposes primarily national in character. The mining and metallurgical branches with their principal field stations at Albany, Oregon, and each with a few outlying subunit field stations elsewhere in the region, suggest incipient tendencies toward regionalization. With the creation by Secretary Krug in 1946 of the Interior Department's Pacific Northwest Coördinating Committee, the chief of the Bureau of Mines selected the head of the metallurgical branch's Albany station as bureau representative on that committee. He was named coördinator for the bureau in the committee's work. This new position furnishes a focus for unifying the planning of the bureau's activities in the Pacific Northwest. The coördinator is expected to promote coördination between the appropriate programs of the several branches, and to help gear them into a long-range regional program for the Department of the Interior. His work as coördinator is based not on the power of command but on his right of suggestion to the field representatives of the other branches and of recommendation to the director of the bureau. He is also allowed to review the program budget items proposed by field offices of the other branches situated in the region, but there is no regional budget for the bureau as a whole. So far as day-to-day administration is concerned each field station of each branch of the bureau operates independently and under the supervision of its respective branch chief or higher field officer.

⁴ See the postscript note to this chapter for a description and chart of the reorganization of the bureau which was announced on September 1, 1949. The above account in the text is allowed to stand because (1) it indicates how far the bureau has traveled under stimuli within the Department of the Interior to make itself a better vehicle for regional as well as national operations, and (2) the new structure is still in the process of transition from the old to the new pattern. (November, 1949).

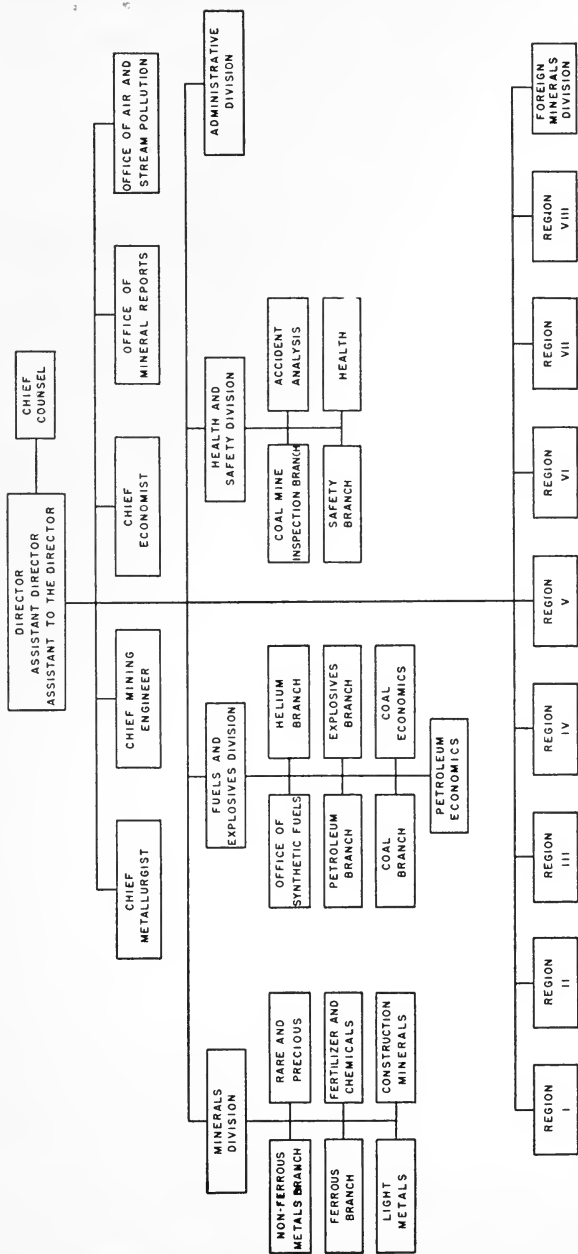
Interagency Relations of the Bureau of Mines

The closest functional ties of the Bureau of Mines are with its parent, the Geological Survey. The latter's geological field studies are the starting point for the exploratory work the bureau has undertaken as well as for some of its research tasks. When the bureau was carrying the brunt of mineral explorations, geologists from the USGS were constantly used as advisers. At present a major collaborative effort concerns investigation of the important phosphate deposits on Western public lands, whose early exploration the Department of the Interior is trying to accelerate. Some competition still lingers between these two agencies as is illustrated by the exploration program, but there is little evidence of undue friction. One might raise the query, however, whether the merging of the bureau and a reconstituted Geological Survey might not be an appropriate step for the future so as to reunite the geological and mineral work within a single bureau structure. Such a unification might greatly facilitate the regional planning phases of mineral-resource development and management.

We have noted in chapter iv the emphasis placed by the Bonneville Power Administration, prior to 1947, on the potential utilization of regional minerals for industrial processes requiring electric energy. Its concern for such an energy market and for general economic development in the region led it to compile the most extensive inventory of mineral information about the region possessed by any public or private agency. That task would have been more appropriately the function of the Bureau of Mines had its leadership at that time been interested in regional development. There is no doubt that until the establishment in 1946 of the Interior Department's Pacific Northwest Coördination Committee the bureau headquarters was disinclined to respond sympathetically to the kind of reorientation in its work which the BPA was demanding. Since that time the stimulus furnished by the departmental committee, the demise of BPA's unit engaged in market development and research, the postwar demand for electric energy, and the modification of conceptions within the Bureau of Mines have produced a much more harmonious interagency atmosphere. It seems probable that in the future the bureau's programs will be more carefully adjusted between considerations of nation-wide and of regional importance. If so, it will become the center of mining industry and of mineral data for the Pacific Northwest.

Postscript Note (November, 1949)

On September 6, 1949 a Department of the Interior press release announced a reorganization of the Bureau of Mines, which became effec-



Bureau of Mines: Organization Chart.

tive on September 1 but will not be complete until the spring of 1950. Not only does the new design greatly alter the basic pattern for the Washington offices of the bureau but for the first time it gives the bureau an integrated field structure centering in the leadership of regional directors, one in each of seven continental regions, with an eighth in Alaska and a ninth for all work abroad. Region 2 comprises Oregon, Washington, Idaho, and Montana and is known as the Northwestern region. It will use Albany, Oregon, as headquarters.

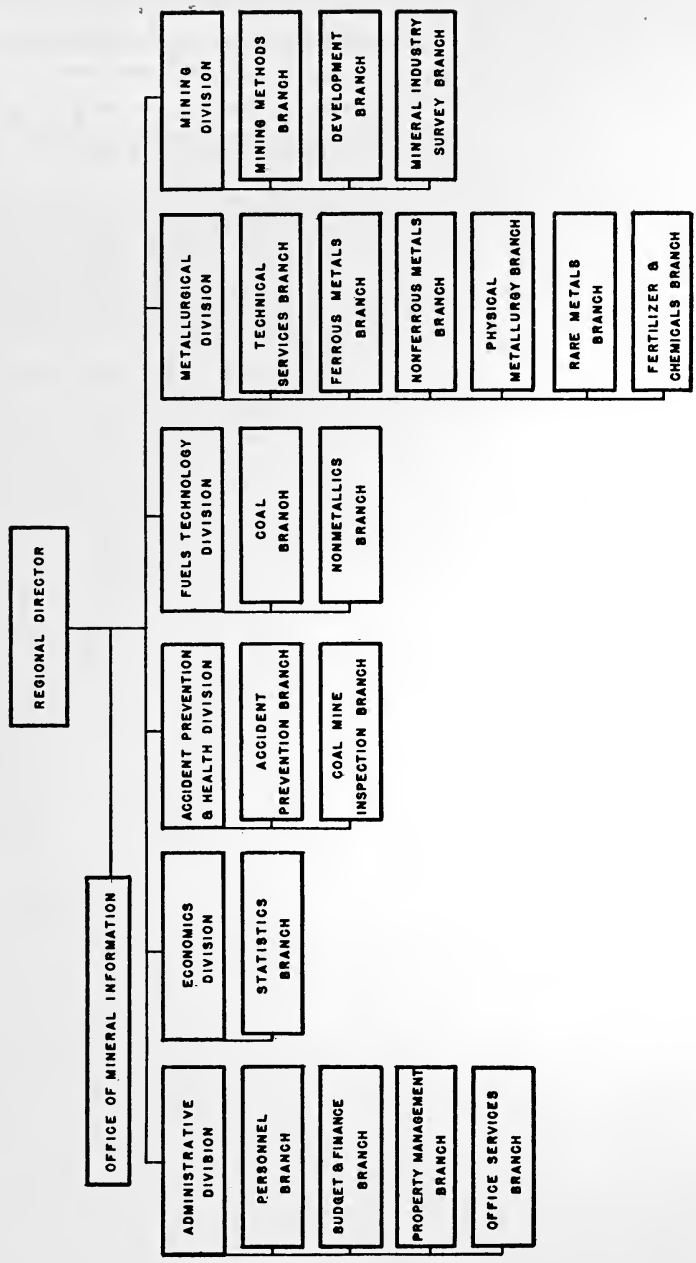
In a statement to the mining industry, the director of the bureau, James Boyd, emphasized the advantages expected from the new organization plan. He said that the old organization failed to coordinate the bureau's field activities with the national program. Neither did it respond adequately to local mineral-industry needs. It had hampered the bureau efforts to obtain, analyze, and provide to the policy-making agencies of the government essential information and advice to meet the needs of mineral industries. He declared the new organization attempted to delegate maximum responsibility for operations to experiment stations and field offices leaving to the headquarters' staff more time for planning and direction of the bureau's programs and their integration with the minerals activities of other agencies.

He pointed out the key importance of the new regional directors who would be responsible for all bureau activities in their regions. This would include contact with state and local officials. One of the beneficial results expected from the reorganization was simplification of administrative procedure. Heretofore some of the most trivial administrative decisions had been referred to Washington for action. Likewise each of the bureau's five divisions had maintained separate field offices which reported to their division chiefs in Washington. Each had separate allotments of funds resulting in duplicate sets of books, often far out of time phase. The new plan would give the regional directors full authority to act. They would control the signing of contracts, the disbursement of funds, accounting, and personnel management, with only staff direction from Washington.

The new Washington organization is to be staff only. Its technical experts will be relieved of administrative tasks so as to give full time to planning the research programs.

The new field arrangements will not alter the nature of the programs performed in the Pacific Northwest, except that a unit at Albany will be added for the collection of mining-industry statistics. For the new responsibilities of the coordinator who becomes regional director some increase in field staff will be provided.

It is evident that the "fermentation" over structure and procedure which in the Department of the Interior bore its first notable fruit in the



Bureau of Mines: Regional Organization Chart.

decentralization of the Bureau of Reclamation during the war is still at work. If it proves successful the demonstration may persuade its fellow engineering and research craftsmen who run the Geological Survey that their functions are also susceptible of integration at the field level under decentralized leadership.

The Beginnings of Intradepartmental Integration

OUR DESCRIPTION of the interagency relationships that have grown out of the administrative needs in the management of federal resource programs in the region indicates that success in dealing with many of these joint-agency interests is conditioned by better departmental management by the Departments of Agriculture and the Interior. Although there are important interagency relationships transcending department lines, the integration of purposes and programs within these two departments would greatly advance the total social efficiency of administrative effort. It is very hopeful, therefore, that within recent years signs of department-wide field management have appeared. More progress on this administrative front has probably been made in the Pacific Northwest than in any other region. Because the lessons to be drawn from this experience are applicable to federal resource management generally we shall present in some detail the manifestations of this departmentalizing tendency.

Regional Organization Experiments of the U.S.D.A.

Outside the Tennessee Valley region, the first federal experience with special coördinating machinery designed to bring the combined impact of all the administrative services of a federal department to bear on the natural resource (and human) problems of a large interstate region occurred in the U.S. Department of Agriculture. During the desiccating 'thirties which brought the farmers and many of the townfolk of the Great Plains near to desperation, the secretary of agriculture designated a special representative of his department in each of the two Great Plains regions—northern and southern. The task of these representatives was to act for the secretary in marshaling the talent and financial aid of his department to help meet the tragic situation so dramatically signaled by the "dust storms." Working with the agricultural councils of state colleges and with federal-agency officers, these regional coördinators helped to render emergency assistance, revise Department of Agriculture agency

programs to meet the crises, and develop plans for readjusting agriculture in the Great Plains regions.

We have no way of knowing how well adapted to a continuing coördinating function for regional areas generally the organizations there created might have been. We do not know their procedural practices and leadership methods. If this experience has ever been objectively evaluated either by the Department of Agriculture or by competent outside students of federal administration the results have not been made public. Yet the fact of such an experience undoubtedly encouraged the department to try other experiments in area or regional integration as special problems arose whose solution depended on the combined impact of all appropriate departmental effort.

The disastrous economic situation of the 'thirties had by April, 1940, become so acute in the Wenatchee, Washington, apple country that, at the request of the local people the president declared an emergency distress area in the counties of Chelan, Douglas, Okanogan, and Grant. Concurrently, the Department of Agriculture began, with the coöperation of county and state land-use planning committees, to organize a plan for using the combined resources of its research and action agencies to halt the rapidly developing bankruptcy of the orchard industry and the dislocation of farm families and dependent urban people. A special representative of the department was assigned to the area in January, 1941, to coördinate all agency activities in relation to the approved program of the growers, and to the activities of the intensively organized farm groups that simultaneously sprang up among the people of the area. This departmental field official worked with the Washington assistance of an "Inter-Bureau Advisory Committee" of local field officials representing the participating agencies.

While the onset of the Second World War reversed the price trends for apples, there can be no doubt that this special program, spearheaded and coördinated by a representative of the secretary of agriculture, produced salutary results in this orchard region. The coördination work was intensive and detailed. The relative smoothness of its operation was due partly to the challenge to each agency's field staff of an informed and active local farmer public opinion, and partly to the compulsions which the organization, at field and center, created.

Another war-born experiment—this time on a regional basis—was launched in the autumn of 1941. At that time, the secretary through the Bureau of Agricultural Economics (which three years before had been made the central planning organ for the department) established an interbureau Coördinating Committee on Post Defense Programs.¹ This was to be com-

¹ Secretarial memorandum No. 913, Suppl. 1, September 17, 1941.

pleted by a committee in each of the nine regions into which the country was to be divided, including one for the Pacific Northwest (Idaho, Oregon, and Washington), composed of field representatives of the "action" agencies of the Department of Agriculture and of the Bureau of Agricultural Economics, with a chairman named by the secretary.

The task of these regional groups was to assist the central committee in planning a postwar shelf of rural works programs designed to advance the state of the nation's land resources (through soil conservation, forestry, water development, flood control, and land reclamation), to provide needed public-capital facilities for rural people (such as rural electric systems), and to promote rural welfare through such facilities as housing, hospitals, and sanitation. They were also instructed to develop suitable programs to raise the standard of living through improved educational and medical services, better nutrition, improved tenure practices, the modernization of farm equipment, and the development of coöperatives. At that time the staff agencies surrounding the president and in the department generally believed that the end of the defense activity would bring an economic slump unless plans were made for taking up the employment slack left by cessation of war production. In such an event agriculture would be a principal sufferer as it had been in the early 'twenties and in the 'thirties.

Pearl Harbor brought this activity to a temporary halt. The department bent its energies to organizing for the war production of food and fiber. To this end it established a nation-wide system of county and state USDA war boards, composed of action agency field men in the counties and states. Their job, under the chairmanship of the county and state AAA committee chairmen, was to enlist the full force and mutual aid of all agricultural agencies to attain the production goals for the various crops by helping the farmers to secure the necessary technical help, agricultural equipment, and labor force. The boards were intended to operate by the discussion and clearance of common problems, by giving voluntary assistance within the limits of delegated authority and funds, and by referring promptly to the secretary's central war board for resolution issues or problems that could not be solved by these voluntary means at the local level. The success of these departmental group instruments for administrative coördination at the local and state levels varied from place to place. However, so long as the emergency lasted the habits of interagency coöperation and the dissemination of information about the programs of the entire department among the field services of its several operating agencies were distinctly advanced.

Early in 1947 the department converted the state and county war boards into agricultural councils, consisting of federal, state-college, and state agriculture officials at the two levels and of advisory but nonvoting mem-

bers from private groups and agencies (such as the grange, Farm Bureau, equipment companies). They have been used to react to production goals for particular crops and on private-support problems. They have also been asked to examine and comment on the department's new statement of national agricultural policy. For the purpose of giving advice to the Department of Agriculture the state councils are authorized to communicate directly with the secretary via the department's committee on program policies. Signs are already evident that the councils are likely to disintegrate unless concrete jobs are given them by the department.

This tendency towards a departmental range of interests was further stimulated by USDA area equipment committees, also created early in the war to conserve and fully utilize on a local, decentralized basis, all equipment belonging to the department. Each federal agricultural agency in the region was represented on the committee. The chairman was elected annually though, in this region throughout the war and for some time thereafter, an able assistant regional forester served continuously. To give service to each agency in the area an executive assistant was employed who worked directly for the secretary of agriculture. These committees were successful in caring for bureau equipment needs with a minimum of new investment during a period of national civilian shortage. So useful did they become that they have been continued as permanent regional coordinating service agencies.

With the completion of the administrative organization for war production, the Department of Agriculture revived its postdefense-planning-committee structure (renamed "postwar committees"). The Pacific Northwest Regional Committee for Postwar Programs was expanded to include representatives not only from the USDA bureaus operating in the region, but from the three state colleges and the extension services, the Pacific Northwest Regional Planning Commission (until July 1, 1943 the regional agency for the National Resources Planning Board), and the Pacific Northwest Regional Council. It continued to use the subcommittee structure that had been authorized before December 7, 1941, and it worked with a system of state planning committees set up for that purpose. Few concrete results were attained by the time the structure ceased to function in 1945. The committee had no staff; it lacked clear effective leadership from Washington; and the regional activity leaders who were presumed to furnish leadership and stimulation to the state groups in their several special planning programs (such as health, settlement, housing, rangeland) were often too busy, or inert, or bureau-minded to function properly. About the only concrete results of this effort were a regional agricultural atlas, prepared by the secretary of the committee, a joint land-classification study of certain areas in the state of Washington which had been requested

by the Washington State Planning Council, a second land study in Idaho, and a report on the proper disposal (from the standpoint of good use) of land purchased by the military forces which would presumably be declared surplus when the war should end.

There is no doubt that the activities of the committee were hindered by the lack of common regional boundaries, by the inconvenient location of some of the regional offices, and at times by inappropriate organization inhibiting effective coördination. Lacking effective stimulation from the department, field activity leaders were, it is said, too prone to act on the principle ascribed to one member who was quoted as saying that if there were anything worth doing in his agency's jurisdiction his agency would have thought of it and be doing it.

When the war ended, the committee, at the suggestion of its chairman, was converted into a standing regional advisory committee to aid the department's representative on the Columbia Basin Inter-Agency Committee to be launched early in the spring of 1946. On April 10, 1946, an "organization" meeting under the chairmanship of the regional forester at Portland discussed ways and means by which the USDA representative on the inter-agency committee might be kept informed of the interests in its work on the part of the several agricultural agencies. A two-way flow of information was planned, and as a method of mutually acquainting all USDA agency field representatives with the work of their sister bureaus, the preparation of a brief but comprehensive statement *Activities and Functions of the Department of Agriculture* was set in motion. In this initial "metamorphic" meeting membership was confined to the six major departmental operating agencies—the Forest Service, Soil Conservation Service, Farm Security Administration, Production and Marketing Administration, Agricultural Research Administration, and the Bureau of Agricultural Economics.

A new and important step in organizing the department in the Pacific Northwest was the appointment by the secretary on August 1, 1946, of a special regional representative of his office to serve as the department's representative on the newly established Columbia Basin Inter-Agency Committee and on the Bonneville Power Administration's advisory board;² to act as a liaison and coördinating officer for the department for its own agency field establishments; to consult with state agricultural agencies and with local and private groups concerned with agricultural programs; and to take over the chairmanship of the regional agricultural advisory committee. The officer who in the early 'forties had served as special representative of the secretary in carrying through a coördinated departmental

² Secretarial memorandum No. 1170. So far as membership on the Bonneville Advisory Board is concerned, the post has been a sinecure, for there has been but one meeting since the establishment of this office.

program for the distressed Wenatchee area was named for this post. Shortly after his arrival the state colleges of Oregon, Idaho, Montana, Washington, Wyoming, Utah, and Nevada were included on the regional committee.

Because the focus of attention of this departmental committee was its relationship to the Columbia Basin Inter-Agency Committee, it was concerned first with anticipating what that interdepartmental committee might undertake, and how best to articulate with its work. At its October, 1946, meeting the committee had from the assistant secretary a statement of fundamental policy relating to functions of the department in irrigated agriculture. The statement reaffirmed the views expressed before the Congress during hearings on recent legislation (especially H. R. 520 and H. R. 5434) that (1) the USDA should handle the agricultural phases of irrigation work on federal projects and (2) that the division of jurisdiction between the Departments of Agriculture and the Interior should follow the pattern set forth in the Wheeler-Case legislation.

The Pacific Northwest Regional Advisory Committee members felt that the Department of Agriculture, in implementing departmental policy, was at great disadvantage because it was not "in" on the river plans of either the Bureau of Reclamation or the Corps of Engineers until so late that the delay incident to a genuine review of agricultural feasibility of projects would put the department in the impossible role of an obstructionist. It was known that the army was about to present to the Columbia Basin Inter-Agency Committee proposals for the McKenzie section of the Willamette Valley project, yet the agricultural agencies knew little about it or the agricultural interests to be affected. The interagency committee therefore on October 29, 1946, recommended to the department:

- (1) That the feasibility of irrigation agricultural developments and watershed problems of the Columbia River Basin, and coastal areas of Oregon and Washington be ascertained prior to requests for construction and development authorization, and
- (2) That these investigations be made by the U.S. Department of Agriculture and cooperating state agencies.

Responding to Assistant Secretary Brannan's request to prepare a list of tasks that would be needed to participate effectively in the "program" of the CBIAC, the committee felt that it could make only a few cogent job proposals unless and until the interdepartmental river committee developed a program—and none was then in sight. It did urge the immediate launching of investigations to determine the agricultural feasibility of irrigation farming on the proposed Mountain Home project in Idaho and the Kennewick Highlands project in Washington and Crooked River in Oregon (already submitted by the Bureau of Reclamation) and on the Foster Creek and Willamette Valley projects then being developed by the

army engineers. But it believed that these tasks, already "behind the eight ball" because of delay, could not be done without money which the department would have to obtain and make available to the appropriate field establishments.

This problem of making adequate agricultural reviews of project reports by the army and the Bureau of Reclamation, and of preparing agricultural feasibility and watershed studies for probable projects, was again the center of interest in the committee meetings of February and May, 1947. Before the May meeting the House Appropriations Committee report for the fiscal year 1948 had affirmed the principle that the Department of Agriculture should return to the original notion of its functions which were limited by the act of May 15, 1862, to research and information. By way of the appropriation process the House committee was apparently attempting to repeal the basic legislative policies which the Congresses of the 'thirties and early 'forties had adopted in authorizing the action agency programs. Nevertheless the committee, with the encouragement of the assistant secretary, continued to lay plans for implementing the departmental policy that determination of agricultural feasibility of federal irrigation proposals was the job of USDA and the state colleges and should not, because of lack of funds, be surrendered to either the Bureau of Reclamation or the Corps of Engineers. The committee developed estimates of funds and personnel required to carry through such surveys for the Foster Creek and the Crooked River areas, both of which, it was understood, the Bureau of Reclamation would not study.

The discomfort of the agricultural agencies at being asked to review completed studies by the construction agencies, led the committee at its November 24-25, 1947, meeting to recommend to the secretary and to the Federal Inter-Agency River Basin Committee in Washington that "agreement be reached that we participate from the beginning of multiple purpose investigations by any agency rather than being called in at the end for superficial review."

Like its sister committee of the Department of the Interior, the USDA regional advisory committee agreed to push for the formulation of a coordinated departmental resource and development program for the whole Columbia Basin. This decision was undoubtedly influenced by a parallel proposal developed by the department's special field representative for the Missouri Basin region which had been approved by the secretary. There was also the stimulus to match, on the regional level, the departmental nation-wide long-range agricultural program which the secretary had given to the two Congressional committees on agriculture early in October, 1947. The committee decided that "the first step is to inventory or assay the programs and activities of the agencies as they are now functioning and

make that the basis for a statement on current operations. From that point then the committee should endeavor to meet Assistant Secretary Brannan's request for estimates on the additional facilities necessary for an adequate resource conservation and development program, including estimates of the personnel and funds required." While much of the work of formulating such an over-all program would be done by the several operating agencies, when funds and authorizations should be granted, it was the belief of the committee that the chairman's office, as field representative for the secretary, should be given at least \$50,000 for the balance of the current fiscal year (with somewhat larger sums thereafter) to employ the small central professional and secretarial staff needed to pull the whole job together and to direct the central investigations and planning activities that would be required. These it believed represented the committee's minimum requirements for its assigned job.

The committee had before it, in making its recommendations, an outline of suggestions for a regional program developed by the field representative with the aid of the national office. The drafting of a regional plan for agriculture awaited the appropriation and release of funds and the granting of authority from Washington. But it was clear that, when prepared, it would differ in many important respects from the regional program of the Department of the Interior, since it must emphasize rural social services; price policies for farm income; research in marketing, distribution and consumption of farm products; as well as the physical construction, management, and research programs concerned with soil, forest, forage, and other resources. It should, however, possess the one advantage that its social goals would have authentic guidance from the years of effective economic and social research performed by the Bureau of Agricultural Economics, from which the department had recently developed its national "long-range policy of abundance in American agriculture."³ Two major task-

³ In the two years since this brave start was made no agricultural program has been developed by this USDA structure for the Pacific Northwest. The successor to the first field representative has in recent months again launched an effort to build such a plan, using an outline which the department has modeled after the scope of the program completed for the Missouri Valley by its corresponding field representative and advisory committee. It will be a number of months before the first draft of this project will be ready. It may be noted that the final responsibility for synthesizing and integrating the ideas of the several USDA agencies and the state colleges is given to the regional representative of the secretary.

In the interval between these two efforts of the USDA regional representative to work out an agricultural program, two other interconnecting efforts in the land segment of resource planning have been started. The first is under the field committee of the Department of the Interior for the Pacific Northwest and the second a paralleling interdepartmental project recently authorized by the Columbia Basin Inter-Agency Committee. Both of these activities are briefly characterized below. (November, 1949.)

force jobs have been undertaken by the secretary's representative with the support and aid of his advisory committee. One grew out of the 1948 flood emergency in the Columbia River Valley. The field representative was instructed to prepare a preliminary estimate of damages to agriculture and to the department's own activities for presentation to Congress in time to be acted upon before adjournment for the national conventions. He necessarily drew upon the agency field staff, which completed the assignment by neglecting other work. A more deliberate and careful appraisal was to be made by a technician assigned by one of the agencies to the field representative of the secretary, who would work with and through the state and county agricultural councils.

The second undertaking was a study of the agricultural feasibility of irrigating certain lands adjacent to Foster Creek Dam. This would also be directed by a technician, reporting to the field representative, assisted by a staff recruited from several agencies represented on the advisory committee. Because the field representative had no budget for this purpose and the agencies were reluctant to cut into their resources, it took more than six months to get this survey staff pledged and organized. It represented the equivalent of an appropriation of \$80,000.

The genesis of this project and the repercussions following its announcement are important items in the analysis of interdepartmental relations between USDA and the Bureau of Reclamation. The survey was requested by a state of Washington agency, the Columbia Basin Commission, which had reported its inability to secure the survey from the Bureau of Reclamation. It was reported to have exhibited a letter from the undersecretary of the interior declining to proceed with a survey. There can be little doubt that in view of the Department of Agriculture's determination to act on agricultural issues for all irrigated lands it was receptive to this opportunity to exercise the role of adviser on federal projects. At any rate, a tentative affirmative commitment was given the Columbia Basin Commission by the assistant secretary more than a year before the bureau was notified of the proposed survey. In the meantime the field representative and his regional advisory committee began scraping the barrel to find staff and funds to organize for the job, and six months later the tentative commitment was made "firm" by the field representative, who promised to have a survey party ready as soon as spring weather should allow. Finally on May 12, 1948, the field representative wrote the regional director of the Bureau of Reclamation at Boise (with copies to all members of the Columbia Basin Inter-Agency Committee) reciting these facts and soliciting the coöperation of other members of the committee on those interrelated engineering questions that would undoubtedly arise. The letter particularly requested early

coöperation with the Bureau of Reclamation in determining the feasibility of construction features if irrigation should be found to be agriculturally feasible.

The response of the bureau officials was adverse to this suggested coöperation, and conversational follow-up did not succeed in winning its acceptance. The bureau's formal reply of May 27 complained of the Department of Agriculture's failure to inform the bureau earlier of its interest in Foster Creek. It declared its own active interest in the same area, and enclosed a one-page notice of its intent to conduct a project investigation which had been made out in July, 1946, and mailed to all members of the Federal Inter-Agency River Basin Committee at Washington. The bureau said in its reply that investigations, started in 1946, had been curtailed until the current spring through lack of funds but were now going ahead on a detailed reconnaissance basis. It affirmed its legal obligation to make this study and to report to Congress on both agricultural and engineering feasibility. It noted that in the discussion it had unsuccessfully urged the Department of Agriculture to merge its survey with that of the bureau "looking toward the issuance of a single report by the Bureau in which full recognition would be given to the cooperation and contribution of your Department." Two independent reports were thus to be made. It considered and rejected the further suggestion of the Department of Agriculture that the work be divided, each department taking exclusive responsibility for a major segment of the survey (such as the classification of land by agriculture) "inasmuch as it is necessary for the Bureau to retain primary responsibility for all phases of the study." Finally the letter indicated willingness to consider further the suggestion by the Agriculture Department for collaboration in the development of basic land-and-economic data required by both organizations.

This stalemate was broken a few weeks later when on invitation from the department's field representative and the head of his survey group, representatives of the field study of the bureau attended a survey staff meeting just before the USDA party started for Foster Creek. The bureau, reversing its position, agreed to a division of the area to be studied, the bureau to take the Indian lands and the Department of Agriculture to examine the rest. It is fruitless to ruminate on the sudden erosion of bureau intransigence; it is hopeful that duplicating field surveys are to be avoided.⁴

⁴ The two reports were prepared and the Department of Agriculture report went forward to Washington. There it has been held, without approval. It is expected that it will be reexamined in the field and if necessary the engineering and economic studies essential to agricultural-feasibility determination redone by USDA staff before a final report is available to the Columbia Basin Commission and the public. Despite the growth

Concern of the Department of Agriculture with an improved regional coördination of its programs was undoubtedly influenced not only by the fear of the valley-authority propaganda, but by the competitive advantage of the army engineers and the Bureau of Reclamation in appeals for local popular and political support. That this new interest in regional integration of agricultural plans and programs is not attributable solely to these competitive forces is indicated by the launching in 1940-1941 of a series of studies of action-agency program and administrative relationships at the county level, and later at the regional level. The purpose of the studies was to try to discover what organizational changes were needed to produce more effective and better articulated field programs and administration. Those studies were terminated by our entrance into the Second World War.

In the Missouri Valley the combined Sloan and Pick plans had wrapped individual water projects in a dramatic river-system plan and as a result of this heightened appeal had won comprehensive authorization from Congress. Even the single-construction-project mode of authorization, traditionally used by those agencies, furnished superior political support through its appeal to local pressures. The USDA, on the other hand, had customarily gone to Congress with national programs of resource management whose impact on particular localities or regions was obscure, partly because the allocation of funds and work programs to particular localities or regions has been determined, not by Congress, but by agency heads concerned with activities in every part of the nation; partly because the department has never adopted a common regional design, in area or structure, for its action agencies. In the last years of the Wallace regime, under the leadership of Milton Eisenhower as land-use coördinator and of Paul Appleby as undersecretary, plans were drawn up for common regional boundaries. But their fulfillment was impeded by political obstacles in Congress and by the complete turnover in top departmental leadership that followed the appointment of Secretary Wickard. There has been no organizational or appropriation basis for unified agricultural regional plans and implementing programs. Furthermore, Department of Agriculture resource programs have lacked the general public appeal of great river-construction projects, except when, as during the dust-storm years,

of interagency coöperation in the past few years, under the aegis of the Departments of Agriculture and the Interior and the Columbia Basin Inter-Agency Committee (which we discuss below) it is still too frail a foundation for a genuine joint-coöperative exploration of this irrigation problem. The Bureau of Reclamation is only interested in an engineering study sufficient for a reconnaissance report, while USDA wants a complete agricultural-feasibility report. These divergent purposes alone are sufficient to inhibit a joint venture. (November, 1949.)

some striking physical manifestation of agricultural maladjustment suddenly bursts upon public attention.

This new concern with regionalization of agricultural planning and action had also led to the establishment at Washington of a departmental advisory committee to help the assistant secretary, its chairman, in his supervision of regionalization efforts in the Missouri, Columbia, and other river valleys as well as in his representation of the department on the Federal Inter-Agency River Basin Committee at Washington.

These developments in the organization and practice of the Department of Agriculture in the Columbia Valley region represent a significant start toward unified departmental regional planning and administrative adjustment. But the field representative does not yet have either the tools or the departmental support to enable this beginning to bear healthy fruit. He must have a small continuing professional staff, to work on continuing coordination tasks, and from time to time a special project staff to assist the agencies in the common enterprises that his committee may undertake. He has already proposed as a minimum the establishment of four working subcommittees (on factual data, research, information, and project plans) whose chairmen under his guidance would constitute a steering committee.

In March, 1948, the department's advisory committee, meeting in Washington with secretarial field representatives, approved the estimates recommended by the Pacific Northwest Regional Advisory Committee and the field representative; but the necessary appropriations were not obtained. Likewise the need of each operating member of the committee for staff of its own to organize and follow through on coordination questions in which it should be an active participant did not find recognition in the budget.

In the beginning the orientation of the regional representative and his advisory committee was almost solely concerned with making effective the voice of the Department of Agriculture on the Columbia Basin Inter-Agency Committee. While that is too narrow a goal for departmental coordination, it may widen automatically as the interdepartmental committee widens its view, and begins to function as a unified over-all federal regional planning instrument.

There are undoubtedly agency program frictions or gaps within the departmental galaxy whose resolution or adjustment will require the catalyzing influence of the department, or may even necessitate Congressional action. Certainly little has yet been accomplished to resolve the conflict between the Soil Conservation Service and the old AAA activities in the Production and Marketing Administration. The two conservation programs depend for articulation upon the accidents of local personalities servicing the two agencies. Since the secretary really has very limited con-

trol over the local AAA organization—for in effect it is a guild structure—it will probably require Congressional legislation to resolve the inconsistencies of policy and administration, and to focus the whole impact of conservation funds on a unified program. A similar situation exists in the SCS-Extension Service friction. The department has actually slight control over the behavior of county agents or state specialists. If there is disagreement or jealousy the SCS is the only party to the difficulty that the secretary can constrain to modification of attitudes. In these two situations the field representative is limited by the same circumstances that check the secretary of agriculture.

The usual differences also exist among the several bureaus in their regional boundaries and in delegations of authority which make coordination continually difficult and expensive and sometimes impossible. For example the inclusion of three Forest Service regions (in whole or in part) in the Pacific Northwest requires that three regional foresters and three directors of forest and range experiment stations be consulted and utilized on many interagency problems. Two Soil Conservation Service regions are involved, two Production and Marketing Administration regions, and two Farm and Home Administration field organizations. These complications of areal jurisdiction and the difficulties of program correlation that arise from differences in delegations of authority to the field (including budgetary powers and time tables) are fundamental obstacles to the achievement of departmental regional coordination.

The field representative of the secretary must be authorized to tackle these mundane organizational issues and to work out solutions in which he will be supported by the weight of the Washington establishment. Otherwise his work will be complicated and confused, and the results of the new departmental devices at the regional level will be incomplete and disappointing.⁵

⁵ From the summer of 1948 to the late summer of 1949 intradepartmental coordination in the Department of Agriculture through the special representative of the secretary was largely at a standstill owing to the illness and resignation of the first representative. His successor, Herbert Peet, was given more positive authority to develop a coordinated departmental program for the Pacific Northwest. As noted above, the preparation of such a program (modeled on the 1949 Missouri River Basin agricultural program) was started. It is too early to predict its substance or quality. Reliance on the several operating agencies and the state colleges for preparing the initial materials for such a program is only partly the result of choice; until the budget provides a central regional staff, the department representative must largely rely on agency staff work.

The new projected scheme for a regional staff for the field representative of USDA differs from that adopted for the Department of the Interior's corresponding regional representative. Each operating agency of USDA is expected (when funds are provided) to appoint a representative to work with him. That agency official is to have full authority to bind his agency with reference to the department's regional program. The fact that there are three Forest Service regions, that Production and Marketing Administration

*The Department of the Interior Pacific Northwest
Coördination Committee*

Near the close of the regime of Secretary Ickes the leavening influence of some of the younger staff in the secretarial establishment and in the bureaus of the Department of the Interior began to show itself. It was apparent not only in the adoption of improved devices for departmental management in Washington, but in a reconsideration of program relationships in the field and of the bearing of field structure upon effective resource management. We have already noted the comprehensive organizational changes in the Bureau of Reclamation, which give the major drainage-basin areas a regional organization to plan and supervise irrigation project development in the light of whole drainage-basin needs. The metamorphosis of the old General Land Office, plus the Grazing Service, into the Bureau of Land Management (not yet completed) also places in the field a structure with more ample powers destined ultimately to revolutionize the management of the public domain. The Office of Indian Affairs has felt a similar impulse to reëxamine the form of its field organization and the authority with which it should be clothed.⁶

These and other manifestations of administrative self-criticism were also indirectly stimulated in part by the much advertised Sloan plan for the development of the Missouri River Basin (after its reconciliation with the army's Pick plan and its approval and initial financing by Congress). That posed the need for concerted effort by the Department of the Interior to bring all of its affected bureaus into a working agreement as to their parts in that program and for the coördinated timing and performance of their respective tasks.

has no regional field offices, and that some of the other USDA agencies present a regional area pattern not coincident with the Columbia Valley region is said to necessitate this staffing plan. The most striking difference in organization conception from that used in the Department of the Interior, is the location of these agency deputies in the office of the departmental regional representative where they are to be viewed as members of his staff as well as bureau spokesmen. This unprecedented plan (if it materializes) will deserve careful observation for the light it may throw on methods of intradepartmental field coördination. (November, 1949.)

⁶ Within the past two months, as noted earlier in chapter xii, pp. 406-410, the Bureau of Mines has at last given way to the demand for decentralization, integrated for all field functions at the regional level. There is now a regional representative to speak for the bureau on interagency issues to whom considerable local authority has been delegated.

The Bureau of Indian Affairs is also continuing to decentralize. It has recently given to its regional officials (lately named "area directors") more complete responsibility for administering Indian Service activities in their areas. As against 100 field offices formerly reporting to the commissioner at Washington, there will be only 11 area directors and 10 superintendents of detached field offices. (December, 1949.)

This enterprise of effectuating the Missouri Basin plan gave birth to a number of intradepartmental devices for field coördination. One was the allocation by the secretary of the interior from a common appropriation of the specific amounts to be allowed each participating bureau so that the work of each would be geared to a common department developmental policy. Congressmen from the Missouri region have not liked this too well, as is evidenced by the fact that they succeeded in getting into the departmental appropriation a special item for the Bureau of Mines in this valley program.

In 1945 and 1946 the department concentrated attention on getting under way eleven units chosen for initial construction from the twenty-eight projects of the entire basin program by an interdepartmental committee of Washington and field representatives. To keep the secretary informed, a reports office was opened in Billings, Montana, to compile monthly reports of work accomplished on its assignments by each participating agency of the Department of the Interior. A reports staff consisting of a chief and three liaison officers, together with secretarial force, prepared narrative and graphic summaries of work accomplished by each agency on each unit in the program, projected against the work planned. These monthly and cumulative summaries (augmented and illuminated by paralleling expenditure reports) were used not only to inform the department and all the other parties to the program where the whole program and its several parts stand at any given period, but to act as automatic incentives to the participant agencies to keep abreast of their obligations. During the first year of the operation of this system (fiscal 1946) it became evident that a mere reporting device was not sufficient to achieve all of the coördination necessary. In March, 1946, a second Omaha meeting of field and Washington men reconsidered the Missouri River program and in particular gave thought to completing the kind of field coördinating machinery needed to do this job as well as to prepare for the Department of the Interior's effectual participation in the work of the Missouri River Inter-Agency subcommittee which had recently been established by the Federal Inter-Agency River Basin Committee. In 1946 a departmental coördinating committee was created in the Missouri Basin area. The reports staff now serves under the chairman of that committee.

Also fermenting in the secretary's office in the spring of 1946 were plans and discussions for improving the coördinating of Interior's many national programs both in the field and in Washington. Secretary Krug's concern with better internal management of his department led him to assign some of his top-flight staff intelligence to consider alternative answers to the organization problems and the most feasible modes of making headway.

Out of this background came the creation in the summer of 1946 of a

departmental coordination committee, under the chairmanship of the undersecretary, and shortly thereafter the establishment under its supervision of a system of temporary field coordinating committees in the Western regions.⁷ From the latter has evolved the experimental Pacific Northwest Coördination Committee.

The temporary field committee in the Pacific Northwest consisted of the administrator of the Bonneville Power Administration, the regional directors of the Bureau of Reclamation, the Fish and Wildlife Service, and the National Park Service; and field representatives designated by the Geological Survey, Bureau of Mines, General Land Office, Grazing Service, and Office of Indian Affairs. This committee was asked to make recommendations to the chairman of the departmental coordinating committee concerning a desirable departmental regionalization program. This was to include regional boundaries and headquarters; departmental staff facilities; interagency councils or committees; techniques for regional coordination; and the decentralization both of authority for substantive programs and of administrative services within the several agencies. Through its elected chairman, the temporary field committee for the Pacific Northwest reported late in August, 1946, that it believed that a continuing field committee for the region should be created on an experimental basis. It proposed that the chairman of the proposed committee be chosen by the members and that the office rotate yearly; that the committee's area of jurisdiction include Oregon, Washington, Idaho, and Montana west of the Continental Divide, with Portland, Oregon, the office center. It proposed that the committee be concerned primarily with coordinating the preparation of plans and programs for the development of land, water, mineral, and energy resources of the region, and secondarily with improvements in administrative facilities to improve service and effect economies.

The committee recorded its belief that since the basic need was coordination of plans, programs, and budgets, the proposed continuing committee plan would make unnecessary the establishment of a "Departmental regional office with line authority over all activities in the region." It warned against the bottleneck effect which the latter mode of coordination would have upon administrative operations. It felt that whatever arrangement was adopted should not interfere with existing cooperative relationships among two or more agencies. It reported a consensus that "more authority should be delegated to the field offices of some bureaus" because that would be "essential if effective, coordinated programs for the region are to be developed."

Under the aegis of the temporary committee, there was completed and

⁷ Order No. 2205, June 4, 1946, established the central committee; order No. 2221, July 3, 1946, directed that committee to establish the temporary field committees.

submitted to the departmental coördination committee on September 25, 1946, a "draft plan for liaison between Bonneville Power Administration, and the Bureau of Mines and the Geological Survey in mineral resource investigations." The plan (which was approved in Washington) not only set forth the agreed jurisdictional interests and activities of the three agencies in minerals investigations, but proposed a minerals subcommittee for the continuing "Pacific Northwest Coördination Committee" (about to be announced by the secretary) which would:

- (1) Draw up a list of minerals, commodities, and problems—arranged on a priority basis—requiring more information.
- (2) Discuss this list with interested local private and public agencies in the region.
- (3) Adopt a final list to become the basis for preparing work- and budget-programs by the representatives of the three agencies.
- (4) Meet quarterly and annually to review problems and progress.

There can be no doubt of the importance of this agreement because of the promise it gave for regular and thorough treatment on a regional basis of the mutual program needs of the agencies concerned and the more effective use of funds for regional mineral discovery and utilization. Unfortunately the refusal of Congress to provide funds for the resources and development division of the Bonneville Power Administration eliminated after July 1, 1947, the source of greatest stimulation for the development of a coördinated regional minerals program. The subcommittee drew up a priority list of minerals and problem items and has since then continued to meet, especially to aid in developing a minerals section of the departmental regional program and to give guidance on the special Western phosphates program (both of which are described below). However, the loss of the Bonneville minerals-industry specialists has been a serious blow to its initial impetus.

On September 26, 1946, came the departmental order (No. 2257) creating the Pacific Northwest Coördination Committee. Its agency representation differed from that of the temporary committee in one respect: The regional director of the new Bureau of Land Management superseded the representatives of the General Land Office and the Grazing Service, for those agencies had ceased to exist when the bureau was established. The two agency heads were asked to delegate to their ranking field officials "such substantial authority as is necessary to carry out the provisions of this order." The areal jurisdiction given the committee followed the recommendations of the temporary field committee except that for western Montana only water, power, and minerals programs were to be included. The order accepted the suggestions of the temporary committee concerning headquarters and the selection of a chairman. The chairman and com-

mittee were ordered to report to the secretary through the departmental coördination committee. A full-time executive secretary and a small secretarial staff, financed by contributions from the several agencies represented on the committee, were also authorized.

What was the committee to do? Its charter enjoined it to:

a. Consider the scope and adequacy of the current and future programs of the several Interior bureaus in this region in relation to each other and with respect to the over-all program of the Department, and submit recommendations thereon.

b. Consider conflicts or duplication in programs and submit recommendations for their solution.

c. Interchange information and consider and recommend procedures relating to such interchange and to the formulation and support of a unified departmental program. . . .

d. Consider the adequacy of the authority delegated by the bureaus to their regional representatives and submit recommendations thereon. . . .

5. The Committee may consider ways and means for effecting improvements and economies in administration, including but not limited to centralized administrative service, joint use of facilities, controlled housing and submit recommendations thereon.

The order also asked the committee to submit by February 15, 1947, a report recommending what further steps toward departmental regionalization should be taken; and by March 15 a second report dealing with the coördination of programs and activities (departmental and interdepartmental) specified in the orders that had created the central coördinating committee and the temporary field committees. When called together by the chairman of the temporary field committee the new committee selected the regional director of the Bureau of Reclamation as its first chairman, and shortly afterward chose Roy F. Bessey as its executive director.

This was an important choice, because it equipped the committee with a staff head whose knowledge of the natural resources of the Pacific Northwest, of the federal-agency programs relating to them, of federal field personnel, and of state officials associated with resource-management tasks was probably unequalled. He had served as regional officer for the National Resources Planning Board (and its numerous predecessors) until its demise in 1943 and later on the staff of the administrator of the Bonneville Power Administration. For over twelve years he had been studying resource-management problems from the interagency point of view.

The task of drawing up a budget, making agency fund allocations, finding office space, selecting a small secretarial staff, and negotiating for limited technical assistance to aid in report preparation had been accomplished by the end of 1946. But already two special important substantive jobs had been given the committee: (1) to analyze and try to resolve the conflict over

the Columbia River salmon fisheries between the Interior Department agencies primarily concerned with salmon conservation (Fish and Wildlife Service, Office of Indian Affairs, and National Park Service) and the river and power construction agencies (Bonneville Power Administration, the Corps of Engineers, and the Bureau of Reclamation); and (2) the inter-agency problems involved in the development of the Western phosphate deposits which lie chiefly in the Pacific Northwest.

The salmon issue had been precipitated by a protest sent the secretary of the interior by the Fish and Wildlife Service on October 1, 1946, and supported later by the Office of Indian Affairs, against the construction by the Corps of Engineers of the lower Snake River dams and the main-stem dams below the confluence of the Snake and the Columbia. The chairman of the departmental coördination committee not only invited the Bonneville Power Administration and the Bureau of Reclamation to comment on these criticisms but asked the newly created regional coördinating committee if it cared to consider the questions raised and to make recommendations before the departmental committee should try to resolve the issues. The regional committee accepted the assignment and accordingly constituted a special technical subcommittee to summarize the facts, develop the issues, and propose possible methods of resolving the conflicts.

This first effort at voluntary adjustment of conflicting interests within the department appeared to be a distinct success. The subcommittee report, as modified and approved by the full coördination committee, made clear the nature of the facts and the genuine conflicts of purpose inherent in the full use of the river resource. It fully established the menace to the continuance of the salmon runs involved in the losses to both upstream and downstream migrants at Bonneville Dam; likewise it established the probable greater losses incident to each of the proposed higher dams at The Dalles, Umatilla, and on the lower Snake, together with the cumulative ill-effect of the whole series on salmon life. This danger plus the drowning of the remaining ancient fishing grounds of the Indians, the largest of which is located at Celilo Falls, brought the Office of Indian Affairs into opposition to the dam program. To destroy these fishing stations would violate obligations to its Indian wards assumed by the treaties of 1855. Several of these treaty grounds had already been destroyed by earlier federal river projects. On the same side was ranged the National Park Service because of the probable damage to recreation activities identified with salmon and steel-head sports fishing on the many tributaries of the mid- and upper Columbia and Snake.

On the other hand the Bonneville Power Administration presented a strong factual case showing the unprecedented growth in power demand, and its probable continuance. It contended that to perform its service to

the people of the region BPA would need by 1956 new generating facilities equal to those that might be installed at McNary, The Dalles, Chief Joseph, Detroit, Hungry Horse, and the four lower Snake River dams. While the Department of the Interior has no direct responsibility for water navigation, the report noted the adverse effects on slack-water navigation on the mid-Columbia and the lower Snake if the dams were not built or if they were postponed. The Bureau of Reclamation's interest in irrigation by-products from this group of proposed dams was not urgent, because for at least ten years the Columbia Basin project could probably meet the major irrigation needs of the agricultural areas adjacent to those stretches of the river under review. The bureau, however, was interested in the ultimate watering of a considerable body of land from McNary Dam pool and of smaller amounts from some of the other projects under consideration.

While the Bonneville Power Administration felt that the proposed Dalles dam would be economically most advantageous from the standpoint of good regional power distribution, and although it entertained doubts about the feasibility of obtaining a satisfactory rescheduling of dam construction, it joined with the other agencies in recommending a group of adjustment proposals to the department. The most important recommendations were:

(1) Reschedule the dam construction program so as to 1) rush to completion the installation of generators at dams (private as well as public) already built or under construction, 2) push ahead the building of the authorized Foster Creek dam and 3) step up the authorization and construction of dams on Hell's Canyon and at other possible locations on the upper tributaries of the Columbia. This acceleration of upstream power projects, for which the department was asked to seek authorization and funds, would permit the delay of dams at The Dalles and on the lower Snake, thus allowing the Fish and Wildlife Service experts to 1) solve the difficulties of salmon migration over the dams and 2) with the aid of the state agencies, develop the streams of the lower-river watershed for the successful transplantation and retention of the runs that would continue to be menaced by the system of Columbia and Snake River dams.

(2) That the department seek funds immediately for the Fish and Wildlife Service to carry out the essential research and lower-river development programs for salmon.

(3) That the department obtain funds for the Indian Service to study the Indian problems involved in destruction of salmon fisheries, and to provide suitable facilities if possible.

(4) That the department, after consideration of the conflicting interests involved, adopt and announce a definite long-term and immediate policy and procedure for the planning, programing, and completion of river-development projects which would allow full and early participation of all agencies concerned.

This report furnished the basis for a departmental decision which, as expressed in a memorandum of the assistant secretary on March 6, 1947, generally endorsed the recommendations of the regional committee. It

sent this endorsement to the Federal Inter-Agency River Basin Committee at Washington, which in turn referred the whole matter to the Columbia Basin Inter-Agency Committee. In the meantime, news of the departmental policy, which the secretary had not made public, had leaked out and had aroused the opposition particularly of the navigation interests. Deprived of the supporting factual analysis on which the department policy had been based, the Fish and Wildlife Service, the Indian Service, and the Park Service felt that the policy was in danger of regional condemnation before its positive conservation features could be understood. The Pacific Northwest Coördinating Committee, therefore, urgently requested that the secretary make public the entire factual report upon which the department's policy had been based, and that request was tardily acted upon.

The sequel to this valiant effort at intradepartmental policy and program adjustment is told below in the account of the Columbia Basin Inter-Agency Committee.⁸ The failure not only of that committee but of the two Interior Department regional agency representatives to support the recommendations of the Department of the Interior and its Pacific Northwest Coördinating Committee, for a rearranged dam schedule suggests some of the frailties of the new regional federal policy coördinating machinery; all the more so as the Interior Department agencies had already agreed, however reluctantly, to the new schedule.

Before the Second World War the interest of farm organizations, the TVA, and its own minerals and power agencies led the Department of the Interior to constitute a committee on a program to develop the Western phosphate deposits, most of which lie on public lands administered by its bureaus. But the war prevented the completion of an effective plan. Because the newer techniques for producing improved high-content phosphate fertilizers suggested important power-utilization possibilities, the Bonneville Power Administration spearheaded a renewal of activity in this matter by assigning a well-qualified technician to work out the elements of a successful development program. He found it necessary to enlist the interest not only of the Bureau of Mines and the Geological Survey, but of the TVA particularly for studying the furnace behavior of Western rock, the recovery of vanadium products, and production costs), the Department of Agriculture, the state colleges, the Bureau of Land Management, the Office of Indian Affairs, the big farm organizations, and private industrial concerns. His ideas were reviewed by the special minerals subcommittee of the Pacific Northwest Coördination Committee constituted in the autumn of 1946.

These activities culminated in the promulgation on February 11, 1947, by Assistant Secretary Davidson of a "Departmental Program for Develop-

⁸ Chapter xiv.

ing a Western Phosphate Fertilizer Industry." This gave notice to all heads of Department of the Interior bureaus and offices and to the Pacific Northwest Coördination Committee of a plan to launch a series of related investigations covering all phases of the phosphate-development problem, from intensive raw-material surveys, through the mining costs and other problems, industrial processing, transportation, provision of electric power, and marketing, to the use of the fertilizer on the land in the Western states. It also included an inquiry into public-land law and policies which might need modification for the protection of the public and of the Indians, as well as for the encouragement of private investment in utilization capital.

The Pacific Northwest Coördination Committee was assigned the duties of promoting the interagency coöperative agreements necessary to push the work along, of fostering local public understanding where that might be of particular use, and of reporting on the progress or its lack in the fulfillment of the assignments and of the program generally. The minerals subcommittee was joined with the Bureau of Mines. The USGS and the technician who had prepared the general plan (and who was later made temporarily a member of the staff of the Pacific Northwest Coördination Committee) were to push the raw-material studies, the mining investigations, the industrial-process testing, and the by-product recovery studies. To the coördination committee was directly entrusted general oversight of the agency studies in fertilizer production costs, and in the informational work with private industry.

This coöperative phosphate investigation was at first estimated to cost \$135,000 to be spread over a two-year period. But the curtailments in funds for all the Interior Department agencies for the fiscal year 1948 has markedly reduced the tempo at which the program can be completed. It certainly cannot now be finished within two years despite any "coördinating" the committee or the department may do.

Shortly after its creation the secretary referred to the coördination committee the task of formulating a plan for the development and administration of a system of public recreational areas and programs for the entire Pacific Northwest. The National Park Service was already working with the Bureau of Reclamation and the Corps of Engineers (on a reimbursable payment basis) on recreational plans for reservoir areas included in the river-project plans of those construction agencies, and to it the leadership in formulating the larger program was entrusted. The coördination committee gave it a subcommittee composed of staff representatives of the other interested agencies of the Interior Department.

While an outline for the preparation of a basin-wide plan was developed by the Park Service and the executive director of the Pacific Northwest Coördination Committee, and preliminary discussions about it were carried

on with some of the state and federal agencies which might be affected, the failure of Congress to accede to budget requests of the Park Service for the fiscal year 1948 have made it impossible for the present to go forward with this study.

It was clearly understood that a comprehensive regional public-recreation study would involve the coöperation of other federal departments as well as state and local agencies. Provisions looking toward the inclusion of associate membership from the latter on the recreation subcommittee were suggested as a means of assuring an integrated recreational plan.

In addition to the three foregoing special-program tasks, the secretary ordered the coördination committee (as noted above) to prepare by the middle of February, 1947, a report on further steps which the Department of the Interior should take toward regionalizing its work. He ordered a second report by March 15 dealing with the programs of the several agencies in the region to make certain that "these programs (1) do not conflict in purpose, (2) are properly timed, (3) involve no duplication of effort, and (4) offer the greatest degree of mutual support."⁹ The preparation of these two reports occupied much of the time of the committee and its staff during the first half of 1947.

An important self-education process was intrinsic in performing these tasks. This began, in a formal way, with the development of a lengthy questionnaire intended to bring together information concerning each agency's various programs; the relation of these programs to regional resource development; the principal program relationships with other agencies (extra- as well as intra-departmental), and the problems of interagency coördination resulting therefrom; the machinery, methods, and devices used in planning, programing, and budgeting; and the administrative services (if any) performed for other federal agencies. The assembly of this information, including supplementary and follow-up staff interviews, sharpened the understanding of the field representatives of each of the eight bureaus about the activities and organization of its sister bureaus; but it also revealed many differences in the degree of authority delegated to field personnel, the unity of field structure, the use of systematic planning in advance of budget formulation, the timing of budget estimates and the scope of fiscal powers, and interagency relationships. The Bureau of Land Management and the Office of Indian Affairs were in a state of organizational fluidity because of major changes then being determined at Washington. This presented the committee with some uncertainty as to the machinery for interagency coördination to be appraised in its report, but at the same time gave it additional opportunity to influence the character of the changes in directions it might feel desirable.

⁹ Departmental order No. 2205, June 4, 1946.

The "regionalization report" (as the document submitted to the secretary on February 13, 1947, was called) summarized the facts relating to field structure, regional, and subregional administrative areas, and the differing degrees of authority delegation over personnel, budgeting, and planning which it discovered among the committee agencies. While it explicitly recognized that many of these differences might be justified by the special operating requirements of different programs with different work loads and techniques or by varying interagency relationships, it expressed the view that the existing pattern of central-to-field relations and of levels of authority had grown out of many and changing historical circumstances from which time may have drained much original significance. It noted instances of tardy adaptation of agency structure and practices to changes in the character and volume of program activities. It pointed out that it was not necessary for every agency to follow the same plan of field organization in order to improve the basis for regionally integrating plans and programs. Bonneville Power Administration, in particular, would not afford a model for the other seven agencies because it was in the unique situation of constituting, in effect, a bureau headquartered in a single region. While its capacity to determine what it would do in an interagency regional matter was nearly as wide as the limits of its basic statutes permitted, other agency field establishments, such as those of the Bureau of Reclamation and the Bureau of Land Management, must operate within administrative and program policies fixed by their national offices.

However, the committee noted approvingly the great decentralizing changes recently made by the Bureau of Reclamation and those in process within the Bureau of Land Management and the Office of Indian Affairs. It recommended that for the six "line" agencies there should be developed

a reasonably uniform pattern of regional management of the respective programs. . . . Each such regional agency, under a director or administrator, should have authorities commensurate with responsibilities for carrying out a regional program and for its coordination with related programs. The delegations should cover in parallel, although not necessarily in identical fashion, decentralized authorities for (1) regional program management, (2) planning, programming and budget formulation on a regional basis, (3) personnel management and actions, (4) business transactions, and (5) cooperative agreements for research, service and work projects.

The committee specifically recommended the consideration of "suggestions made by the regional directors of the Bureau of Land Management and the Indian Service to their respective agency chiefs for increasing their authorities" in the areas itemized above because of their significance for interdepartmental coordination in the field.

For the two agencies the committee characterized primarily as "staff"—

the Bureau of Mines and the Geological Survey—it felt that “probably a more highly decentralized pattern than that now existing can be evolved ultimately. . . . In these instances, decentralization might take the form of progressively greater delegations of authority to the regional coordinator or representative rather than the creation of a management office.” This suggestion was intended to build upon the new action taken by those agencies when the coördination committee was created. Both of them had field structures composed of separate field offices for the functional branches, which were independent of each other; the Geological Survey had field offices of the divisions of the same branch, which had no common field supervisor. Therefore, to participate in work assigned the coördination committee, each agency had appointed one of its field officials to act as its representative.

In the Geological Survey the authority of the staff scientist assigned as “coördinator” was essentially that of a center of information and advice to and from the various independent field offices and the branch chiefs in Washington. The coördinator for the Bureau of Mines was to exercise similar informational clearing-house functions; but in addition he had been formally recognized as a regional center of advice and negotiation for program changes, in the interest of better integration, and as having the right to make suggestions to the national office for long-range regional objectives. In each case, however, the coördinator was without authority to order program modifications or to exercise the other attributes of administrative authority over the whole field organization within the region which is normally associated with a regionally decentralized field structure.

The committee believed that continuing detailed studies were essential to the step-by-step evolution of a departmental and bureau structure best suited at all levels to attain the objectives of departmental regionalization and program coördination. It therefore recommended that the department and the bureaus continue to explore feasible steps to be taken.

The committee was unable, through lack of time, to explore the feasibility of common service facilities for the several departmental agencies in the region. But it observed that the possibility of any accomplishment in that direction would be largely contingent upon the use by all Interior Department agencies of a common building in Portland where five of the eight bureaus had their principal field or regional offices. In reaffirming the use of Portland as the committee's own office center, it noted the probable continuance of the regional center of the Bureau of Reclamation on the dry side of the Cascades. For that bureau and the National Park Service (which because of the light work load in the Pacific Northwest, would probably need to continue its regional center in San Francisco) it was suggested that if the work of the coördination committee expanded greatly,

liaison offices might be established in Portland. The National Park Service had already located a subregional office in Portland to handle the reservoir-area recreation studies for the Corps of Engineers and the Bureau of Reclamation.

A further argument for the continuance of Portland as the regional capital for the Department of the Interior was the fact that Portland was also the headquarters for the Corps of Engineers (North Pacific division and Portland district) and for the resource-managing Department of Agriculture agencies with which Interior Department bureaus would need to be frequently in contact over plans and projects.

In commending the use of varying regional boundaries by the secretarial order which started the regionalization program, the committee pointed out that its task would be simplified if western Montana could be included in the Pacific Northwest for all resource-management functions. In western Montana only water, power, and minerals had been included—land resources being outside the committee's purview. This left in doubt those combinations of resources involved in recreation, wildlife, and Indian-reservation matters. The land exemption in the order was probably dictated by the facts that the new Bureau of Land Management was placing all of Montana in another region, and that the Indian Service reorganization was also leaving western Montana outside the Portland-centered district. The National Park Service had for some time placed the national parks in that area under the jurisdiction of the Omaha rather than the San Francisco office.

The committee observed that the constant interplay between land- and water-management activities made it desirable to work toward an identity of the Columbia River drainage basin and the region for land-use programs. As a result of the experiences of the committee and of discussions with the agency heads and the secretary, the areal jurisdiction of the committee was modified in May, 1948, to include not only all of Washington, Oregon, and Idaho but the parts of the Columbia River Basin that lie in Montana, Wyoming, Utah, and Nevada.¹⁰

The coördination report of March 11 began the systematic consideration of interagency program coördination. It pointed out that coördination must start at the investigation and planning stages, and it warmly approved the stress laid on joint or departmental investigations in the Columbia River Basin report, which the department, under Bureau of Reclamation leadership, had recently prepared and was about to publish. It said that comprehensive multiple-use plans necessitate the participation of all agencies concerned, and in an atmosphere favorable to synthesis; that it is the function of the department, possibly through the Pacific Northwest Coör-

¹⁰ Departmental order No. 2429, May 18, 1948.

dination Committee, and through the flow of information and guidance, to furnish the essential organizational and psychological climate; that adequate recognition of joint interests is especially important in the investigational phase, where the precise range of data needed and the mode of analysis and presentation can be most closely tied with all the needs to be served; and that effort expended here will produce greatly expanded results in the efficiency and economy of conservation and development programs. It said that the project list contained in the Columbia River Basin report (expanded in several ways) should be "examined by all agencies concerned and principles and procedures in each case worked out so as to maximize results."

Recognizing that the Columbia River Basin report was the first approximation to a Department of Interior program for the Pacific Northwest, the committee proposed that it spearhead, as a second step, a "skeletonized advance master schedule constituting a six-year regional program for the Department" and that it keep the schedule current by basing it on paralleling advance programs of investigation, research, construction and development prepared by each member agency." In other words: "Each member agency should work toward a long-range region-wide program covering conservation and development aims, policies and projects, research and investigation programs, construction programs and the like—as a basis for guiding the selection of particular programs and projects, and for inter-agency consideration of programs. The Committee, likewise, should work toward a similar over-all generalized Departmental regional program."

However, to wait for a comprehensive review of all plans and programs of the agencies was not essential, in the view of the committee, to the launching of useful coördination effort. Initial work might be started quickly by centering on those projects for basin development already authorized by Congress or definitely proposed. "This means that measures should be taken by the committee soon for (1) the establishment of agreed procedures for joint investigations and plans relating thereto, and (2) inter-agency consultation on design phases of projects which because of multipurpose characteristics affect more than a single agency, including agencies of other departments."

This report also emphasized the significance of budget-estimating and fiscal-management powers and procedures of the field establishments in achieving field-program coördination. It summarized for the first time the varying procedures, authorities, and timetables used in the field by the eight operating agencies. Some of these are fixed by Congress, which holds certain agencies in much tighter leash as to appropriation details than it does others. But most of the differences and difficulties are the result of bureau or department or Bureau of the Budget policies. In the degree of

control over the preparation of field estimates exercised by the ranking field representatives great variations were found—one agency allowing no regular comprehensive field-budget submittals, another (as a result of the creation of the coördination committee) granting the right of review of program items to its committee representative.

On the other side of the spectrum of authority, the BPA and the regional director of the Bureau of Reclamation had full power to prepare a field budget for all activities under their administrative supervision. An intermediate situation was illustrated by the regional office of another bureau which, while endowed with administrative supervisory duties over local management offices, was completely by-passed in the preparation of field program and other budget estimates, which went directly from the local offices to the national office. The committee endorsed the regional official's suggestion that this practice be amended by giving his office prime responsibility for developing and correlating field estimates.

The estimate-timetable situation was found to be particularly in need of improvement. Even making allowances for the special difficulties which the changes in expenditure policy caused the construction agencies, the tight deadlines imposed on the Bureau of Reclamation's regional establishment for formulating its 1948 fiscal-year estimates, both preliminary and final, made it impossible to clear with their field directors the program items of concern to other agencies. Also, the deadlines made it virtually impossible for the regional director to review preliminary project estimates before they had reached the commissioner's office. The dates on which preliminary estimates had been required from subregional field units by those regional offices clothed with budgetary review of local offices had varied from April 1 to June 12, and the dates for regional transmission to Washington ranged from April 21 to July 20.

The committee's interest in budget correlation was centered on "items expressing new program proposals or modifications of old programs which embodied important changes in activity policy." It pointed out that correlation in these matters would depend on "(1) agency internal assignments of estimating responsibility and (2) time schedules." It declared that the "minimum needs of the Committee in the performance of its assignment requires the several agencies to give their regional representatives complete information concerning program and budget intentions within the region. It is also felt that those representatives must likewise be allowed some latitude in discussing with each other and the Committee as a whole, possible modifications of programs and estimates that may be necessary in order to effect inter-agency coordination and support."

In indicating its intention to review field-budget programs of its constituent agencies, the coördination committee suggested that this task be

done early in June. By this time proposed programs for most agencies would have been fairly well formulated and the probable appropriations for the immediately ensuing fiscal year would be indicated by the reports of the appropriation committees of the Congress (if not by final enactment). The coördination committee suggested not only that the several agencies revise their estimate timetables to facilitate the committee's June review, but that the Department of the Interior and the Bureau of the Budget revise their dates for issuing instructions and date lines so that they could be received in the field before the preparation of preliminary estimates.

The urgency of timetable changes by the agencies and the Bureau of the Budget was reiterated in the supplementary review of program proposals for the fiscal year 1949, adopted by the committee five months later (October 3, 1947). On July 14, 1947, the Bureau of the Budget released new instructions calling for a number of changes in the form of budget submissions for the fiscal year 1949. Within the department and Washington offices of the agencies it required several weeks to apply the changes and to prepare bureau instructions for the field. For example the Bureau of Reclamation did not have these instructions until August 7 and August 26. But the field offices were asked to have their completed submissions in Washington by September 15. In the view of the committee it was impossible for the project field staff to assimilate and apply the new instructions in so short a time.

The committee proposed that the department attempt to persuade the Bureau of the Budget to release its instructions not later than February 1 of each year "to permit analysis, adaptation to Departmental and bureau requirements, circularization to regional and field offices, and necessary consultation to secure proper application." The committee asked the department and bureaus to relay these instructions and their amplifications to the field in time for regional review by the coördination committee in early June.

In endorsing the suggestions of the regional director of the Bureau of Reclamation to allow his office and the other water-management agencies of the department larger latitude in making direct field agreements for the performance of tasks of mutual interest, the committee asked for a general delegation of such authority to the field offices so long as such direct agreements conformed to over-all requirements of their respective bureaus.

The final paragraph of the coördination committee's report disavowed any desire to interfere with the policies of any agency concerning the relations of its field officers with Washington, but insisted that in the interest of its own efficiency the committee needed to be regularly informed of contemplated program estimates. The report concluded with the statement that the committee could not satisfactorily perform its future tasks, including

recommendations for better coördination of programs, until each of its eight member agencies furnished its representative on the committee with complete budgetary and other information relating to proposed changes in its activity in the Pacific Northwest.

The sequel to this preliminary report on program coördination was the systematic review during April and early May of the program items contained in the budget estimates for the fiscal years 1948 and 1949. This task was turned over to a working subcommittee of staff representatives from each agency under the chairmanship of the committee's executive director. This subcommittee developed a method for reporting the program items from the several estimates and for flagging the interagency interests. These statements were then subjected to some days of oral discussion, and after successive revisions were adopted by the coördination committee on May 13, and sent to the chairman of the departmental coördination committee.

This first program review was greatly handicapped by the drastic re-trenchments for most of the Interior Department agencies recommended by the House Appropriations Committee and approved by the House of Representatives; and the review was further handicapped by the uncertainties incident to the failure of the House and Senate to agree until nearly a month after the beginning of the new fiscal year 1948. Not only were many plans for 1948 in jeopardy but funds finally allowed for that year would greatly influence estimates for 1949. To try to coördinate program plans when programs were in imminent danger of complete liquidation or drastic curtailment called for clairvoyance and a great hardihood by the coördinators. In the face of these uncertainties and of the consequent situation of administrative near-catastrophe in some field agencies, the May program review was chiefly valuable as an exercise in mutual education by the members of the committee and in the discovery of detailed interagency program interests.

It had been the committee's intent to meet in June to consider interagency program matters in the light of funds made available by Congress to the bureaus for 1948 before allocations to the field establishments should be frozen. But the disorder created by the delay in the enactment of the Interior Department appropriation bill, and by the severe cuts for many activities, made that impossible. As soon as the smoke had cleared away, however, the committee revived its staff subcommittee to aid it to reëxamine in more detail those aspects of the 1949 fiscal budget proposals involving important program alterations or additions consequent upon the 1948 cuts. The committee confined this review to programs of clearly significant interagency interest. Wherever it felt that some action was called for to meet the interagency or regional interest, it made appropriate recom-

mendations. Thus, for example, it asked the Fish and Wildlife Service to take the lead in working out with the states of Oregon and Washington, and with the local communities, a plan for speeding up the pollution-abatement programs of the latter so that the department's "lower river" program for restoring or transplanting salmon runs might not be endangered by tardy cleansing of essential streams (such as the Willamette). In general this supplementary review made it clear that, because of the changes in Congressional appropriation policy, programs must be adjusted to a much slower tempo of work than was hoped in May.

The continuance of the committee beyond July 1, 1947, was itself in doubt during the late spring and the summer because the House Appropriations Committee had incorporated a clause (subsequently approved by the House) which barred funds for "the expense of any regional, field, or other office or committee for which approval has not been given by Congress prior to the establishment of such activity." Without a small permanent staff the job could not be done. This had been recognized at the outset when a budget for the first year had been calculated at the rate of an annual expenditure of \$40,000. Because the department had no unobligated funds for the purpose, the bureaus had been asked to contribute the money to carry the committee's organization to July 1, 1947, on the basis of 20 per cent each for Bonneville Power Administration and the Bureau of Reclamation, and 10 per cent each from the other six agencies. Except for the Geological Survey (which for some months insisted that it had no legal power to make such a contribution), the bureaus had gone along with this plan on the understanding that for the fiscal year 1948 the department would obtain a separate appropriation for the committee's support. Even if the secretary should succeed in persuading Congress to modify the sweeping prohibitory clause (as ultimately it did) the drastic slash in departmental funds by nearly one-third the 1947 figure and by about 40 per cent of the amount approved by the Bureau of the Budget, made doubtful what support the secretary could directly provide to continue this regional coördination experiment. Since the bureaus too were being cut back, with particular severity the BPA, the Bureau of Reclamation, and the Office of Indian Affairs, their field spokesmen in the Pacific Northwest could not be sanguine about continued bureau willingness to shoulder the budget costs of the committee office.

Secretary Krug, however, assured the committee of his deep interest in seeing its work go on because of its prospective value to the department for other areas in the West, in moving toward decentralized but regionally coördinated field administration. It should be emphasized that Assistant Secretary Davidson, who had headed a department committee on regionalization created to guide the formation of regional committees, had

met the committee in Portland (and its predecessor, the temporary field committee) to explain the departmental concern for its success, to discuss its program of work, its organization, and financing. Secretary Krug had made a special point of meeting with the committee when it was considering its February, 1947, report on "regionalization" in order to let it know "that he is personally behind this program and will push it to the limit." The committee itself, notwithstanding the gloomy prospect facing the entire department in the last weeks of the old fiscal year, formally advised the secretary of its hope that some method of financing its work be found.

The financial arrangements and budget for the committee's work during the fiscal year 1948 were delayed until early October. In the meantime its summer activity had to be curtailed, but it kept moving such program items, especially the Columbia-River-salmon versus dam-adjustment plans, as it had already developed.

Ultimately a 1948 budget of \$30,000 was approved, with the secretary allocating \$5,000 of departmental funds, and the agencies defraying the balance on a ratio of contribution identical with that used in 1947. The general staff of the committee was placed on the payroll of the department's new program division.

Early in September Secretary Krug wrote the chairman asking the Pacific Northwest Coördination Committee to "prepare a statement of the programs to be carried on by the Department in that region over the next five or ten years. . . . The statement should deal in specific terms with the results to be achieved and the steps recommended to achieve them." Estimates of cost were to be included where available. A preliminary draft was requested for November 1, and a completed draft before January 1, 1948. The secretary also asked the committee to "develop and recommend a procedure for semi-annual review and appraisal of the long range program and the progress of the work of the various agencies involved. Such a procedure will permit the program to be modified as events may dictate."

This request was directly in line with one of the conclusions contained in the committee's March 11 report on coördination, which, after proposing that each agency member work toward a long-range region-wide program, had said: "The Committee likewise should work toward a similar over-all generalized Departmental regional program." At its October 3 meeting, attended by Assistant Secretary Davidson, the committee formally accepted the new assignment and reviewed a preliminary outline of scope and method, authorized the chairmen of its technical subcommittees to serve as a steering group to help the staff prepare drafts of program statements, approved the employment of a special program consultant for three months to assist in this work, and took other steps in the fulfillment of this new task. It incidentally proposed that it meet with the secretary and

the chiefs of the bureaus in Washington to review the proposed program and other matters of administrative policy before the final completion of the report. This proposition was agreed to by the assistant secretary.

The year's experience had developed some tensions between the departmentally oriented urgings from the secretary's office, and the bureau particularisms plus the committee's yearning for autonomy. This meeting was intended to reduce such strains by clarifying respective areas of responsibility.

The statement of a long-range departmental program for the Pacific Northwest is not yet in final approved form; unless Washington pressures for change are greater than has thus far been indicated, the general character and importance of the document are reasonably clear. When it was reviewed in this form by the executive director before the December, 1947, meeting of the Columbia Basin Inter-Agency Committee, the representatives of two other departments felt that, among other objections, the proposed Interior Department program took in "too much territory." That reaction highlights the inescapable necessity for any department which has as many land, water, minerals, and energy resource responsibilities as does the Department of Interior in the West, to begin its consideration of long-range interagency regional goals with a consideration of the total economy of the particular region and some of its relationships to the national economy. In the subsequent informal discussion it appeared that some of the members of the CBIAC felt that that committee should itself prepare a comprehensive regional program, which would weld together all of the federal and state programs relating to regional resource management and development. Lacking such an over-all conspectus for the entire federal government's work in the Pacific Northwest, the coordination committee for the Department of the Interior was compelled to make its own assumptions on the basis of evidence available to it concerning population trends and needs, and concerning industrial and agricultural tendencies requiring support and encouragement. It has had to project its ideas of resource-development programs against these population and economic assumptions for the Pacific Northwest. There is room for difference of opinion as to whether or not the population tendencies and economic traits accepted as "true" are the best that might have been selected. However, resource development and management planning cannot be rationally done on a regional scale until these basic social factors are evaluated and set down as starting points. This the Interior Department's regional program attempts to do. It also attempts to weigh these regional assumptions in the light of national needs and available resources.

Undoubtedly the regional coordination committee needs and will obtain correction and help from the national offices within the Department

of Interior—which in turn should have the critical aid of the Executive Office of the President and of other national departments; this Interior regional program-planning group was compelled to break the ice in a total situation which it can only partly perceive with clarity and for which it shares fulfillment responsibility with other departments and with the states. Luckily there was at hand the comprehensive study of the Twentieth Century Fund *Survey of America's Needs and Resources* of which the coördination committee made substantial use.

The program assumes that the remarkable war-born increase in regional population is permanent, and that by 1960 the total will further expand by over a half million and perhaps by a full million. To care for that growth the resource base must expand to keep pace with and to improve living standards. It further assumes that the economy which has heretofore characterized the Columbia Valley states will require for that purpose greater manufacturing and merchandising diversification and less dependence on the extraction and sale of unfinished, or partly finished, raw materials. The committee's social philosophy is pithily summarized in these words:

"In preparing its initial program proposal, the Committee has tried to visualize a regional economy which should be developed, kept and used for the benefit of its people—and as a substantial part of the national economy. Since people must live in and by this economy, it was felt that people—those that are here and those that are definitely coming in the next 6 to 12 years—must be, with national needs and the available resources, the primary considerations in determining the scope and magnitude of the regional program."¹¹

This social objective, the committee affirms, is to be translated into specific basic programs and projects necessary to conserve or develop or further utilize (or all of these) the land, water, mineral, and other resources which nature gave the region.

It is evident that the committee (and the Department of the Interior when it has ratified its program as a desirable departmental target) in part is resuming the task pioneered in the Pacific Northwest by the regional planning commission but which has lapsed since the demise of the National Resources Planning Board. Its conception of the general goal of federal effort in the Columbia River Valley resembles (when due allowance for regional differences is made) that which has characterized the principal purposes of the Tennessee Valley Authority for the people of the watershed where its efforts are concentrated.

It is impossible to give in brief compass an adequate review of the concrete program proposals of this pioneer effort to view and state in an inte-

¹¹ *Summary of the Proposal of an Integrated Program for the Department of the Interior in the Pacific Northwest*, Pacific Northwest Coördinating Committee of the Department of the Interior (mimeographed).

grated way a series of five to ten year goals for the whole departmental effort in the region. The major programs and areas included cover: basic topographic, hydrologic, and geologic data, land development and management, water development and control, energy conservation and development (excluding atomic energy), mineral development and utilization, fish-and-wildlife conservation and development, scenic and recreational resources-conservation and -development programs for the special needs of the Indian people.

A Program Proposal for the Pacific Northwest

To illustrate concretely the character of activities envisaged as well as to illuminate some of the significant interagency and interdepartmental interests inescapably tapped when a single department tries to lay out for itself the particular and general resource objectives it ought to strive to achieve, the following summaries of three of the major programs are given.

THE COLLECTION AND PUBLICATION OF BASIC DATA

Beginning with a summary of the work that has been accomplished to date, the needs that should be met in the next six-year period are given in quantitative terms. For example, with only 43.5 per cent of the region now topographically mapped (and over half of that in maps now of obsolete standards) the program lists the number of new quadrangles to be covered, the number of obsolete surveys to be redone with modern standards, and their estimated costs. Included is also a summary of the work to be accomplished in the installation and maintenance of stations to obtain stream-flow records, in making an inventory of ground-water resources, in recording the silt loads and temperatures of regional streams.

Geologic mapping will center on an areal program for use as a "first guide to potential additional sources of mineral materials; and also as one basis for classifying soils and for interpreting ground-water conditions, runoff characteristics and the like." A continuous program in engineering geologic mapping, new to this region until 1947, is also advocated. Such maps are intended to show the "physical characteristics and thickness of rock formations as foundation materials, character and thickness of overburden, distribution of construction materials (sand and gravel, raw materials for cement making, stone, and riprap, brick and tile clays, and light weight aggregates); also the causes and prevention of land slides." These data are of special value in the design and construction of the river structures and other engineering structures which may be built by many federal and state agencies.

LAND DEVELOPMENT AND MANAGEMENT

The conception adopted is that of "unity in land resources use and broad management, extending outward from the community and farm lands to the range and forest lands. All of these lands are bound together in area, basin and regional economies in which the various uses should be reasonably well correlated and balanced if the area or region is to get most effective and sustained yield from its resources. The net result from the public and private stewardships involved should be conservation, development, and management of the land of a region as an estate to support its people and contribute to the national economy on as efficient a basis as possible."

The land-development program proposed for achievement by 1960 would add 1,900,000 acres of croplands through irrigation, drainage, and clearing, to care for an estimated increase of 640,000 people in the region and to help meet the needs of national land economy. Of the addition programmed for the first six years, 800,000 acres would be secured by irrigation alone, and 100,000 acres by clearing, diking, and drainage. (The report recognizes that the latter goal requires the coöperation of the states and of the Departments of Agriculture and War.) Rangeland development by intensive management and integration with farming to increase livestock production for the expected increase in population is a second goal.

Since the Department of the Interior has responsibility for managing a large part of the federal public-domain lands (much of which is now exercised through the Bureau of Land Management), the serious lag in performing cadastral surveys already authorized for Oregon, Washington, and Idaho constitutes a basic obstacle to nearly all its management efforts. The report states that nearly 20,000,000 acres have been included in these authorizations but that funds appropriated have been so scant that only the most urgently required work has been performed. To erase the backlog would require an estimated annual expenditure of \$200,000 for twenty years.¹²

Such surveys are essential to many management programs, including the exchange of land ownerships which economic management of the public lands often dictates. These are of two kinds: exchanges between the federal government and private owners to block up into more compact units forest and grazing lands, and similar exchanges between the Bureau of Land Management and other federal and state agencies. The checkerboard ownerships, created by the methods of original alienation of federal forest and rangelands, make necessary a comprehensive exchange program. One phase of the problem (which the report does not recognize) would be les-

¹² The 1948 appropriation was \$67,000.

sened were the management of O-and-C land and national forests under a single federal agency.

Twelve drainage areas, embracing nearly 5,000,000 acres, are proposed for special soil-moisture-conservation treatment, to stop erosion and restore vegetative cover.

During the 'thirties 25,500,000 acres of vacant public lands in three states of the region were withdrawn from entry or sale pending classification to determine the best use to which they should be put. This makes land surveys and classification studies urgent. Up to the present, classification has been made only when an individual application has been presented for consideration. Such fragmentary classifying can frequently not be done satisfactorily without more thorough consideration of all area resources and of related social factors. The program therefore proposes to inaugurate a plan for classifying lands in advance of the filing of individual applications, so as to give proper consideration to all the resources involved, and to use areas of adequate size to permit economical unit development and the performance of essential social services (such as schools and transportation).

On timberlands totaling approximately 3,500,000 acres an accurate inventory of forest resources should be carried through during the next ten years. This could be done by aerial photography at an estimated cost of 20 cents an acre. Fire-protection facilities for the same lands are also proposed to hold annual losses to a standard of less than 0.2 per cent, the standard for national-forest fire protection. Because of lack of information it is not now possible to prepare a plan for reseeding nonrestocking forest domain land; but for the O-and-C lands (which include about 100,000 acres of nonrestocking forest area) it is proposed to go ahead with reseeding at the rate of 10,000 acres a year. The coöperative sustained-yield forest program involves the initiative of private timberland owners, for which accurate predictions are not possible. But it is anticipated that the Department of the Interior should be prepared to develop and supervise within ten years approximately thirty sustained-yield units including roughly 700,000 acres of federal and 1,000,000 acres of intermingled private forest lands. The proper management of timberlands also will require the launching of an extensive program in timber utilization and in timber-stand improvement.

WATER DEVELOPMENT AND CONTROL

The report notes that despite the river works built during the past twenty years less than half the irrigable land in the Pacific Northwest has been watered, and that only one-tenth of the water-power potential has been harnessed. It insists that further river development is justified not only

by the general population increases anticipated in the region and the nation, but to reduce losses and dangers from floods, to meet inland-navigation needs, improve and assure public and industrial water supplies, and at the same time maintain the fishery and recreational assets inherent in or related to river developments.

The report estimates that by 1960 the region will need from five to seven million kilowatts of additional power, and 1,900,000 acres of new land. These two needs are of most consequence in deciding the scope and rate of multiple-purpose river development. It lists the projects, some not yet authorized, which should be finished by that date. To do this would necessitate a comprehensive program of investigations, carried through at a faster rate than funds now allow. It would also require harmonization of the parallel Columbia Basin reports of the Department of the Interior and the War Department. Also urgent is a comprehensive financial plan for the equitable allocation of costs and benefits in all of the multiple uses of water, and for a basin-wide plan for pooled repayment of all the reimbursable items of cost. Unified planning, programing, and control of investment in basic drainage-basin development must be provided in the interest of financial prudence and maximum financial and economic return on the large outlay required. (As noted above, this proposal for "regionalizing" the federal financial policies for integrated river-development works had already been broached—as one proposal made in the Interior Department's Columbia Basin report—before the Columbia Basin Inter-Agency Committee because of its fundamental interdepartmental nature, but had been gingerly handled and left, like other interdepartmental jurisdictional "hot potatoes," to cool off or for delayed, ultimate resolution by "higher authority.")

The program lists the specific investigations (reconnaissance surveys, comprehensive basin surveys, project investigations) to be undertaken by the Bureau of Reclamation; special studies (such as fishery biology, ground water, excess-land surveys) to be carried through by several Interior Department agencies; project investigations on Indian reservations for irrigation, flood control, and power; new Indian Service projects needing authorization; and existing projects to be expanded or completed by the Indian Service.

This section of the program report closes with explicit recognition that a "basic program of river basin development cannot be complete without the improvements of other agencies, particularly of the Departments of Agriculture and War."

This very brief summary of three sections of the Interior Department's proposed long-term regional program will indicate a few of its elements and some of the principal values implicit in it as well as the limitations

surrounding such an effort.¹³ Certainly such a statement cannot be prepared or periodically revised without compelling each agency to calculate carefully where it is going and why and at what rate. Nor can it fail to bring into the open program situations in which more than a single Interior Department agency is interested and in which joint participation or financial

¹³ This first long-range department report for the region, after review and comment in Washington and some minor modifications, was approved in the spring of 1948. Since then the first annual revision has been made which refines and extends but does not change the basic scope of the regional program. The 1950 revision is to go forward in time to play a more significant role during the initiation of budgetary plans by the several bureaus in Washington. The 1949 report was approved by the secretary of the interior as a guide to the department for preparing its budget estimates for the fiscal year 1951. An identical application to 1952 estimates has been authorized for the 1950 revision.

The most significant outgrowth of this planning effort has been the preparation by the field committee of a comprehensive regional budget for the Department of the Interior. This was perfected in the autumn of 1949 and presented by Assistant Secretary Davidson before the Bureau of the Budget on November 4, 1949. This is a pioneer activity. None of the resource-managing departments had ever before organized its ideas and fiscal projects in such manner as to show the budgetary interrelationships of all its operating agency programs within a single great regional area, except for Alaska. (During the past two years only the Interior Department has made an all-Alaska budget presentation). Unfortunately the regional presentation, with its highlighting of programs which are out of balance with the rest of the departmental job, came after the Bureau of the Budget had heard the several agency budget estimates. Another year, it is to be hoped that the order of bureau consideration can be reversed, so that the president's estimates agency will have before it the essential interrelationship needs when it considers each agency's fiscal plans.

Because of the unique character of this regional budget document, its salient features are noted here.

It tries to relate the estimates for 1951 to the six-year and long-range departmental program for the region so as to make clear the degree to which the attainment of objectives is on or behind schedule. It highlights the instances (which are numerous) in which long-range purposes will not be attained unless funds are increased for the fiscal years after 1951 and kept on schedule thereafter.

Even more emphasized are the problems of program "imbalance." Although the big construction agencies (the Bureau of Reclamation and Bonneville Power Administration) are not fully up to the program schedule of the 1951 estimates submitted to the Bureau of the Budget, their needs are more fully met than are those of the programs for basic data, land management, recreation, fisheries, and mineral exploration. For example the report makes clear that the lower-river fisheries program, which at the time of submission required \$3,000,000 to meet the schedule of dam construction which it must offset, has received only \$970,000; while it was given \$1,200,000 for 1950 it ought to have received \$4,000,000 to move abreast of the job. Again, the reservoir programs of the Bureau of Reclamation and the Corps of Engineers are way ahead of the complementary studies of the National Park Service and the Fish and Wildlife Service. Appropriations and transfers for the latter phases of the integrated river program have been too small to keep pace. The budget suggests the necessary sums for the rest of the period to bring them into balance.

In presenting this regional budget to the Bureau of the Budget it was pointed out that the department could not even utilize all of the elasticity available beneath the "ceiling" total figures enforced by the bureau. This was the result of fixing specific program ceilings, there being six such separate ceilings imposed by the Bureau of the Budget. (November, 1949.)

support may be necessary. It makes clearer the significance of timing in program fulfillment, of budgetary requirements, and of the logistics of departmental efforts for achievement of goals. Equally patent is the fact that the Department of Interior must have the coöperation of other resource-managing departments of federal (and state) government. The department needs this not only in carrying through programs, the full success of which is inherently contingent upon supporting or supplementing activities, but it is often even more important that coöperation occur at the early stages in the formulation of policies and the planning of programs. For these purposes the machinery of federal government in the region and in Washington is at present not well suited or complete.¹⁴

A few tensions which have developed within the coördination committee and between its majority and the executive director have special administrative significance. They arose out of the original charter of the committee from the secretary or from its own "constitution" and its interpretation of its sphere of activity. At its meeting in October, 1946, at which it adopted articles of organization the committee approved a policy which explicitly tied the executive director to it rather than to the department. This is embodied in the statement of that officer's duties and in its statement of staff relationships to the committee. The latter said: "All members of the Committee's staff shall be under the administrative direction and technical supervision of the Executive Director who in turn shall administratively report to the Committee through the Chairman." It continued: "The work performed by the Executive Director and his staff shall originate with the Committee, its subcommittees and with the Executive Director." But an elastic clause was also included which allowed him to "deal directly with individual members of the Committee and with agencies and groups on matters of Committee concern." While the assistant secretary, as acting chairman of the departmental coördinating committee, accepted the regional committee's definition of the executive secretary's relation to it, he explicitly authorized that officer to "feel free to carry on informal contacts with any staff officials of the Department and to render and receive advice on problems relating to the conduct of the business of the Committee."¹⁵ He also included the executive secretary in the exercise of rights accorded any dissident member of the regional committee to have his views reported to Washington, through the regional chairman, along with any report or findings by the majority of the committee.

The complete subordination of the executive director to the committee

¹⁴ See below, chap. xiv, p. 478, postdated footnote 16 for progress on the interdepartmental front since the summer of 1948. (November, 1949.)

¹⁵ Memorandum of February 17, 1947, to the chairman of the Pacific Northwest Coördinating Committee.

and its orientation towards issues that were to develop could not in fact be maintained, if for no other reason than that nearly all of the major jobs which it has been asked to do have been specifically given it by the secretary of the interior. In trying to interpret these tasks, it has been almost inescapable that the executive director should be, by conversation at least, the recipient of suggestions and ideas from the departmental coordination committee and its staff which would stress the departmental as against the operating agencies' points of view. On his trips to Washington and during the visits of the assistant secretary and other members of the department staff in the field, such interchange of ideas on an informal basis was bound to occur. The very qualifications of wide federal experience and service which made the executive director effective in seeing interagency interests were almost certain to increase his receptivity to department-wide considerations, and to give him friendly and personal contacts not only with agency officers but with departmental staff also.

The first chairman, on the other hand, was a busy regional director of a big operating agency in whose service he had spent his mature life. His ability to keep in close contact with the work of the other Interior Department agencies and the matters gestating within the committee's regional headquarters was further handicapped by the isolation and remoteness of his own agency's field headquarters. It was thus doubly difficult for him to give continuous thought and attention, essential to creative leadership, in so new and difficult a task as had been given the regional coordination committee.

A second tension developed from the desires of the assistant secretary, a former general counsel for the Bonneville Power Administration and an outspoken advocate of the valley-authority mode of organizing federal field administration. He wished to push the committee more actively into the promotional role of aiding actual utilization of resources, of forwarding the utilization of forest and fishery wastes, the rapid development of phosphates and other minerals, and recreational developments incident to the several Interior Department programs. To do this the executive director proposed an increase of his professional staff and this precipitated an issue involving the jurisdiction of the several operating agencies. The chairman and a majority of the other agency representatives believed that the suggested committee-staff activities might interfere with the operating responsibilities of their own field establishments. In support of this position one member presented an interesting "constitutional" argument construing the committee's early written agreement about its functions as not only forbidding the committee any control over duties given by Congress to the several agencies, or over their administrative or operational procedures, but limiting the committee's functions to mutual agreement

among the agencies. Moreover, he held that no agreement by committee members could bind all bureau headquarters beyond the scope of the least comprehensive among the authorities delegated to committee members by the heads of their respective agencies. The staff problem was also complicated by bureau sensitivity toward undue representation of a single agency. As in the civil service of the United Nations, staff selections were viewed as involving bureau "national" interests. In its organization articles the committee had implemented this conception by declaring: "It is also a prescribed policy of the Committee that not more than one permanent professional staff member, including the Executive Director, shall be recruited by direct transfer from each agency represented by the Committee membership." The new professional employees proposed were being released from the late research and industrial-development division of the Bonneville Power Administration, then in the process of drastic personnel reductions because of the extraordinary appropriation slash just administered by Congress. Since the executive director was a former employee of the same agency, this would, in the eyes of the other agencies (and in particular of the Bureau of Reclamation which has had a number of serious and continuing conflicts with the Bonneville Power Administration) have given to a single member a monopoly of staff influence in the fulfillment of the committee's tasks.

It was an added aggravation, from that standpoint, that in the preparation of the staff material for the regionalization and the coördination reports the preceding spring, the executive director had used a consultant who had also been identified with the Bonneville Power Administration through his membership on the regional advisory council created by Administrator Raver.

Under the influence of the personal attendance of the assistant secretary at a committee session the issue was temporarily resolved by a compromise which limited the employment of the men in question to temporary assignments. One was to help in the preparation of the regional program for the whole department, which about the same time was made a special duty of the committee by order of Secretary Krug; the other, who had already been working to coördinate the phosphate-development program, was located under the committee's jurisdiction and the supervision of the executive director. Both employments were terminated within four months, one by completion of assignment and resignation, the other (the phosphate coördinator) by transfer to the Bureau of Mines. Thus the committee view ultimately prevailed.

Despite the real contributions which have been made by the Pacific Northwest Coördination Committee of the Department of the Interior in breaking ground in this new area of regional coördination on a department-

wide basis within the traditional national executive structure, most of the organizational problems inherent in a continuing administrative program of that character remain unsolved. The members of the committee were the targets of the urgent desire of the secretary and his immediate staff to build a departmental program, a departmental ethos, and a suitable departmental system of organization, procedure, and practice so as to weld the work of the eight operating bureaus into a coördinated regional program for the Columbia River Valley.

Simultaneously, and even more continuously and intimately, they were under pressure from their Washington bureau heads, not to yield their loyalty to bureau interests. Caught between two lines of executive force, their situation was often uncomfortable and sometimes threatened to become precarious. In a conflict between secretarial suggestion and top-bureau ideology, they were bound to respond with greater sensitivity to the latter because of close ties of long association; also because from it came their own expectations of continued tenure and advancement. The modest proposals for ironing out the inadequacies in delegation of agency authority to regional field officers which the coördinating committee, with considerable courage on the part of some of its members, had pointed out in its February, 1947, regionalization report have not led to the necessary action in Washington.¹⁶ Neither have the several agencies and the department made the recommended changes in budget-estimate timetables so indispensable to program-planning coördination. These changes must be made in Washington; they can be carried through only by secretarial control of the agency heads. If the secretary is not strong enough to do this directly, he cannot hope to accomplish it indirectly by "turning the heat" onto the field representatives of the bureaus. Early resolution of many of these problems was promised the committee in the fall of 1947 when the committee was to meet with the secretary and the heads of the agencies to thresh out these organization and power issues. This meeting was not held, however, until mid-May, 1948, when many matters were canvassed, including the questions just enumerated, the proposed long-range regional departmental program, and the relation of the executive director to the committee. In these discussions the bureau point of view, as contrasted with departmental interests, appears to have generally prevailed. Existing relationships were continued with but slight alteration.¹⁷ The committee

¹⁶ This situation has markedly improved during recent months for the Bureau of Mines (as shown in the postscript in chap. xii, p. 406-410 above) and the Bureau of Indian Affairs. (November, 1949.)

¹⁷ The restatement of the committee's charter was contained in a secretarial order (No. 2429 of May 18, 1948), and in a memorandum by Assistant Secretary Davidson (May 20, 1948) setting forth the relationships of the executive director to the coördination committee and to the department.

was to retain the same membership and to choose its own chairman from its agency members on a rotating basis. The chairman remained the official link between the committee and the secretary, this connection being made through the chairman of the secretary's program committee, which had been established some months before with supervision over the department's regional coördinating-committee structure. The executive director was to be on the payroll of the program-committee staff, but his relationship to the committee as its employee was to remain substantially unaltered. He was to be directed by the chairman of the committee, not by the program chief of staff. The only changes in his position were the explicit right to make known to the committee his views on problems before it, even though they should differ from those of the committee, and the right to suggest to the committee new directions which its work ought to take.

The new charter of the committee continues the functions which had evolved during the preceding eighteen months, laying special stress upon the yearly revision of the department-wide program and the joint yearly scheduling of activities to achieve program objectives. The committee as a unit was authorized to establish and maintain contacts with the states and with other federal agencies involved in these programs. These would be in addition to such contacts on the part of individual Interior Department agencies. The committee was also asked to watch for overlaps, duplications, and gaps in agency programs, and to explore means for obtaining economies in administration, particularly through possible centralized services, joint facilities, or common field office quarters.¹⁸

¹⁸ On August 25, 1949, came a revamping of the committee's charter and of the functions of the executive director who now became the permanent chairman. This was accomplished through a secretarial order (No. 2465) which created a similar departmental field-committee system, together with departmental chairmen, for seven regional areas (including Alaska, for which some differences were provided). The chairman was now to be appointed by and to represent the secretary of the department. The committees were to be renamed "field committees." The secretary appointed the former executive director as chairman. He and his staff became at once part of the staff of the departmental program committee through whose chairman the regional chairmen reported to the secretary. The issue of staff relationships to the regional committee was thus erased, and the basis for "juridical" claims of a constricting character by agency committee members disappeared. The committee was still to function as a kind of field "board of directors" in hammering out and revising a department-wide, long-range program, including program schedules and budget proposals. It was to continue to explore overlaps, gaps, or duplications in programs and to recommend action for overcoming obstacles and deficiencies. It was to continue to "serve as a focal point for the Department in dealing with other Federal state and local agencies and public and private groups on matters of mutual concern to the agencies of the Department which are related to the broad purposes of the Committee." The chairman's authority, aside from the brief announcement that he was to be appointed by and represent the secretary, was stated as follows:

"On matters of common departmental interest in the region, as described in section 4(d), he shall represent the Department as a whole in relationships with other Federal agencies, state and local agencies, and other public and private groups or persons."

On the heels of this reaffirmation of the coördination committee's program and structure, another special assignment was precipitated by the Columbia River flood of late May and early June. The committee had already decided to move its subcommittees into exploratory action and in

Nowhere is the chairman given any authority to control committee action or supersede its recommendations. He has the same right as any other member to communicate his disagreement with recommendations made by the majority. (This conception of the chairmanship is in contrast to that contained in the recent restatement by the secretary of the Department of Agriculture of the duties of his field representative for the Pacific Northwest, as noted above.)

In fact the new order has not greatly modified the manner of operations of the committee. It has, however, freed the chairman to state the departmental, interagency point of view during its deliberations without risk of criticism for presumption, and it has removed one of the "hedged and ditches" for bureau resistance to departmental influence in the field situation.

The work of the committee has gone forward with new vigor since the fall of 1948, but for this much credit must probably be laid to the reflection of President Truman and the presumed continuance in the office of Secretary Krug whose personal concern with field coördination was well known. An intermittent policy of "foot dragging" pursued by some of the bureaus in the hope that the departmental field scheme would be quietly buried after November gave way to acquiescence at worst and greater affirmative interest in other instances. With the announcement of the army's "308" review report of the Columbia, and the prospect of accelerated river-construction programs, the need for coöperative interagency planning became more urgent.

At any rate, the functioning of the committee as an integrating device has steadily progressed. The Bureau of Reclamation, to be sure, in responding to the president's specific injunction that it and the Corps of Engineers harmonize their plans for river development to prevent the recurrence of the 1948 flood jumped ahead with the perfection of a bi-agency agreement. While that agreement left out or incompletely recognized the interests of other Interior Department agencies, it was a step toward integration which had long been called for. But by this time the need for an even wider approach had arrived, and that became the function, so far as the Department of the Interior was concerned, of the field committee. It brought into focus—in the review of that agreement—the other interests of Interior Department agencies in the combined proposed programs of the bureau and the corps.

The committee has made real progress in refining its long-term regional program for the department, in reducing this to significant budget issues and proposals, in following through on problems of imbalance in programs, and in initiating new and promising studies looking toward better integrated, accelerated land and mineral programs. It has undoubtedly been an important stimulus to the Columbia Basin Inter-Agency Committee to get started on the interdepartmental program coördination job. The chairman of the Interior Department's field committee is now an official alternate member for the Department of the Interior on the CBIAC, and thus is in a much more favorable position to participate effectively than when he attended meetings merely as an observer.

Despite these advances of the past 18 months, the new departmental field structure still suffers from the slowness with which the secretary develops control over the bureaus at Washington. The recent resignation of Secretary Krug creates another period of uncertainty until it can be known what policies toward this new field procedure and program his successor will follow. Once more the hopes of those bureaus which dislike the new system that it may be abolished or allowed to die of inanition have been roused. If, however, Secretary Chapman is genuinely sympathetic with Krug's decentralizing and integrating administrative objectives, the next three years should permit a reasonable time in which to demonstrate the value of this new field-committee system. (November, 1949.)

particular had ordered its water and energy subcommittee to review the recently released project reports by the Corps of Engineers. It was thus establishing a procedure to supplement the individual agency comments heretofore exclusively utilized for reviewing project reports from other departments. Following the great flood the secretary, in response to presidential request, ordered the committee, in coöperation with the Corps of Engineers, to review the long-range program of the department in the Columbia River watershed to see what steps, immediate and prospective, should be taken to avert the repetition of flood disaster. The committee drew up a list of reservoirs, under Interior Department agency jurisdiction, —some under construction, some authorized, and several in the advanced planning stage—which would be appropriate for the first phase of a tributary storage program and which might be incorporated in a joint program with the army. This program aimed at total storage of approximately 23,000,000–25,000,000 acre-feet of which perhaps between 15,000,000 and 20,000,000 acre-feet would be available for flood control. Army estimates indicated that such a volume of storage would have reduced the flood crest of 1948 by about nine feet and that of the greater 1894 flood by about seven feet. The committee also presented a preliminary list of more than a dozen other projects adapted to flood control which would require thorough investigation. In this joint effort of the committee and the army to outline a comprehensive flood-control program it was recognized that within the Department of the Interior a number of conflicts over water development and use would have to be resolved; also, that a comprehensive reservoir-operating program tying Interior Department and Army Department reservoirs together into a single system, would have to be agreed upon.¹⁹

The regional committee of the Interior Department, like its sister committee in the Department of Agriculture, was also the focus for organizing emergency aid to flood victims. That took the form chiefly of the use of heavy equipment and of technical assistance. The chairman and executive director also organized the collection of data on losses suffered under Interior Department jurisdiction. This information was for use by the Congress in its consideration of special disaster appropriations.

The big jobs ahead of the committee clearly relate to comprehensive plans and it is becoming increasingly evident that these will soon have to move from the departmental into the interdepartmental and the federal-state spheres.

As in the Department of Agriculture, the effort of the Interior Department to build regional coördination has been continuously handicapped

¹⁹ Further use of the committee came with the release of the army's "308" review report, in October, 1948. As related below in the Postscript, this was of real importance in bringing into departmental focus the proposed agreement between the Bureau of Reclamation and the Corps of Engineers.

by lack of proper financing. Inadequacy of his staff has limited the ability of the executive secretary to service his committee and its subcommittees, and to build the familiarity that is needed with all the programs including those of the states, which impinge on the work of the Interior Department in the region. Nor has there been recognition of the need of the agency field offices for additional funds to release staff to initiate and to follow through coördination assignments. The "payoff" of coördination effort is contingent upon staff follow-through, and this often cannot be accomplished without funds for the field establishments.

There can be no gainsaying that, despite these fiscal handicaps, much initial headway toward interagency correlation of plans and programs has been made under the Department of the Interior's Pacific Northwest Coördination Committee. Progress has been real, even though there have been short periods during the committee's year and a half of life when almost complete time marking has prevailed. When the committee has gone forward, the stimulus has come largely from challenges placed before it by the secretary's office or as a result of sudden emergency. Self-generating interests within the committee have played an essential role, though a minor one except for the precipitation of the Columbia River salmon problem.

The committee's experience illustrates the truth, which is suggested at many points in this study, that field officers would often like to get together to iron out interagency conflicts, or to increase their effectiveness by joint plans and coöperative action. They see the ill consequences of failure to work together and the benefits that might accrue from the merging of plans and action. But their desires for coöperation are too often held in check or inhibited because of bureau policy. Bureau isolationism in Washington is much more intransigent, much more inclined to assert, "this is solely our responsibility" than it is in the field. To avoid wrath at headquarters field officers frequently fail to take the initiative in interagency planning or action though they would like to do so and though they know that such a course would produce the most effective total result in public service.

The chances of breaking through this particularism would, in the judgment of the writer, be greatly improved if the head of the field coördination committee were entirely detached from bureau affiliation, and able to speak for the total departmental interest. If this Department of the Interior field committee is to go steadily forward toward its expressed objectives it must be strengthened by the presence of a departmental coördinator, who, as head of a small regional professional staff and as chairman of the coördination committee, can furnish leadership which stands outside of particular bureau loyalties, and can look with habitual objectivity at the needs of the department's relation to the total regional situation. If he has the right qualifications, he can, with the help of a small qualified profes-

sional program liaison staff, communicate increasing concern for inter-agency articulation and regional benefit to the members of his committee. He will be able to release a great deal of latent informed insight which many field men already have but which cannot obtain overt or effective administrative expression under the traditional bureau organization. Where it becomes clear that changes in bureau structure, delegations of authority, or program jurisdiction must be made in the interest of a better total departmental achievement in resource management for the region, he, rather than a committee of bureau field representatives, should "carry the ball."²⁰ He will, moreover, have to be supported by departmental staff in Washington who will carry through with the Washington agency heads those modifications of bureau policy (including field authority and structure) which are necessary to make regional coördination effort effective. If the secretary cannot exercise such control over his own bureau chiefs, the whole design for regional articulation will falter and ultimately fail.

The secretary's office organization, with its coördination committee chaired by the undersecretary, and with its more recently created program division, seems to be an adequate structure for linking a departmental regional coördinator and a regional coördination committee together. At the Washington end of the relationship, the hesitations and delay would appear to have been due to successive changes in the posts of the undersecretary and assistant secretaries, as well as to the political weaknesses inherent in secretarial relations with agency heads buttressed by powerful-interest clients, during the disintegration of a New Deal presidential regime increasingly menaced by the electoral success of an "Old Deal" party.

²⁰ As suggested in preceding footnotes, the changes wrought by the secretarial order of August 25, 1948, did provide a chairman detached from bureau allegiance. He has thus been able to furnish more effective leadership of the kind suggested above in his new role than he could as executive director, or than could any other committee member. But to some extent he has been inhibited from playing as positive a lead as the chairmanship permits (even with the "soft pedaling" of that position under the secretary's new order) by habits of conduct and expectation established when he was executive director. Nevertheless he has constantly sought, in cases of agency conflicts, to discover ways of compromise, to resolve them, or at least to reduce the number of conflicting issues which might have to be decided by the secretary.

There has been during this year and a half, the cumulative benefit of closer personal acquaintance of the several committee members as well as of the technical staff brought together by the jobs of the subcommittees. With the habit of working together has grown the ease of joint consideration (both within and outside of committee relationships). Each group achievement has built a greater sense of mutual concern and of "corporateness." Definite progress has been made away from a collection of eight agency diplomats toward a "board of directors" feeling. Still imperfect, this change might be more rapidly completed and other goals (such as management improvement urged by the president and the Hoover Commission) might be attained if the recommendations made by the committee in its reports on "regionalization" and "coördination" early in 1947 were given effect by the bureaus, and the department. (November, 1949.)

CHAPTER XIV

Incipient Interdepartmental Coördination in the Pacific Northwest

TWO EXPERIENCES since 1934 throw some light on the possibilities and difficulties of reaching across the entire region to coördinate the policies and programs of the federal, and to some extent the state, agencies that develop or manage resources. The first of these, the Pacific Northwest Regional Planning Commission, came to an end, after nine years of effort, in 1943. The second, the Columbia Basin Inter-Agency Committee, was created in 1946 and is still functioning. We review first the highlights in the work of the earlier organization.

THE LATE PACIFIC NORTHWEST REGIONAL PLANNING COMMISSION

Interdepartmental and interlevel governmental planning in the Pacific Northwest arose in early 1934 from the necessities of governmental action during a time of acute urban and rural economic distress. The public-works programs to provide relief for unemployment and adjustment in agriculture were the immediate stimuli for a regional planning commission and for the four state planning boards and the county, area, and city planning boards through which much of its work was done. It was on the initiative of the regional advisor of the Public Works Administration and with the encouragement of its central planning committee, the National Resources Board, that this whole planning structure was brought into being. The statutes which underlay the state board system explicitly included advice on public works among the planning functions. The Public Works Administration and the Works Progress Administration regularly utilized the state boards to sift the lists of public works projects submitted to them for approval by local and state agencies.

The regional planning commission was not given an explicit advisory role in these works projects, despite its resolution during the first year of its life that it ought to be used on PWA projects of regional scope. Never-

theless it did informally and intermittently communicate its views on special matters.

While the purposes of the regional commission developed far beyond this public-works aim, its composition reflected its peculiar origin.¹ Its membership consisted of the chairmen of the four state planning boards and the part-time district chairman of the National Resources Board, who also served as chairman of the regional commission and head of the regional office.

As the National Resources Board was metamorphosed, during the following years, by various stages, into the National Resources Planning Board, a presidential staff agency, the district chairman became the immediate representative of the presidential office in the Pacific Northwest on such problems of interstate and interdepartmental planning as were delegated to the field. The first chairman's conviction that sound regional planning required the participation of state and local officials and private civic groups accounts for the decentralized conduct of the regional commission's activities. His lead was followed by the two succeeding chairmen until Congress in the spring of 1943 finally refused to appropriate funds for the National Resources Planning Board. In this way Congress not only killed the central-planning-staff agency for the president, but ended the "commission" effort at regional planning and removed the chief forces working toward coordination of the plans and programs of federal, state, and local agencies relating to natural resources and to the social difficulties incident to the depression and the war.

During its decade of work the regional planning commission and its staff engaged in many activities not directly related to federal interagency matters. They furnished stimuli, technical aid, and guidance to state, local, and private groups concerned with improving the economic base and the social facilities for their people, so many of whom were, during the 'thirties, the victims of economic and weather catastrophes.

The sudden wartime migration to the region's industrial and military establishments created dislocations and community stresses which presented another crop of acute difficulties whose solution often required three-level action—local, state, and federal. In this situation the regional

¹ The mature aims were later stated by its chief of staff in the following words:
Improving and securing the resource base of the region and component areas.
Filling gaps in the industrial and employment patterns of the region.
Improving the patterns and effectiveness of public works and services.
Improving the patterns of coöperative organization for planning, construction and management of essential regional resources, works and services.
Improving and widening the understanding of the nature and functions of the regional economy, and those of component areas.

R. F. Bessey, "National Resources Planning Board and Pacific Northwest Regional Planning Commission in Program of Planning for the Pacific Northwest." *Northwest Industry* (December, 1942).

planning commission found opportunity to lead by persuasion, research and fact finding, and grants-in-aid of local and state planning. It stood at the apex of a loosely cohering federated planning structure for the Pacific Northwest region, which was trying to bring both public and private purposes into harmony with the objective of more complete, stable, and high-level urban employment, more durable and prosperous agriculture, and a continuing, well-utilized resource base.

The story of this effort in its many ramifications has been told elsewhere.² Here we are concerned with that aspect of its experience which relates to the coördination of plans and programs for the federal departments whose agencies carried on field operations within the Columbia Valley region.

It should be noted, first, that the parent body of the regional commission was in the early years identified with the Department of the Interior, for Secretary Ickes as head of the Public Works Administration was the chief of the original National Resources Board and remained administratively in charge of the staff organization of the National Resources Committee which, as a cabinet subcommittee group, superseded it. Until the president by executive order lifted the planning organization into his immediate executive office in 1939, the efforts at interdepartmental coördination were continually handicapped by the unwillingness of the other departments to accept the guidance of a planning unit reporting through one of their rivals. That unwillingness was probably most pronounced in Washington but was also reflected in the attitudes of some of the federal field establishments, particularly in those older organizations content with their places in the federal developmental planning sun. The newer federal action agencies, such as the Resettlement Administration (later changed to the Farm Security Administration) and the Soil Conservation Service, were glad of the public attention and support which the publications and conferences sponsored by the Regional Planning Commission (and the state and local planning-board studies) gave to their programs. The Forest Service field officers were particularly coöperative and energetic in these activities, which gave them an opportunity to educate the regional public in the unsolved problems of forest and grazing conservation and sustained yield.

While the structure of the regional commission denied membership to the federal operating agencies, their field representatives furnished a large part of the man power used and of the information developed by the technical committees which the regional commission and the state boards

² See particularly: *Regional Planning, Part I: Pacific Northwest*, pp. 135 ff.; Charles McKinley, *Five Years of Planning in the Pacific Northwest*, Northwest Regional Council (May, 1939); R. F. Bessey, "National Resources Planning Board and Pacific Northwest Regional Planning Commission in Program Planning for the Pacific Northwest," *Northwest Industry* (December, 1942).

created. These committees were projected on a comprehensive scale to cover the entire spectrum of governmental purposes in the region.

Actually it was the water and land committees, and certain of their sub-committees, which functioned best and furnished to the commission information and reports on special problems for commission consideration. Their federal members played the most active role, in part because their regular duties in prosecution of their agencies' water and land programs enabled them to travel, attend meetings, or obtain information, which were essential to effective technical committee work. When the regional commission undertook the preparation of special reports, sometimes specifically requested by the president, through the National Resources Committee (Planning Board) its special staff under the direction of the commission's own regional counsellor was usually assisted either by staff assigned by one or more of the federal operating agencies in the region or by special supplementing studies undertaken within those agencies. This was well exemplified in the Columbia Basin report, which appeared in 1936 as the first regional planning report under the auspices of the National Resources Committee. For that report the Corps of Engineers, the Bureau of Reclamation, the Forest Service, and the Resettlement Administration assigned staff representatives in the field to aid in the collection and analysis of data and the preparation of recommendations.

A second illustration of a process which tied the federal agencies, through their field representatives, into the planning work of the regional commission followed the president's call in 1938 for a special report on the land and migration problems created by the flow of families from the desiccated Great Plains states into the Pacific Northwest.³ The commission's staff enlisted the active coöperation of field officers of the Bureau of Reclamation, the General Land Office, the Grazing Service, the Forest Service, the National Park Service, the Indian Service, the Geological Survey (conservation branch), the Bonneville Power Administration, the Public Works Administration, the Bureau of Agricultural Economics, the Farm Security Administration, the Extension Service, the Corps of Engineers, and the Social Security Board.⁴ There were no departmental unifying centers of information and coöperation so that direct relations with each operating agency were essential in building this interdepartmental survey organization. This study was followed in 1941 by a further examination of the same and related problems caused by the accelerated wave of migrants who

³ See *Migration and the Development of Economic Opportunity in the Pacific Northwest*, Pacific Northwest Regional Planning Commission (August, 1939, mimeographed). *Development of Resources and of Economic Opportunity in the Pacific Northwest*, Pacific Northwest Regional Planning Commission, National Resources Planning Board (1942).

⁴ Bureau of Agricultural Economics coöperation through staff assignment was especially important.

flocked into the region to man the war industries. In both of these research efforts, the commission drew into its work the active and essential participation of the nation's principal land and water agencies.

Unquestionably the result of these studies and of others which were launched was to improve the atmosphere for interagency federal coordination. Agency activities and objectives were necessarily placed in a context broader than bureau particularisms, broader even than the entire federal responsibility. Men increased their familiarity with programs outside their own organizations; in committee meetings, at sessions of the regional commission, and at the annual regional conferences, exchange and ferment of ideas proceeded even though not marked by formal official agreements. This does not mean that the commission was able to erase conflicts stemming from divergent interests in basic jurisdiction or to win always a regional outlook in place of narrower views. Certainly it did not convert the Corps of Engineers or the Bureau of Reclamation officials to its recommendations that (1) a regional high-voltage grid be built to tie the generators at Grand Coulee and Bonneville dams with each other and with major load centers, particularly Puget Sound; (2) that a "postage stamp" uniform rate be adopted to spread the benefits of low-cost power throughout the region; and (3) that a public corporation be created to operate the new federal transmission lines and related power facilities, and market the power. While the first two of these recommendations were ultimately accepted by the president and Congress as basic policies, they did not rest upon the consensus of the construction agencies.

On the other hand the commission's special report *Forest Resources of the Pacific Northwest* (completed in 1938) buttressed the objectives of the forest-management agencies of both the Department of Agriculture and the Department of the Interior and helped to spell out conservation steps to be taken at every level of government as well as by private industry. By its wide dissemination it gave to all the advantages of a greatly widened public interest and understanding.

Of special interest, from our standpoint, was the organization, under the direction of the water-resources committee of the National Resources Committee, of drainage-basin committees and subcommittees for the river systems of the nation. One of these was the Pacific Northwest Drainage Basin Committee, which in turn was divided into a number of subbasin committees. Strictly speaking these committees were not a part of the regional planning commission's jurisdiction, but, as is indicated below, they were tied to it via the commission's regional counsellor. This structure was the instrument for a series of national river-basin reports on water conservation and development problems, and for the continuing annual review of river projects proposed for public-works programs.

In this river-committee pattern of interagency program correlation, the federal water agencies probably played the dominant role, for a majority of each committee usually came from the federal government. However, the states were given representation. The main committee was chaired by the regional counsellor of the National Resources Committee which also provided a distinguished West-coast hydraulic engineer as a special water consultant to the committees. The Corps of Engineers was the most influential federal agency on these basin committees, if for no other reason than that the centralization of field organization in the Bureau of Reclamation, which had not yet been regionalized, frequently led to the absence of their spokesmen from committee meetings; when their field men did attend they were often not sufficiently informed about bureau plans outside their own particular projects either to contribute information or to express a basin-wide point of view.

As a device for developing an integrated program for river-development projects, the basin-committee system was a useful beginning. But it fell far short of the need. This was the result partly of the unwillingness of the established river-planning agencies, such as the Corps of Engineers and the Bureau of Reclamation, to accept the mediation of the National Resources Committee and its satellite field committees; and partly of the aversion of the local and state officials and pressure groups and their responsive Congressional spokesmen to any plan that interfered with the good old methods of pork-barrel priority. Even so, the army engineers and the bureau profited from the committee deliberations. The committee's accumulated information about other agency activities and interests provided the Corps of Engineers with knowledge which, with the quadrennial shifts in its district leadership, it would otherwise have often overlooked or misunderstood. That the army plans needed such external information and points of view is well illustrated by its *post hoc* addition of salmon facilities in the Bonneville Dam. No adequate study of the fish-migration problem was made until after the initial designs had been completed and construction begun.

The recommendations in every major regional study undertaken by the regional planning commission were replete with calls for federal assistance. For example every one of the many proposals of the 1939 study of "Migration and the Development of Economic Opportunity in the Pacific Northwest" called for assistance from one or more federal agencies. Yet the structure of the regional planning commission was never amended from its original public-works emphasis to reflect the paramount federal financial and administrative interests to which report after report called attention. So sensitive were members of the commission, including the three successive chairmen, to state purogatives that they were unwilling to dilute or

displace the preponderant representation of the states for fear of federal domination.

The 1936 Columbia Basin report acknowledged differences of opinion as to its membership, but expressed agreement that the national interest should be better organized for consultation with the planning commission. It suggested that a coördinating committee selected from the federal conservation, development, and public-works agencies might be brought "into a strong, well defined and effective relationship with the regional commission." However, it went on to say that this proposal did not intend to increase federal membership on the commission itself, since to do so would render it less regional and less representative of the states. It suggested further that this proposed federal committee should meet under the chairmanship of the commission's chairman and that it be authorized to work out all problems of relationships between federal departments in the region and between federal and state agencies (except in the power producing and marketing function) "in order that greater unity of purpose and energy of execution may be displayed."⁵

During the life of the regional planning commission the Departments of Agriculture and the Interior, whose agencies were so continually concerned with its activities, had no regional mechanism for intradepartmental coördination. No member of a single agency could reflect a departmental point of view, give information or express policy attitudes representing an integrated consideration of departmental policy. This was one great obstacle to making effective the regional planning commission's concession to federal interest in the over-all planning process. But there were other difficulties—lack of authority of many field officers to speak for their agencies, uneven and limited delegations of authority to field officers, inadequate budgetary powers, jurisdictions that did not heed the regional boundaries, inadequate information, narrow technical interests, limited social conceptions of operating field officials; all these impediments in greater or lesser degree stood as obstacles to incorporation at the top commission level of federal agency representation. At its demise in 1943 this problem was still unsolved.

No federal agency-coördinating committee was ever established and no changes in representation on the regional commission were made. The commission remained an organization dominated by the four chairmen of the state planning boards. Not even the fifth and key member, the commission's chairman, the only paid member, expressed with any official intimacy the federal interest in the region, for he was functioning on a part-time basis. He continued to practice his private profession while carry-

⁵ *Regional Planning Part I: Pacific Northwest*, National Resources Committee (1936), pp. xiii, 9.

ing on his official duties, and his link to federal officialdom was solely through the National Resources Planning Board which in turn was a group of citizens serving the president on a part-time basis. The only continuing tie with federal interests was the regional counsellor of the National Resources Planning Board who was the full-time head of the regional staff and the executive officer of the commission. There thus remained at the regional as well as the national level a wide gap between the thinking, the aspirations, and the proposals of the over-all planning agency and the experience and intentions of the federal operating organizations toward which so many proposals were directed. Structurally, therefore, this single experiment with interdepartmental, interlevel, regional planning reflected the beginning of an uncompleted process and does not offer a fully developed model for the regional coördination of federal planning and operating functions, which must sooner or later be attained.

Its greatest organizational success was probably achieved through its aid to and support of state and local planning. Yet, sadly enough, when it disappeared and its technical guidance and financial assistance were withdrawn, much of the state and local planning activity also ground slowly to a stop. State planning continued for a time in Washington and Montana but today little remains in either state save that some of the work and policies have been incorporated within the Department of Conservation in the former and the water board in the latter. Interest in joint state-regional planning revived for a brief period in 1944 in the form of a five-state governors' group called the "Northwest Development Association" but it soon died of state particularism, gubernatorial changes, and indifference.

Nevertheless, despite the circumstances in which the Pacific Northwest Regional Planning Commission was born and in which it worked, it made a great many significant and lasting contributions to regional improvement. It was led by gifted chairmen who knew the region well, who saw most of its key needs and were relatively free from state or agency particularisms. In a real sense they, with the help of a small, continuously employed, able, and broad-gauged staff, furnished some of the same kind of orientation for public and private endeavor as has been so notable under the leadership of the TVA board in the Tennessee Valley. Through such leadership and the civic and official discussion which it continually stimulated, the regional commission greatly increased the number of active minds at work on the many facets of the region's public problems. They brought to the forefront of public consciousness as never before the idea of region-wide needs and values; they increased the understanding of the region's stake in the welfare of other regions and in national and international policy. They moderated the myopia of much public-works promo-

tion effort. They gave a great impetus to the recognition of the importance of research and the preparation of basic data in order to prepare properly plans for governmental action. In countless ways the activities of the regional planning commission created a leaven that is still at work. It is probable that its most important federal inheritors have been, first, the Bonneville Power Administration and, second, the Columbia Basin Inter-Agency Committee. To the latter's story we now turn.

THE COLUMBIA BASIN INTER-AGENCY COMMITTEE (CBIAC)

Three years after the Federal Inter-Agency River Basin Committee began its attempt to integrate river plans at the national level, it decided, on February 5, 1946, to establish its second field subcommittee, the Columbia Basin Inter-Agency Committee, in order to provide "a means through which the field representatives of the participating federal agencies may effectively interchange information and coordinate their activities among themselves and with those of the states in the planning and execution of works for the control and use of the waters of the Columbia River system and the streams of the coastal drainage areas."

The membership pattern followed that of the Missouri Basin Inter-Agency Committee created the year before, except that in addition to the representative from the Department of the Interior (the regional director of the Bureau of Reclamation), the Bonneville Power Administration was given separate representation. The federal agency members consisted of the division engineer of the North Pacific division, U.S. Army; the regional director, Bureau of Reclamation (Boise); the regional engineer of the Federal Power Commission (San Francisco); the special field representative of the secretary of the Department of Agriculture; and the administrator of the Bonneville Power Administration.

This recognition of BPA's special interest was due to the desire of Administrator Raver to use the same membership for the Bonneville Power Administration's advisory board, as well as to the vital concern of his agency with the total economy of the Pacific Northwest including the rate and character of river development. Early in 1947 a field officer of the Department of Commerce was added to the federal-agency membership, following the admission of the secretary of commerce to the parent committee at Washington. State representation was accorded the governors of Oregon, Idaho, Montana, Wyoming, Washington, Utah, and Nevada, but the governor of Washington declined to participate.⁶ Each governor has

⁶ Governor Wallgren's declination asserted the predominant interest of the state of Washington in the Columbia Basin and his unwillingness on that account to accept a merely equal status with representatives of other states with minor or nominal interests. There is reason to think that his real reason was unwillingness to participate in a substitute for a Columbia Valley Authority. As a matter of fact the governor has had

chosen as his representative a state official connected with one of the water-resource departments, such as the state engineer, the state water-conservation board, or the state reclamation engineer.

The committee was authorized to select its own chairman who serves for one year, each federal agency to receive in rotation the honor of this post. Colonel Theron D. Weaver of the Corps of Engineers, the first chairman, was succeeded on June 30, 1947, by R. J. Newell of the Bureau of Reclamation.⁷

It is too early to be optimistic about what may be accomplished by this new mechanism for coordinated river development and management. Its most promising fields of endeavor, like that of its Washington counterpart, appear thus far to lie on the technical level. Through a subcommittee on hydrology a program of needed studies in that technical field was prepared and endorsed by the main committee. That program stressed the need for more complete ground-water studies and particularly urged the support of the USGS 1948 appropriation requests for a ground-water program. It also recommended the extension of snow-survey courses and frequent analysis of data for circularization among vitally concerned federal, state, and private agencies. It endorsed the suggestions of the USDA technicians for additional investigations "on effects of geologic factors, watershed management, and land use practices, on infiltration, erosion and siltation." Following this general survey of hydrologic needs, the subcommittee prepared a master net of stream-gauging stations (existing and proposed) for the whole river system under the committee's jurisdiction that should be recommended for continuing federal support. That network plan was completed in the spring of 1948 and is ready for presentation to the full committee. If it is accepted, it will go forward to the Federal Inter-Agency River Basin Committee with the expectation that, if approved there, Washington inter-departmental backing for budget requests to carry out the plan will be forthcoming.⁸

an "observer" at every meeting. During the latter part of Wallgren's regime his head of the state department of conservation (who was also a member of the state's Columbia Basin commission) attended meetings and took an active part in committee discussions. When Langlie succeeded Wallgren, the state of Washington officially accepted membership in the committee. (November, 1949.)

⁷ On the expiration of Newell's term the regional engineer of the Federal Power Commission became chairman and in June, 1949, the new field representative of the Department of Agriculture succeeded him. (November, 1949.)

⁸ Since mid-1948 this subcommittee's proposed master network of stream-gauging stations has been held up by the Washington Federal Inter-Agency River Basin Committee to which, on approval by the CBIAC it was sent in the summer of 1948. The Washington committee's objection to the plan was that a similar basic network program was needed throughout the nation and that until that could be worked out for all rivers it was not desirable to go ahead on the Columbia. Thus the program has been stymied. This subcommittee has been proceeding, however, to develop a plan for the adequate forecasting

Next, the hydrology subcommittee turned its attention to the preparation of a similar network of snow courses to be added to those already covered. A series of similar programs for other aspects of hydrological data recording will probably keep this subcommittee busy for some time.

A second technical subcommittee has been reviewing the materials prepared by a technical subcommittee of the Washington committee on the problems encountered in calculating benefits and costs of river projects. It was asked to study legislation affecting these matters. It also proposed to make "payout studies" for existing and proposed major river structures on the Columbia at which hydroelectric energy is generated or storage for it provided. However, the cut in appropriations for the fiscal year 1948 so limited the staff that might otherwise have been assigned to these jobs that the committee has done virtually nothing save to follow the releases of its technical counterpart at Washington. While the latter has possessed a full-time staff, it has during the course of three years produced little but expository statements of current practice among the several development agencies. The hard job of criticizing cost and benefit principles and assumptions has not yet been tackled by any unit in this river-basin-committee structure.⁹

The first subcommittee assignment illustrates the slowness with which this interdepartmental agency got under way. This was the preparation of a handbook giving the outstanding facts about the region, the work of the several departments represented on the committee, and some of the

of runoff on the Columbia River watershed. This is a matter of increasing importance as more river structures are completed and the time for integrated operation approaches, as more land is irrigated and more water is required for domestic and industrial purposes. The committee has indicated that there is a probable need for a continuous forecasting system which will serve not only flood control but all these other purposes. How to organize for this purpose and what additional facilities will be required are technical and administrative issues of high importance. (November, 1949.)

⁹ During the past year the subcommittee has gone a step further and has criticized a study prepared by a special committee of the American Society of Civil Engineers. It has also suggested general criteria that should be applied in fixing policies for the assessment of charges for multiple-purpose projects. The subcommittee's basic theory was expressed in the following sentences included in its report to the CBIAC on June 8, 1949:

"It is the opinion of the sub-committee that the matter of charges for the products of a multiple purpose development *should not be approached from the point of view of the reimbursement of the costs but that it should be considered in the light of the broader and more fundamental objective of furthering the basic purposes for which the project was undertaken in the first place, namely, a net gain in the national income—the greatest good for the greatest number. . . .* It must be borne in mind that the project is not undertaken in the first place unless it is estimated that the benefits will exceed the costs. In other words, the costs will be returned by the economy as a whole."

This report was considered at the August, 1949, meeting of the CBIAC and it was then decided to instruct the sub-committee to develop and illustrate this principle further so that the recommendations might be considered in connection with new legislation. (November, 1949.)

questions with which it would be concerned. It took a year and a half to prepare this document and six months more to get it cleared in Washington and published. Some of the delay was the result of disputes over what should get into the volume, for a number of members claimed so much for their jobs as to trench on prerogatives claimed by others. There was suspicion lest the volume suggest too much coördination and planning jurisdiction for the committee. When finally this elementary but useful statement was accepted, neither the chairman nor the committee had funds for its reproduction. Accordingly the Corps of Engineers financed and distributed it.

The Columbia Basin Inter-Agency Committee has no money or staff of its own. This has continually handicapped the work of the technical subcommittees, and it speaks well for members of the latter that they have been willing to use a good deal of their own personal time to carry through a number of assignments.

Even the secretarial work for the committee is dependent upon gratuitous service from the agency whose representative acts as chairman. The time and cost involved in arranging for the monthly committee meetings, taking notes and organizing the minutes and arranging for subcommittee work, warrant a small special committee staff. If the committee is to function properly it will require an independent budget so that it can employ such secretarial and technical personnel as its evolving duties may require. If it meets the challenges of basin-wide coördination that may and should be thrown in its direction, its need for a highly qualified staff will increase and should be promptly met.

The committee's chief activity during its first year and a half consisted of monthly meetings for the exchange of information about the principal water-resource activities and program events of the month relating to the several federal bureaus and states. These reports were directed as much toward the education of the general public as toward orientation and information of the committee members. All meetings were open to the public, and, since they were held in different cities throughout the region, they were attended by state and local officials interested in certain phases of the federal programs, by newspapermen, and by a considerable retinue of lesser officers from the federal-agency members.

This use of the open public meeting, without executive sessions of the committee itself, was a replica of the policy pursued by the Missouri Basin Inter-Agency Committee, which was also initially chaired by a representative of the Corps of Engineers. Its principal utility was that of informing and impressing the public with the value of the several programs. However, coördination in the usual administrative sense of that term cannot be

effectively practiced in the atmosphere of a public hearing. Some members and observers showed growing impatience with this sanhedrin technique and a belief that the committee must become a working group trying to analyze interagency issues and to arrive at sound recommendations for adjusting the interests of its several member agencies in joint or conflicting projects and activities.

The public-hearing technique used by the committee gave rise to a basic issue of procedure at the meeting in Salem on November 13, 1946. This occurred when an oral exposition by the Portland district engineer of modifications in plans for the Willamette Valley project was followed by a motion for the endorsement of the altered plans. No copies of the written report had been submitted to the members of the committee in advance of the meeting, and thus no opportunity had been given for a review of the army's data, assumptions, or contingent effects on other agencies. This failure to inform the committee members in advance was the basis for a mild protest by the USDA spokesman, who indicated his embarrassment at having to vote on a question about which he felt uninformed and unprepared. He subsequently put into writing his objections to this type of "booster club" procedure. He protested that as a representative of the several agencies of his department he felt he could not perform his function without an opportunity for prior consultation on new proposals involving interagency relations. He declared that he reflected rather than determined the judgment of interested agencies in the Department of Agriculture and therefore could not exercise his personal judgment on major issues presented at committee meetings.

The situation of this departmental representative was similar to that of the member from the Interior Department, who also is intended to reflect the interests and judgments of (potentially) eight separate bureaus. Because the Corps of Engineers is the only unit in the Department of the Army sharing in river-basin development or water-resource management there was no need for the representative of that agency (the chairman) to go outside his own organization in deciding when or how to vote. He was further in a special position because his own plans were approved by the motion. He could therefore readily afford to remind the representative from the Department of Agriculture that the public would be impatient with delays in committee action.

Since this episode the committee has adopted the practice of holding frequent executive sessions. The monthly meeting usually opens with a public meeting when general informational papers are presented by the several federal or state agency members. This is then followed by an executive session in which committee reports are received and additional in-

formational statements presented. The exchange of information has been greatly improved and the request of a single agency for the immediate approval of its projects has not been repeated.

Three problems presented to the committee during 1947 and 1948 will test its adequacy as an instrument of planning and program coordination. The first is the plan developed by the Bureau of Reclamation with the support of the Department of the Interior for a basin-wide repayment plan for federal river projects and for a rule to determine in advance which multiple-purpose projects should be built by the army and which by the bureau. These proposals are part of the recommendations growing out of the Interior Department's Columbia River Basin report recently sent to the president but submitted for confidential review in 1946. Briefly stated, the repayment plan would pool into a single account for the return of project costs that must be repaid to the Treasury, and for fixing power rates, the revenues from power sold from both bureau- and army-built projects, after deduction of costs of operation, maintenance, replacement, and amortization costs chargeable to power. The rate program suggested would be a unified one, with widespread use at low rates as an objective, coupled with a somewhat contradictory obligation: not only to care for the usual operating, maintenance, and replacement charges but in addition for (1) an annual 3-per-cent interest charge and (2) charges allocated to other purposes (namely, irrigation).¹⁰ The suggested rule for deciding which projects each agency shall construct would give to the army the single-purpose navigation and flood-control projects and those in which flood control and navigation are estimated to exceed irrigation benefits. To the bureau would go the single-purpose power and irrigation works and those in which the estimated irrigation benefits exceed the combined benefits of flood control and navigation.

Both of these formulae, and especially the latter, go to the heart of the jurisdictional issues. The formula for a single cost account, while abandoning the particularistic project-by-project system of fiscal liability and therefore economic feasibility, would do so primarily for the benefit of reclamation projects and not of the consumers of hydroelectric energy. One might legitimately add, also for the benefit of the private-power interests in view of the undoubted effect of the proposed 3-per-cent interest charge in addition to the irrigation subsidies from power.

This mode of determining construction jurisdiction would deprive the army of such projects as the already authorized Foster Creek Dam and the upstream storage projects like those in Hell's Canyon on which the army has held public hearings.

It is said that the army had proposed a different formula for deciding

¹⁰ The 3-per-cent interest policy has been modified since this report was first presented.

construction jurisdiction for projects primarily engaged in power production, and that the bureau rejected it. That formula would have divided the river geographically, giving the bureau projects above the dividing point, and the engineers all below.

The discussion in the committee meetings skirted around these main issues. It consisted primarily of a series of questions and answers to clarify the meanings of the bureau's suggestion, though questions from the Army Department and Federal Power Commission spokesmen touched upon jurisdictional points. Since the April, 1947, meeting of the committee when this problem was broached, it has not been pursued further. Possibly the committee's neglect to follow through on these issues is partly the fault of the Department of the Interior which has not asked it to approve the proposals or recommend modifications.¹¹

The second fundamental coördination issue arose from a situation originating within the Department of the Interior which faced the responsibility of resolving the conflicting views and interests of salmon fisheries, Indian rights, recreation, irrigation, and electric-power needs with respect to the proposed series of Columbia River dams. Four operating bureaus have differing responsibilities relating to these divergent objectives. The issue came to a head chiefly because the BPA's concern for meeting the phenomenal postwar power demand had led it to urge an accelerated construction program by both the Bureau of Reclamation and the U.S. Army. The secretary of the interior consequently referred the question to the department's newly organized Pacific Northwest Coördination Committee, which, as explained above (chapter xiii), developed a plan for adjusting these conflicting interests in a way to offer hope of salvaging the salmon runs on the Columbia. That proposal, after modification and approval by the secretary of the interior, was referred to the Federal Inter-Agency River Basin Committee because the navigation interests of the army engineers and the power interests of the Federal Power Commission would also be vitally affected. The Washington committee in turn sent it to the Columbia Basin Inter-Agency Committee for review and recommendation. We have already noted that this plan would run counter to the navigation aspirations of the mid-Columbia and lower Snake communities, because it would have speeded the authorization and construction of the Hell's Canyon and other upstream power and storage projects while deferring

¹¹ These issues were never revived before the CBIAC. Ultimately they were considered and resolved but on a wholly bilateral basis, namely, by the Departments of the Army and the Interior. (See Postscript for that story.) It should be made clear here that the members of the CBIAC have not been clothed with authority either in their charter from the parent committee in Washington, or by their departmental principals, to resolve jurisdictional issues or questions of fundamental policy. What might be accomplished by such an agency were its members given power to bind their departments can only be guessed. (November, 1949.)

the authorized Snake River navigation dams and the proposed navigation and power dam at The Dalles.

A special meeting, primarily to hear the pressure-group spokesmen for the competing vocation and locality interests, was scheduled for late June, 1947. The location of the meeting suggested by the chairman and accepted by the other members was Walla Walla, the active center of upstream navigation agitation. Inasmuch as Walla Walla is five hundred miles away from the chief center of the salmon industry at the mouth of the Columbia River, there was considerable feeling in the latter camp that the chairman had planned the meeting to their disadvantage. Efforts of the Department of the Interior representative to change the location to a more central point, such as Portland, came too late to make the necessary hotel and other meeting arrangements. The fisheries people however turned up at Walla Walla in goodly numbers.

After the two-day hearing the committee adjourned, but agreed to hold a closed executive session the next month to consider the disposition of this problem. The July, 1947, meeting was thus the first session attended only by committee members and staff. It was also the initial meeting for the second chairman, R. J. Newell of the Department of the Interior. Here the Fish and Wildlife Service, through its regional head of fishery studies for the Columbia Basin, explained the proposed fisheries program for the lower Columbia River and tributaries. This program is the principal plan of the FWS for offsetting the harmful effects on salmon runs of the dam-building program on the Columbia and Snake, of which it had asked a partial and temporary moratorium. The committee agreed that the Walla Walla testimony should be turned over to a representative technical subcommittee for careful analysis, and that the subcommittee might gather additional facts and report its findings. Then the committee might proceed to formulate its recommendations upon the proposals of the Department of the Interior. The committee took a second step by creating a standing subcommittee (including representatives from each of the states) to consider other plans for river development. This was clearly a very desirable move in view of the urgent need for a positive fishery-conservation and -development plan and the problem of coördination of effort among the several state and federal agencies.

When the factual analysis was ready and the committee resumed its consideration of the Interior Department's recommendations to resolve the conflict between those concerned with preserving the salmon runs and the power, navigation, and irrigation interests, it endorsed the secondary proposals but objected to the rescheduling of any authorized dams—that item in the recommendations which the fisheries agencies believed the most crucial in the race against time and salmon extinction. It also recom-

mended merely compensation rather than substitution for the fishing rights of the Indians whenever such rights would be adversely affected by proposed projects.

The vote in favor of this vital modification was unanimous, including votes of the two Interior Department agencies on the committee. There may have been sound reasons for this switch in attitude by the Bonneville Power Administration and the Bureau of Reclamation representatives which in their mature judgment were fully warranted. Yet, it is impossible for a student of administration not to wonder whether the result might have been altered if a member on this committee had been directly chosen by the Secretary of the Interior from outside the operating bureaus as his field representative for the Pacific Northwest. If he had agreed to the modifications which carried, he would certainly not have done so without presenting a thorough defense of the case for the reschedule proposal of the department. Such a full presentation was not made by either of Interior Department's members, and it was unrealistic to expect them to do so in view of their sense of agency responsibility for their particular programs, which depended on continuous and, in the one case, accelerated, dam construction.¹²

A third major opportunity to test the capacity of the Columbia Basin Inter-Agency Committee for integrated water planning was afforded by the recent active interest of both the U.S. Army and the Bureau of Reclamation in Hell's Canyon. As explained in chapter ii, the Corps of Engineers ran ahead of the bureau in its exploration of dam and reservoir sites in that great potential water-storage section of the Snake River where hydroelectric power purposes are of primary significance. At the December, 1947, committee meeting at Baker, Oregon, the army was scheduled to present the findings of its recently completed study of a project in Hell's Canyon. The bureau, though furnished with some of the army data, had not seen the report. Without informing the Corps of Engineers, it had determined to stake out its own claim for the development of that part of the middle Snake. Consequently after the spokesmen for the corps had in the morning session given a detailed description of its project study, the chairman (then the chief of the bureau's Boise regional office) at the afternoon meeting introduced the head of his project planning staff who gave a brief and sketchy outline of the bureau's plan for a Hell's Canyon project. Not having been furnished the army's rock drilling and other exploratory data on the alternative dam sites, the bureau chose a site reported on by the army in 1942 but later abandoned as a result of its more complete and

¹² It is to the committee's credit that since taking this action it has on a number of occasions restated its support of the program for lower-river salmon fisheries, and has used its influence to obtain budgetary support for its fulfillment. (November, 1949.)

recent studies. The suggested height of the bureau's proposed dam was an estimate based in part on a guess of the depth required to reach bedrock, so that the total height proposed exceeded that recommended by the Corps of Engineers. The bureau's case for its Hell's Canyon development rested on the thesis that the power revenues from it were essential to further development of irrigation in the southeastern part of the region. The bureau's presentation was not much discussed.

Publicity on the committee meeting (which is the prerogative of the chairman) played up the bureau statement. When the committee adjourned it found that the Baker paper carried a big front-page story discussing the bureau's proposals, with an aerial photograph of the canyon in which, by photographic superimposition, a replica of Boulder Dam (but heading in the wrong direction!) had been located on the bureau site. Similar news and photographic stories were printed in the Portland papers the following day. Thus the bureau in competition for public attention drove the army from Hell's Canyon! It was a "tit" for the army's "tat" the year before when the latter organized the Salem meeting to push through its revised Willamette Valley project proposals. But it was not the stuff from which coordination is bred.¹³

Given the existing splits in federal organization for planning river development, the obviously desirable mode of investigating projects carrying joint interests is through joint engineering studies of location, characteristics, and feasibility. But instead, each agency is a contestant in a race and must therefore make its own investigation. The army was way ahead in this race, so that if the bureau was to have a chance to win, it had to throw considerable sums of new money into its own survey and if possible find fault with the army plans.

The decision to make these races does not rest primarily with the regional representatives who sit on the Columbia Basin Inter-Agency Committee, but with their Washington principals. Thus, like diplomats at an international conference, committee members may speak their own words but the sounds may express ideas laid down by their respective national chiefs. Their principals will have to clothe regional representatives, openly and as a matter of administrative record, with discretion to make field accommodations, to compromise bureau jurisdictional advantage in their region. Otherwise it is not likely that some of the most persisting problems that lie athwart the goal of unified, balanced river development in the Columbia River system can be solved by existing organizations in the region. This is a counterpart of the need we have already explored on the intra-departmental level.

¹³ This extemporized project report was followed up four months later with a formal and properly documented report.

The requisites for interdepartmental coördination on river-basin plans appear to be (1) greater and more uniform delegations of discretion to regional representatives of the several departmental management agencies, and (2) a regional representative of the only office which stands apart from particular agency and departmental loyalties and interests—the presidency. Without a spokesman for the national executive whose loyalty encompasses the total federal job in the region, the committee will lack the catalyzing, persuading, assisting, and integrating factor necessary to yield the adjustments in attitude and policy that the really important federal coördination issues will require.¹⁴

The Bonneville Power Administration proposed to the chairmen in August, 1947, that the committee be used to canvass the programs which the several agencies were planning to incorporate in their budget requests for the fiscal year (1949). While the suggestion eschewed any intention to constitute the committee as a fiscal review agency it did urge the committee to study the areas of activity in which each of the several agencies intended to work during the year so that all programs might be more closely coördinated and welded into a total regional objective. While nothing came of this suggestion, in the spring of 1948 the committee returned to the idea, in expanded long-range form, of reviewing water programs of all the federal agencies and the states as expressed in fiscal terms. On March 10, 1948, it authorized a subcommittee to prepare a six-year program for the Columbia River Basin. The impulse for this, the most ambitious job yet undertaken, came from two sources: (1) a tabular compilation of a six-year project program for the Missouri Basin by the Missouri Basin Inter-Agency Committee and (2) the work of the Department of the Interior's Pacific Northwest Coördination Committee in developing a department-wide regional program for the Interior Department. The subcommittee (on which each federal agency and two of the states were represented) was instructed to keep in mind the following:

- (1) A short concise report, rather than a long and complicated one.
- (2) Segregation of the presently authorized projects from proposed projects.
- (3) Limiting the program to projects concerned with the use or conservation of water or activities concerned with water use and conservation.

As the work has progressed, this rigid framework has seemed to expand and to keep in the center of attention the needs of the people and the nation, and to focus all projects on the question of social and economic value. It has also been determined to present the program on a regional as against a state basis. Whether the review by the subcommittee and its parent group of the data developed by the several agencies and states will be a matter

¹⁴ See chapter xvii for further discussion of this last question.

chiefly of compilation or of genuine critical evaluation remains to be seen.¹⁵

Undoubtedly a number of committee members have become restive over the inadequate results of time and effort thus far invested in this river-basin agency. They have felt that in the handling of the May-June flood-emergency problems the committee should have been the center of both emergency and new planning effort. Instead the Federal Works Agency was pulled into the lead place, and a few of the departmental agencies jumped into the center of the limelight in competition with General Fleming. They have been filled with frustration by such episodes as that of army-bureau rivalry over Hell's Canyon. There is an apparent growing determination either to get somewhere on the major coordination issues "or else."¹⁶

¹⁵ The six-year program was published as the committee's report on October 15, 1948: *Interim State and Inter-Agency Program, Related to Conservation and Development of Land and Water Resources in the Pacific Northwest, 1949-1954*. It was not a critical review, but simply a summation of projects proposed by the several states and federal agencies, translated into estimated cost totals for each of the six years. The introductory text sketches in very general terms the resource problems and needs, and similarly in general terms suggests the needs of correlation. Actually there was no analysis of agency interrelationships required by the different projects and no concrete proposals for attaining coordination where needed. These failures could be discounted as a first step but there is no present indication of an "honest to goodness" follow-up periodical revision which would grapple with these issues. (November, 1949.)

¹⁶ Undoubtedly genuine progress in analysis tasks has been made in the past 18 months. Some of the illustrations of this fact have been indicated in preceding footnotes. Among the more important tendencies and activities the following stand out:

(1). The appointment of a subcommittee on "operating plan" at the September 17, 1948, meeting. At this time the army's "308" review report was about to be released; also completed was the work done the preceding summer at the request of the president by the Departments of Army and the Interior to work out a correlated plan looking toward prevention of the recurrence of the flood disaster of the preceding May-June Columbia freshet. The subcommittee was directed to initiate the study of those factors involved in developing a coordinated plan for operating the release and control of waters from the reservoirs under construction and authorized in a Columbia River development program. These instructions were later made more specific. They resulted in a report, dated June, 1949, on a *Coordinated Operating Plan—Existing and Authorized Federal Plants in the Columbia River Basin*. The report set down the rules that should be followed in operating Hungry Horse and Grand Coulee reservoirs in order to suit the best interests of power, flood control, irrigation, and navigation. The principal contribution to these several purposes was to be attained by careful timing and programming in the operations of these two reservoirs, and especially those for Hungry Horse.

Under the plan suggested maximum benefits for all purposes could be attained. These included the development of 3,540,000 kilowatts of prime power, pumping power, and water to irrigate 1,000,000 acres of land, direct flood-control benefits on the Flathead River and incidental benefits on the lower Columbia, and navigation benefits on the Columbia above Bonneville Dam. The report included rule curves to guide reservoir operations. It concluded by pointing out that the proposed plan of operations would require continuing modifications as changes in the system of reservoirs occur and as forecasting procedures and water-control techniques improve. As each new storage reservoir is added to the system great increase in operating complexity will ensue.

The committee was continued to work on an operating plan which would embrace additional plants proposed in the army's review report, to make depletion studies on

the upper Snake, and determine return flows from the Columbia Basin project. Meanwhile a new task force was assigned the job of constructing a design for an operating organization to run the operating plan brought in by the first committee. The new committee is still wrestling with this assignment which takes it into the center of agency-jurisdiction prerogatives and raises the question of whether any organization for operating a complex multiple-purpose reservoir system can be designed without unifying the entire water-development-federal-agency structure.

(2). In the summer of 1949, largely on the initiative of the representatives of the Departments of the Interior and of Agriculture (who on their own regional departmental committees were already wrestling with the same problem), a subcommittee on land problems was appointed to initiate work on land planning for the region. It was a doubly propitious time to start this project because the new field representative of the secretary of agriculture (who was also beginning his service as chairman of the CBIAC) was resuming the preparation of a long-range regional program for the Agriculture Department. To date the fruits of this subcommittee's work include (1) the formulation of a statement *Objectives of a Long Range Land Plan and Program for the Pacific Northwest* and (2) the beginning of an inventory of the land functions of various agencies.

[The statement above noted was presented to the CBIAC and adopted tentatively on November 16, 1949. It is a series of very general policy objectives, which ought to be taken for granted were all governmental participants, federal and state, conservation-minded.]

(3). The problems of water scarcity in some parts of the region consequent upon the increasing drafts on this resource coming from industrial, municipal, irrigation, and other uses, led to the recent creation of another subcommittee on problems of water supply. This has not yet had time to produce an analysis of water supply problems.

During the last year the governor members of CBIAC have used it for two principal purposes, aside from that of general information: (1) to dramatize their opposition to the existing army-bureau-BPA plans of development, and (2) to stake out claims for compensation to Montana, Nevada, and other headwater states for waters originating in those states which produce power, irrigation, and other benefits downstream. (November, 1949.)

CHAPTER XV

The Tennessee Valley Authority as a Model: Its Job and Its Methods

DURING THE very process of its birth the Tennessee Valley Authority began to attract public attention. TVA not only had behind it the interest generated by many years of controversy over Muscle Shoals, but it was the beneficiary of the combined paternity of Senator George Norris and President Franklin D. Roosevelt, then at the height of their unusual national popularity. Furthermore, the boldness of the conception expressed in the TVA statute, and the capacity for dramatic exposition and action evinced by the first chairman and his associates, captured the imaginations of millions of people outside the valley. It was not long before the towns TVA built and the river structures it brought into being lent themselves to striking picturization and thus to advertising TVA's achievements in concrete and spectacular ways. In addition, the vigorous controversies with private utilities in the valley made the headlines frequently. Behind these stories and pictures lay the interest attaching to the social changes being stirred up in a backward but picturesque region. There can be no doubt also that the TVA board was skillful and indefatigable in interesting in its work the people not only of the valley but of the nation.

So it is that in the Pacific Northwest, as in other regions of the West, the TVA has become the ideal—the model—for a large number of citizens dissatisfied with the operation of traditional federal resource-management agencies. Its virtue as a solvent of interagency conflict and also as a provider of the good things of life for the rank and file of the public has been widely and vigorously acclaimed. This enthusiasm has been equaled only by the abhorrence with which other groups, particularly organized business, commercial, and trade associations, have greeted the same administrative idea. Few have been neutral or agnostic in their attitudes. Hence, it seems essential to any appraisal of the issues that are central to this study that we understand what the Tennessee Valley Authority has been doing these

past fifteen years and how as an administrative agency it conducts its several tasks.

Nature of the Tennessee Valley and Its Problems

The Tennessee Valley is a region of about 56,000 square miles, shaped like an irregular crescent about 1,000 miles long and 150 miles wide at its broadest part. It has great diversity of climates, topography, soil, vegetative cover, and types of farming. One-third of the watershed is mountainous, for the most part covered with timber, and two-thirds is in farms with a population density in the middle 'thirties of 48.5 farm dwellers per square mile in farms. About half of the total farm area is in woodland, some of which is pastured; the other half is in meadows, crops, and pasture. In Tennessee, which is fairly typical of the region, the average farm contains 70 acres, only 44 of which are available for crops and pasture, or about 8.9 acres per person for the entire valley population. Moreover, the tendency over several decades has been toward a decrease in the size of the farms. The destruction of the original forest cover followed by fire has in the course of generations greatly depleted the forest and soil resources. The Tennessee watershed, like the whole Appalachian plateau, is a "badly eroded and eroding region" because of "the relatively steep slopes, the high annual precipitation, the lack of soil protection through freezing in winter, the long period elapsing since settlement, and the previous dominance of erosion-permitting row crops."¹

In 1933 about 3,000,000 people lived in this valley, a large number of whom were victims of economic difficulties. Their per-capita income, urban and rural, was less than half the average for the United States as a whole. The social situation was preponderantly one of rural poverty; only one-fourth of the population lived in towns of 2,500 or over and 54 per cent were actually farmers. This preoccupation of the Tennessee Valley to agriculture is striking in comparison with the Columbia River Valley, also a region of extracting and agricultural activity, where less than one-quarter of the people in Oregon, Washington, and Idaho actually live on farms.² To one who has seen at first hand the living conditions of many of the farm folk in the Tennessee region the following undramatic summary of the situation in the early 'thirties seems very conservative:

¹ Carlton R. Ball, *A Study of the Work of the Land Grant Colleges in the Tennessee Valley Area in Cooperation with the TVA*, p. 8.

² The census of 1940 revealed considerable urban drift within the Tennessee Valley since the coming of the authority. In 1940, 30.6 per cent of the people were living in cities and only 46.1 per cent on the farms. In addition to this drift to the cities inside the valley 200,000 persons were lost through migration to other states. In the decade from 1930 to 1940 the valley farm population increased 6.1 per cent, while the total non-farm population gained by 18.7 per cent.

The inevitable result of uneconomic land holdings, excess population, and sometimes poor soil also, has been a relatively low production per acre and per capita. This has caused a relatively low standard of living for a considerable part of the population, both owners and tenants. Inability to provide adequate machinery, soil amendments, and fertilizers caused low production per acre. Small acreage resulting from small original holdings and increase in population has kept production per capita low. The growing population also has forced farming farther and farther up the steeper and more rapidly eroding slopes.

The production of primary food and feed crops, both plant and animal, is not sufficient for the needs of the Tennessee River area. Cotton and tobacco are the principal surplus commercial crops. They do not produce sufficient cash income to balance the deficit caused by the necessary purchase of deficient food and feeds. Increasing acreages of the soil-depleting cash crops, grown in an attempt to overcome this cash deficit, have resulted in the more rapid deterioration of land resources through soil erosion and depletion of fertility. Until the eradication of the cattle tick in recent years, the development of a livestock industry was severely hampered.

From these bases has developed a condition of dietary deficiency, inadequate housing and equipment, meager transportation facilities, and lack of educational and health opportunities which has restricted the development and useful expression of fine native abilities, entailing loss to the whole country. Thus there has been a vicious circle of continuing deprivations, which has not yet been broken for a considerable part of the people of this area.³

Clearly the Tennessee Valley region urgently needed help to lift its standard of living to a decent American level. It was a rural region as preponderantly engaged in farming as North Dakota, the most agricultural state of the North, and yet, unlike the latter, did not produce enough primary food for the needs of its own people. This was the social situation confronting the TVA when it began its work in 1933.

The Job of the TVA

The general purpose of the TVA as stated in the preamble of the act is to operate the United States nitrate facilities at Muscle Shoals "in the interest of national defense and for agricultural and industrial development, and to improve the navigation in the Tennessee River and Mississippi River Basins." This general task was spelled out in considerable detail in other provisions of the act and in subsequent presidential orders which the act authorized. The authority was charged with the construction of a system of dams and reservoirs on the main river and its tributaries so as to provide a nine-foot channel in the river from Knoxville to its mouth and to maintain a water supply for that channel, all in the interest of promoting navigation on the river and controlling destructive flood waters on the Tennessee and in the Mississippi drainage basin. The statute differs from those

³ Ball, *op. cit.*, pp. 10-11.

which have become standard for authorizing the work of the Corps of Engineers and the Bureau of Reclamation in that it authorized a system of structures instead of particular projects. The act did require the authority to report to Congress by 1936 a general plan for the unified development of the river, but gave to it the right to work out a complete program and to proceed with construction whenever money should be made available by subsequent appropriations.

The TVA report of 1936 entitled "The Unified Development of the Tennessee River System" recommended the construction of twelve major dams and reservoirs, including those already completed or under way. Nine of these would be main stream structures to complete the navigation program over the 640-mile waterway from the mouth of the river to Knoxville. The other three were to be tributary structures. As a result of the war and the urgent need in that region for greater hydroelectric facilities the 1936 program has been expanded so that the system now includes the nine completed dams on the main river together with fifteen storage structures on the tributaries, all owned and operated by the TVA. In addition, five smaller tributary structures owned by the Aluminum Company of America are, under an agreement with the TVA, operated as integral parts of the river system. A few more tributary structures to this system of twenty-nine dams and reservoirs may be added, but the essential river-system control program has been completed.⁴

The construction of the major stream facilities included not only the building of the dams, navigation locks, and power-generating facilities, but also dredging operations in the upper reaches of each main-stream reservoir. This task resulted from the requirement that the authority complete a nine-foot channel for navigation up to Knoxville. (It is actually about eleven feet in order to carry nine-foot-draft boats safely.) Because these jobs were not large enough to interest private contractors, TVA has owned and operated a floating plant.

To summarize this development, within a period of twelve years the authority planned, designed, and built sixteen dams and prepared as many reservoirs to receive the newly impounded water.⁵ For several reasons it carried out this program by the direct employment of construction crews as against the traditional federal-agency practice of building by contract: first, the urgent need to get relief work under way as quickly as possible; second, the desire to have trained crews and a well-knit construction organization able to move from project to project and improve their efficiency

⁴ Four TVA-owned tributary dams and reservoirs and one of the main river dams were acquired from the Tennessee Electric Co., when the TVA purchased its properties. (See the *TVA Handbook*, p. 21.)

⁵ Work on Watauga and South Holston was suspended during the war, but resumed in 1947.

as experience ripened; third, the desire of the board to maximize the social usefulness of the construction program through training the local rural population of this backward region in permanent vocational skills for use in industries and on the farms when construction should be over. This method also gave the authority greater opportunity to improve the living standards of the people. Thus TVA undertook to perform its construction work as a model employer: First by assisting the local governments to provide educational opportunities for the construction force and their families; the fact that a large number of the construction projects were located in rural territory made such augmented facilities essential. Second, TVA was interested in providing local government services adequate to the needs of the new construction population. Third, it planned and built decent construction towns with housing and community facilities essential for a healthy and efficient population. Fourth, it was concerned with improving library and recreation facilities.

Undoubtedly this force-account method of handling the construction work has been one cause of attack upon the TVA because it offered no profits to the construction firms accustomed to building for federal agencies. However, had the authority not adopted this procedure, it is exceedingly doubtful that it would have undertaken its program of social by-products in education, health, recreation, and housing, services which, once performed, have tended to continue after cessation of TVA construction activity. There can be little doubt that interest has been stimulated on the part of the older federal developmental agencies in emulating this in their own future dam constructions.

A glance at this type of activity in the Tennessee Valley emphasizes the contrast between the policies of the TVA with regard to the welfare of the construction community and those of the older development agencies which have been operating in the Columbia River Valley. That contrast is well illustrated by the character of the villages established by the TVA in rural or uninhabited territory as compared with those which simultaneously grew up around the Bonneville and Grand Coulee dams where little or no attention was given to the essential needs of the rank and file of the construction workers or their families. The Bureau of Reclamation and the army took care of their own supervisory employees, and the contractors built facilities for their key staff, but the bulk of their construction workers fell victims to the exploitation of enterprisers in real estate, boardinghouses, bawdy houses, taverns, and other businesses, who hastened to give them inferior facilities for fancy prices. Unsanitary, dirty, firetrap quarters were the rule. Shacks for workers' families jammed end to end and side to side defaced the steep hillsides on the Oregon side of the river at Bonneville Dam. No decent, well-planned, general community recreation

facilities were provided at that site on either side of the Columbia. At Grand Coulee a desert city sprang up on the plateau above the dam. It was (and still is) a wide-open town full of dirt and noise, a rendezvous for parasites, and equipped with the barest of community requirements.

Norris is an idyllic dream town compared with these, and even the much more modest village built for Fontana Dam workers was by contrast a haven of beauty, peace, and comfort. Just as the private contractor on a big federal project remote from hotels, restaurants, and other community facilities must make some provisions for at least the key members of his crew, so the TVA provided and operated restaurants, stores, and hotels in its construction villages. The fact that its view of workmen needs was more humane and inclusive than that of the usual contractor means only that its facilities have been ample for a larger part of the construction force and have been carefully organized and managed. It is from these incidental construction-camp tasks that most of the illustrations have been taken to prove the allegations of "socialism" and "communism."

The second major benefit from the force-account construction policy has been the speed with which the new structures urgently needed for war production were rushed to completion. Thus Douglas Dam, begun in January, 1942, was generating electricity in March of 1943. Douglas Dam cost approximately the same sum as Wheeler Dam, one of the initial structures, which took three years to bring to the same stage of use. It is believed that this accelerated rate of construction was the result, in large part, of the skills developed by a permanent crew, and of the perfection of organization procedures through repeated construction experiences.

In planning for its projects the TVA was authorized by the statute to cooperate with federal, state, and local agencies "in the readjustment of populations displaced" by the reservoirs and by acquisition of land for the protection of watersheds. Accordingly the authority studied the needs of the farmers about to be removed and gave them individual services in the discovery of farming opportunities at new locations. In addition it was necessary to help the towns which were to be partly inundated by the new reservoirs. This was the origin of the authority's city-planning advisory services to local government agencies. That service has been rendered through the instrumentality of state organizations such as the state planning boards to which the authority contributes money for the employment of qualified planning technicians.

It was necessary, in dealing with people removed from reservoir sites, to exercise great care to ease their pain, particularly with regard to those aspects of life about which sentiments are deeply held. For this reason the authority made it a special point to remove the graveyards to new locations. Many school districts were disrupted by the inundation of their buildings

and the loss of taxable property. Their reorganization had to be worked out with TVA assistance. Outstanding bond issues or other fiscal obligations for schools destroyed had to be adjusted with the assistance of TVA funds. A similar program was necessary in connection with county governments, particularly for roads which were destroyed or submerged.

Reservoir Operation and Water Control

A group of twenty-nine reservoirs ⁶ on a single river system would require integrated operations even for a single purpose such as flood control, but multiple-purpose operation necessitates an even more highly organized and carefully planned program. In the Tennessee Valley such a program began when the projects were designed; it was then indicated what each reservoir was expected to contribute to each of the major purposes: navigation, flood control, and power. The tributary reservoirs are not concerned with navigation because the nine pools formed by the main-stem structures (with the aid of some dredging) furnish a nine-foot minimum depth through the entire 650 miles to Knoxville. So the uses which have to be reconciled in multiple-purpose operations are flood control, hydroelectric power, health, and, last in priority, fisheries. While flood control was given statutory preference, its needs were not stated in terms so specific and absolute as were those of navigation. The effort to overcome malaria is the result of the agency's own determination and is given at all times the fullest consideration which operating programs can afford.

An important factor in the reconciliation of flood control and power production is the natural concentration of the greatest flood hazard between mid-December and the first of April. It is then that storms sweeping in from the Gulf of Mexico enter the valley at its lower western end and travel toward the higher elevations in a direction from southwest to northeast. Occasional West Indian hurricane storms, from June to October 15, produce intense precipitation, but touch only limited sections of the upper watershed near its northeast boundary, and are not of major consequence to the whole system. Neither is snow a factor of importance in this climate, for the little that falls disappears quickly, even in the mountains. Systematic stream-flow records for 70 years and historical data for an additional 30

⁶ For the account of reservoir operations which follows I am particularly indebted to J. S. Bowman, chief water-control planning engineer, N. W. Bowden, chief of the water-control section, and A. S. Fry, chief of the hydraulic-data division, of the water-control-planning department of the TVA. I have also drawn heavily upon two articles by chief engineer C. E. Blee, entitled "Multiple Purpose Reservoir Operations, Tennessee River System," in *Civil Engineering* (1945), and a paper *Hydrometeorology* by A. S. Fry and A. E. Showalter. Van Court Hare, assistant to the chief engineer, was also helpful in interpreting some of the technical material and in furnishing graphic illustrative material.

years make it clear that during about eight months of the year the operation of the system reservoirs for protection against flood is not needed, save in a limited part of the upper watershed. Flood protection during that period does not conflict with power uses.

During the flood season it is intended to give maximum flood protection and to serve the other purposes, particularly power, so far as is compatible with that function.

The flood-control plans were worked out with the fact in mind that at two points on the river system the danger from flood was of special importance. These critical locations are at Chattanooga where the presence of a highly industrialized population in a narrow part of the main river valley creates special hazards; and at the mouth of the river where it joins the Cumberland and the Ohio, creating particular danger to the lowlands of that region as well as to those further down on the Mississippi, whenever two or more of these streams are in flood simultaneously.

As the system was designed, a certain part of the upper space in each reservoir was earmarked for flood control. For each reservoir an operating "rule curve" has been prepared which fixes for each day of the year the height above which it is not to be filled except during a flood. These limits have been assigned to each reservoir on the basis of its planned contribution to system-wide protection. During the war, when certain hydroelectric plants were authorized specifically for war production, an exception was made for them. They were to be allowed for the duration of war production only, to operate primarily for power. They have since been covered by the limitations of the multiple-purpose rule curves.

The flood control "rule curves" are based on long-range predictions of storm and flood conditions. But floods are the result of short-time weather phenomena. Actually the problem of operating the reservoir therefore becomes also one of maximizing the protection against each experience on the theory that it might turn out to be a major flood. To do this effectively it is necessary to know (1) the watershed characteristics affecting the rate and volume of runoff, including the variant characteristics of each main and subwatershed; (2) the rates of stream flow in various sections of the river at various stages; (3) the intensity of the storm, its probable duration, and rate of movement; and (4) the probable area to be covered by the storm.

In 1930 the TVA made an agreement with the U.S. Weather Bureau for a special hydrometeorological staff to forecast storms in the Tennessee Valley. Thus in addition to its own hydrologists, who are responsible for studying the stream and watershed flow characteristics of the valley and compiling all the hydrological data relevant to planning and operating the system, the authority has had the assistance of the Weather Bureau. Its

forecasting staff is prepared to estimate quantities of precipitation in advance of approaching storms for each of the seven major subdivisions of the valley which experience storms has shown to be significant units for forecasting and operating purposes. The forecasts anticipate the weather for three-day periods (and during flood season five-day extended forecasts are also made). The forecast of the amount of precipitation is limited to thirty-six hours, though it is probable that this too will eventually be extended. The quantitative precipitation predictions are then converted by the hydrologists into quantitative figures of watershed runoff and river flow.

Early each morning during the flood period a preliminary forecast is ready for the TVA water-planning engineers, which is refined upon the basis of later weather information into a complete corrected forecast for 10 A.M. At 11 A.M. a combined conference between the Weather Bureau and the TVA staff makes corrections in the water-control program for the day (which was first prepared at 9 A.M.) as well as in the three- to seven-day advance water-routing and control program which is prepared for each reservoir each day. It is thus possible to replan and vary the water-control program three times each day if the latest forecasts indicate this to be necessary.

To supplement and verify or correct the forecast data the TVA engineers operate an elaborate system of rain and stream gauges covering the entire watershed. From 350 to 400 people read and report these recordings and forty-one radio-reporting gauges are used on the higher and more inaccessible parts of the watershed. This radio-reporting gauge was devised by one of the TVA engineers. A station on one of the highest peaks distinguishes rain from snow. Gauges broadcast at two-hour intervals. Since these data are essential to estimates of actual runoff and water conditions confronting each reservoir in flood season, the daily reports from this network are vital to reservoir operations.

Because timing is of key importance in reservoir operation for flood control, experimental studies to determine the rates at which water flows in the river channels and in the reservoirs were important. On the basis of these rates, of the distances between important points in the system, and of the quantitative forecasts, it is possible to develop operating plans to get the water past the critical points with the least damage. As the heavy rains coming up from the Gulf begin to fall in the lower valley, the downstream reservoirs are opened for rapid evacuation. The interval of two or three days before the rain reaches the high slopes of the upstream tributaries permits their reservoirs to be lowered so that when the intense precipitation comes they will be nearly empty. They can then be closed to catch the runoff and so permit the main-stream reservoirs to be still further evacuated; or, if the rain continues heavy below, or the needs of the Ohio and

Mississippi require it, to be held stationary or permitted a controlled rise.

One of the chief objectives in the "game" is to get the water past Chattanooga without rising above thirty feet, which is the beginning of flood stage there. The handling of the runoff from the heavy storm on the upper watershed which threatened Chattanooga in January, 1946, illustrates the flood-operating problem. When the storm began the reservoir behind Fontana Dam on the Little Tennessee River, high in the Great Smokies, was a few feet below the operating "rule curve" norm. As it caught the runoff it shot up some twenty feet. At the same time the big Chickamauga reservoir on the main stem just above Chattanooga also went from its ideal winter point to within five feet of the top of the spillway gates, though not beyond its flood-storage limits. The water level in the river at Chattanooga was held to the beginning of flood stage so that no real damage was done. (Under "natural" conditions, without the reservoir system it would have been ten feet higher.) The great Kentucky Reservoir, last in the lower river, was being evacuated while Fontana and Chickamauga were filling, so that its operating curve showed a dip of more than three feet below the "rule curve" for that season. But a few days later, when Fontana and Chickamauga were emptying, Kentucky rose again, reaching five feet above its "rule curve" level. Similarly, the timing sequences in the operation of all seven main-stream reservoirs and of the tributary storage reservoirs were involved in averting this single flood menace to Chattanooga. It is important to realize that in order to beat the "enemy" some mind sitting at the operating center of the entire chain of river structures had to work out accurately this whole strategic campaign of reservoir operation. It was indispensable moreover that the program be promptly and exactly executed and for that purpose a precise procedure, which need not be explained here, has been developed.

When floods on the Tennessee coincide with those on the lower Ohio and Mississippi the War Department is authorized (under a recent flood-control act) to regulate the release of water from the Tennessee into the Ohio. This requires free and frequent exchange of information between the TVA and the army engineers; also, it requires arrangement of a TVA operating program so as to coordinate the discharges from Kentucky Dam with the army's requirements.

It is easy to lose sight of the fact that even as water is being released and routed for flood control it is also being used, at least in part, for the production of electricity. Of course when water goes over the spillway gates or through the valves opened in the sluices on the tributary high dams it is wasted for power production.

The production of power at all times must be related to the total long-run power program. That, too, is the subject of advance planning, on a

system-wide basis (including the steam plants acquired and built by the TVA) which begins where flood control plans and operations leave off. Curves for the total system requirements are developed showing: (1) the anticipated hydroelectric energy in storage during the entire twelve months; (2) the energy which will be needed to meet expected loads; and (3) the amount which will have to be obtained from steam to care for electric-water-power deficiencies. For each reservoir a separate curve is drawn showing how it is expected to fit into the year's system-wide program. Generally the reservoirs in the main-river plants carry the load during the flood-danger season, while the tributary reservoirs on the higher elevations are inactive as they are held empty or are allowed to fill at the close of the season. During the drier season, from the late spring to early winter, the situation is reversed, and the tributary reservoirs are drawn down so that the water from each is run through its turbines and through every set of turbines in the entire chain of dams below.

The "rule curve" for every reservoir in the malaria-infested part of the valley includes a time program of operations for controlling the malaria-carrying mosquito which breeds in the floating debris and bank vegetation along the still lake shores. For this purpose the main-river reservoirs are brought to full crest in the spring and held for a short time, then dropped to the upper normal operating level so as to deposit the debris on shore and check vegetation growth. The disease-producing insect multiplies from the middle of May to around the first of October. By raising and lowering the water levels by a foot at one-week intervals and gradually reducing the total level, the larvae are stranded, and the vegetation ceases to furnish protection against the natural enemies of the mosquito young. While these reservoir-operation methods require some supplementary aid to master the mosquito-breeding problem, they are of outstanding importance in attaining malaria control. Fluctuations are not feasible on the tributary reservoirs, but the more rapid and extensive drawdown helps to produce a shore free of watered vegetation where breeding of mosquitoes might occur.

Fishing, though it is regarded as a minor objective, is not ignored in the multiple-purpose programming of reservoir operations. The chief problem is the disturbance of spawning, which takes place from about April 15 to May 15. Fortunately this is after the major flood season, so that reservoir operations can usually be made compatible with fish needs. Spawning occurs in shallow water, about eighteen inches deep. Since the hatch is not jeopardized so long as the eggs are covered, it is the policy to try to prevent any drawdown of lake level greater than a foot during the spawning season. On the main-stream reservoirs that is sometimes not possible. On the tributaries the problem is solved by allowing the reservoirs to fill gradually,

which does not disturb the spawning process. The widespread belief that the fish in this region cannot survive a large drawdown in the reservoirs even after the eggs have hatched and the young fish have developed has proven false for good quality fish. Only inferior species (the "rough" fish like carp) require constant levels.

The fulfillment of multiple-purpose operations on the Tennessee in the spirit of the statutory intention rests in part upon the internal checks against distortions in favor of the revenue-producing purpose, hydroelectric power. These checks are of special importance because of the fact that at each dam the operating force which controls the water from the reservoir is under the direction of the power manager, an arrangement well justified by the economics of integrated management.

The first check against distortion is the "rule curve" established by the board for each reservoir based upon the allocation of water for power, flood control, navigation, health, and fisheries in accordance with the board's over-all policies. In fixing these curves the board is advised by the chief engineer (and his water-control-planning department). The board delegates to him the responsibility for carrying out its established water-use priorities in the actual operating process. The chief engineer is staffed with a water-control-planning department which is detached from any operating connection with any one of the multiple purposes. The head of this department is chairman of a continuing committee of three (the other two members representing power and health interests) whose function it is to resolve difficulties arising from the competition between purposes. Prior to each meeting the chairman, as the neutral member, prepares an agenda which he circulates to all departments in the TVA which might conceivably have an interest in the question at issue. These he also invites to send representatives to the meeting. The committee considers the problem and makes recommendations to the chief engineer. If the competing interests cannot agree, a conference may be called between the conflicting use representatives; if a consensus is still not obtained the chief engineer makes the decision.

Day to day water-operating problems not covered by the curve or by instruction are handled by the head of the water-control section of the water-control-planning department who is connected by leased telephone wire with each reservoir. For example, should it become necessary to change the level of a reservoir very quickly to meet a mosquito-control problem, this officer would decide, within established policies, whether and how that change should be made. Or if a river boat should become stranded and ask for a foot more of water the chief of the water-control section would decide what to do. He is not responsible to the power manager or to the health and safety chief but only to the chief engineer.

Recreation and the Reservoirs

When the Norris Dam was planned the TVA acquired a large area adjacent to the reservoir in order to carry out watershed-protection measures. At the instance of the regional planning department, which had designed the town of Norris, it was decided to set up on this land adjacent to the lake two demonstration parks which would not only give the region that kind of recreational facility for the first time, but might stimulate tourist trade in a section greatly needing new sources of income. One of these parks is near the dam and is especially planned for tourists, being equipped with a camp, a lodge, twenty-five cabins, a restaurant, trailer camp area, picnic areas, swimming beach, riding stables, and trails throughout its 3,887 acres. The other, Big Ridge Park, is twelve miles up the lake and was designed for many of the same uses but on a more primitive basis. These first two demonstration parks have been followed by three others located at Wheeler, Wilson, and Pickwick Landing dams.

That a great interest has developed in such facilities is evidenced by the creation of a new Tennessee State Parks division in the department of conservation under whose leadership three state parks have been developed on TVA reservoir land, under favorable lease terms. The Tennessee park division aids any county or city which desires to develop a park along the reservoir, and TVA has agreed to accept its guidance in arranging the leases. This state and local park movement has spread to the other valley states, so that by 1947 a total of 6 state parks, 19 county and municipal parks, and 20 group camps lined the lake shores leased or transferred from TVA. This movement is apparently only well begun. By 1946 leases had also been made, under guidance of the state park department, to private parties for 39 fishing and 13 marine camps where enthusiastic sailing-boat devotees and the disciples of Izaak Walton find convenient facilities for the enjoyment of their sports.⁷ The tremendous popular interest in these new activities is visible to anyone who travels the highways skirting the reservoir areas. Undoubtedly the growth of public interest in these and other forms of outdoor recreation was greatly stimulated by a study of the scenic resources of the valley which TVA carried through as a part of its regional planning assignment. The published volume describing these resources and opportunities has had wide circulation.

Besides making recreation opportunities available to the states and

⁷ Those afflicted with a psychosis about "free enterprise" may note that the fishing camps are "licensed by the authority to private individuals who operate them for profit." *TVA Handbook* (1946 ed.), p. 171. See also *Annual Report of the Tennessee Valley Authority for 1947*, p. 21.

localities, the TVA has conducted its reservoir purchases and its management program so as to improve the recreational assets of some of the national forests, the national parks, and the Fish and Wildlife Service. Instead of buying a narrow ribbon of land just above the high-water line, as has been the practice of the Bureau of Reclamation and the Corps of Engineers in their reservoir developments, the TVA acquired enough land to help fend against the malaria mosquito, to protect acute watershed situations, and to aid other public-land-management agencies where that was convenient and justified.

Where its proposed purchase area comes close to the reserves of one of these sister federal agencies, TVA does not leave a narrow strip of unmanaged wild land between. Instead it buys the intervening area, where that seems justified, to round out the unit by making contact with the other agency. In North Carolina where a number of reservoir areas were close to national forests the TVA offered to the Forest Service remnants of land not needed for reservoir operation. On the Hiwassee it relinquished a part of the project area to be operated by the Forest Service as a recreational unit.

The Fontana Reservoir purchase illustrates both the flexibility of the TVA's land-acquisition powers and the economic and social realism with which they were used. The lake was to flood out a mountain road on the north side of the reservoir. To build the road on higher ground would have been very expensive, in fact more costly than the purchase of the entire tract between the reservoir and the south border of the Great Smoky National Park. Since the road served only a few people in that remote area, chiefly recreationists, the state highway department and county governments were glad to be rid of the expense of its maintenance if the outstanding bonds issued for its construction could be cared for. The National Park Service was intending at some future time to build an access road into this area from a different and more useful direction. So an agreement was perfected by which TVA bought the entire area, turned over all land not needed for reservoir management as an addition to the Great Smoky National Park, and helped the county take care of the outstanding bonds against the road. TVA saved money as did the state and the county; and the park was brought to the edge of the beautiful new mountain lake and placed under experienced and professional management.

It is difficult for one interested in the development of the river resources of the Columbia Valley not to wish that the TVA powers and policies in reservoir land purchases had been available and exercised in the planning of the great artificial lake above Coulee Dam and the lesser but lovely lakes at Fern Ridge and Cottage Grove on the Willamette Valley project.

The Health and Safety Program

In transferring a swift flowing river into a chain of placid lakes with a surface of approximately 650,000 acres and a shore line of 10,000 miles in a region where malaria is endemic, the TVA incurred a health obligation which it could not justifiably avoid. This is the reason for most of its public health work.

The malaria-control job employs a number of fundamental methods. First, it is important to prevent the breeding of the mosquito (*Anopheles quadrimaculatus*) whose female members acquire the germ by biting a malaria-ridden human and perhaps twelve days later (during the twilight or night time) jab it into the blood stream of another human. Second, it is necessary to remove the biting opportunity by screening mosquitoes out of homes and other buildings. Third, it is important to develop the habit, on the part of those living in the malaria areas, of staying inside during the danger periods of the day and year. Fourth, it is desirable to treat infected persons so as to cure the disease and thus reduce the sources of infection.

TVA has promoted all phases of this program, for to be effective they must all be carried on simultaneously. It had of course the special responsibility of preventing the breeding of the "quad" along the edges of the reservoirs where vegetation and still water offered such splendid opportunity for reproduction. That was met by the sudden alternating one-foot changes in water level described above. In addition a good deal of engineering work has been done to dam off low places and to fill shallow depressions which might become prolific sources of mosquito development. It was also necessary to clear off the brush and vegetation from the reservoir edges, to dust certain parts of the shore line with poison and to spray other sections with oil. Airplane applications of DDT have largely displaced oil and Paris green, and greatly reduced costs.

Nor was it sufficient to take these control precautions merely along the shore of the reservoir, because the culprit mosquito can travel a mile from its breeding place. Even that one-mile band would not suffice for protective measures because inside it there are frequently other marshy breeding places often arranged in chainlike series away from the reservoir, which, if uncontrolled, would permit the continuous transmission of the disease-bearing insect for considerable distances from the river. These physical relationships have required the coöperation of local and state health agencies and have led to coöperative agreements with the local authorities. Under these standard agreements TVA furnishes funds and technical assistance for sanitary inspection and control, and for health education; conducts in its laboratory at Wilson Dam, which lies near the center of

the worst malaria area, various kinds of research designed to improve the methods of malaria control; and subsidizes the medical research work of the staff of the University of Tennessee College of Medicine at Memphis, which is engaged in experiments on the medicinal treatment of malaria and in the search for more effective drugs. However, all of these efforts will be only partly successful unless the people who live in the danger zones are alive to the nature of the problem and develop the willingness to solve it. Consequently, in such critical areas as that in northern Alabama TVA has furnished funds to the state health department to employ a health educational specialist. He works with the teachers and the educational agencies, instructing them in the fundamentals of malaria control and in the techniques of bringing these facts home to both children and adults in their communities. In 1934 a blood test was given to every fifth family in the vicinity of Wheeler Dam in northern Alabama. It showed more than one-third of the population to be victims of malaria. If any of these people were bitten by the "quad," malaria infection would be started on its way to new victims. A recent similar survey in the same locality shows that control and medical effort have reduced the infection incidence to less than 0.1 per cent. The 1946 survey on problem areas of five lower-river reservoirs showed a decline of malaria incidence since 1938 from 10 per cent to less than 0.1 per cent. This program is being rapidly expanded in other malaria sections, where it is making particular use of the teachers' colleges and of summer workshops for teachers and local sanitary officials, in whom it expects to develop effective educational leadership for malaria control in the various communities.

Another aspect of reservoir development is the pollution problem. TVA's concern for stream pollution is an outgrowth of the change in the character of the river and of the impending industrial development made possible by the hydroelectric program. In anticipation of these changes, the TVA sponsored a region-wide conference in 1935 of the public health officials of the seven valley states. An outcome of this was a pollution survey of the streams, undertaken by TVA at the request of the state officers. It showed that while the river was receiving domestic sewage from a population of 605,000 the waste pouring into it from the 250 industrial plants comprised a pollution load equal to that of a population of 1,300,000. More than 50 per cent of the total sewage load, including domestic sewage, was coming from less than a score of pulp, paper, and rayon plants.⁸ Of course since that time the construction of the dams has greatly changed the river. The basic problem today is to prevent the lakes and streams from becoming industrial sewers while at the same time taking care of necessary industrial waste. The jurisdiction over this question belongs primarily to the states.

⁸ *TVA Handbook* (1946 ed.), p. 190.

Yet TVA as a regional agency, seeing the entire regional situation and having responsibility for the water program in the region, has felt it necessary to assume leadership in the development of an antipollution program.

Tennessee set up a special board to study the pollution problem, and the TVA health and safety technicians have supplied it with technical information and helped prepare its report to the state legislature. In 1945 the Tennessee legislature created a permanent state board with broad powers over the control of water pollution. The state health officer plays the principal role on this permanent board and the TVA continues its technical assistance. The authority has set up a pollution laboratory service to the states as well as to its own departments, some of which, like the Department of Commerce, have special responsibility in this regard because of their relation to the promotion and development of new industrial opportunities in the valley. The pollution problem centers in that part of the river system between Knoxville and Chattanooga where industry has been concentrated. Here the need is principally to prevent undue pollution from new industries and to change the methods of handling waste by the old.

For these and the other public health problems which TVA has undertaken to help solve, it has solicited and obtained valuable assistance from the U.S. Public Health Service which has done a great deal of research work within the valley. During most of its history TVA has hired the services of at least one USPHS staff member. Cooperation has thus been continuous, intimate, and cordial. The USPHS has not confined its aid to the two phases of public health work just reviewed, but has extended it to the venereal-disease and industrial-hygiene programs which TVA has carried on for its own employees.

Whenever the authority has decided to build a new dam it has at once acquainted the state health officers with the additional public-health burden to be anticipated in the vicinity of the new construction project. Thereafter, joint appraisals of the added health-service requirements have been made and agreements have been perfected under which TVA has furnished financial or technical assistance toward new or expanded services. In places where no local public health agencies existed new ones were created. The principal services required on construction projects have related to the control of communicable disease, the sanitation of water, milk, and food supplies, and the disposal of wastes. A by-product of these local health arrangements has been the strengthening of the local health facilities in the valley, and this has tended to persist into the postconstruction period.

Another phase of TVA health work is directed toward its own employees. This program consists of a complete entrance and exit physical examination and careful maintenance of a health record for every employee; "com-

pulsory immunization against smallpox and typhoid fever; compulsory treatment of venereal diseases; complete facilities for emergency treatment of accidents and illnesses from mobile first aid units to completely equipped hospitals on construction projects; periodic health examinations for permanent employees; health guidance and family care programs for employees and their families in construction villages.”⁹ The program also includes a very complete safety plan with a safety staff constantly circulating on the jobs to carry to every employee the information and attitudes essential to prevention of accidents and, in the chemical works and the rock tunnel work, the prevention of occupational diseases.

In launching this program the authority was motivated by a number of considerations. It desired as a good business objective to keep its employees as free as possible from illness and accidents. This expectation has been realized, as subsequent data have shown. For example, the percentage of injuries resulting in loss of time dropped in the first six years from an average of 8 to only 2½ in the last year. Simultaneously the compensation cost for injuries dropped from \$2.75 each to only \$0.46, a saving which more than offset the added cost of the most intensive medical program developed in the intervening years. While the authority believes that such a complete program, with its emphasis on prevention, pays in dollars and cents, it has also had two other purposes in mind: (1) to demonstrate what a model employer program should do; and (2) to contribute to the permanent improvement of health conditions and practices in the valley through the new habits and new attitudes toward health which the construction workers would take home to the surrounding farms and villages when their work with the TVA should end.

TVA as a Producer and Transmitter of Power

The TVA had in the hydroelectric generating facilities of its 29 dams and its 6 major and a few minor steam electric-generating plants in early 1947 an installed capacity of more than 2,500,000 kilowatts. Beginning late in 1947 and continuing through 1951 slightly more than 400,000 additional kilowatts of capacity are available in its own dams, and when the Cumberland River projects built by the Corps of Engineers are completed there will be more than 250,000 kilowatts additional capacity, which TVA has been asked to market through its transmission system. It sold in the 1947 fiscal year an average of about one billion kilowatt-hours a month, the greatest electrical energy output of any one system in the world.

⁹ From a statement by Harry L. Case, then chief of the Health Education and Information Service of the TVA, in a paper presented to the Southeastern Tuberculosis Conference at Asheville, N.C. in September, 1941.

To take this energy to market TVA has created a network of approximately 6,000 miles of transmission lines and the many substations that such a transmission system requires. These lines radiate throughout the valley, and extend beyond into the Cumberland Valley, into southern and western Kentucky and to a large part of Mississippi lying beyond the Tennessee Valley. This expansion in Mississippi outside the valley results from the purchase of the properties of the Commonwealth and Southern Corporation in that state early in the authority's power program.

In developing its policies for the marketing of electricity, the TVA adopted a conception of region-wide benefit. It therefore decided to sell energy at a uniform price throughout the transmission system, except for a 10-per-cent differential to customers taking service at the bus bar of the generating stations. That exception has since been abolished so that today the rate is entirely uniform.

A second major policy was to increase total revenues by reducing the consumer rates and so creating a mass demand for electricity. This was achieved partly by fixing the wholesale rate at a figure somewhat lower than that of private utilities; but, more fundamentally, by insisting upon a retail rate that would assure marked reduction in the price of power to all classes of users; by helping to finance public ownership systems of rural coöperatives and municipalities; by standardizing and reducing the cost of home electric ranges and refrigerators; and by launching in a big way a utilization-research and promotion program, particularly for the benefit of rural consumers.

TVA was active in rural electrification before the Rural Electrification Administration was born, and, as the pioneer in that field, had broken through the restrictions with which private companies had hedged rural service in the valley and limited electrification to about 3 per cent of the farms. By following the Congressional direction to favor public and non-profit distribution agencies and by lending money for acquisition and construction (which Congress also authorized) it began a development of rural electrification which has, aided since 1935 by REA, brought electricity to more than 38 per cent of the valley farms.

While numerous provisions of the TVA act emphasize the special attention the board shall give to domestic and rural consumers and public and nonprofit organizations in the disposal of its electric energy, it was also specifically authorized to extend credit (for a five-year period) to public agencies and nonprofit coöperatives with which to acquire, improve, and operate existing facilities and to issue up to \$50,000,000 in bonds for this purpose (Section 15*a*).

During its first six years, litigation instituted by the private utilities virtually paralyzed the TVA's effort to attain the surplus-electric-disposal

purposes laid down in the statute. But when the courts finally cleared away the litigious obstructions an accelerated movement to buy out the private-utility systems got under way. Jointly with the municipalities in the valley TVA had completed by 1942 "a program of negotiation and purchase which put practically every city in Tennessee, as well as many in adjacent states, in the power business. Eighty-five municipalities were contracting for TVA power by July, 1942."¹⁰ Most of the cities financed their part of such purchases with revenue bonds for which they found a ready market at low interest rates. By 1945 ninety-two municipal and county distributors were selling TVA-generated electricity.¹¹

Rural distribution is handled by 46 coöperative distribution systems, by a few city systems which serve outlying rural territory, by three county-operated systems, and, in a small territory, by TVA itself supplying rural consumers directly on a temporary basis.

The region has no public utility districts but most of the coöperatives cover areas of more than one county, southern counties being typically small. The coöperatives, however, are required to pay property taxes, which public utility districts would not. Moreover, they find it difficult to combine rural with town populations for making more economic distribution units because Congress has forbidden the Rural Electrification Administration to include towns of over 500 population in the coöperatives which it finances. Every effort to raise that limit has been blocked.

A glance at the current map of distribution agencies in the valley shows an almost solid pattern of public and coöperative ownership. The most recent extension occurred in the far northeastern corner of the valley where TVA, six municipalities, and one coöperative bought out the last large private system in the valley. The complete supersession of private distribution by publicly and coöperatively owned distributors within thirteen years presents a most important contrast in federal power policy as between the Tennessee Valley and the Pacific Northwest. With the removal of private operation through purchase has disappeared most of the virulent criticism of the TVA in that region. It is reported that when the records of the private systems were transferred TVA discovered how generally that opposition had been bolstered through economic favors conferred upon local public officials, newspaper men, and "civic" leaders. Only in the outlying "fringe" distribution areas does there now appear to be conflict with private utilities. There efforts are made to obtain agreements with the local coöperative managers not to extend their lines beyond fixed boundaries; the old policy of retaining local lawyers and giving secret favors to

¹⁰ C. Herman Pritchett, *The Tennessee Valley Authority: A Study in Public Administration* (Chapel Hill: University of North Carolina Press, 1943), p. 73.

¹¹ *Report on TVA Power Program for the Fiscal Year 1945* by the Manager of Power, TVA, p. 20. (The number remained the same in 1947).

local officials to block further penetration into private-utility territory is alleged to continue.

Perhaps the most interesting "lion and lamb" episode in this conflict of public versus private ownership is the agreement made in 1941, when the shadows of war were lengthening, between the Aluminum Company of America and the TVA. The arrangement concerned the construction and operation of the Fontana Dam, and the operation of the five substantial and three minor hydroelectric plants on the Little Tennessee and its tributaries which Alcoa had built or acquired during the preceding thirty years. The company agreed that TVA might build the dam at Fontana, a site to which it had rights, and might direct the operation of all its hydroelectric plants on the Little Tennessee after Fontana should be finished. As a result, since January, 1945, TVA has directed the operation of the Alcoa generators as a part of its own integrated system.

This agreement was accepted by Alcoa because it allows the company not only the amount of power generated at all its plants, but 11,000 kilowatts of additional prime energy. This represents the company's share of the extra power which can be generated as a result of the coordinated operation of TVA's and Alcoa's plants. Both parties have gained a very appreciable block of power by this integrated program. Whenever Alcoa is unable to use all the power to which it is entitled under its regular delivery schedule, as in 1945, it is allowed to have the excess stored by TVA in the Fontana Reservoir. But it may use later only five-eighths of the stored energy, and TVA is entitled to the remainder.

The war brought on a pooling program in the Tennessee Valley as it did elsewhere, but the amount of federally generated energy available for transfer to private interconnected systems was markedly smaller than was supplied by Bonneville and Grand Coulee generators to the Northwest power pool. Nevertheless, the interconnected systems, which benefited by the pools of which the TVA was an integral part, stretched from the Great Lakes to the Gulf and from the Carolina coast to beyond the Mississippi.

In the conduct of its power operations the TVA has certain freedoms not accorded to other federal agencies such as the Bonneville Power Administration. Thus, its rate schedules are not subject to review by the Federal Power Commission or any other federal agency; it may make a rate change by simply drawing it up and promulgating it. The Bonneville Power Administration on the other hand must submit its proposed rate schedule through the Division of Power to the secretary of the interior for approval and then to the Federal Power Commission for acceptance or rejection. As for the TVA, no private-utility or public-distribution agency has the right to protest to the FPC against a proposed rate change or to demand

the privilege of a hearing before the power commission takes action. BPA applications for rate approvals in the Pacific Northwest are subject to such interventions.

In planning its hydroelectric developments the TVA does not have to submit the designs for its structures to the FPC for review in the interest of water-power conservation. Here it differs markedly from the obligation of the Corps of Engineers and the Bureau of Reclamation. In other words, the TVA has the full jurisdiction in the Tennessee Valley water-power development to determine the best multiple-purpose program including power and does not share it with any other agency. However, it is subject to the right of the FPC to order temporary interconnections with other power systems in time of war or other emergency. During the critical drought in the Southeast in 1941 TVA was involved in such an order by the FPC.

Again, Congress gave the TVA the right, subject to the approval of the president, to make its own allocations of the costs of the river structures chargeable to hydroelectric development as against other purposes. In contrast, allocations of cost as between various purposes for the Bonneville Dam and the Grand Coulee Dam were determined by the FPC. Another contrast in its power functions is the freedom TVA has enjoyed, as contrasted with Bonneville Power Administration, in obtaining funds for transmission lines and appurtenant facilities. Both agencies must obtain such funds from Congress. But TVA does not have to undergo an item-by-item review, with each bit of transmission line and each substation facility subject to blue pencil or reduction as does BPA. The fact that the private utilities are out of the Tennessee Valley may account for this difference in critical scrutiny.

Like the federal power facilities in the Pacific Northwest, those of the Tennessee Valley were rapidly expanded as a result of the outbreak of war. The TVA has served both military facilities and some of the largest industrial plants in the country. During the fiscal year 1945 these industrial and government consumers took 61 per cent of the output of its electric generators. It served directly those establishments requiring 30,000 kilowatts or more. With the extraordinary increase in demand for electric energy during and since the war period, TVA's revenues have grown phenomenally, reaching \$39,000,000 in the fiscal year 1945. The accumulated revenue from the beginning of power operations to June 30, 1945, was \$180,000,000, of which \$153,000,000 accumulated during the last five years. Its net income before interest for 1947 was \$21,839,000, while its net investment in fixed-power assets after deducting reserves for depreciation was \$397,000,000. These figures represent a very healthy condition.

Navigation and Transportation

A nine-foot channel to Knoxville, by Congressional injunction a principal object of construction effort since the TVA began its main-river program, was attained with the completion of the dams at Kentucky and Fort Loudoun. The full channel width of 300 feet is also available except at Hales Bar and Dam No. 1 which were built before the TVA was established. Hales Bar Dam is now being reconstructed to increase its utility for both navigation and flood control.

While the main-river structures now provide slack-water navigation for the entire distance, maintenance dredging will be required in the near future to preserve the statutory navigation depth. The army has contended that the maintenance function belongs to its Corps of Engineers. An agreement, signed on July 11, 1947, gives the army the function of maintaining navigation channels, while TVA will maintain channels for recreation and malaria control and do any new dredging for navigation.

The army was operating a lock at the site of Wheeler Dam before the TVA was established. The board turned over all lock operation at main-river structures to the army engineers and also made use of their technical knowledge by employing them to design most of the locks which it built. These decisions appear to have been motivated partly by a desire to be friendly with a sister federal agency which was losing most of its jurisdiction over the Tennessee, and partly through uncertainty about the interpretation of its statutory authority with regard to this function. Under the agreement of 1947 the army engineers are to continue to operate the locks, make minor repairs on them, control the housing facilities for lock operators, and revise the river navigation charts.

To encourage the use of the waterway by shippers, TVA from time to time issues charts showing the sailing line, channel marking system, depth of water, and other navigation information for each reservoir.

Its most essential navigation service, however, is the construction and operation of four public-use freight terminals intended to make it easy for small producers and shippers to assemble their material for transport and by so combining a number of small lots of a given commodity to obtain quantity rates. They were built after 1942 when the war interfered with obtaining the state legislation necessary to permit local agencies to build and operate such structures. They were carefully located following economic studies of terminal opportunities and it is planned to transfer them ultimately to local agencies. TVA built a fifth facility for transferring coal from cars to barges.

The phenomenal growth of freight traffic on the river after 1939 was

largely induced by the great increase in war activities in the valley. Nevertheless there is hope for a large volume of permanent traffic on the river, already evident in increased shipments of coal, coke, grain, and automobiles. The narrow and crooked roads leading from the northern automobile-producing centers into the Tennessee Valley make it expensive to bring in new cars by the trailer method. Hence it is possible to save from \$10 to \$20 a car by water shipment. One barge can carry 200 cars.

One of the chief services of TVA's commerce department is to make clear to valley businessmen the economy of changing their transportation routings to the waterway. Studies of particular commodities to various destinations have been made to demonstrate these comparative transportation costs. TVA acts as intervenor for valley shippers before the Interstate Commerce Commission in the effort to obtain joint water-and-rail rates and water-and-truck rates for miscellaneous freight. As yet, however, only one joint rail-water rate has been established. The movement of wheat from the Middle West by water has already begun but would be beneficially affected by joint rates. An interregional agriculture complex of great benefit to the valley farmers is hoped for from this new freight movement. Valley farmers, supplied with wheat much cheaper than they can produce it, can concentrate on livestock production, using their land for grasses and pastures, for which it is best adapted and for which the mild winters and long growing season are peculiarly suited. Coal from the valley is regarded as one of the useful exchange commodities in this interregional business.

One of the most gratifying facts in the river-transportation story is the marked increase in ton-miles of traffic, and the record traffic volume during the first six months of 1947. Sand and gravel tonnage due to dam construction is being rapidly superseded by more permanent types of traffic over longer distances. In fact, commercial tonnage other than sand and gravel more than doubled from 1941 to 1944. Petroleum products, coal, and coke now constitute the bulk of river traffic, but a steady increase in high-value goods has been reported since the war.

The "Water on the Land" Program of the TVA

THE LAND-USE PROGRAM

So much for those parts of the TVA program which have to do with the improvements in the river and the major structures contributing to that improvement. Another basic phase of the TVA program the agency calls the "water on the land" activities. In this cluster of functions the land-use program is of outstanding importance. It stems in part from the authority's fertilizer duties arising from the transfer to it of the nitrate plant at Muscle

Shoals; it had been built during the First World War and had been the object of controversy ever since. The TVA Act¹² specifies elaborately its powers and duties relating to experimentation in the production of fertilizers and the demonstration of their use. Of particular importance is paragraph *c* which reads: "To cooperate with national, state, district or county experimental stations or demonstration farms, with farmers, land owners and associations of farmers or land owners for the use of new forms of fertilizer or fertilizer practices during the initial or experimental period of their introduction and for promoting the prevention of soil erosion by the use of fertilizer and otherwise." Undoubtedly Congress expected that the production of nitrogenous fertilizers would be the authority's principal experimental activity in the fertilizer field. However, the broad language of the act left the authority legally free to shift its experimentation to phosphates or other forms of fertilizer, and it early decided to center its efforts on the production of phosphates. Since the coming of the Second World War it has experimented with forms of nitrogenous fertilizer and is using a part of the Muscle Shoals establishment for that purpose. This shift in emphasis was based upon certain cardinal facts about the soils and the agriculture of the region with which Congress was not fully conversant when the statute was adopted. The soils of this area are particularly deficient in those nutrients essential to the production of grasses and legumes. Cotton and corn had been the principal crops chiefly because nothing else would grow in soil so deficient in essential minerals. Regardless of the decline in the world price of cotton and in the yields of corn, farmers had no choice until the character of their soil nutrients should be drastically changed.

To produce a change in agriculture, therefore, required a large-scale application of the materials essential for other crops, which were phosphate and lime. This was the conclusion of the state-college technicians of the region to whom TVA went for advice. Their unanimous recommendation that the authority shift its attention to phosphates led to the purchase by the TVA of large phosphate deposits in middle Tennessee and the conversion of a part of the Muscle Shoals plant to electric furnaces; these were to carry out experiments in the production of higher concentrations of phosphates. The best commercial phosphate fertilizer contained not more than 18 per cent of phosphate. Consequently, the farmer had to pay excessive costs for hauling inert materials of no value to the soil. Development of a richer concentration of phosphate which would be absorbed by vegetation would permit an enormous saving to the farmers.

Turning its attention to this problem the TVA has produced various forms of superphosphate with concentrations of 40 and 61 per cent. Further

¹² TVA Act, Section 5, *a-i*.

experimentation, already far advanced, offers prospects that even these concentrations will be markedly increased.

The authority was concerned with the fertilizer problem not only because the act directed it to help the farmers with cheaper and better fertilizer, but also because of a theory of relationships (of which H. A. Morgan was the author) between fertilizer and the safety and usefulness of the dams and reservoirs. That theory runs as follows: The application of phosphate to the soil is essential to the production of grasses and legumes, which in turn are required in order to stop erosion. Erosion must be halted to prevent the siltation of the reservoirs and the ultimate injury or destruction of the dams as producers of navigation facilities, controllers of floods, and sources of hydroelectric energy. It was believed that without a widespread and accelerated change in land-use practices all over the valley siltation would take place so rapidly as to damage seriously the river structures within a few generations. Data developed by the TVA in its studies of siltation have modified this theory. Information now available indicates that with the exception¹³ of one river structure on the Ocoee tributary (a minor dam purchased from one of the private utilities), the reservoirs and dams of the Tennessee River system are in no danger of serious early damage. But even though recent information discounts the urgency of the land-use program from the standpoint of insurance to the reservoirs and dams, there is no doubt of its extraordinary importance in holding the soil, in bringing prosperity to the valley's farming population, and in furnishing the agricultural production essential to the processing industries which have sprung up during the brief history of the TVA.

The basic farm program sponsored by the TVA consists of two kinds of demonstrations of improved farm practices, the unit demonstrations and the community or area demonstrations. The unit-demonstration program is carried on by individual farmers chosen by a committee of a local agricultural association (sponsored by the TVA and the Extension Service). The committee is instructed to select farmers who represent all of the more important kinds of farming conditions in the area: small as well as large and negro as well as white farmers. To each unit-demonstration farmer the authority agrees to furnish its triple superphosphate in the amount of thirty pounds per acre, for which the demonstration farmer has to pay only the freight cost. In return the farmer agrees to use the phosphate only on soil-building and erosion-protecting crops and to lime his soil simultaneously with the application of the phosphate. He also agrees to keep records

¹³ This one exception receives silt from the famous Copper Basin which is one of the most notorious examples of accelerated erosion in the United States. This is due to copper-mining operations which destroyed the timber and vegetation on the watershed, and not to agricultural activities.

on the results and to allow the results to be demonstrated to his neighbors.

The Bureau of Plant Industry with funds made available by the TVA surveys the farm soils, indicating the kind of crops most suited to each soil type. For land best adapted to permanent forestry, the TVA foresters will advise on tree planting and will furnish trees free of charge. This agreement runs for five years and may be renewed for another five-year period, although it may be terminated sooner if the farmer fails to keep his part of the bargain.

This unit-test demonstration has not been confined to the valley. Through coöperation with the state extension services it has been carried on in other counties in the valley states and in nineteen other states.

The area type of demonstration is designed for the improvement of an entire small watershed. Before it can be inaugurated 80 per cent of the farmers in the area must come into the program, though it has been customary for a larger number to join. The activities are similar to those in the unit-test demonstration; TVA furnishes the phosphate under the same conditions except that individual records are not required. Since the end of the war the area demonstration has been expanded rapidly. The reasons for shifting the emphasis from the unit tests to the area demonstrations are cogent. In the first place, the community method builds support under those farmers who are reluctant to join or who are likely to become tired of the demonstration. This is particularly important in this valley where so many small farmers have for generations been attached to folkways that take no account of scientific agriculture and where a fundamentalism and nonscientific rural culture inhibits the ready acceptance by the farmer of the techniques coming out of the experiment stations and the agricultural colleges. A great many farmers are unfamiliar with the care of livestock. To learn a new pattern of farming activities is difficult, and the community support which the area demonstration furnishes is therefore essential to such farmers and to the success of the demonstration program.

A second reason for this shift is the many coöperative by-products which are anticipated. Coöperation in soil-improvement practices is expected to lead to coöperation in many other phases of farming and farm life. Thus the improvement of livestock can be most rapidly obtained by the coöperative purchase of bulls; the harvesting of certain new crops, particularly small grains and seeds, is most advantageously performed by community thrashers; the joint purchase of improved seed, lime, and other farm supplies has also been stimulated where community organizations have developed. On the other side of the farmers' needs also, namely, the marketing of his crops to best advantage, the community demonstration program appears to offer a stimulus.

The decision to carry out these fertilizer and land-use projects led to the

question of how it should be done; should TVA build up its own organization to carry this program directly to the farmers or should it make use of the existing state and county agencies, chiefly the extension services, and the state colleges?¹⁴ There was disagreement within the board, but the second alternative, favored by H. A. Morgan and David Lilienthal, finally won out. Under the program of administration then created the TVA makes use of the extension services, which agreed to place an assistant county agent in each of the valley counties to take charge of the demonstration work but still to function as a full-fledged member of the county agent's staff. TVA pays his salary and also pays for the employment of various state agricultural specialists to aid the county agents in carrying on the program. TVA makes money available to the colleges for experimental work, including research on farm machinery. It has, for example, provided approximately \$1,250,000 in five years to the University of Tennessee alone for the research program in farm problems.

Aside from a report on the fertilizer furnished to each farmer (which goes directly to the TVA staff for checking) the responsibility for results in this program, for seeing that the agreements are maintained, for supervising selection of farmers by the local agricultural associations in accordance with the standards laid down, for assuring maintenance of proper records, and so forth rests in the hands of the various extension services. To transfer this administrative authority to state and local agencies was an act of faith on the part of the TVA which it has justified as follows: first, during its early days it was quite uncertain whether TVA would outlast the period of acute relief needs; if it should not continue, as large and rapid a contribution as possible to a permanent change in agriculture was specially needed. This could be done, it was felt, only if the interests of local institutions were fully tied to the program.

Along with that reasoning was the belief that no fundamental agricultural land-use program would be accepted unless it had the active and earnest support of the people in the locality, including their local institutions. Moreover, in this region many communities were intensely suspicious of a federal government dominated by the Democratic party. In eastern Tennessee and the mountainous sections of adjoining states a small white farming population closely attached to the Republican party had lived since the Civil War. To overcome this and other antipathies to such an agency as the TVA it seemed essential to use the state and local agencies which these people were accustomed to regard with favor. For these reasons the authority accepted the risk of some distortion of its program by channeling its administrative responsibility through the extension services and the county agents.

¹⁴ The Soil Conservation Service with its demonstration program had not yet been born.

These farm-demonstration programs have not been confined to the Tennessee Valley. Phosphate has been made available to carry them into other states through the extension services. During 1945 unit-area demonstration programs were in effect in twenty-two other states, although of the 36,876 farms in the program at that time 28,840 were on the Tennessee watershed. Since 1945 the number of outside states participating has been declining, but the total farms in the Tennessee Valley had by 1947 increased to slightly over 32,000, and for the whole country, to 40,302.¹⁵ By 1946 a total of 52,295 farms had been included in this program, embracing a total of 7,566,174 acres.¹⁶

What have been the results of this intensive and expensive land-use and fertilizer program? It is impossible to give exact quantitative answers. The records of land-use changes which are in the hands of the state extension services are not complete and some of them may be inaccurate because important changes in the planned rotations have sometimes not been recorded on the written schedules. While a precise quantitative summation of the shift from soil-depleting crops to soil-conserving crops cannot be given, nevertheless a number of sample audits in different communities in different parts of the valley indicate that dairying has increased, although not as greatly as the production of beef cattle, and that there has been a marked improvement in crop diversification with more cattle, sheep, poultry, legumes, and hay. To a very marked degree row crops have come down off the hills onto the level land. One informed estimate is that the cotton and corn acreage has decreased about 20 per cent. One of these audits for 68 test demonstration farms in northern Georgia showed a 22 per cent decrease in row crops, including corn, cotton, and tobacco, and a 63 per cent increase in pastures, meadows, and cover crops in the ten years from 1935 to 1945.¹⁷ It is felt that the decrease might have been greater had national farm policy not offered price support as a counterincentive to continue the production of cotton. It is clear also that there has been a marked increase in the yield per unit of land and labor, and that farm income has been appreciably increased. There is some evidence, however, that the smallest farmers with the least acreage have been the least helped simply because they could not make the changes and at the same time continue to provide a living for their families. This is a problem which may transcend the possibilities of any demonstration program. Another unsolved problem resulted from the TVA reservoir-purchase program. Despite its efforts to relocate displaced farm families it could not prevent many of the poorest farmers who were unable to afford good lands else-

¹⁵ *Annual Report, TVA, 1947*, p. 38.

¹⁶ *TVA Handbook* (1946 ed.), p. 10.

¹⁷ *Annual Report, TVA, 1947*, p. 39.

where from moving up into the hilly and mountainous areas where they have tried to clear and farm land too steep and too poor to provide a family with a decent income.

Early in 1946 a special technical staff unit was set up in the agricultural-relations division of the TVA to begin a careful appraisal of the results of this farm-demonstration program so as to spot its weaknesses and to plan for improvements. This is a laudable indication of the authority's earnest good faith in attempting to secure the best results for the funds and efforts expended. Despite all the effort and money which has gone into this program and the changes which have undoubtedly occurred, one who visits the valley for the first time, if he is sensitive to the condition of the land and its use, is bound to be impressed by the size of the job which remains to be accomplished.

FORESTRY IN THE TENNESSEE VALLEY

The second major phase of the authority's "water on the land" program is concerned with forestry. The valley was originally covered with forests but in the course of the long period of settlement practically all the virgin timber has been cut off. Today, 55 per cent of the area is in woodland but much of it is poorly restocked with scrub or inferior species. About 40 per cent of the timbered area is in farm woodlands; about 53 per cent is under private ownership and primarily utilized for industrial lumber operations, and the remaining 17 per cent is in public ownership. When the authority began its operations the CCC program was being used by federal and state agencies in part for timber-improvement jobs. TVA, which had purchased more than 100,000 acres for the Norris Reservoir and was to purchase in the next two years some 300,000 acres more, made use of a number of CCC camps both on its reservoir properties and on other cut-over areas on the watershed to restore some of the most severely eroded nonforested lands where only a forest planting could stop the erosion of topsoils. About 58,000,000 seedlings were planted on 38,000 acres of reservoir property.

Simultaneously the authority's foresters carried on an intensive inventory of the timber resources of the valley to learn their conditions and the problems calling for remedial action. They also made a complete inventory of all timber-using industries and their activities. It was learned that the timber industries in the valley contributed approximately \$100,000,000 of income annually which proper timber management could double or treble while at the same time affording greatly superior watershed protection.

The board early decided that the authority should not interfere with the timber-management functions of the Forest Service in national forests. In fact after the Norris Reservoir purchases the board changed its policy and transferred to the Forest Service any forest units on new reservoirs

which were near the national forests and needed protection. As a result of these decisions the forestry program of the authority has taken three major directions: (1) on TVA's own land the practice of proper forest management for watershed protection and for demonstration purposes; (2) to owners of farm wood lots, assistance through the extension services to improve management practices and (3) aid to private timber operators in changing over to sustained-yield management and good silvicultural methods.

It may be noted that these functions are identical with the programs of the Forest Service. However, by spending proportionately more money within the valley TVA was able to do a more intensive job of aiding the farm and timber owners and thus to speed up the transition to good practices and consequent watershed protection. Whenever possible it has used the services of local fire-protective associations, the Forest Service and the National Park Service to guard its forest lands. By practicing model silviculture over the past thirteen years it has developed its reservoir properties as "show me" demonstrations of what ought to be done by private timber owners.

Beginning in 1941 TVA began a demonstration program of woodland management on private lands to stimulate the adoption of sound protection, management, and utilization practices by private owners none of whom had theretofore practiced sustained-yield management. Its inventory of forest resources, completed that year, gave it a sound factual basis on which to proceed. Working through the state extension service for those projects situated on farms, and through the state forester for industrial, institutional, and nonfarm ownerships, the TVA provided funds and technical aid for a complete report on each demonstration area chosen—including an inventory of the timber, the marking of trees ready for harvest, and recommendations for management on a sustained-production basis. The owners in return agreed to help with the field work—a condition psychologically essential for success—to take part in formulating the recommended management plan, and to carry out the program.

By 1947 the farm woodland management demonstrations covered 559 farms distributed among 84 of the valley counties, with a total forest acreage of 36,800.

The timber buyers and logging operators are reported to have accepted the selective cutting required by this program, so that proper harvesting methods will no longer be stopped by their insistence on closer cutting operations. During the war the TVA foresters (who for the most part are stationed in the field in close touch with the county agents, and state foresters' representatives) helped the private timber operators with their priority problems. It is reported that through that relationship interest in improved

timber management grew rapidly, so that by the end of the war the number of requests by commercial operators for management plans exceeded available staff resources. In 1947, demonstrations on 34 commercial forests covering 170,500 acres were in operation.

TVA has resumed its tree-planting program on private eroded lands, which was liquidated when the CCC program collapsed; it operates the nurseries and furnishes trees free of charge to the owners who will do their own planting. The extension-service representatives choose the farms for which trees are to be made available; the state forester distributes the trees and recommends the nonfarm lands to receive them. The program is restricted to the more seriously eroded lands (as was the earlier CCC program) in order not to compete with the Clark-McNary program of tree distribution to the states.

Another forestry activity of TVA is the research directed to improving the economic returns from timber crops. For example, since the disappearance of the chestnut tree threatens the source of tannin, TVA has subsidized the chemists at one of the state institutions to develop a method of extracting tannin from oak slabs and pine bark, both of which are waste products in the valley timber operations. Simultaneously experiments are under way to use the fiber left from the slabs for composition boards or paper. The black locust, which is a native tree, is being improved by intensive breeding methods intended to produce a straighter, faster growing, and commercially more valuable tree. Many farmers sell black walnuts from the native trees on their wood lots, but the nuts are small and hard to crack. TVA has taken the improved strains bred to produce large nuts with thinner shells and is testing them for adaptation to the valley. It is also working on cheap methods of propagation so that the small farmers can afford to plant them.

In summary, TVA's work in forestry is not essentially different from that of the Forest Service, but it operates more generally through state agencies and has thrown more money and man power into the job so as to hasten the results of good management in this retarded region.

Research and Development

Much ink has been shed about the TVA's effect on business and private enterprise. The bogey of socialism and communism has been raised persistently by the ignorant and the malicious. The facts are clear, however, that aside from its construction camps, the transmission of electrical energy, and a small amount of temporary distribution to rural customers, TVA's activity in the field of business has been restricted to research, development, and demonstration. This is true even of its fertilizer program which has

involved rather sizable production and large-scale demonstration. That program has been basically directed towards the development of new and improved techniques in the manufacture of fertilizer and not toward its commercial distribution by TVA.

The basis for TVA's research program relating to new opportunities in industry, commerce, and agriculture is to be found principally in the provisions of Section 22 of its act which directed the president, through such means as he might choose—and he chose the TVA—to make surveys and plans to guide Congress and the states in the orderly and proper “physical, economic and social development” of the valley. The president or his agent was authorized to “make such studies, experiments or demonstrations as may be necessary and suitable to that end.” It is important that under this language the authority was not limited to laboratory research and experimentation. Unlike most research agencies of the federal government the TVA is empowered to carry its studies from the laboratory and demonstration stages to a point where private industry can take over and put the fruits of research into immediate use. It may continue its research until the question of economic feasibility is answered and the problems of production technique are worked out.

The difference between its authorization and that of the other federal research agencies is illustrated by one of the most interesting projects which the TVA has carried to success. Some years ago the forest-products laboratory of the U.S. Forest Service devised a lamination process by which short lengths of low-grade hardwood could be glued together into a competent and attractive flooring. One of the most difficult forest-management problems in the South and particularly in the Tennessee Valley is the great quantity of inferior hardwood species which in the past have not been worth cutting and so have continued to crowd out the better species. The TVA technicians took over the lamination process of the forest-products laboratory and devised machinery, chiefly a hydraulic press, which would turn out a continuous twelve-inch flooring board from laminated hardwood strips. They obtained the assistance of Georgia Tech to build this machine, and took it to Knoxville, where they set up a complete small factory unit including sawing, machining, and gluing. Here they tried out the process to obtain reasonable forecasts of cost and to solve the typical production problems. After some years of work the machine and the plant were perfected, production costs established, and the project turned over to a private company. The company has been given an exclusive license for a period sufficient to provide incentive and opportunity to work out the production “bugs” involved in full-scale operations. When this trial period is over the machine will become available to any lumber producer in the region for commercial use.

This undertaking illustrates also the orientation of the TVA staff in selecting research and development projects. These are set up not simply for the purpose of helping a few entrepreneurs make money, but chiefly to further the whole program of regional economic improvement. The successful completion of this cull-hardwood-flooring project which the Forest Service had to drop at the laboratory stage, offers the prospect of widespread benefits to all farm wood-lot and timber owners, who may in the future sell their cull hardwood for enough to pay for its removal. This in turn promises great improvements in timber production, profit to a new hardwood-flooring business, and employment to many people.

The head of the commerce department of TVA, John P. Ferris, well expressed the spirit of the research and development work in a description of this project before its completion. He said: "When this research is completed the result will be available to private enterprise but we want something more—industry geared to agriculture—not just any old industry."¹⁸

The work done on frozen foods is another striking example of research and development's contribution to agriculture, industry, and commerce. The work began with strawberries, a crop which had been produced in considerable quantities in the valley but in the early 'thirties was rapidly declining because of adverse economic conditions. The farmers were getting only about 65 cents a crate on the Cincinnati market—less than it cost to pick, pack, and ship the berries. The answer to the problem seemed to lie in a freezing process which could prevent a glut on the market and send the product to consuming centers in condition to demand a good price. Before undertaking the study of freezing techniques the TVA financed an economic study by the University of Tennessee of the frozen food and related industries. The results indicated a great opportunity both for strawberries and for other valley products. Simultaneously a study was made of some thirty varieties of strawberries grown in the valley. The best were chosen for experimentation to discover which, if any, of the local species were suitable for freezing.

In the meantime the state experiment station was induced to work on the breeding of new and more productive varieties, and in the course of some years it succeeded in producing a variety which would frequently yield more than three times as many berries per acre as the best of the old ones. Exploration of the freezing process disclosed that patents on existing methods would require a new technique to be devised. The outcome was a process by which the berries can be frozen much more rapidly than under previous methods but at higher temperatures, a combination which yields a better product. In the course of the research it was necessary to build a

¹⁸ From a paper presented to the Knoxville session of the American Society of Civil Engineers, March 13, 1944.

pilot plant so as to learn how to construct and test a commercial freezing enterprise. This was located in a city adjacent to berry production, where the farmers' coöperation helped to interest the farmers in new methods of harvesting in order to get the berries to the freezing plant at the proper stage of ripeness.

When the berry problem had been solved attention was turned to the freezing of vegetables so as to prolong the season and increase the profitability of the freezing industry. A variety of such products has been successfully included in this program.

Transporting the frozen food to market presented another problem because carriers had no equipment to maintain refrigeration at the zero temperatures essential to best marketing results. The TVA technicians therefore designed a successful truck with its own refrigerating process powered from its motor.

When the initial pilot-freezing-plant study was completed the farmers' coöperative took it over and has not only run it successfully, but has extended its operations into other centers in the valley. The authority technicians are continuing their research and experimentation on frozen foods in an experimental plant built on a river barge. After the processing problems in one agricultural section have been solved, it will be easy to move the floating plant on to another center.

From the freezing problems, research has gone into dehydration and other methods of preserving foods. Moreover, the TVA technicians, working in coöperation with the state agencies, are available as consultants to businessmen entering frozen-food or food-processing industry whenever other qualified consulting-engineer talent is not available.

A third research project with similar regional implications is the pressure cooker developed in coöperation with the University of Tennessee for extracting oil from cotton seed—an important industry in this region. There is a large number of small mills in competition with a few large mills in Atlanta and other big terminal cities. It is estimated that about 85 per cent of the minerals taken from the soil is retained in the hulls which are left in the cake and meal after the oil has been extracted. The many small mills customarily trade the cake and meal to the farmer who brings them his cotton seed. Thus the farmer feeds to the livestock on his farm the precious fertilizer which was sucked from the soil in the process of cotton growth. On the other hand, the big mills in the terminal cities which buy their raw material from country dealers sell their cake and meal all over the United States, so that the fertility contained in these products is lost to the valley. For this reason the authority and the agricultural colleges wanted to improve the efficiency of the country mills, thus enabling them to compete effectively with the big mills. The cooking equipment is now

manufactured by a Southern firm and is being rapidly installed in the country mills.

Another area of research directed toward new opportunities for regional industry involved the exploration of regional mineral resources in cooperation with the state and other federal agencies. TVA has not been inhibited from exploratory work even though the Bureau of Mines is also legally authorized to do it. Its explorations have disclosed important coal-bearing lands adjacent to new river-navigation facilities. This led to the shipment in 1944 of 300,000 tons of coal chiefly for war industries in the valley. The principal opportunity in the field of minerals is believed to lie in such marginal minerals as the silicas, mica, and clays, which heretofore have not been widely used for industrial purposes. TVA's early research among these non-metals included work in kaoline, which is found in abundance within the region. TVA's improved refining process has made this clay available to American pottery producers, who now for the first time are independent of foreign sources of raw material.

Successful research was also applied to the production of mica. The use of Southern mica had been greatly handicapped by lack of a satisfactory process of splitting the mineral from the "books" in which it comes. With the aid of research talent of the Georgia agricultural experiment station, the TVA people developed a simple machine which will split the mica into any required thickness. Recent investigations have uncovered unexpected reserves of talc in certain Georgia counties and have located new reserves of feldspar in North Carolina and improved the processes for its commercial production. In general the mineral studies have concentrated on regional minerals, susceptible, through discovery of commercial quantities or through improved processing methods, of supporting new or expanded industrial activities within the region.

Wide publicity has been given to some of the developments of farm machinery that have grown out of this research program, practically all of which has been carried on with or through the research facilities of the state institutions. Among the more important devices that have come increasingly into use both in the valley and elsewhere are: (1) a hay drier which increases the protein content of hay while insuring it against damage from rain; (2) a trailer thrasher which makes feasible the production of small grains for local stock on the small farms of the valley; (3) a castor bean huller; (4) a dehydrator for community use; (5) a combination seed and fertilizer distributor; (6) an electric sweet-potato drier and (7) a small but inexpensive feed grinder.

As soon as a mechanical device has been perfected and tested, it has been the practice to send out bulletins describing its nature and soliciting inspection by any potential manufacturer who might be interested in producing

it on a commercial basis. To the producer offering the best terms and the most favorable prospects of successful production TVA gives an exclusive license for a short term of years. In this way its research devices are brought into rapid use, manufacturing opportunities are created, and employment is stimulated.

In addition to forwarding the discovery and use of specific raw materials in the valley, for which there seem to be special opportunities of region-wide utility, the research program of the authority has offered general support to a more industrialized development, with its concomitant increments of commerce and employment. Thus it early began comprehensive studies of the railway freight pattern in the South, which disclosed that the industrial development of the Tennessee Valley, as well as of other parts of the Southeast (and of the Far West), had been seriously impeded by a freight-rate structure; it discriminated against the manufacturers of finished products in this raw material-producing region in competition with manufacturers in the North and East. Undoubtedly these studies, which were printed and reported to Congress, played an important part in the initiation of an investigation of this problem by the Interstate Commerce Commission which on May 15, 1945, ordered drastic revisions in the interterritorial freight-rate structure of the railroads—a basic change which for the first time allows Southern industry to develop without an initial handicap of discriminatory freight tariffs.

The Pacific coast, including the Columbia River Valley, was not included in that revision, although it suffers from an equally discriminatory railway rate structure. A similar comprehensive rate inquiry and revision is equally necessary there if the new electric-energy resources of the Pacific Northwest are to be most effective in the utilization of the raw materials which the region so abundantly possesses.

While the new navigation facilities on the main river have already given a partial answer to the bulk-freight problem, habit has inhibited many businessmen in the region from learning, on their own initiative, how they might reduce their freight costs by transferring to water transport or to combined truck and water or rail and water. One of the important research services, therefore, which the TVA economic analysts have begun for businessmen in the valley is the periodic bulletin presentation of water-freight figures as compared with rail costs on different commodities between various points of origin and destination.

The work of the economic analyst is also essential to the research activities of the able staff of physical scientists and engineers whose enthusiasm for exploring promising leads on a new process, raw material, or machine will be fruitless unless the resulting fabricated commodity can be sold for

a profit. Hence it is the function of the TVA economists to carry on a continuous study of the economic feasibility and strategic location of specific types of industries and of the markets which might reasonably be expected for their products. They try to discover not only what industries and businesses might operate most successfully in the valley but also which will promote the best development and use of regional resources.

This brief review of the TVA's research and development activities suggests that its fundamental role has been to help the farmers, businessmen, and investors in the valley to rediscover opportunities for effective and continuous use of the resources with which they have all the while been surrounded, and in so doing to increase their profit, improve their incomes, and raise their standards of living. It has helped to redress to some extent the imbalance of research talent as between the valley and other parts of the nation by (1) financial assistance to enable state and local institutions and personnel to make the most of their own research skills, and (2) by use of its own laboratories, experimental plants, and technicians to initiate investigations which no other agency was prepared to undertake but which seemed to offer lasting opportunity for profit to a large number of valley people—businessmen, farmers, and workers. This was a role of suggestion, illustration, and advice; far from superseding "private enterprise" it has been centered on the objective of increasing the opportunities for "private enterprise" and extending them to more people.

It is not the purpose of this review to evaluate the results of TVA activity. Yet it may be permitted to note some figures which indicate that the undertaking has attained a considerable measure of success. The number of manufacturing establishments in the 122 counties grew from 1346 in 1935 to 2069 in 1939, a favorable change of 31.4 per cent, which was nearly 50 per cent greater than for the entire area of the seven valley states (their increase being 22.6 per cent), and nearly three times as great as for the country as a whole (12.2 per cent). Factory employment in the valley recovered its predepression percentage during that period, while in the nation at large it suffered a marked decline. Concurrent with the increase in industrial and commercial employment in the valley was a marked decline in agricultural employment, indicating that the damming up of population on subsistence farms was coming to an end, as opportunity for urban employment increased. There was a marked increase in total factory payrolls in the valley, exceeded only in the East North Central and the Pacific Coast states. The value added to products by manufacturing in the valley exceeded the 1929 level by 44 per cent, while the national average in 1937 was below that of 1929. These figures suggest the greater contribution which manufacturing was making to the income of the valley.

As for commerce, retail sales rose from \$90 per capita in 1935 to \$160 in 1939, an increase greater by about one-third than for the nation as a whole and exceeded only by that of the Mountain states.¹⁹

Aids to Local Government

Almost from the beginning of the reservoir-construction program the TVA has found it necessary to consider the need of local governments for advice and aid in community planning, local finance, and administration. The inescapable disruption of towns, school districts, and counties by flooding of lands and purchase of watershed areas compelled it to pay close attention to the consequences of these disturbances upon the localities and their governmental arrangements.

Having set up its own staff of city-planning technicians to help work out the construction-town designs and housing arrangements, TVA was in a position not only to furnish funds to help care for damages to community facilities of towns that were to be partly flooded, but also to help to replan them. For example, one inland town of 3,000, about to be partly drowned by the Guntersville Dam, was able, through TVA aid to its city-planning commission and council, to work out a relocation program, with greatly improved facilities for industry and community amenities, and to take advantage of its river location to become an important transshipment point for the new river traffic. By 1940 its population had increased more than 40 per cent. This form of assistance came later to be channeled through the state planning boards which, by agreement with the TVA, employ planning technicians to aid the localities while TVA helps pay their salaries and supplements their technical staffs. As the war came, this service was extended to the towns in the valley affected by the expansion of defense industries.

The authority's need for construction-camp housing led to the study of prefabricated houses that could be moved from project to project and still give living comfort to their occupants. The staff worked out designs and carried out experiments in the construction and assembly of a number of types. From this effort came standard design, construction, and assembly plans which were later given to the army and the Federal Works Agency for housing defense workers and, in particular, the employees of the atom-

¹⁹ This statistical summary is taken from "Industrial Trends in the Tennessee Valley" by Lewis C. Copeland and W. K. McPherson, in *Social Forces* (March, 1946). Another and briefer statistical summary of some of the same factors is contained in tabulations prepared by Professor Herman Finer, in his *The TVA: Lessons for International Application*, (Montreal: The International Labour Office, 1944), pp. 210-213. In that tabulation, however, Finer takes the counties covered by the power-transmission system as the "regional" area.

bomb industries situated at Oak Ridge (Tennessee) and Hanford (Washington).

The school districts had in some places to be redesigned, because of loss of territory, population, and buildings. Aid from the authority sometimes resulted in new consolidated school districts with improved buildings, facilities, and teaching staffs. The authority also came to the aid of county governments faced with tax and road difficulties because of reservoir developments.

To meet these inescapable consequences of the river program, the TVA has employed technicians not only in planning, but in local public finance and administration. The latter have been called upon to help work out the in-lieu-tax payments which the TVA makes to localities and to examine local accounting and fiscal problems involved in the operation of public electric-distribution systems whose resale rates are subject to TVA control. In the course of these studies of local finance and government many deficiencies in organization and administration have been encountered. This has led to coöperative work on municipal and county government with most of the states of the region. Out of this have come manuals on local accounting and assessment. The need for research in municipal administration and local government, and for instruction in government in some of the higher educational institutions, has been rapidly filled by the organization of municipal leagues, bureaus of municipal research, and new departments of political science and public administration. TVA has been an important leaven in this process of improving the equipment of the states for solving problems of local public administration.

The Conservation and Development of Popular Intelligence

The directors of the TVA have from the beginning taken the position that no program of natural-resource conservation and development could succeed unless the people of the valley understood it and actively participated in its formulation and management. They were bound, therefore, to be seriously concerned with the quality of the human resources of the valley. That is why at every opportunity they used their reservoir-construction and operating program, as has been indicated previously, to improve the health not only of TVA workers but of the people adjacent to public works. It also explains in part the impetus given to recreation in the utilization of reservoir properties.

In a region which has lagged so far behind the more advantaged parts of the nation in provision for public education it was necessary, in the pursuit of the authority's objective, to seize every legitimate opportunity

to expand the quantity and quality of educational facilities. The first opportunity came with the employment of local residents for construction work. The responsibilities of a humane employer included the provision of good schools for the workers' families, for most of the dams were built in remote rural areas where these facilities were exceedingly meager. At first TVA found it necessary in some instances to build and operate its own schools, but for the most part it encouraged the local authorities, by funds and technical assistance, to provide good standard school and library facilities. Ordinarily after the construction period is over these improvements have become permanent assets to the local rural citizens.

We have already indicated how the malaria-control program necessitated popular understanding and coöperation and how community education to that end has been developed coöperatively with the health and educational agencies both state and local. So with the whole land-use program: Public understanding was believed to be so essential that its administration was turned over to the extramural teaching branch of the state colleges—the Extension Service. Even the research program has made continual use of the research talents within the higher educational institutions of the valley states.

The board believed that if the resource problems and opportunities of the valley were to be generally understood and brought to the forefront of popular consciousness, the facts about them must be introduced into the school curriculum for pupils at all levels of maturity. It first tried this out at the TVA "company" construction town of Norris and then asked a group of educators from the seven states to meet as consultants to its technicians in the preparation of reports on the different phases of the regional program for use in the schools.

School people have shown keen interest in the incorporation into the formal school curricula of the data on the regional situation which have emerged from these years of TVA leadership in analysis and development. The teachers' colleges and the preachers' colleges (which are quite numerous) are training their graduates through workshops and other devices to take their places as informed educational leaders in regional problems. The American Council on Education has organized a Committee on Southern Regional Studies and Education which has been translating the technical data developed by the state and federal agencies into forms for ready and effective use by the children and teachers. Three of the states have also made this an official duty of state officers. In Catoosa County, Georgia, an experiment is being tried out which brings directly into the classrooms the data developed in the farm test demonstration program in that county.

In all of these activities TVA lends advice, technical assistance and, where

appropriate, funds; but the people of the valley through their own leaders are "carrying the ball."

Interagency Relations of the TVA

The TVA Act authorized the board to request the assistance of any employee of any other federal department or independent establishment; it directed the president, if he believed it to be in the public interest, to order such a service to the authority and provided that the person so ordered "shall be thereafter subject to the orders, rules and regulations of the Board."²⁰

The initial uncertainty in the minds of other federal agencies as to how far the board might wish to go in "taking them over" seems to have been dispelled early in its history by its clear policy of seeking the cooperation of other federal agencies and of paying for any extra expenditures required of them. The first dams were designed by the Denver engineers of the Bureau of Reclamation so that there might be no delay in getting work started pending the recruitment of a qualified group of design engineers. After it got under way TVA took over the entire design and construction task, but the friendly relation with the bureau technicians has been maintained. The bureau's data on stresses and concrete temperatures have been used in design calculations, and its instruments for measuring these factors have been installed in TVA structures.

TVA AND THE CORPS OF ENGINEERS

TVA was explicitly directed to construct dams and reservoirs on the Tennessee so as to provide a nine-foot channel to Knoxville "which will best serve to promote navigation on the Tennessee River and Mississippi River drainage basins . . ." This provision might appear to have pushed the army out of its accustomed navigation and flood-control functions on this river system. But the issue was confused by Section 5*k*, which ordered the corporation to allot and deliver free of charge to the War Department "so much power as shall be necessary in the judgment of said Department for use in operation of all locks, lifts or other facilities in aid of navigation." Furthermore, Section 7 transfers to the TVA all the developments which had been made at Muscle Shoals, then under army jurisdiction, except the locks. The implication of these two provisions is the basis for the army claim, which the board early conceded, that its engineers should operate all navigation locks built by TVA. Consequently, at each dam on the main stream, two independent administrative forces (and if structures are remote from cities, operators' living quarters), divide the operating functions.

The army also claims separate maintenance jurisdiction over the locks.

²⁰ TVA Act, Section 5*l*.

Although because of the newness of the structures repairs have not yet been needed, the time will come when such work will require the purchase of expensive machinery, duplicating that which the TVA already uses. Unless and until the volume of traffic so increases as to require the constant use of the locks it would seem that a single agency could operate the entire facilities on each structure without a separate locks' crew and with a saving of most of the operating labor cost incurred by the army. The independent operation of the locks will ordinarily not conflict with the water-control program of TVA. In the very dry summer of 1937, when too many lockages would have wasted water needed for power and other purposes, TVA asked the army to restrict the number of lockages for pleasure boats at Chickamauga Dam so as to take through a whole fleet at a time. The army responded by fixing two lockages a day for such craft.

Because the army engineers were familiar with navigation lock structures, they designed all those built by TVA and have furnished inspectors to check on the conformity of construction to design specifications. Because the achievement of a nine-foot navigation channel required some dredging on the upper ends of reservoirs, TVA has dredging equipment which could be used for channel maintenance as siltation may require. But the army contends that channel maintenance is its function.

Flood-control functions are also the subject of some duplication and conflict between these two agencies. The reservoir system was not intended to give Chattanooga complete protection from the largest probable flood.²¹ That objective would require local protective levees, estimated to give protection against floods 60 per cent greater than that of 1867, which is the greatest flood on record. But the board's authority to provide flood-control protection appears to be limited to the construction of dams and reservoirs (Section 4j). Local flood-control works anywhere on the Tennessee system appear to be the job of the army, which has been making studies on the various tributaries concerning channel improvement and other modes of control simultaneously with TVA's studies and its reservoir-construction program. Nor was it the practice until very recently for the army reports to be submitted to the TVA for review before going to the president and Congress.

The difficulty inherent in this split jurisdiction is indicated in the discussion of the relation between small tributary developments and the entire river-system program sketched in the 1936 unified program. It said:

In a general program for the unified development of the Tennessee River System, the small tributary rivers with drainage areas of 25 or 30 square miles up to 300 to 600 square miles, play an important part. No single construction

²¹ This was clearly indicated in the 1936 comprehensive report to Congress *The Unified Development of the Tennessee River System*, p. 19.

project on one of these small streams will vitally affect navigation or flood control on the lower river, but if a habit of control becomes general, then the total cumulative effect on the lower river for navigation, flood control and power development may be important. On the other hand, channel improvements on the smaller tributaries without regard to conditions below may have an adverse effect. In their natural condition these stream channels tend to check the flow of floods since their banks and flood plains are covered with timber. When this timber is cleared away, especially along the banks, flood water rushes down more rapidly and conditions in the lower rivers are made worse. . . . Bank caving, erosion and gullyng may be accelerated, and silt deposits in navigable streams may be increased. Less water may be allowed to soak into the soil, and the low water flow may be reduced.

If, on the other hand, necessary local improvements of this character are balanced by storage on the smaller streams, the bad effect of ditching and draining may be overcome, and definite improvements may be secured.²²

The new navigation facilities on the Tennessee River system require the regulation of structures built along or across the river. That jurisdiction is divided between the TVA and the army. Section 26 of the TVA Act provides for a double-barreled review. It invests the board as the guardian of unified development and regulation of the river system with the right to approve or deny the erection of any "dam or appurtenant works or other obstructions affecting navigation, flood control or public lands or reservations." But it also recognizes the existing jurisdiction of the Department of the Army concerning the erection of any structures on the river. On the Little Tennessee tributary a special provision gave the Department of the Army power to overrule the board of the TVA, should the latter deny an application for the construction, operation, or maintenance of a river structure. The Aluminum Company of America had already partly developed that tributary and apparently wanted the security of the Army Department's veto over a possible rejection by the board of the company's plans for future construction and operation on this stream.

The dual jurisdiction on the main river has led to an agreement between the army and TVA that each will notify every applicant for a structure that he must submit a duplicate application to the other agency. The army's review is concerned solely with navigation; TVA on the other hand examines each request in the light of its probable effect on all the purposes over which it has jurisdiction. Clearance with the TVA takes a considerable time because its broader interest requires that every department having a potential concern be given the opportunity to scrutinize the application and to make recommendations. The army and the board have an informal understanding that each will inform the other of its attitude toward an application before clearing it. It is reported that among nearly 500 requests there has been only one disagreement.

²² *Op. cit.*, pp. 47-49.

The army determines bridge clearances and retains full jurisdiction in the regulation of draw-span operations in bridges, although TVA may make recommendations. The TVA originally had the right to compel a railway company owning a bridge over the Tennessee River to raise it at the company's own expense; but because TVA's reservoirs disturbed the existing railway structures, the authority sought an amendment to its basic law allowing it to defray the cost of raising or removing such bridges when changes were made necessary by its own projects. The amendment as adopted by Congress requires that the plans for any alteration or new structure thus erected must be approved by the chief engineer and the secretary of war.²³

The connection between the work of the Corps of Engineers and the TVA is not confined solely to the Tennessee Valley. The army is still in charge of navigation and flood control on the Mississippi, Cumberland, and Ohio rivers, which as we have noted above have important physical relations to the Tennessee system with regard to flood control. In controlling release of flood water from the Tennessee into the Ohio whenever floods occur on the Ohio and Mississippi, the army directs the operation of the Kentucky Dam so far as it relates to flood-control functions. In flood periods there is a full exchange of hydrologic and weather data between TVA and the division engineer.

Where the Cumberland and the Tennessee join the Ohio, they lie within ten miles of one another. This proximity makes possible an interconnecting channel by which water from one stream might be routed to the other. The board of the TVA proposed to the army that a dam be built near the mouth of the Cumberland and that a canal be constructed to join the two streams just above the proposed Cumberland Dam and the Kentucky Dam on the Tennessee. With these structures the authority believes it would be unnecessary to install hydroelectric generators in the proposed Cumberland Dam since all potential power could be produced by the generators in the Kentucky Dam. TVA also argued that these structures would give extra insurance during floods on either river system when the other was not threatened. It is reported that this proposal is not acceptable to the army.

A rather acute situation has developed on the upper Cumberland in connection with the three small hydroelectric projects which the army has partly finished at Dale Hollow, Center Hill, and Wolf Creek adjacent to the present transmission network of the TVA and within the potential TVA market area. These projects were sponsored by Senator McKellar during his fight against Douglas Dam which TVA had urged as a war project and before the army had prepared a general developmental plan for the Cumberland; their construction was let before any program had

²³ *Public Law* No. 307, 77th Cong., 1st sess.

been worked out by the president's office for their administration. The omnibus Flood Control Bill of 1944 as sent to Congress from the War Department left the distribution of power from the Cumberland and other army-built projects to the private utilities, who would take the power at the bus bar. That provision was opposed by the president after Secretary Ickes had raised objections. As finally passed the act assigned the distribution of power from all army projects to the secretary of the interior.

When the Wolf Creek Dam was completed in the spring of 1946 the secretary of the interior asked the TVA to take over the marketing of its hydroelectric power; the army would continue to operate the generators. This seemed to the TVA an unpleasant prospect. They had not been consulted when the Cumberland projects were started and had no control over the costs for their hydroelectric energy. Moreover the fiscal obligations imposed by the statute for these projects were quite different from those for the Tennessee Valley and the rates are determined by the Department of the Interior and the Federal Power Commission. Despite these difficulties, the TVA feels that two different transmission systems could not be justified for the Cumberland and Tennessee Valley projects and has therefore accepted the transmission assignment for the Cumberland projects and tied them into the TVA system. This whole situation is fraught with acute interagency friction, which further developments by the army on the Cumberland will probably increase. From the standpoint of hydroelectric power functions as well as flood control, it is clear that the Cumberland and the Tennessee River systems require unified management. Indeed, the TVA in a special report to the president has recommended that the Cumberland River be joined with the Tennessee Valley and planned under its control. Thus far, however, the army shows no sign of retreating from its Cumberland front.

TVA AND THE MINOR FEDERAL WATER AGENCIES

Before TVA came into existence the mapping of sailing lines and the placing of markers was the job of the army engineers, but in 1937 the U.S. Coast Guard, which had recently absorbed the Life Saving Service, took over this task. Today it maintains three depots for buoys, boats, and other equipment. However, when markers are lost or displaced, they are frequently restored by the maintenance staff of the TVA who continuously patrol the entire river. TVA is the only agency which has all the engineering data essential to the marking of channels and mapping of sailing lines, and it assembles these data for the coast guard. Thus its relationships with the coast guard on the Tennessee are practically identical with those of the Corps of Engineers on the Columbia.

The impounding of water on the lower reaches of the main stream has

made possible large refuges for wild fowl and other wild animals; the lengthening of the shore line has markedly multiplied the food supply for such fur-bearing animals as the muskrat and mink, which feed along the edges of the water, so that their population has rapidly increased. In cooperation with the Fish and Wildlife Service TVA has established a number of refuges, particularly along Wheeler and Kentucky reservoirs. One of the most recent of these involved the transfer of over 9,000 acres of TVA land on the east shore of the Kentucky Reservoir to the Kentucky Woodlands National Wildlife Refuge, operated by the Fish and Wildlife Service for the protection of all forms of wildlife. This donation provides for the FWS a refuge area fronting on both the Cumberland and the Tennessee rivers, another example of the functional union between these two river systems. On the Wheeler Reservoir an area of 40,000 acres set aside for waterfowl is managed by the FWS for wildlife purposes, and by TVA for the other water purposes which it serves. One of the problems which has developed in connection with this activity is the provision of additional food supply for wild fowl. Experiments have been made by the authority in planting seed in the mud exposed during the summer period. In 1944 for example about 200 acres were planted to wild millet and smart weed, chiefly for wild ducks.

When TVA began its program of reservoir construction it was the belief of Biological Survey technicians that the river would become a biological desert, ruined for fish and wild creatures.²⁴ They asserted that unless special hatcheries were provided the game fish of the river were likely to be severely depleted by the manipulations of reservoir levels for malarial control. Accordingly, the authority built a hatchery at Norris and another in Alabama and turned them over to the FWS for operation. The actual results of the reservoir program have contradicted these lugubrious predictions. Plankton on which small fish feed has multiplied enormously with corresponding increase of the game fish which eat the small fish. Not only have the expensive hatcheries been abandoned as unnecessary, but the laws of all the states providing for a closed spring season on the reservoirs have been suspended. Even so it is estimated that the increased fish take amounts to only 20 per cent of the fish that mature each year. Because of the rich larders the reservoirs provide for them, game fish grow to mature size in a much shorter period than formerly. The reservoir operating crew which measures the silt flows and water temperatures at frequent intervals provides an informational service to fishermen which tells them how deep to sink their lures in order to reach the water layers which the fish find most congenial.

²⁴ In 1939 the Biological Survey was consolidated with the Bureau of Fisheries into the Fish and Wildlife Service.

TVA makes much the same use of the water-resources branch of the U.S. Geological Survey as do the U.S. Army and the Bureau of Reclamation in the Columbia Valley. The amount of stream gauging which that water-data-accumulating agency may perform is subject to the financial limitations inherent in the system of matching state funds. The result is its chronic inability, in the Tennessee Valley as elsewhere, to provide the complete information which water-development programs require. Consequently the authority allots about \$6,000 yearly to the USGS for additional stream-flow measurements, and operates a few gauges with its own staff.

Although the Weather Bureau is, strictly speaking, not a water agency, part of its work, as explained above, ties closely with the hydrological functions of TVA. In addition to its special forecasting service for the authority, it has also been engaged for two years in a study of the maximum precipitation to be expected on the watershed and its subdivisions. These studies are identical with those described above, which it has begun for the Bureau of Reclamation and which will be utilized in replanning the reservoir-operating program.

TVA AND THE U.S. DEPARTMENT OF AGRICULTURE

When the TVA began its work the U.S. Department of Agriculture was just beginning its new "action" programs. The Agricultural Adjustment Administration was the first of these and in its early phase was simply a crop-restricting and income-increasing enterprise. At first AAA used the Extension Service's county-agent system to administer the pig-liquidation and crop-limitation job, though, partly because the Extension Service people were often unsympathetic with the program, it later set up its own administrative staff for the county AAA committees. The Soil Conservation Service was not yet in existence. The Farm Security Administration did not emerge from the Resettlement Administration until 1936. It should be clear then that in the first years of the TVA the USDA had, outside of the Forest Service, no reason to fear the absorption of its job by this new multiple-purpose regional agency.

The early uneasiness in the Forest Service lest TVA take over the national forests in the valley was early relieved as TVA's watershed program developed. As indicated above, substantial accretions of forest land have been brought under the management of the Forest Service as a result of TVA purchases. On the research and utilization front, TVA's activities have been well dovetailed into the comparable functions of the Forest Service. Extensive sites on the Norris Reservoir watershed have been turned over to the Asheville Forest and Range Experiment Station for the study of "forest influences" and the Forest Service technicians make their data available to the TVA people. There is no doubt that in this technical field

the TVA hydrologists and engineers have relied heavily upon the research findings of the Asheville technicians and of the forest-products laboratory which has been used by the Forest Service as its utilization-research center for many years.

On the forestry front the only important question that might be raised concerning interagency relations is that of assistance to farmers and private timber owners in the establishment of good forest-management practices. In that field, the TVA is duplicating the kind of work done by the Forest Service on farm forestry (by the Soil Conservation Service until 1945). This does not mean that they work on the same farms or with the same private operators; in that sense there is no duplication. But TVA is intensifying within the Tennessee Valley the kind of activities which the Forest Service conducts with smaller appropriations, and therefore smaller staff, on fewer projects. There is duplication, in the region, of overhead, travel, and the like, but not of jobs. From the standpoint of need, there can be little doubt that the backwardness of the Tennessee Valley in forest management and the potential value of its timber resources warranted a larger and more intensive program, and that there has been plenty of work for all the available foresters.

Since the early days of the TVA river-system program an elaborate soil-survey program has been under way. This is a three-way undertaking which TVA shares with the land-grant colleges and universities of the valley states, and the division of soil survey of the Bureau of Plant Industry, Soils and Agricultural Engineering of the USDA. The first surveys were made in reservoir areas as a basis for appraising land which TVA purchased and for deciding on its use. But they were also integral to the entire agricultural program, particularly on the test demonstration farms and by the middle of 1945 had covered about 65 per cent of the watershed.²⁵

This activity, as well as a number of other joint agricultural programs, is regulated by a basic "memorandum of understanding" negotiated in April, 1936, between TVA, USDA, and the seven agricultural colleges of the valley. The board decided to rely on the work of the colleges, the experiment stations, and the USDA bureaus for technical answers required by its regional agricultural program. Building upon the established practice of coöperation between the state colleges and the USDA in research and extension projects this agreement created a permanent organization for coöperation. Each college agreed to designate a state contact officer to keep in close touch with the agricultural programs of the TVA and the USDA (particularly of the program-planning division of the Agricultural Adjustment Administration) and to report on them to the state experiment stations and extension services, who would establish in each state special

²⁵ *TVA Handbook* (1946 ed.), p. 13.

joint committees on such problems as erosion control, land use, land settlement, and rural electrification.

At the center of this plan was a correlating committee of three, one each from TVA, the Department of Agriculture, and the agricultural colleges. This committee employed a full-time secretary to carry on its business. Its major task was to consider and to make recommendations upon all joint projects proposed by any party to the agreement. Because of the scope covered by potential projects, this job was split up among technical subcommittees appointed by the valley-states conference—an informal group composed of the deans of the colleges, the directors of the extension services and experiment stations, and representatives from TVA. The subcommittees dealt with biological and physical research, extension and resident teaching, coöperatives, and resources utilization (the last being a kind of catchall which has dealt mostly with social-science questions).

To make the committees useful as advisors to the correlating committee, staff services were provided by TVA. It has been the job of these staff men, called "correlators," to digest the technical material basic to the decisions of their committees. The valley-states conference has continued as a forum for the discussion of committee reports and for reacting to them by resolution.

Aside from the value of this organization for eliciting the best answers to technical questions, it has also undoubtedly served to unite the full political force of the seven state-college groups behind the TVA practice of delegating the administration of agricultural functions to the state extension services.²⁶

²⁶ In the spring of 1949, appeared a study by Philip Selznick undertaken in 1942-1943, under grant from the Social Science Research Council. This throws a flood of light on the influence of the state agricultural colleges, with their extension services, upon TVA policy and relations with the action agencies (particularly the Farm Security Administration and the Soil Conservation Service) of the U.S. Department of Agriculture.

Selznick had access to internal memoranda covering the history of TVA discussions and activities down to 1943, and the further opportunity of multitudinous interviews with its staff. His factual account of the influence of the state colleges and their principal pressure-group clients (American Farm Bureau Federation) on TVA attitudes and policies deserves great weight. His analysis indicates that TVA's own agricultural-relations department consistently and aggressively espoused the state-college-extension-service-farm-bureau policies, and through its tie with one member of the board, Harcourt Morgan, often overcame the more friendly attitudes or policies proposed by other functional divisions.

In particular he traces the defeat of the other divisions who wished to work closely with the Farm Security Administration in carrying through a plan of joint activity to help the underprivileged farmers in the valley. He reviews the steps by which the agricultural-relations department blocked the TVA forestry-relations department in its effort to obtain approval for a joint TVA-FSA program. It stood out against another proposal from the manager's office for joint effort in handling migratory farm labor, surplus farm population, and difficulties of the low-income farmers—and it won. Even the agreed plan, sponsored by the reservoir-property-management department in 1937, for FSA to

Between the state-college group and TVA on the one side and the Department of Agriculture on the other a vigorous controversy has arisen over the status of the Soil Conservation Service. That agency had not been organized when TVA began its fertilizer-demonstration program. In its early days in the Department of Agriculture the SCS too was a demonstration agency, but by 1938 it had begun its swing to an action program, working through state-created local soil-conservation districts, which it had invented. Until the end of 1945 it kept out of the Tennessee Valley on orders originally issued by Secretary Henry A. Wallace, but this self-denial has come to an end. In the spring of 1946 Assistant Secretary Charles F. Brannan told the TVA and the state colleges that SCS would service districts in the valley states.

TVA AND THE BUREAU OF MINES

In the Tennessee Valley, whose fertile land and timber had been so seriously depleted, hope for early increase in industrial activity necessarily centered in considerable measure on the use of minerals. The Bureau of Mines in the Department of the Interior was charged with the exploration of these resources and with the improvement in methods of mining and treatment which might give commercial values to minerals formerly neglected. So TVA's interest has inescapably overlapped that of the bureau. Its mineral-testing laboratory at Muscle Shoals is equipped for the grinding, classification, separation, and flotation of minerals. We have already described its exploratory work and general mineral activity.

To avoid duplication, the staff of the bureau, which has taken over a TVA laboratory building at Norris under a coöperative agreement, regularly exchanges information with the TVA minerals-research group. What goes on at the Norris laboratory is formally reported each month to the TVA, and TVA minerals reports are regularly given the bureau. From the TVA side, however, there is some criticism that the bureau field staff has too little to say concerning the projects on which it shall work and that consequently many problems are undertaken which have no regional significance. One case is cited of a problem which had been fully explored and

aid some of the farm families displaced by TVA reservoirs was terminated two years later under pressure of TVA agriculturists who Selznick affirms were acting for the state colleges and the farm bureau federation. The hostility of the farm bureau federation to FSA was not merely local, but part of a national group policy. The ties of the TVA agricultural-relations department to this organization, via the state colleges, appear in Selznick's story to have been the major impediment to coöperation between TVA and FSA. They were also of importance in the marshaling of strength for the conflict with the USDA over the entrance of the Soil Conservation Service into the valley. Philip Selznick, *TVA and the Grass Roots: A Study in the Sociology of Formal Organization* (University of California Press, 1949), particularly chapters iv and v. (November, 1949.)

reported upon by TVA but which the Washington office of the bureau insisted be done all over again by the Norris bureau technicians.

POTENTIAL CONFLICT WITH THE DEPARTMENT OF COMMERCE

The description of the research and development work of the TVA, most of which centers in its Department of Commerce, has indicated the close association which TVA has established with many of the newer industries in the valley. The timber-manufacturing industries have been given much technical assistance, including help on fabrication and plant problems, by the utilization staff in the forestry-relations department. These services for businessmen resemble those which have recently been projected by the U.S. Department of Commerce, which, under the impulse of Henry Wallace, proposed to perform a service for small businessmen comparable to that rendered to farmers by the Extension Service. In pursuit of that objective, funds were granted by Congress in 1946 with which to establish regional field offices staffed with industrial and business technicians to give advice on industrial engineering, chemical engineering, accounting, taxation, and financial problems. The projection of such a service in the Tennessee Valley will require careful articulation with similar services of the TVA forestry-relations and commerce departments.

The TVA: A Regional Public Corporation

It is not intended to offer here a full-dress description of the corporate peculiarities of the TVA or to examine in detail its internal administrative structure and practice.²⁷ The fact that the authority is a corporation gives it a few fundamental peculiarities not found in the traditional government bureau. One of these is the right to sue and be sued, which exempts the authority from the usual immunities of a "sovereign" when, in the course of its work, private parties are wronged or injured. TVA is also given a general right to contract and to buy or lease real estate or personal property needed in the transaction of its business. It may adopt, amend, and repeal bylaws. It has no capital stock; decisions are made by majority vote of its board of three directors, who are appointed for nine-year, overlapping terms by the president with the consent of the Senate.

In addition to these traditional characteristics of a corporation, the authority has also been granted certain freedoms not usually accorded a

²⁷ Readers interested in a full account of these matters will do well to consult the excellent study of Professor C. Herman Pritchett, *The Tennessee Valley Authority: A Study in Public Administration* (Chapel Hill: University of North Carolina Press, 1943) and the later volume prepared by Professor Herman Finer, *The TVA: Lessons for International Application* (Montreal: The International Labour Office, 1944).

federal administrative bureau. It is free of the recruitment-examination and classification controls imposed upon the regular federal civil service but is obligated to establish its own merit system and to eliminate political considerations from its personnel policies. In so doing it has developed recruitment, examination, and appointment procedures less rigid and formalistic than those which characterize the regular federal civil service system, and it has been able to pay higher top salaries than the classification act of 1925 allowed. Its freedom in matters of personnel has recently been slightly curtailed by new legislation relating to veterans' preference and man-power ceilings, the former enforced by the Civil Service Commission and the latter by the Bureau of the Budget.

On the financial front the principal differences between TVA and the traditional federal bureau are:

(1) TVA is not required to present to Congress as detailed budget estimates as are other agencies, and it receives a lump-sum appropriation with the understanding that it will not abuse this greater fiscal discretion.²⁸ But it is subject to close scrutiny with regard to all its fiscal and program activities when it appears before the Bureau of the Budget and the Congressional subcommittees on appropriations, and it must conform to the wishes of these committees concerning expenditure policies or run the risk of losing its lump-sum elasticity in the expenditures.

(2) TVA has been accorded much greater freedom than has the Bonneville Power Administration in its fiscal plans for transmission-line and substation construction. Each piece of line or each facility does not have to run the gauntlet before the Congressional committees as is true of BPA. TVA can thus develop its transmission system free of the distortions due to local objections. Perhaps the fact that private systems are no longer in the Tennessee Valley makes possible the continuance of this greater budgetary freedom for TVA.

(3) Its original act allowed the authority to issue bonds to a total of \$50,000,000 for construction of facilities for electric-power production, but it did not make use of that right. In 1935 it was given authority for a five-year period to issue \$50,000,000 of bonds for loans to public and coöperative distributing agencies for the acquisition or construction of electric-distribution facilities. In 1939 it was given the authority to issue \$61,000,000 of bonds for the acquisition of a specific list of private-utility properties, for loans to public and non-profit distribution systems, and for other related purposes. This bonding power expired in 1941. These bonds together with PWA loans to municipalities were the means for the rapid supersession of the private-utility distribution systems in the valley by local public and coöperative agencies, and for the acquisition by the authority of the transmission and generation facilities of the big companies.

(4) The TVA is also allowed to retain that part of its revenues from the sale of power "or other products manufactured by the Corporation" which it regards as necessary for operating its dams and reservoirs and for "conducting its business in generating, transmitting, and distributing electric energy and in

²⁸ Thus the act for the fiscal year 1949 (*Public Law No. 860*, 80th Cong., 2d sess., chap. 773) gives one total figure and within it one other figure limiting the amount that may be used for construction.

manufacturing, selling and distributing fertilizer and fertilizer ingredients.”²⁹ It may also retain 1,000,000 dollars each year for emergency purposes. New construction, however (save that which might be in the nature of an emergency), cannot be financed from revenues, but rests upon Congressional appropriation. All other receipts of the corporation (including those from the sale of property) go to the Treasury where they are deposited in a TVA fund which also includes appropriated monies. Such money as remains in the fund at the end of the fiscal year is reappropriated by Congress, which adds whatever sums it feels are required for operation and for new capital expenditures.

A further concession to corporate discretion came after a seven-year running battle with the comptroller general who had insisted that TVA was subject to the usual audit and claim-settlement review which he performs for the regular departmental agencies. Two amendments to the act explicitly recognize that TVA methods may vary from the customary federal purchasing requirements and that it may approximate the practices “common among businessmen” when caring for an emergency, buying repair parts, or purchasing goods or services costing not over \$500. In comparing bids the board is allowed to consider the quality and adaptability of supplies and the reliability, experience, and other qualifications of the bidder, as well as the price of the commodity.

The authority is subject to the continuous audit of the comptroller general, but is entitled to see his annual audit report and has an opportunity to point out errors and answer criticisms before he files it with the president and Congress. His right to settle claims for or against the authority is drastically limited by a provision which forbids him to “disallow credit for, nor withhold funds because of, any expenditures which the Board shall determine to have been necessary to carry out the provisions of said Act.”³⁰ Thus has been removed the interference with the authority’s administrative discretion (illustrated by the absurd disallowance of a purchase of books of ice tickets at a discount because that would constitute an advance of government funds!) which is inherent in the audit and claim-settlement functions as habitually practiced by the comptroller general.³¹

It will be seen from this summary that the corporate freedom of the TVA is greatly limited as compared with that of older government corporations, such as the Panama Railroad Corporation (in the War Department), the Emergency Fleet Corporation, the Inland Waterways Corporation, and the Reconstruction Finance Corporation, which had been created before the coming of the New Deal and provided with capital and expendable

²⁹ TVA Act, Section 26.

³⁰ TVA Act, Section 9.

³¹ For a clear and full account of the conflict with the comptroller general see Pritchett, *op. cit.*, pp. 249 ff.

revenues which made it unnecessary for them to come to Congress for annual appropriations. They were also explicitly free from the review of the comptroller general. The situation of the TVA is more like that of the orthodox government bureau than of a public corporation as that was generally conceived when TVA was born.

It may be that we have in recent years used the corporate form of federal administration for inappropriate functions and under too loose administrative and Congressional surveillance. It is possible also that, as Professor Leonard White believes, the desirable elasticities in personnel, finance, and other matters which we have in the past been willing to allow to the corporation could be provided, were we inventive and bold enough, within the framework of the ordinary government department or bureau. But until such an arrangement is worked out, the government-corporation form may afford to an agency, which has been performing functions resembling those of a private business, some essential administrative discretion that Congress has denied and will probably for some time continue to deny to the typical bureau.

But the functions of the TVA are only in part like those of a private business enterprise. Aside from its power functions and its fertilizer experimental functions, which involve research, manufacture, testing, and distribution on a fairly big scale, its regional programs resemble, not the duties of a private enterprise, but the accepted tasks of regular governmental agencies concerned with resource conservation and development. The power-generating and marketing tasks clearly require a greater degree of flexibility of administrative authority than Congress has allowed to the orthodox administrative agency. Moreover, that kind of government job needs the continuous challenge of the corporate financial balance sheet, even though such obligations should not be cut to fit the Procrustean bed of private profit.

TVA's Use of Grants-in-Aid

One of the most significant administrative features of the TVA is its grant-in-aid system for encouraging state and local agencies to undertake activities relating to the many different phases of the total regional program. Such use of funds for such a variety of purposes constitutes one of the most interesting administrative innovations in federal administrative experience. The purposes for which grants have been made are nearly as varied as the spectrum of the authority's duties.

This method is the result of deliberate philosophy and choice. Early in its history the authority decided to do as many tasks as possible through state and local governments and nonprofit associations of farmers. That

decision, as fully exemplified in the land-use program, clearly meant that TVA would not undertake to build up its own staff and thus itself assume full responsibility for the work done. Instead, TVA would furnish the funds for strengthening state and local services while relying upon written contractual conditions, specified administrative standards, and close staff contacts to obtain desired results.

In pursuing this policy the TVA has in effect become a reappropriating agent of Congress, and in this role it is free to devise the standards and conditions under which grants will be forthcoming. It can vary the requirements to suit its sense of the needs of each project or each general situation. It can hammer out with each state or local agency specific conditions which are mutually satisfactory. It thus has an opportunity to "tailor-make" the pattern of fiscal and administrative relationships governing each agreement. So far as the writer knows, no systematic appraisal of the results of this elaboration and modification of the familiar grant-in-aid principle has been made by competent outside students. However, the Congressional committees which annually scrutinize the appropriation estimates for these purposes have had sufficient confidence in their results to make money repeatedly available without statutory interference with the authority's administrative and policy discretion.³²

If the results of this method of administering the regional developmental programs through the stimulation of state and local agencies are to be measured by the conviction of the board and its leading officers, then it has been an extraordinary success. They point to case after case of state governments, or departments, or town officials, county boards, school districts, or a university or teachers' college having launched, as a result of TVA aid, into urgently needed services, or having revived and strengthened moribund activities which are basic to any valley-wide program of improved resource management and utility. These many small federal expenditures they assert have fertilized the region with new local interest and initiative, supported by new local complementary expenditures. Once well started this renaissance is reasonably expected to develop its own inde-

³² The Selznick study cited above, while professing not to evaluate the results of the grant-in-aid methods used by TVA, does throw a good deal of doubt on the possession by TVA itself of accurate knowledge concerning how much it has accomplished by the reappropriating techniques it has pursued. He points out that the formal agreements with the state colleges operated "within a context of loose and traditional ties and, as written instruments, have not been always strictly observed or even kept up-to-date." He also notes that little attention has been paid to the effect of the grants-in-aid from the U.S. Department of Agriculture as if they were college funds. In the anxiety of TVA not to interfere with regular Extension Service activities, he asserts that its agriculturalists "have consciously refrained, for example, from sending inspection teams into the field to check on the work of the Extension Service," which is in charge of its land-use program. See Selznick, *op. cit.*, pp. 124 ff. (November, 1949.)

pendent momentum, so that whatever the fate of the authority program, the work thus begun will in a large degree continue. If there is validity in this view (and the writer believes it has some validity), one of the most strategic phases of the program has been the TVA emphasis on university research and the participation of faculty and graduates in the regional program. To a remarkable extent the dormant talent there concentrated has been awakened or released and enlisted to work on problems of the region. In a civilization built upon technology this is crucial to a region which, like the Tennessee Valley, had lagged behind the technologies of its sister regions.

It is not improbable that the adoption of the "indirect" administrative procedure for the general development programs had another motive also—that of survival. When TVA was born the great depression crisis had engendered an experimental mood in the nation. Its lease on life might terminate with the recession of that innovating spirit, when the vested interests of the private utilities, the contractors, and the older federal agencies (such as the Corps of Engineers) which were being elbowed out might revive in sufficient strength to halt its program. But a new source of support for the program might be created if the local folk were to become active participants in it and so share the desire for its perpetuation.

Apart from the grant-in-aid and indirect administrative policies the great breadth and variety of its work gave unusual opportunity to enlist widespread local interest. Nearly every group in the valley can find something in the program that directly appeals to its welfare. Some of its activities take such tangible form (like sacks of phosphate fertilizer with "Tennessee Valley Authority" stamped on them in bold letters, and the massive but beautiful dams) that they become powerful emotional symbols identifying the authority with the valley people. When to these appeals is added the interest of local officials performing new or augmented administrative services, a solid political foundation for the support of the new regional federal agency has indeed been built. These are the chief reasons for the very remarkable displays of valley solidarity in support of the TVA (and of Chairman Lilienthal) in its contests with hostile groups in Congress.

No more ridiculous allegation has been made, in all the extravagant and acrimonious debate about the valley-authority question, than the repeated charge that the TVA represents an attack upon states rights and local government. People who make such statements are either ignorant of its history or purposeful prevaricators. Indeed, precisely the opposite criticism would have much more cogency: namely, that TVA has delegated too much of its responsibility to state and local agencies and has refrained from the imposition of sufficient controls and checks. The writer does not make this

criticism for he does not know enough about the character of the controls TVA has exercised or the adequacy of their administration. It will be impossible for an outsider to reach a just conclusion on this point until this aspect of TVA history has been carefully and objectively appraised by competent students of the art of national administration.³³

The Regional Slant of the TVA

It should be apparent from the account of the activities performed or stimulated by the TVA that what it has been doing is not new to American government, but that the method of the doing is new in part and that the point of view from which the whole enterprise is conceived is wholly new. That point of view is one of integrated regional improvement. Given that conception, and an area predominantly rural, where physical resources had been seriously depleted or neglected, it was inevitable that attention and activity should be primarily concentrated upon the means of improving and maximizing their value. It was natural that the internal organization of the regional agency charged with this work should reflect the principal resource groupings presenting opportunities for improved management and human use. For this reason the abbreviated diagram of the organization shows one cluster (water control in the river channel) concerned with those engineering tasks involved in harnessing the river against floods and creating hydroelectric power and transportation opportunities.

A second major group embraces the work on land resource—including the general agricultural program, the forests and wildlife, and the fertilizer work. Between these two is the power job—steam as well as hydroelectric. The power resource originates as a result of water control in the river channel but must be put to work on the land, though, of course, not solely on the farm. Here the symmetry of organization design ends and it burgeons out like the life of the region into many directions—into industry, commerce, transportation, education, town and city planning, recreation, and industrial research.

But all of these interests and activities have to be integrated in some fashion by the general manager and the board of directors, who must be looking across the whole gamut of services and relating them to each other, pulling in here, pushing out there, rearranging *this* task for better articulation with *that*, as their sense of balanced regional need directs. This cannot

³³ It is quite ironic that the Hoover Commission's task force on natural resources, without any study by its staff, recommended the continuance of the TVA "as an experiment" while opposing the extension of the valley-authority device elsewhere. This was a stand based on social and political views, not on research, and it was accepted by the commission, probably for identical reasons. (November, 1949.)

be done unless they master the essential facts about the whole region, its people as well as its physical resources. Nor can it be done well unless the staff beneath the board and general manager more or less shares this informed region-wide allegiance. The administrative thinking which emerges from the minds of the board and the general manager is in large part determined by the stream of ideas and information welling up from the staff beneath. If that is myopic or blinkered by undue loyalty to a particular job or "bureau" without reference to effects on other tasks, both policy making and its execution will be disjointed and defective. It is the chronic vice of the traditional federal agency dealing with natural-resource development that it creates exclusive loyalties—little bureau patriotisms that undoubtedly serve the function of good morale within the agency but make for indifference toward or friction with other agencies operating in the same geographic area and dealing with related segments of the resource front.

Perhaps TVA's most outstanding contribution to the art of administration has been to infuse most of its division and section heads with a sense of the whole regional program. One of the most striking contrasts between the atmosphere surrounding the staff of the TVA and that of the field officials of the traditional bureaus is the absence from the former of a concern with the local congressmen's favor. The board has successfully insulated its staff from the necessity of cultivating the friendship of local members of Congress. Whatever concern with Congressional attitudes the board may have, its staff has been free to go about its work without perturbation over the reaction of the local senator or representative to the performance of their assigned duties. In other agencies field officials in charge of each level in the field hierarchy must usually be sensitive to local Congressional attitudes. Even though they may refrain from performing special favors they are frequently expected to keep in touch with the representatives or senators from their districts, to make special effort to present in the best light the needs of the service or its defense against criticism or attack, to explain the need for funds, and in general to "cuddle up" when opportunity presents itself.

This administrative asset within the TVA is partly the result of structure and partly of early board policy, which, as in its whole personnel program, has hewed to the line of merit and eschewed politics within its organization. The willingness of the board to take on its own shoulders the sole responsibility for dealing with local congressmen could be duplicated by the regional chief of the traditional operating agencies. But the very dispersion of functions among numerous agencies which often compete with one another and the absence in some agencies of regionally integrated field

structures necessarily brings a much larger number of field administrators into the active cultivation of a favorable interest on the part of the local delegation.

Autonomy of the TVA

The primary operating advantage inherent in the TVA organization is its ability to act quickly and finally, on the basis of information which it can gather promptly, and with a direct "kinesthetic" appreciation of the consequences of its decisions. Its board and officers who make the final decisions live where the problems are. This advantage was illustrated when difficulties in construction arose at Douglas Dam indicating a need for drastic change in the design of certain important features. The board and the chief engineer on the ground at once agreed upon the indicated alteration and work was immediately redirected. In a similar situation the army district engineer would have required the approval of the division engineer and of the chief's office at Washington, while the Bureau of Reclamation project engineer must have waited for Denver to decide. Again when TVA was granting credits to rural electric coöperatives it could and did act with promptitude, thus saving a number of situations that were threatened with disintegration because of local private-utility pressure. The REA, on the other hand, is highly centralized. It moves with great circumspection and deliberation. It cannot hurry.

This handicap is partly due to the restrictions in the statutes which hedge about its lending actions, but partly also to remote administrative control. TVA's dependence upon second- or third-hand regional experience is far less than is characteristic of the top officers of the Washington-centered bureau: its officials can "touch, taste, see, and smell" the situations which the written communications to Washington symbolize.

However, this contrast is diminishing for most of the federal agencies concerned with natural-resource management. The older agencies, such as the Forest Service and the U.S. Army Engineers, have long since granted their field representatives (the region and the forest in the Forest Service, and the division and district in the Corps of Engineers) a large area of final authority. In recent years this drift has begun within the Department of the Interior, and it is currently being greatly accelerated. The field officials of these agencies also live where the problems are. They, too, have the opportunity to push the papers from the desk, and sense by direct contact the situations on which they must pass judgment. The difference in this matter then boils down to the facts that: (1) field authority is very uneven as yet in the departmental agencies, and (2) the judgments of field

officers in even the most decentralized bureaus with regard to *some* matters are *not* final; they are only recommendatory and may be overruled by the bureau chief or the secretary.

In passing judgment on the power of finality of decision possessed by the authority, TVA model, as against a decentralized field organization for the traditional bureau, we must face the question: are there regional issues within the resource-management functions of the federal government which cannot be wisely resolved without reference to a *national administrative* officer charged with balancing the interests of all regions and of the nation as a whole? It is no answer to point to the reporting responsibility of TVA to the president, for the chief of state cannot directly perform this reviewing and coordinating role.³⁴

Whether or not the TVA board has had as much presidential supervision since Arthur Morgan's removal as it has needed, we do not know. It has, of course, come increasingly under scrutiny as to budgetary and fiscal matters by the Bureau of the Budget. Whether earned or not, it has the reputation in its dealing with Washington agencies of inflexibility and "toughness." If this reputation is deserved, it may reflect the "vices of its virtues" of high morale, competence, and drive. Or it may in part express a regional provincialism which feels so keenly the needs of the one section of the United States with which it is identified that it fails to place them in proper national perspective. Certainly were we to multiply valley authorities and by them displace much of the traditional resource-management structure throughout the country, Washington administrative supervision would become necessary and at a level higher than that of the present status of cabinet department.³⁵

The Board Structure of TVA

In the board structure of the TVA lurks some danger to administrative effectiveness and to a lesser degree to democratic control. A tripartite administrative head may wish to move in two or three conflicting directions, or it may develop personal allergies productive of bitter, senseless, internal war. Both of these developments occurred on the TVA board and under less favorable auspices of presidential prestige, favor, and influence might well have wrecked the whole enterprise. Staff devotion to the program undoubtedly performed a most valuable service in surmounting the ill consequences of five years of internal board conflict. The ten-year calm which

³⁴ Senator Pope informed the writer in 1946 that during the eight years since his appointment to the board in 1938 it had met twice with the president.

³⁵ We outline in chapter xvii some of the interregional and national policy problems that a system of valley authorities would generate.

has succeeded the explosions of 1938 resulted from a most favorable personal compatibility of membership and the acceptance of Chairman Lienthal's leadership by the other members.

A full-time board also faces the ever-present temptation to keep itself busy by permitting its members to become too absorbed in the activities of some pet division. This is particularly likely when, as in the TVA, the board members originally divided administrative responsibilities among themselves. Allegiances of staff to particular board members become established in certain divisions which give them special influence in board decisions. Something like this appears to account for the paramount influence of the agricultural-relations division, both before and after the ousting of Arthur Morgan in 1938. This is one of the by-products of the board system which, according to Selznick's study, especially expressed itself through the personality of Harcourt Morgan.

Whenever a national election brings into office a president who is by political philosophy suspicious of this regional agency, his first appointment to the board is likely to reintroduce administrative friction and a divided board, unless all members resign or are removed simultaneously. No agency symbolizes the New Deal political philosophy more completely than the TVA. Despite the undoubted local support which its program has won, the current national reaction against New Dealism, if successful in capturing the presidency as well as the Congress, will doubtless carry into the board's first vacancy a new member responsive to the basic shift in national political policies. To be sure, so long as two members expressing the original social purposes survive, the board majority may cling to policies and programs under attack by Congress and the chief executive. Like other board members in national administration they might become barriers to the expression in administration of fundamental changes in public opinion as reflected in elections. The long and staggered term of nine years was intended by Senator Norris, its author, to reduce the prospects of interference with a public-power program by a hostile Republican president.³⁶ With a subsequent change of the political pendulum this barrier might be used for precisely the opposite purpose.

But it is now clear that a determined president or a determined Congress could remove all three board members. Since the circuit court's decision in the Morgan removal case, the TVA law apparently permits presidential removal on the same basis as for any executive officer.³⁷ Congress, under a unique provision in the TVA statute, may also, by joint resolution and without cause, remove any or all members of the board. That it has failed to exercise that right since the election of 1946, during a period of constant

³⁶ Pritchett, *op. cit.*, p. 218.

³⁷ *Morgan vs. TVA* (1939), 28 F. Suppl. 732.

conflict with a president professing New Deal purposes, gives reasonable assurance, however, that it will not exercise this administrative function, but will rely on the traditional control by the chief executive of his administrative subordinates.

Achievements equal to those of the TVA are not necessarily predictable for valley authorities generally. As Professor Pritchett has pointed out, certain unusually favorable circumstances, in addition to its talented leadership, must be recognized in the history of TVA. The reproduction of these factors in the Columbia, Missouri, or other river valleys is not assured. In its formative years TVA had the personal interest and backing of a president whose political and popular prestige was unprecedented in times of peace. As a result of the economic crisis, the public mind was receptive in 1933 "for an experiment in planning" and Congress was willing

to delegate unusual measures of responsibility to administrative agencies, and had relaxed the normal controls over expenditure of funds. . . .

In the Tennessee region comparatively few other federal resource-development agencies had established themselves on a firm basis. The Department of Agriculture was of course carrying on its agricultural and forestry programs there, and the Corps of Engineers was operating Wilson Dam, maintaining its navigation program, and getting the construction of Wheeler Dam under way. But there was no irrigation or reclamation work, no extensive land holdings, few Indians. Thus the problem of working out its relations with other federal agencies was a relatively uncomplicated one . . .

Because of the fact that the TVA was the only one of its species, the President could spare the time necessary to advise on its policy or settle its internal disputes, Congress was willing to give it unusual privileges, and the departments did not object to yielding some of their responsibilities to it. It had the advantages of being an only child.³⁸

³⁸ Herman Pritchett, "The Transplantability of TVA," *Iowa Law Review*, XXXII (January, 1947), pp. 332-333.

CHAPTER XVI

Proposals for a Columbia Valley Authority

Legislative Proposals before the Second World War

LESS THAN two years after the enactment of the Tennessee Valley Authority Act, and before the TVA was out of swaddling clothes, Senator Pope, of Idaho, introduced a bill (S. 869) for the creation of a Columbia Valley Authority.¹ Although it was soon pushed out of active Congressional struggle by the competing bills relating to the administration of Bonneville Dam sponsored by Senators McNary and Steiwer on the one hand and Senators Bone and Schwellenbach on the other, it did raise the issue of a valley authority for the Pacific Northwest. The articulate regional reaction was overwhelmingly hostile, even in the senator's home state. Thus a special committee of the Idaho State Chamber of Commerce, which included representatives of the leading wool-growers' association, the principal reclamation projects of the Boise Valley, the state mining association, the state bankers association, and the Master of the state grange, voiced determined opposition to the Pope measure and particularly to the "all-inclusive" powers of the proposed corporation which it opined were "too great to be administered by any three men."²

As a matter of fact the Pope Bill gave the proposed Columbia Valley Authority less scope than that exercised by the TVA or than the proposals that, some ten years later, were to be brought forward by Senator Murray for the Missouri River Basin and by Senator Mitchell for the Columbia.

¹ Introduced January 14, 1935, 74th Cong., 1st sess., and referred to the Committee on Agriculture and Forestry. No attempt is made in this chapter to review the proposals in Congress for creating a nation-wide system of valley authorities. Excellent summaries of bills of this more inclusive character, as well as of schemes for particular river systems, have been made by Wesley C. Clark in the *American Political Science Review* (February, 1946), pp. 62 ff., and by Robt. W. Greenleaf in the *Iowa Law Review* (January, 1947), pp. 339 ff.

² "Summary of Results of Informal Hearings Held by Regional Planning Commission," *Columbia Basin Report*, Pacific Northwest Regional Planning Commission (November 1, 1935, mimeographed), appendix Z e.

With one exception it followed the general plan of structure of the TVA by creating a three-man board reporting to the president. Senator Pope, however, stipulated an advisory board made up of the Pacific Northwest Regional Planning Commission plus representatives of the Departments of War, Agriculture, Commerce, and Labor and of the Federal Emergency Relief Administration. He gave the CVA the same exemptions from the classified civil service laws and from the usual bureau fiscal restrictions as are enjoyed by the Tennessee Valley Authority. The substantive powers proposed were the operation of Grand Coulee and Bonneville dams, the transmission, distribution, and sale of surplus electric power, the construction of future dams deemed necessary for the control of flood waters of the Columbia "or any of its tributaries," and the use of such water for irrigation, flood control, navigation and the development of electric power. The authority was enjoined to bring about the maximum use of the river for these purposes and for "(5) the proper use of marginal lands, (6) the proper method of reforestation of lands in said basin suitable for reforestation, and (7) the economic and social well-being of the people living in said basin." As preliminaries to these purposes the president and the corporation were directed to prepare surveys and plans for "guiding and controlling the extent, sequence, and nature of the development that may be equitably and commercially advanced through the expenditure of public funds, and through the guidance and control of public authority, all for the general purpose of fostering an orderly and proper physical, social and economic development of said area."

The Pope Bill deviated from its model however by omitting specific fertilizer production and valley-wide erosion-control programs. It did confer powers of research and experimentation not only for the distribution of electricity to "farm organizations, municipal corporations, States and public sub-divisions of States, counties or municipalities" but also "to further the proper use, conservation, and development of the natural resources of the Columbia River Basin." It also authorized the corporation to "study the question of reforestation within said basin, and the proper use of marginal lands there-in."

This first CVA proposal introduced the function of irrigation into the authority issue, and thus raised a controversy that was absent in the Tennessee Valley. Sentiment in the semiarid parts of the region was at once aroused, and has remained hypersensitive lest an authority plan (1) interfere with states rights in the appropriation and use of waters, (2) menace the financial feasibility of reclamation projects by fixing power rates too low, and (3) eliminate the Bureau of Reclamation as the chief irrigation agency.³ The measure did introduce a feature that might have robbed ir-

³ See the statements filed by the Montana State Water Conservation Board, and the

rigation of power subsidy, for it declared its intention "that the users of water for irrigation shall not be required to pay any part of the projects herein not allocated to irrigation, and that the users of electricity shall not be required to pay any part of said projects not allocated to power, but that the charges for water to be used for irrigation and the charges for power shall be based respectively upon the allocation to irrigation and power. . . ."

During the decade between Senator Pope's proposal and the introduction of Senator Mitchell's first CVA bill (S. 460) in February, 1945, controversy over federal administrative structure and powers within the Columbia River Valley tended to center on the public-power issue, on the relation of the Bonneville Power Administration thereto, and on proposed legislative changes concerning federal power-transmission functions. Beginning with S. 4390, introduced September 30, 1940, by Senator Homer T. Bone, with the collaboration of Congressman Charles H. Leavy, both of Washington, a spate of measures from members of the Pacific Northwest delegation in Congress poured into the legislative hopper. They were concerned with transforming the Bonneville Power Administration into a government corporation limited to the electric-power function. But some of them used the term "authority" in the title proposed for that corporation, and thus in the heat of battle over these measures the use of that word to evoke the emotions of fear and favor was well exercised within the Pacific Northwest some time before Senators Mitchell and Murray were to expand the substantive content of the regional authority issue. These measures were pointed (1) toward accelerating the public or coöperative acquisition of private electric utilities in the region, (2) toward increasing Bonneville Power Administration's freedom of action in meeting the demands upon it as a quasibusiness operation, and (3) toward assuring greater regional coöperation.⁴

All these bills were ostensibly justified by the fact that the Bonneville Project Act of 1937 had explicitly professed to be a temporary measure, framed to meet the urgent need for an administrative mechanism to market the power just being released by the first generators installed at the Bonneville Dam. In these bills to give permanent legal form to this operation (as well as to the transmission of energy from Grand Coulee Dam and

consultant to the Montana State Planning Board with the Pacific Northwest Regional Planning Commission in autumn 1935. *Ibid.*

⁴ The principal bills introduced for these purposes between 1940 and 1942 were, in addition to the Bone Bill of 1940, the following: H. R. 5129 by Congressman Hill, introduced June 23, 1941; a revised proposal by Senator Bone and Congressman Martin Smith, known as S. 1852 and H. R. 5583, both dated August 14, 1941; a revision by Congressman Hill on November 19, 1941 numbered H. R. 6076; and a third attempt by Senator Bone (in collaboration with Senator Wallgren and Congressman Hill) on April 1, 1942, numbered S. 2430 and H. R. 6889.

prospective future dams) the New Deal senators and congressmen from Washington, who were their authors, proposed to make the federal transmission agency the chief means for buying the private-utility systems, for reselling them to local public-utility districts, municipalities, and coöperatives, and for giving management assistance to these local distribution agencies to help them succeed in their tasks.

Each of these bills empowered the federal transmission corporation (not explicitly so named in the latest bills) to issue revenue bonds for the acquisition of utility systems in the transmission area. They thus touched off a bitter battle with the private utilities and their friends who feared the repetition of the private-utility ouster that had taken place in the Tennessee Valley. The odium heaped on them by the opposition came to rest in large part on the Bonneville Power Administration which had participated in the drafting and advocacy of some of them and was committed to the encouragement of public ownership of distribution facilities.

But BPA was concerned also with other features of these bills which proposed to exempt the transmission agency from certain restrictions customarily thrown around bureau business operations. These exemptions, also enjoyed by the TVA, included freedom from the regular civil service regulations, the right to settle tort claims, greater discretion in the letting of contracts and making of purchases, the right to bargain collectively with employees, and particularly the right to use power revenues for operation, maintenance, replacements, and other specified purposes.

The onset of the Second World War, with its appeal to domestic unity and its increasing insistence upon the coöperation of public and private power agencies to meet the rapidly expanded war demand for electric energy, submerged the contest of public versus private distribution of electric power, and its related and incidental issues of federal transmission policy.

Senator Murray's MVA Bill Sets the Stage

As the end of the war came into view, anticipations of a postwar economic slump gave birth to plans for enlarged federal activity in river-development and resource-conservation tasks. The row in the Missouri Valley between the Corps of Engineers and the Bureau of Reclamation over the competing Pick and Sloan plans gave the president the opportunity to renew his recommendation for the expansion of the valley-authority device. The response in the Pacific Northwest as well as in the northern Great Plains, produced two regionally sponsored measures for the whole valley-authority program. These were the first bill by Senator Murray (S. 2089, dated August 18, 1944) and, about five months later, the first Mitchell Bill, S. 460. There is little doubt that the measure proposed by the junior senator from Washington

drew heavily from Senator Murray's draft plan for the Missouri Valley. Moreover, the echoes of the hot dispute that soon developed east of the Continental Divide, particularly in Montana, which nurses the tributaries of both the Missouri and the Columbia and so straddles two regions, carried clearly into the Pacific Northwest.

By the spring of 1945 when the Senate sent the revised Murray Bill (S. 555) to Senator Overton's two hostile subcommittees for hearings and report, the Mitchell proposal was not only generating heated debates in the Pacific Northwest, but the secretary of the interior was stimulated to come to the defense of the valley-authority mechanism, provided it should be located within his own department. The hearings on the Murray measure were opened by the Senate Committee on Commerce in the spring of 1945. Ickes' testimony and his written report to the committee concerning Murray's MVA were of the "yes, but" kind, with the emphasis on the latter word. His major criticism was that the national interest between and over the several regions would not be protected unless the plans and operations of the several authorities were coördinated by an established department, aided by a national advisory board. That department, he held, should be the Department of the Interior which "is and has been for 100 years the principal department in the executive branch engaged in conserving and developing the Nation's natural resources in fuel, lands, minerals, and water. The end sought by the agencies within the Department of the Interior, which operate under my general supervision and direction, is the integrated development of the resources of our watersheds."⁵

When Senator Murray declined to incorporate in his revised draft changes which would have given to the secretary of the interior the supervision of all valley authorities, including the TVA, Secretary Ickes had his own bill ready to present to the committee. Some doubts may have been cast upon the *bona fides* of Secretary Ickes' conversion to the valley-authority philosophy of administration, by his unqualified insistence that despite the creation of authorities, river work constructed, operated, and maintained by the Bureau of Reclamation and by the Corps of Engineers "would continue to be constructed, operated and maintained" by those agencies.⁶ On the other hand the Ickes Bill (so called) as it appeared in the confidential committee print, under date of February 8, 1945, made no such unqualified guarantee of continued use of existing federal bureaus for these public-works purposes.

Administrator Raver of the Bonneville Power Administration also ap-

⁵ Letter to Hon. Josiah Bailey, chairman, Committee on Commerce, United States Senate, dated April 17, 1945, from Harold L. Ickes. Printed in S. Rept. 246, 79th Cong., 1st sess., pp. 11-13.

⁶ *Ibid.*, p. 13.

peared before the committee on behalf of a Missouri Valley Authority and in support of the Department of the Interior position. His testimony was important because Raver was head of an operating agency intimately associated with major developments on the Columbia River and headquartered in the region. Stressing the difficulties he had encountered in the Columbia Valley under the existing federal structure, he said:

In large measure, the deficiencies and obstacles result from a piecemeal and patchwork approach to the problems which grow out of the division of responsibility among numerous developmental agencies—each authorized to function only with respect to a single resource or in a single sphere of activity. I have become convinced that the only way of resolving these difficulties . . . is to entrust primary responsibility for the federal aspects of the development program in that river basin to a single regional development agency, but at the same time, retaining and utilizing the experience and techniques of existing agencies.⁷

The apparent inconsistency between the major emphasis upon a unified regional development agency and the last clause in the above statement was repeated and amplified as follows:

When I say that a single regional development agency should be assigned the primary task of resource development for a valley basin, I do not mean to recommend that existing bureaus concerned with resource development should be abolished. Nor do I mean that the Regional Authority should be cut off from the control of the federal government in Washington. . . .

The regional agency could, and should, be directed to utilize existing agencies with their skills and experience to the maximum possible extent, but it must be given the primary responsibility for planning, deciding, programming, supervising and financing resource development.

But the existing agencies would in reality shrink to mere units of the regional authority if the sentiment expressed in the following statement were fully implemented:

Again I say, the only complete solution is to assign the administrative responsibility of regional resource development to a federal agency that operates at the regional level, with authority and responsibility for formulating a unified program of resource development for the region, and for administering that development program.

While stressing the regional orientation toward management, Administrator Raver necessarily accepted his chief's program for national executive control through the Department of the Interior. But he indicated that the national controls ought to be chiefly centered on (1) the relation of regional programs to national full-employment policies and on (2) other broad na-

⁷ For this and the following quotations from Paul Raver, see *Hearings Before the Subcommittee of the Committee on Commerce*, 79th Cong., 1st sess., on S. 555, Part IV (April 19, 1945), pp. 220 ff.

tional policies and programs. Yet throughout his testimony ran the refrain of regional responsibility.

He presented to the committee a resolution recently adopted by the citizen advisory regional council which he had created for his own Columbia Valley agency and which had on a number of occasions discussed the need for better coordination of regional development functions and programs. It declared:

(1) That a federal agency is now needed to effect coordination at the regional level between existing federal agencies now concerned with river and resources development and operation.

(2) That in creating such an agency Congress should, where practicable, preserve the operating experience and functions of existing agencies.

(3) That an additional grant of federal power should be given this agency in fields of research, particularly in those fields which are not now adequately covered.

(4) That the new agency be so organized as to give more adequate regional autonomy than now exists among the present uncoordinated agencies.

It will be noted that this layman's group, even though affiliated with a Department of the Interior organization, did not endorse the Ickes program for the suzerainty of the Department of the Interior over valley authorities nor cling unqualifiedly to the continuation of existing federal agencies. In thus leaning more clearly toward the TVA model it was undoubtedly reflecting the sentiment of those groups in the Pacific Northwest that wanted a drastic overhauling of federal field structure in the resource-management province. Yet that sentiment, also, was ambivalent in its concern to reconcile somehow the retention of the existing federal resource agencies with the giving of primary planning and administrative responsibility to a new valley authority modeled on the TVA.

This concern is also exemplified in the propaganda literature of the Columbia Valley Authority Information League which sprang into existence shortly after the first Mitchell Bill for CVA was introduced. Its second release explaining the provisions of that measure ran in capital letters the part of its digest which summarized the stipulation that the authority was to work through or in cooperation with other federal departments and agencies, as well as those of the states and localities.⁸ Again in its thirty-second release it branded as absurd the opponents' charge that the Mitchell Bill would result in the replacement of the present federal bureaus. Without qualification it asserted: "The Mitchell Bill provides that the services of the present organization SHALL be used."

This difficulty of grasping for a new omniscient regional authority while clinging to the established federal agencies, reflects a situation which

⁸ Release No. 2 (no date), p. 2.

as Professor Pritchett has well remarked differs greatly from that in the valley of the Tennessee in 1933.⁹

The First Mitchell CVA Bill

Let us examine the first Mitchell CVA proposal, noting the significant variations from the TVA model. It established a public corporation, directed by a board of three chosen by the president for staggered nine-year terms. But instead of direct accountability to the president, as under the TVA Act and the Murray MVA Bill, the board was to present its plans and programs for review to a National River Basin Development Board (composed of the secretary of the interior, as chairman, the secretary of commerce, the chief of engineers, the chairman of the TVA board, the chairman of the CVA board, and the chief executive officers of other regional authorities which Congress might create). The national board was directed to coordinate the CVA recommendations with national plans and programs and with the plans of other valley authorities and federal agencies. Even more significant as a limitation on CVA autonomy was the provision giving the chairman of the national board (the secretary of the interior) the right to "direct and supervise the activities and operations" of the CVA. This would have made the corporation in effect an Interior Department agency.

Another structural departure from the TVA model was the establishment of a "Columbia Valley Advisory Council with which the board of directors of the Corporation shall regularly advise and consult." This group of seven would be composed of gubernatorial nominees from Idaho, Montana, Oregon, and Washington and three regional residents, as public representatives, chosen by the president with the consent of the Senate. This provision recognized the habit established during the days of the Pacific Northwest Regional Planning Commission of regularly concerting state spokesmen for the consideration of federal development plans. This feature had been included in a number of the bills for a Columbia Power Authority or administration during the earlier effort (noted above) to expand the functions and management freedoms of the Bonneville Power Administration.

The provisions covering relation of the CVA to other federal agencies made genuflections of self-denial and consideration which went beyond those of the TVA. For the CVA was instructed "so far as practicable" to conduct its construction and operation of projects and its other activities "through, or in cooperation with" other federal agencies, and to work

⁹ C. Herman Pritchett, "The Transplantability of the TVA," *Iowa Law Review* (January, 1947), pp. 333-335.

through state and local agencies and educational, scientific, and nonprofit organizations. The effect of these limiting provisions on the CVA's displacement of existing federal agencies would clearly depend on its own discretion. For the limitations are hortatory, rather than legally enforceable restrictions.

The importance of this question stands out when the scope of duties and functions of the CVA is noted.

To the CVA were to be transferred the Grand Coulee and Bonneville dams, the Hungry Horse project, the BPA transmission system and all appurtenant facilities. (It was to be allowed to continue to operate these properties through the agency from which they were transferred, except that the employees of the Bonneville Power Administration were to be transferred to the CVA, which would absorb that agency.)

The Columbia Basin project was also to be transferred and whenever the corporation so decided any other dam or water-control project built by the United States could be taken over.

To it went general jurisdiction in planning, building, and operating projects concerned with water development in the Columbia Valley region (defined to include not only the Columbia River watershed, but in addition those parts of Oregon and Washington lying outside that watershed together with additional areas "related to or materially affected by" the developments authorized by the bill). These included not only the major purposes of flood control, navigation, power generation and transmission, and reclamation, but docks, wharves, sewage disposal, water purification, recreation facilities, and rural electric lines and substations.

Like the TVA's its programs were not limited to water resources, but might include fertilizer, chemical and mineral development, the conservation of soils through encouraging farm planning, fertilization and proper land use, and forest conservation by means of reforestation, silvicultural practices, and fire protection.

Its land functions went beyond those of TVA for they included jurisdiction over reclamation by irrigation, land clearing, and drainage, and the right to develop and sell new grasses and plants for improving grazing practices. To accomplish these purposes CVA was given the same jurisdiction exercised by the Grazing Service and the Forest Service in these matters.

Duties in wildlife conservation explicitly paralleled those given the Fish and Wildlife Service. Similar authority was granted over the establishment and operation of recreation facilities, except that CVA should not disturb the National Park Service in its operation of national parks and monuments.

The injunction to prepare within two years and report to the president and Congress a plan (including recommendations) "for the unified development of the Columbia Valley region" included practically every phase of regional resources. Specially emphasized was "a complete plan for the integrated control and utilization of the waters of the Columbia Valley Region which will reconcile and harmonize" not only the major multiple water purposes—flood control, navigation, power, and reclamation—but will promote "soil conservation, afforestation and reforestation, mineral development, preservation of fishing and game resources and recreation . . ."

A unique provision, copied from the Reorganization Act of 1939, placed the burden of denying the authorization of these plans and recommendations on Congress. Whenever the plans and recommendations (or subsequent amendments thereto) have been before Congress for four legislative months and have not been affirmatively disapproved by joint resolution, they become legally effective for fulfillment by the CVA.¹⁰

This brief and incomplete summary indicates that the substantive duties of the CVA as envisaged by the Mitchell Bill would include nearly every important duty exercised by the TVA as well as some which that authority may not perform.¹¹ It is easy to see why the established federal resource agencies in the Pacific Northwest, and their pressure groups and other friends and clients, would be apprehensive over enactment of the Mitchell Bill.

On the side of corporate rights, freedoms, and obligations, the Mitchell Bill closely parallels the TVA Act. The CVA was to have the use of its power and other revenues for operating and maintaining its dams, power systems, fertilizer plants, and other activities. This would greatly reduce its dependence (as compared with the Bonneville Power Administration) on annual appropriations for noncapital expenditures. For certain specified types of capital expense, it was to have authority to issue revenue bonds without specification as to total amount. Unlike the TVA bond authorizations, these would carry no general government obligation.

These funds were to be used for acquiring, operating, and extending electric-utility systems in the Columbia Valley region which might be the object of coöperative and local public purchase programs; for extending credit to such local public or coöperative distribution agencies to build, acquire, or finance their electric systems, and to lend credit to other local nonprofit or public agencies seeking to utilize water stored by the CVA. (This would also include irrigation and domestic water-supply functions.)

The CVA, like its prototype and unlike the Bonneville Power Administration, would be free to establish and change power rates without reference to the Federal Power Commission. Rates would be determined so as to return sufficient revenue, not only to pay operating and maintenance expense but to amortize the capital investment allocated to power together with interest on the unamortized part of the investment. The policies to be followed in the sale of power continued and amplified the preference provisions of the Bonneville Project Act of 1937, giving priority to public and coöperative distribution agencies.

¹⁰ See 79th Cong., 1st sess., S. 460, Section 9d.

¹¹ The TVA could build and operate electric distribution systems in rural areas not adequately served at reasonable rates. No parallel provision is contained in this Mitchell Bill.

To avoid discontent over loss of local taxes through purchase of private-utility systems the corporation was ordered to pay in lieu of taxes sums equal to the real, personal, franchise, excise, and other taxes that would have been paid had the property remained in private ownership. For other real or personal property acquired in the course of its business the CVA was ordered to make payments to take the place of taxes, provided the losses in taxation by the local government exceeded the gains in taxation created by the operations of the corporation. These features would probably have produced in-lieu-tax revenues more adequate than the TVA percentage-gross-revenue payments.

In the financial and accounting operations connected with purchasing and contracting, the bill gave the proposed authority the same relaxation from requirements imposed on the regular bureaus as are enjoyed by the TVA. It was to have identical relationships with the comptroller general in the settlement of claims and the performance of audits. It was given the right to decide its own system of administrative accounts and forms, a privilege also accorded to TVA.

While the bill was less precise than the TVA Act in its exemptions from the civil service laws, the intent seems reasonably clear that the new corporation might work out its own merit system. Its employees were, however, to receive the benefits of the regular federal civil service retirement system save for those employees (presumably the craftsmen in unions) for whom, under authorized collective bargaining contracts, agreements might be made for applying the Social Security Act benefits, including unemployment compensation. The TVA has its own retirement system.

Alarm over States' Water Rights

The sections of the first Mitchell Bill relating to the corporation's legal control over water which might be developed by its river projects deserve special notice. Early in the bill an effort was made to disarm states'-rights sentiment by a general disclaimer of intent to interfere "in any way with the laws of any State relating to the control, appropriation, use, or distribution of water," or to annul or limit "any vested right acquired thereunder."¹²

But the irrigation groups both friendly and hostile, strenuously objected to this and certain other parts of the measure as menacing their special interests. At a number of points the bill conferred on the corporation the right to *sell* water. The orthodox view of all Western states is that Congress years ago acknowledged the jurisdiction of the states over water within their borders for reclamation purposes and their right to determine the

¹² 79th Cong., 1st sess., S. 460, Section 1d.

law governing the rights to that precious liquid. The measure also proposed to restrict sale of water to owners of 160 acres or less, to compel water purchasers to sell any land in excess of 160 acres at the value fixed by the corporation under an antispeculation appraisal procedure, and to control the resale rate of water clear down to the consumer.

All these provisions raised a hue and cry from the National Reclamation Association and its affiliated state reclamation groups (one of which was revived in 1945 from a chronically moribund state to fight the Mitchell Bill). Furthermore the Washington and Oregon state granges, which had been the chief backers of the public-power movement in the region and had grown increasingly favorable to a valley authority, likewise took alarm. The Master of the Oregon State Grange created a special committee on irrigation and reclamation to consider S. 460 and the other authority bills. On June 22, 1945, writing to Senator Mitchell of the objections to his bill made by this grange committee, he said:

The basis of the objections to these provisions (Section 1*d* and Section 12) is the Committee's belief that despite the statement contained in Section 1*d* the effect of the enactment of your bill in its present form will be (1) to interfere with state laws relating to the control, appropriation, use, or distribution of water, (2) perhaps to adversely affect existing water rights acquired under such state laws, and (3) as to waters developed and stored by the CVA, to substitute a system of sale upon contracts of limited duration for one of continuous delivery of water, without limitation as to time, to users who by virtue of appropriation and beneficial use pursuant to state laws have acquired a permanent right to such use.

The grange committee then suggested substitutes for the objectionable sections, which would satisfy the interests of the irrigationists. Their proposals were to use language essentially the same as Section 8 of the Reclamation Act to cover the vested and state water-right issue, and to adopt the provisions of the secretary of the interior's authority bill governing maximum size of irrigated tracts for antispeculation purposes. Promptly came a reply from the senator accepting *in toto* the proposals of the grange committee and promising at the appropriate time to incorporate them as amendments to his bill. The senator disclaimed any intention "to depart from the well established rules of law relating to water rights. That would create confusion and uncertainty."¹³

The Columbia Valley Authority Information League, the newly formed valley authority advocate in the region, applauded Senator Mitchell's acceptance of the grange amendments. It also proposed modifications of the 160-acre limitation which would not penalize inheritances or mortgage foreclosures on irrigated areas in excess of that amount. It felt that

¹³ Letter from Hugh S. Mitchell, dated July 5, 1945, to Morton Tompkins, Master, Oregon State Grange.

the antispeculation provision should follow the Columbia Basin Act in terminating land price control five years after water should be delivered to the land; and that S. 460 failed to give proper protection to existing small-ditch companies, many of which had been established for as long as 75 years.¹⁴

Many friends of the authority plan were not pleased with the subordination of the proposed CVA to the secretary of the interior and a national review board. They wanted the regional autonomy possessed by the TVA, and were not satisfied with the advisory council as a substitute.

The Second Mitchell Bill

When the Mitchell Bill appeared in revised form, on December 20, 1945, as S. 1716, it included the changes relating to state control over water rights and irrigation which the grange had proposed. Yet it is doubtful if the suspicion of many irrigationists caused by the *faux pas* in draftsmanship perpetrated in the original bill was erased by these changes. S. 1716 also retreated from the Interior Department control specified in the first draft by omitting all reference either to a national reviewing board or to the secretary of the interior as a director and supervisor of the authority. Instead the new CVA plan made the corporation's board administratively accountable only to the president, and required its members to maintain their residence within the Columbia Valley region.

The Columbia Valley advisory council also disappeared from the redraft, and in its place the corporation was directed to "establish procedures for regular consultation and interchange of views on matters of policy with one or more representatives of each of the States of Idaho, Montana, Oregon and Washington (to be designated by the respective governors thereof), representatives of business, agricultural, and labor interests of the region, appropriate officers of representative local and State agencies and institutions, with which the Corporation has coöperative arrangements, contracts, and agreements, and representatives of the general public of the region." This change gave more flexibility in the advisory machinery, and provided a wider social basis for its composition. But it weakened its official character and its dependence upon the state governors.

Substantive powers of the CVA were not essentially altered. However, the clause directing it to use its multiple-purpose water functions with due regard to "such economic, social and cultural values as may be affected or furthered by the projects and activities" was deleted. A more complete transfer of major river projects, including those authorized but not yet

¹⁴ See release No. 36 (undated).

constructed, was made in the new bill, but the transfer of employees of the Bonneville Power Administration, the Bureau of Reclamation, and the Corps of Engineers was left optional with the authority. Further transfers of dams and other property of the United States would be made, not at the discretion of the authority but by the president.

The research and experimentation functions were broadened by the inclusion of the phrases "to plan and to conduct economic, scientific and technological investigations, surveys and studies, to establish, maintain and operate laboratories, research facilities and pilot plants, and to undertake experiments and demonstrations, all for the purpose of developing new uses and new and improved techniques and methods for the discovery, extraction, production, processing, and use of the resources and products of the region, and of fostering an orderly and proper physical, economic and social development thereof." This would clearly permit research activities as wide as those allowed the TVA.

On the agricultural front, also, the new bill appeared to give to the proposed CVA powers over land use equaling if not exceeding those of its Tennessee Valley prototype.

On the other hand, those clauses were dropped which explicitly conferred on the CVA the same powers vested in the Fish and Wildlife Service, the Forest Service, the Grazing Service, the Bureau of Mines, and the National Park Service. Despite these omissions the substantive tasks spelled out for the new regional corporation would cover the most important duties undertaken by these other federal agencies.

A new feature in the revised measure was the permission for a region-wide, multiple-purpose cost-allocation plan. Instead of allocations by projects, the measure reflected the policies recently advocated by the Bureau of Reclamation and the Department of the Interior for a river-system-wide allocation financial program.

The features of the original bill relating to corporate fiscal, personnel, and internal management powers were retained but, in many respects, cleared of ambiguities and strengthened by improved draftsmanship.

Regional Debate and Propaganda

It is not the writer's intention to chart the propaganda and pressure-group battle that raged within the region during the public discussion of the two Mitchell bills and before their author was retired from the Senate by the election of 1946. Nevertheless, brief note should be taken of the nature of the contest that developed and the forces identifiable as contestants.

As indicated above, the state granges of Oregon and Washington, speaking through their Masters, favored a valley-authority plan. Their

official publications played a leading part in the presentation of favorable argument and publicity. They had been public-power enthusiasts before the TVA was born, and were impressed by the benefits they believed to have resulted in the Tennessee Valley from the supersession of private distribution companies by coöperative and publicly owned systems. They had backed the Public Utility District laws in their states, and in Washington had been successful in helping establish district agencies which found themselves hampered by many legal and financial obstacles in their efforts to buy out private systems. In Oregon the utility-district movement had almost been stymied by legislative, judicial, and administrative hurdles which grange leaders believed had been erected through private-utility influence. The grangers were also interested in resource development as a source of better markets for agricultural products and of increased farm income, and the valley-authority device seemed to offer promise of a better concert of public effort in those directions.

Some of the commissioners of the Public Utility Districts were also active backers of the authority campaign. They had participated in the organization of a Columbia Valley Authority Information League in 1945. Washington state officialdom (then under the influence of the Democratic Governor Wallgren) and a strong New Deal senatorial and Congressional delegation, lent support to a number of pro-CVA propaganda organizations that lived anaemic but lingering lives during this contest. Late in 1945 a "League for a Columbia Valley Authority" was formed at Portland to build up support for the revised Mitchell Bill. Its organizers were representatives of the propaganda organization referred to above, the Masters of the Oregon and Washington state granges, a regional director of the C.I.O., the presidents of the Montana, Idaho, Washington, and Oregon Farmers Union, the head of one of the leading electric coöperatives, the chief of the Washington Public Utility Commissioners Association, representatives of various public-power groups, the executive secretary of the Oregon State Federation of Labor, the secretary of the Columbia Power Trades Council (a body organized to bargain collectively with the Bonneville Power Administration) and a few individuals most of whom were employed by the Bonneville Power Administration but who lacked representative or official status. This group never received sufficient financial support to play an important role in regional agitation. What was left of it was taken over by Hugh Mitchell after his defeat in the senatorial race in November, 1946. Aside from a few small city and rural newspapers, these were the principal articulate regional spokesmen favoring a CVA.

Leading the overt opposition in both the Columbia and the Missouri valleys was the National Reclamation Association, and its affiliated state

reclamation associations or congresses. Before the Mitchell or Murray bills had been offered to the Congress, the National Reclamation Association had already become the leading civic pressure group in the West to combat the valley authority "menace." Its officers had joined with Midwestern, Southern, and Eastern opponents in the formation of the Continuing Committee of the Water Conservation Conference, to unite on a national basis the opposition forces that could speak in accents of civic concern for water-resource conservation.¹⁵ Within two weeks after Senator Mitchell presented S. 460, a condemnatory analysis was written by Judge Clifford Stone, a Denver attorney and a director of the NRA. The introductory paragraph indicates the spirit of the opposition's case, which was repeated with vigor and thoroughness throughout the Pacific Northwest. It read: "Although this bill contains many of the 'stock provisions' of other proposed valley authority legislation, its provisions are more far reaching than any previously introduced. In general it can be said that it creates a federal corporation clothed with all the powers of government to guide, foster, direct, control and dominate the physical, economic, and social development of the region. The Authority derives its powers from the Federal Government and thereby political control is welded with economic and social control and creates a perfect set-up for autocracy."

While this was the constant refrain used by the National Reclamation Association and the state reclamation groups, the other leading arguments repeated the emphasis already developed in the contest against the Murray bills for an MVA. These had been given standard elaboration, for example, at the December 12, 1944, meeting at Helena of the Montana State Reclamation Association where Judge Stone, representing the National Reclamation Association and the Water Conservation Board of Colorado, was the leading speaker. The arguments were:

(1) that state rights over water law would be menaced and vested rights thrown into confusion; (2) that the TVA experience had produced extravagant and wasteful expenditures, with no yardstick value, with doubtful solvency as a power operation had proper accounting methods been used, and with a flood-control program that inundated more good agricultural land in its reservoirs than would be damaged by the greatest floods; (3) that the differences between the Pacific Northwest and the Tennessee Valley regions were so great that the success of TVA, even if true, would not prove the suitability of the authority for this region; (4) that state and local agencies would be overawed and coerced by the power and influence of an authority; and in particular the Corps of Engineers and the Bureau of Reclamation were specially qualified by experience and knowledge to plan, build, and operate the river projects as directed by Congress.

¹⁵ See chapter xviii for a more complete discussion of the National Reclamation Association as a pressure group, and its pressure alliances.

Meetings of the state reclamation groups heard invited speakers damn the idea of a CVA and praise the Corps of Engineers and the Bureau of Reclamation. The pattern of practices for these meetings began before the Mitchell Bill made its appearance but in anticipation of expansion of administrative support and pressure for a CVA. Thus, late in 1944, when the MVA issue was hot and local enthusiasts for valley authorities were increasingly vocal about a Columbia Valley Authority, the Oregon Reclamation Congress met at Salem. It adopted a series of resolutions expressing the sentiments noted above, with a brevity of discussion that was to become standard practice. At the Oregon meeting these resolutions were drafted and presented by a committee of which Alan Smith, attorney and lobbyist of the Pacific Power and Light Company, was chairman. The first resolution denounced the federalization trend as "designed to replace local ownership by national ownership, and to supplant local autonomy with exclusive federal control" and announced the opposition of the Oregon group to the "policy of the Federal Government taking and keeping control over the consumptive use of water in the West." The second called attention to proposed valley-authority legislation and declared that the "Oregon Reclamation Congress does hereby declare its opposition to the passage of such authority legislation." The justificatory "Whereas" for this sentiment illustrated the opposition charges. It said:

. . . the authorities are in the form of Government corporations, vested with unlimited powers, clothed with Governmental immunity from responsibility for their acts, free from ordinary congressional controls, beyond the jurisdiction of the General Accounting Office, deprive the states of jurisdiction over the distribution and use of waters within their boundaries; prevent compacts between States, relating to such waters; drastically interfere with and seek to control the economy of the affected states; centralize powers and duties more appropriately lodged in and efficiently performed by the states; bring into public ownership large segments of privately owned property displacing tax revenues and thus increasing taxes on remaining property, and finally build unwholesome and undesirable Governmental monopolies, and are therefore unnecessary, unwise and undesirable.

That these fears of "federalization" were not directed toward the Corps of Engineers or the Bureau of Reclamation was made evident by the final resolution which thanked by name four gentlemen who assisted in making the meeting a success, including the Portland district engineer of the corps and the regional director of the Bureau of Reclamation.

To concert the effort of the state reclamation groups against the creation of a Columbia Valley Authority a regional meeting of delegates from the state associations of the four Northwestern states convened at Spokane on March 9, 1945. The chairman was Judge Robert Sawyer, vice-president of the National Reclamation Association (and soon to become its presi-

dent) who had been a leading figure in the meeting of the Oregon Reclamation Congress at Salem a few months earlier, and was soon to participate in the formation of the Northwest Development Association—a group which has taken over the continuing leadership in fighting CVA proposals and in defending development through established federal agencies. Here delegates from the state groups, representatives of the leading trans-continental railways, private-utility men, chamber-of-commerce representatives and officials of the Corps of Engineers, the Bureau of Reclamation, and the Forest Service met behind closed doors to plan the strategy of the opposition to a CVA and to adopt the customary resolutions of condemnation.¹⁶ This time the resolutions of favor included the Department of Agriculture along with the Corps of Engineers and the Bureau of Reclamation.

It is said that the spokesman for the Washington State Reclamation Association (also a high officer in the National Reclamation Association and secretary of the Spokane Chamber of Commerce) specially solicited the help of the other state groups because the senators and congressmen from Washington were all either committed to the CVA plan or leaning in that direction.

The Pacific Northwest Development Association was organized in May, 1945, by "representatives" of five states at a Portland meeting. Two of its first board of directors were also members of an upper-Columbia association concerned with Montana interests. Its relation to the reclamation associations is indicated by the fact that on its first board were the president of the Washington State Reclamation Association, the secretary of the Idaho Reclamation Association, and the president of the Montana Reclamation Association. While Judge Sawyer held no office in this group, he was reported as participating in its organization meeting. In November, 1945, the association chose Dan Noble as its managing director. He was formerly agricultural agent for the Milwaukee Railroad, a position which on all the major railroads involved close affiliation with the National Reclamation Association and other reclamation groups. That this group was also identified with private-power interests was alleged by the pro-CVA spokesmen. This allegation had some basis, though the extent of these relations has never been disclosed. It is known, however, that the Pacific Power and Light Company contributed in 1945 some \$3,900 to the Pacific Northwest Development Association, and that the Northwestern Electric Company gave \$2,300 to the same organization that year. Contributions in lesser, but substantial sums made in subsequent years.¹⁷

¹⁶ It is reported that the secretary of the Eastern Washington Public Utility District Commissioners Association was ejected from the meeting three times.

¹⁷ See the annual reports of miscellaneous income deductions by these companies as filed with the State of Washington Department of Public Utilities.

In the strategy of the opposition the most frequent overt activity was the adoption of resolutions for transmission to Congress by local chambers of commerce condemning the CVA bills and commending the Corps of Engineers and the Bureau of Reclamation. Every daily metropolitan newspaper in the region opposed the Mitchell bills, as did the overwhelming majority of the small city and rural papers. Memorials were adopted in the Montana and Oregon legislative sessions of 1945 asking Congress to defeat any bill for a Columbia Valley Authority. In the Oregon senate which passed such a resolution by a vote of 23 to 5, not a single member rose to defend the CVA plan, though several opposed the resolution as presumptuous, since Congress was studying the whole problem.¹⁸

A number of other important regional groups, such as the principal associations in the timber industries, joined in the condemnation of the Mitchell bills and all other authority legislation.

The private-utility companies were of course active in opposition, but whether or not it was true, as was charged by the grange journals in Oregon and Washington, that they were using the National Reclamation Association, the state reclamation groups, the Pacific Northwest Development Association, and the chambers of commerce as fronts in this contest, could not be proven in view of the private character of financial and interpersonal relationships inherent in formation and operation of private associations. As already indicated this charge had some basis in provable fact with reference to the Pacific Northwest Development Association. There are a few similar bits of evidence of the utility-interest relationship with some of the reclamation groups. Again the state of Washington records indicate that in 1946 the leading Oregon utility made a contribution of \$500 to the Washington State Reclamation Association, and that it paid former Governor Ralph Carr of Colorado, long identified with irrigation interests in the Rocky Mountain states, \$6,420 for services, a payment repeated in lesser amount the following year. Governor Carr made a barnstorming tour throughout the Pacific Northwest speaking before chambers of commerce and other civic groups, against the proposed CVA when that issue was hottest. It would strain credulity to conclude that these acknowledged sums were the only contributions from private-utility sources to the groups opposing a CVA. Finally many individual citizens without articulate association outlets though skeptical of the perfection claimed for the existing scheme of federal resource administration, particularly with relation to water management, doubted the Messianic claims of pro-CVA propaganda and felt puzzled and uncertain about the suitability of a valley authority for the Columbia River region.

When the election of November, 1946, retired to private life Senator

¹⁸ Portland *Oregonian*, March 3, 1945.

Mitchell and a number of Washington New Deal congressmen, the political stock of the CVA movement took a drastic tumble. The center of its support had been in the state of Washington. The replacement by the voters of that state of most of its liberal Congressional delegation with Republican conservatives deprived the authority proponents of effective political power. Pro-CVA leadership shifted to Senator Glen Taylor of Idaho, although Congressman Walt Horan from central Washington continued to sponsor a whittled-down version of the CVA conception.

The Horan and Taylor Proposals

In April, 1945, Horan had introduced H. R. 2923 for the establishment of a Columbia Valley Coöperative Authority, which would have restricted the duties of the authority to *water* planning, development, and management. Like the Mitchell Bill S. 460, from which many of its provisions were copied, the Horan Bill would have permitted the authority to carry out its duties either directly or through existing federal, state, or local agencies. It proposed the immediate transfer to the authority of the Bonneville project, together with the facilities, duties, and employees of the Bonneville Power Administration.

Aside from limiting the functions of the authority to water resources and hydroelectricity, the Horan scheme differed most significantly from the first Mitchell Bill in its provisions for the corporate board and advisory council. The board of five directors controlling the corporation would be appointed by the president, but one of the five would be chosen from each of the four states of the region upon recommendation by the governor. This board would be flanked by a Columbia Valley advisory council, composed of the governors of Idaho, Oregon, Montana, and Washington, the director of conservation and development of Wyoming, and the members of a seven-man Columbia Basin commission to be created by each of the four states. Meeting not less than once a year this council of 33 would review all proposals of the authority for water-resource utilization and its comments would be attached to any proposals presented to the president and Congress.

After the 1946 retreat from the New Deal in the state of Washington, Congressman Horan revised his authority plan, and in June, 1947, introduced a new measure (H. R. 3969) for the establishment of a public corporation to be called the Columbia Interstate Commission. This agency would be the same as that contemplated in the earlier Horan measure in corporate structure, and its machinery of control and advice. Aside from improvements in language the chief differences were (1) an obeisance to the private-enterprise philosophy by declaring one intention of the act to

be the encouragement of "the spread and growth of private industry through making natural resources of the region more readily accessible" and by directing the corporation to confine its water-resource duties "to those activities which are not properly in the province of private industry or which are of such a nature as to be of the public interest and yet beyond the means or willingness of private industry to provide," (2) a new limitation on the transmission and sale of electric energy to prevent the possibility of retail distribution by the corporation, (3) the right of the board to pick and choose those employees of the Bonneville Power Administration whom it would retain upon the transfer to it of that agency.

Both Horan bills gave the authority the right to issue revenue bonds for financing water-utilization projects but, unlike some of the earlier Columbia Authority bills and the Mitchell bills, made no specific mention of the right to acquire private utilities for resale to publicly and coöperatively owned distribution agencies.

In a press release of June 25, 1947, Horan explained the key purposes of his revised bill. It "is not," he said, "a 'valley authority' scheme. It does not set up an autocratic Federal agency with power to regulate the economic life of the region. It does not enter the field of private enterprise. It halts the trend toward federal domination of resource development and guarantees a full measure of States Rights to the Pacific Northwest." Asserting that "at present, all policy decisions are made by Federal agencies; the people who live along the river's banks have no voice in their own future" he averred that his bill would transfer the balance of control to the representatives of the states.

While rejecting the multiple-resource development of the full-fledged valley-authority plans, the congressman did not accept the contention of the leading critics of the valley authority that the existing federal-agency setup was satisfactory. He felt that the "17 different Government agencies concerned with the development of the Columbia River" each of which "must separately represent itself before the Congress" should not be so "jealously" protected.¹⁹ Said he, "Passage of this bill would make it possible for the members of Congress to review the entire question of Columbia River Development through one legislative committee, thereby gaining a full and accurate picture of the work done, the policies followed, the financial operations, and the relationship of this integrated activity to the entire governmental structure."

In the upper house Senator Taylor, in association with Senators Murray of Montana, Langer, Sparkman, and Hill, introduced the valley-authority proposal again in the summer of 1947. He used for a model the second Mitchell Bill, which he retained intact except for one major and a few

¹⁹ Speech in the House of Representatives, *Congressional Record* (June 25, 1947).

minor substantive alterations, and a few amendments in draftsmanship. The principal modification proposed by Taylor (which he took from a revised Missouri Valley Authority bill introduced three months earlier by Senator Murray) dealt with the regional advisory mechanism. Taylor (and Murray) proposed a regional advisory committee to be used by the authority's board for passing on its initial unified plan for the region and for broad policy questions. This committee would give representation for this purpose to eight federal departments and agencies and to the governors of the four states. In addition it allowed three local members each to the interests of agriculture, commerce, labor, and wildlife—all to be named by the president. It was evidently intended to make this group a really vital consultative body, because it was required to meet at least twice a year, and it might also meet either on petition of a majority of its members or on call by the corporation board.

Minor departures from the Mitchell plan for CVA included (1) the transfer of all existing federal river works to the corporation, (2) the omission of rural electric lines from corporate functions, (3) adoption of the fiscal provisions of the Government Corporation Control Act of 1945 and the right of the comptroller general to approve the accounting system, (4) the omission of the right of access to information in the patent office for use in corporation operations and (5) the placing of irrigation (so important to Senator Taylor's constituents) ahead of flood control and navigation whenever these major purposes were mentioned in the text of the bill. Though little serious hope was entertained by the advocates of a Columbia Valley Authority that the Eightieth Congress would accept such a proposal, the Taylor Bill did serve to keep the idea alive in the region pending the return of a political atmosphere more favorable for its consideration.

Basic Criticisms of CVA Proposals

The proposals for a Columbia Valley Authority, and the discussion which accompanied it, reveal a number of basic issues in federal administration which would be precipitated by such a change in executive structure. Foremost among these is how to relate such an agency to the chief executive of the nation. The first Mitchell Bill was the only regionally sponsored proposal which made an attempt to face up to this question, and it did so by a means which, however pleasing to former Secretary Ickes, was not only disapproved by sentiment in the Pacific Northwest but was bound to incur the uniform and strenuous opposition of all departments except the Department of the Interior. The history of the National-Resources Committee, which was tied to the chairmanship and administrative supervision

of the secretary of the interior in both field and central operations, indicates the unwisdom of tying an agency which must work with many departments on an equal basis into administrative subordination to one of them. While there were several reasons for the incomplete acceptance of the National-Resources Committee as a staff agency of the chief executive, the fact that the Departments of Agriculture, War, Labor, Commerce, and, from time to time, other central departments and agencies, had to report to a staff and an operating advisory committee which was supervised by the secretary of the interior was a constant obstacle in obtaining coordination and cooperation. This is no reflection on former Secretary Ickes. Any other department chief would have been as unwillingly accepted for this task. The constant sniping and resistance which this planning agency met before it was transferred directly to the Executive Office of the President, was mild in comparison with the opposition likely to be generated were operating supervision of a valley authority (or all valley authorities) to vest in the head of only one of the departments whose functions would key into its activities.

The valley-authority mode of organizing natural-resource development and management calls for a drastic overhaul of the national executive pattern. Under the valley-authority plan the existing domestic cabinet departments and noncabinet operating agencies should shed any of their operating duties which duplicate those entrusted to the authorities. That is the only satisfactory solution of the dilemma posed by the Mitchell and Murray bills which sought to retain existing agencies while giving the authority the power to displace them whenever it might so elect. The existing departments should assume a staff relationship to a central office of valley authorities, directly attached to the president's office and higher in status than the cabinet departments.

It is true that had Secretary Ickes realized his desire to absorb the Forest Service and the civil functions of the Corps of Engineers into an enlarged Department of Conservation, some of the difficulties of overlapping would have disappeared. But, apart from the doubtful wisdom (to be pointed out in the next chapter) of placing all the wild-land functions in such a department, is the fact that many of the problems of functional jurisdiction would still remain unsolved. Questions involving the functions of the Departments of Agriculture, Labor, Commerce and the Federal Security Agency would not be cared for even under such a consolidation.

So far was even pro-CVA sentiment in the region from accepting the supervision of Secretary Ickes, or any other department head, that all the proposals, except the first Mitchell measure, leaned in the direction of regional autonomy. The most centrifugal plan as well as the most conservative proposal was that of Congressman Horan. This expression of desire

for federal largess in the form of huge development and operating funds while displacing national administrative control by a four-state-dominated body merely expressed the customary political ambivalence of the entire West. Yet from the standpoint of national responsibility it is anarchic and undemocratic. To turn over authority management to such a group would sever the basic line of control running through the chief executive to the Congress—and that is the only means, even under a check-and-balance constitutional system, by which responsibility for the execution of national duties can be had.

Regional and state interest in the important tasks proposed for a CVA or any other similar body must be satisfied in some other manner. On that point there is large room for choice. But the choice should take the form of an advisory and consultative connection. The indispensability of complementary action by the states, through legislative and administrative coöperation, is reason enough why the states as political entities are entitled to such a relationship to an authority. All proposals properly recognized this truth. Yet it is also true that local official advice may overlook the many economic and social interests that would feel vitally concerned with so catholic a program as that entrusted to a valley authority. These are accorded recognition by both the second Mitchell Bill and the Taylor Bill. But it is an open question whether the interest group representation therein proposed should be on a parity with the state governments in reviewing proposed development plans and basic policies. Perhaps more than a single advisory and consultative group, permitting the separation of official and unofficial advice, would make a more workable plan for correlating the policies and acts of local public bodies with those of a valley authority, and vice versa; such a plan would also afford the federal agency other and more direct means of sensing the impact of its work upon private interests particularly affected by it.

If the Tennessee Valley model is to be followed in the Columbia Valley, the Missouri Valley, and in other appropriate resource regions of the nation, these issues of basic administrative structure must be faced. Only partial and for the most part doubtful answers have yet been embodied in proposed legislation.²⁰

²⁰ See Postscript, pp. 643 ff. for a summary of the recent Columbia Valley Administration bill sponsored by President Truman and vigorously pushed by the secretary of the interior as a part of the Fair Deal program of the second Truman administration. (November, 1949.)

CHAPTER XVII

Alternatives to a Valley Authority

OUR APPRAISAL of the present federal organization in the Pacific Northwest leads to the conclusion that, despite incipient efforts, it does not yet meet the requirements of an integrated resource-management program for the region. We are also of the opinion that the valley-authority method of organizing for that purpose runs serious risk of restricting effective national administrative responsibility unless a drastic and revolutionary change in the accepted pattern of departmental administration is simultaneously made. This does not mean that such an untoward development would occur simply by the addition of one more valley authority to the experimental TVA. But it is scarcely justifiable to demand an authority for the Columbia River and to deny it for any or all of the other regions which may confront similar resource-management problems.

Values in Traditional Structure

Many values are inherent in the traditional vertical bureau and departmental mode of organizing national administration. That explains the universal adoption by those nations sharing the essentials of Western civilization of similar forms of national administration within their domestic boundaries. These values include: (1) greater assurance that similar treatment will be accorded similar resource problems throughout the nation; (2) the utilization of central services which cannot be afforded in each regional area; (3) the restraint of sectionalist and provincialist tendencies which in the United States have often injured administrative efficiency, and erected obstacles to the fulfillment of policies in the national and international interest. In a period of history when the basic physical resources of every region are used by the people of every other area within the nation and by many beyond our borders, the regional resource programs and their administration have a significance which transcends the locality and region where nature has placed them. These interregional and international interests vary with the resource and with the peculiar chain of social relations in which its exploitation and use may be involved.

We tried to indicate in chapter i that the very conception of "region" as an administrative area of unique and separate distinction is only partly valid; that the natural characteristics underlying it are being constantly modified in social and, therefore, governmental consequences; that this modification is caused by the cultural developments which tend to break down the isolation, the differences, the uniquenesses even, that once upon a time more clearly characterized the several areas or regions of the United States. Our basic cultural tendencies are in the direction of uniformity, whereas the regional conception rests upon persisting and significant differences stemming out of peculiarities of land structure, topography, climate, and the evolutionary history of flora and fauna related to them.

Need of Reconstruction

The national and international interest in the location, extraction, use, and ownership of physical resources is most completely and strikingly illustrated by the part which fissionable materials are clearly destined to play in human welfare. All of us acknowledge that national and international interest must have right of way over regional considerations in deciding how and by whom these materials shall be taken from the earth, processed, and put to use. The whole conservation "problem" in this material so transcends all regional interests that no one, least of all David Lilienthal, is suggesting that development and management of these materials be delegated to a regional authority. The need for centralized control in this case is so extreme that all can see and will acknowledge it.

Our mineral resources are not renewable and many of them exist so far as is now known in limited supplies. There is clearly a national concern with reference to their exploitation and use which however adequately expressed in Congressional statutes will require for its administrative fulfillment and control some kind of a national executive entity. Its function would be to furnish supervision and to inaugurate the research in extraction techniques, processing, and use in order to maximize and prolong the life of these exhaustible and often irreplaceable resources. This is not to say that in minerals, as in the renewable-resource group, many of these research, planning, and supervisory activities should not be decentralized. But no matter how ingenious we may be in decentralizing authority so that it will improve management by making the job more "manageable," and by providing attention to diversities, there is still a clear case for an administrative center at the national level to act for the president and the Congress for realizing national public-policy interests. To do this it must have ultimate power to curb, advise, technically aid, and, if necessary, must be able to withdraw administrative power from the

regional establishment through which it must seek to accomplish the bulk of the operating job.

Let us take a second example of a centralized administrative need, this time in a renewable resource. The Forest Service maintains the forest-products laboratory at Madison which it staffs with physicists, chemists, and a variety of engineering research technicians and foresters. These men are highly specialized in nearly every phase of wood-utilization problems. They have been furnished with laboratory equipment costing millions of dollars. To duplicate that staff and plant in every regional area as part of the facilities for a valley authority or for any other regional mechanism would be economically indefensible even though certain wood-laboratory problems in particular regions may well be handled in smaller specialized laboratories. But there are obvious economies in the use of a central laboratory for a great deal of the research in the utilization of wood products and wood characteristics. This is true notwithstanding the parallel need for achieving a greater sensitivity to and interest in the peculiar research requirements of the several regions (including the Pacific Northwest) which the Madison laboratory has not always exhibited. To some extent this insensitivity has been due to lack of funds.

The Madison laboratory advanced substantially the art of lumber curing for all the timber regions of the nation. It has greatly improved and cheapened the glues and resins needed for combining all kinds of small wood pieces or thin wood sheets into larger units which increased the utility of forest production everywhere.

Yet the Madison laboratory is only one of a whole series of research activities conducted by the Forest Service. Most of its research is distributed among the regional forest and range experiment stations. These however cannot be best utilized without some central guidance and regulation. Among them a specialization of research programs has developed of value not solely to the particular region in which they are situated. Particular timber types are often not contained in any single region although they may predominate in one or two. There has to be an agreed national allocation of many research tasks that have interregional significance. This is particularly true when, as nearly always, funds are limited. These reasons explain why for many years range research for the Pacific Northwest was almost neglected at the Portland and Missoula experiment stations and was concentrated at Ogden, Utah. There are grazing problems in all three regions but the intermountain region had a greater balance of range interests than did the other two. Its experiment station has, therefore, been fed the lion's share of research funds for range problems, even though there are some peculiar and different questions in each of the other two regional experimental areas which are now being explored by

their stations. Such determinations in research work require the decision of a national supervisory unit, in this instance, the assistant chief forester in charge of the research divisions.

It should be clear from our earlier description that a similar situation exists for the maintenance of the Denver research center by the Bureau of Reclamation for servicing all its regions engaged in the building of dams and other reclamation structures. Should a combination of the civil functions of the Corps of Engineers with the bureau's engineering duties be made in the Denver center as we advocate below, it seems probable that some of the central laboratory facilities of the Corps of Engineers could be beneficially amalgamated with the Denver establishment. The conservation of each of the natural resources of the Pacific Northwest whose management we have been examining benefits from more or less centrally directed research facilities even though frequently regional facilities and staff should supplement the national ones. Yet it is reasonable to doubt whether in all instances (particularly in regard to mineralogical and wildlife research) the distribution of research activities as between center and field does not at present err on the side of overcentralization. We hold this doubt without concluding, at the same time, that centralized research and supervision should be superseded solely by regional institutions.

But there are other administrative needs also which, regardless of how we organize for resource management in the field, ought to be performed by national centers of administration. Within the limits of Congressional policy these centers must devise the functional standards of quality, quantity, variety, and cost for similar programs being performed in all the regions or river basins of the land. Such standards must be based in part upon national interests. To be concrete, let us take timber resources. The character of the soil and of the climate (rainfall, particularly) differs greatly from region to region in their effects upon timber production. More rapid production can be obtained with less effort and cost, for example, in the southeastern part of the United States than in Idaho or most other parts of the Rocky Mountain area. Trees grow more rapidly there than in most localities of the Pacific Northwest. Were the decisions concerning the intensiveness of a forest-management program to vest wholly in a regional agency or agencies that determination might be thoroughly unjustified in terms of over-all national policy. It is likely to be far better to spend money for intensive timber management where forest production per unit of investment is high than where it is moderate or low. It may even be wiser to manage some low producing forested areas primarily for watershed protection, grazing, and recreation.

Cost and productivity standards, however, are not necessarily the only bases for such policy decisions. Thus the intensive forestry program

practiced by the TVA may be justified from the national standpoint partly by social considerations relating to the improvement of the living standards of a depressed rural area. (A specific illustration is the money spent by TVA to find methods of cheaply reproducing improved black-walnut planting stock so that the poor farmers of that area can afford to plant them for supplemental income purposes.) Nevertheless, such a forestry-program decision should be made in the light of all comparable regional situations so that ultimately similar depressed forested areas may benefit by comparable programs.

The measurements for these variable factors necessarily used in the construction of management standards cannot be developed by Congress. They cannot be safely performed by isolated or competing regional administrative agencies. It is the task of a central administrative organization which will utilize the data and insight developed throughout the entire field and central experience. A similar need for central administrative mediation and decision is present for each of the other multiple uses of the forest resources.¹

From the water-resources front, we may take the illustration of hydro-electric power to indicate the need for national as well as regional administration. There is a national interest in preventing undue inter-regional price competition in power rates. There is a regional interest in obtaining the benefits of regional water power which may be more cheaply developed than in other regions. The reconciliation of these conflicting interests requires an over-all national view. Who is to furnish it? At present the Federal Power Commission performs this function for some agencies such as the Bonneville Power Administration, but not for others, such as the TVA, which fixes its own rates.

Closely related to and imbedded in this problem is the policy of interest rates on construction funds and of costs returnable from power revenues. Here at present is great confusion, a confusion stemming from the capriciously varying statutes which authorize particular developments and from differing administrative decisions. As a result, not only different interest rates are charged but different periods of amortization for similar types of investment. Power revenues of the TVA are legally charged with a return of power investment, while those from Bonneville Dam must make repayment plus interest. Power revenues from Grand Coulee are charged with repayment of power, plus approximately three-fourths of the cost of the whole Columbia Basin project chargeable to irrigation, a large share of the operating cost of the transmission system, all operating costs of Coulee Dam (including those due to irrigation and river regulation) and a sum of

¹ Acknowledgment is due M. H. Wolfe, assistant regional forester, Missoula, Montana, for calling attention to some of these problems in forest administration.

\$70,786,815 over the repayment period. (This last item equals an interest charge on the power investment, at 3 per cent, and it has been earmarked for three possible purposes: (1) further subsidy to irrigation costs on the Columbia Basin project; (2) subsidy to other irrigation and power projects in the Columbia River drainage area; or (3) reduction in power rates.)² At present no one administrative agency is responsible for reviewing such situations so as to help Congress rationalize this unfair and illogical tangle, and then to keep it straight.

The power function also illustrates other interregional issues which a national administrative agency ought to help resolve. With technological development already permitting economic high-tension transmission for distances of 500 miles, and with greater distances almost certainly feasible in the near future, the electric phase of multiple-purpose projects transcends river-basin boundaries. This will demand answers which Congress cannot readily find without the mediation of the executive branch. We illustrated this above by reciting incipient interagency differences between Bonneville Power Administration and the Bureau of Reclamation over the sale of Fort Peck power to the Montana Power Company. An increasing number of similar problems relating to electric power will arise in the Pacific Northwest as its huge resources of this form of energy are released from its rivers.

Another example of interregional problems arising from the use of water resources, is the diversion of water from those watersheds with a surplus to valleys of scarcity. Interests in the former are almost certain to protest at such diversions and the regional administrative agency there would normally be responsive to that attitude. Already a California congressman has introduced a bill proposing to divert water from the Columbia River system to California. On the hypothetical assumption that such a proposal may at some future time be feasible, it is easy to picture the Kilkenny battle between a Columbia Valley and a Central Valley Authority which would be precipitated by such an issue. It is naïve to say, as some enthusiasts for the valley-authority mechanism do, that Congress will itself do the necessary coordinating of such questions. It lacks the essential institutions for such a purpose.

To be sure statutory changes will have to be resorted to when competing administrative agencies have no effective administrative master or when existing statutes prevent administrative solutions. There are undoubtedly numerous administrative conflicts directly traceable to Congressional inconsistencies which only Congress can remedy. (One wonders if some of these might have been forestalled had there been a greater degree of ad-

² *Joint Report on Allocation and Repayment of the Costs of the Columbia Basin Project*, pp. 45 ff.

ministrative unity and better coördination in the national executive when these matters came before Congress.) Congressional intervention is the method used in trying to solve rows between the Corps of Engineers and the Bureau of Reclamation. The Flood Control Act of 1944 (Section 1*b*), to which we have referred above, is a good example of that kind of solution. While such laws may be helpful, some of these attempts—as the proposal to split by statute the jurisdiction over the flood-control parts of the multiple-purpose reservoirs on the Snake River, the upper Columbia, and the other Western rivers—will be administratively cumbersome and probably unworkable without supplementing administrative coördinating devices. This example points to the conclusion that some of the most important conflicts cannot be resolved properly without a revision of the national executive structure.

This study does not aspire to outline a complete plan for rationalizing the national executive organization upon the basis of the traditional bureau and departmental pattern. But we cannot ignore the patent fact that a number of the most persistent field conflicts in federal management of natural resources in the Pacific Northwest and other regions stem from faulty organizational relationships created by our present departmental pattern. That structure grew up, item by item, as new political responses were made to rapidly changing social needs during the nineteenth century. Only during the past decade has there been a systematic effort to rethink the structure appropriate to national administration or to equip the departments and the president with staff adequate for the continuous analysis of administrative organization and procedure.³ There is still much disagreement over the considerations (some would say “principles”) that should weigh most heavily in the design of departmental units. A fairly general consensus prevails, however, among informed students that no matter what groups may be chosen whether on the basis of purpose, matériel, clientele, process, or convenience, never will all the relationships and needs of a homogeneous cluster of activities within a given national bureau or departmental unit be neatly and completely contained. Always will there be aspects of a given purpose, matériel, and the like, which escape control by the major agency created therefor, and which will have to be attended to from time to time by horizontal coördinating devices or offices.

Yet it is clear that within the natural-resource and other fields the larger the combination of activities closely related by the appropriate cohering

³ The most nearly complete single study yet made relating to the whole national executive organization was that of the Brookings Institution in 1936-1937 for the Senate committee chaired by Senator Byrd. That analysis is contained in S. Rept. 1275, 75th Cong., 1st sess.

tie, the easier is the task of coördinating the relations that count for most in achieving the principal administrative purposes. The more intimate is the structural connection, the easier the transmission of information, the development and use of the insight at center and field, the issuance of directives, and the exaction of conformity to orders. The fragmentation of resource administration in field as well as at the center arising from its historical evolution has, therefore, been one of the major reasons why even after the acceptance of conceptions like "multiple purpose" and "integrated regional development" so little is achieved so slowly.

The regrouping of closely related functions into single operating units and their further coalescence with other comparable bureaus under broad departments with common social objectives would make possible a great reduction of jurisdictional friction and jealousy in the field. But that possibility, if it is to be converted into actuality, would require the simultaneous reconceiving of central-to-field relations so as to release and stimulate field initiative for grappling with the local diversities which inherently characterize physical resources. Coincident with such release of field initiative for the more prompt and accurate application of administrative judgment to locally variant situations must go two other organizational provisos: (1) the clear formulation of national policy standards to guide and if necessary restrain field initiative in the interest of overlying national purposes and (2) the development of a new pattern of integrating administrative devices across the whole resource front within a given homogeneous regional administrative area. Of the second qualification we shall have more to say later.

Unification of the River Management Functions

Perhaps the most obvious need for a reconcentration of splintered resource tasks lies in the planning, building, and operating of our major river structures—what the TVA has called the functions included in controlling the "water in the river channel." We have argued above that the prospects are dismal that jurisdictional conflicts between the Corps of Engineers and the Bureau of Reclamation can be settled by the Federal Inter-Agency River Basin Committee and its valley subcommittees. If they had a common executive superior reporting directly to the president, some improvement might be expected. But there is no good organizational logic in continuing two agencies which do almost the same work on the same river system. Nor is there much sense in giving water-planning powers (though with slight staff facilities for them) to a third agency, the Federal Power Commission. Under this setup we have and will continue to have duplicating river planning. This has become more true in the past few years. Each

agency is going in for multiple-purpose projects. Each is trying to see the river system as a whole

These tendencies, taken by themselves, are laudable but they multiply the jurisdictional problems of planning, timing, and operation. The melting snows on the west slopes of the Rocky Mountains which feed the upper tributaries of the Columbia and the Snake become the waters held in the reservoirs (existing, under construction, and prospective) built and operated by the Bureau of Reclamation in southern Idaho and western Montana. They will descend under mixed Bureau of Reclamation or Bonneville Power Administration control to be again restrained by dams being proposed for construction and operation by the Corps of Engineers before they are released on the upper Columbia to Grand Coulee Dam, where the bureau again takes over reservoir operation, or on the mid- and lower Columbia to the generators at McNary (now under construction) and Bonneville dams, which the army builds and operates. These waters are a part of a great single force which demands unified human manipulation if it is to be used to best advantage.

After a considerable period of misunderstanding between the Bureau of Reclamation and the Bonneville Power Administration concerning the release of Grand Coulee Reservoir storage, a written agreement was concluded which has temporarily adjusted the interests of the two agencies. But the army's interest in navigation has not yet been covered by any explicit understanding concerning its claim on storage water. Actual navigation problems have thus far been restricted to a few stranded barges but as navigation above Bonneville Dam increases and as the demand on power grows tighter some decision will be required as to which uses shall have priority rights to water. The Grand Coulee Reservoir was not planned for flood control. If as a result of the flood disaster of May-June, 1948, Coulee Dam outlets are enlarged and the reservoir operated for flood control, a further need for unified management will have been added.

A striking example of the loss of full social benefit when the water-planning and operation job for a river is split between two agencies (each of which by legislative inheritance and tradition has been responsible for limited water uses) is furnished by the Yakima River projects of the Bureau of Reclamation. There the bureau built many years ago five irrigation reservoirs which have made possible the remarkable harvest of fruit and vegetables from the intensively cultivated irrigation farms of the Yakima Valley. But in building and operating these reservoirs, it gave no consideration to their possible usefulness for controlling the periodic winter floods that have afflicted the towns and farms of the flood plain. Since 1896 seven major floods caused by heavy rains on early winter mountain snow, have swept down the valley inundating city basements, scouring away the

orchard trees and topsoils of productive farms. The flood of December, 1933, covered approximately 45,000 acres and destroyed property worth over \$1,250,000.

Recent studies by the Corps of Engineers indicate that practically all of this winter flood damage could have been avoided and the flood waters kept within accustomed river channels without danger to irrigation storage needs without appreciable additional investment. This could have been accomplished by changing the operating programs of the five reservoirs, by making minor spillway-gate improvements on one of the dams and in inexpensive outlet changes at another. The seasonal occurrence of Yakima floods is so early in the winter cycle that full reservoir operation for flood control will solve practically this entire winter flood problem and yet allow plenty of time for the accumulations for the next irrigation season. Why was this not done years ago? Because it was none of the bureau's business to concern itself with flood control; it did not study the flood experience nor analyze the flood-prevention problem; it was primarily concerned with the reactions of irrigationists, always anxious lest the summer supply be found short.

In some administrative situations a good case can be made for duplication and friction, but it must be so planned as to serve some purpose worth the cost of the friction. Here is no evidence of any such benefit. On the contrary much money is unquestionably wasted by the use of duplicating and competing engineering field parties, overhead staff, and laboratories. The operating difficulties are not yet important, but they will soon become so as the number of completed multiple-purpose river structures increases the need for unified river control.

Undoubtedly the Corps of Engineers and the Bureau of Reclamation are engaged in a continual contest for the favor of local pressure groups and for Congressional sponsorship. These contests exacerbate the disunifying social forces within the region. The row over Chief Joseph Dam and the incipient conflict over the question of who shall build the Hell's Canyon dams are illustrations of jurisdictional conflicts which are bound to multiply as the upper-river storage and multiple-purpose development program goes forward. These engineering-construction organizations naturally wish a constant backlog of projects in order to hold themselves intact; wide fluctuations in volume of work disrupt such organizations. The race for favor and funds is likely to be won by that agency which can offer the most blandishments in the form of the largest local benefits for the least local contribution. The army engineers clearly have the edge in such contests because flood control and navigation, unlike irrigation, are now practically free gifts from Uncle Samuel. This largesse which the army distributes is a potent inducement to the urban shipping and related

businesses and to urban and rural owners of bottomland to unite behind its "nonpolitical" projects. This appeal of "something for nothing" has been hard for the bureau to match. Despite the unearned gains in the form of added traffic for the railroad companies and increased business for the local merchants, professions, and service trades which are normal incidents of reclamation projects, these have to be paid for (though without interest) by the farmers who buy the reclaimed land and the water.

The evidence of jurisdictional conflict is not confined to the Columbia River Valley. The row in the Missouri area became a national scandal and compelled a surface reconciliation in 1944. Conflict is acute in the Central Valley of California. There the bid of the army for local support has taken open advantage of its lower level of restrictions and of financial requirements. This is illustrated by the statements during the summer of 1945 by General Thos. Robbins at the time the first assistant to Chief Engineer Eugene Reybold, who while visiting the valley was quoted in the *Sacramento Bee* of August 21, 1945, as saying: "If Californians would wake up and get the water first and then decide what to do with it she [*sic*] would be better off." This statement was viewed by Bureau of Reclamation officials as open incitement to stymie the bureau program because the signing of contracts for the sale of water would be made exceedingly difficult if not impossible were the river structures built before contracts should be made. Other statements by the general held out the bait of exemption from the 160-acre limitation if the army built the disputed dams.⁴

Such conflict issues have not been settled by the Federal Inter-Agency River Basin Committee because they are firmly embedded in the basic struggle for jurisdiction which stems from the division of a single job between two agencies working under differing legal conditions and with different philosophies of water use. It ought not to be forgotten (as much journalistic discussion appears to forget) that jurisdictional conflicts between bureaus are not mere exhibitions of bureaucratic cussedness. Administrative officers are human and have their fair share of such traits, but most of the warfare, open and covert, which develops between them, grows out of two factors: (1) the splitting of a job by Congress that by its nature is unified, and (2) the desire of organized pressure groups, vocational or geographic or both, to further their advantage by aggrandizing one agency at the expense of another. This "advantage" is made possible by the differential provisions of alternative Congressional statutes which set going a kind of Gresham's law of political behavior by which cheaper motives drive out the better. Although the bureau's disadvantage has been whittled down by inclusion of nonreimbursable flood control, fish and

⁴ See the *Fresno Bee*, August 17, 1945.

wildlife, and other benefits in new reclamation projects, the bulk of its project costs must still be repaid by the landowners, water users, and power consumers.

The very procedure followed in the initiation of most river projects invites and reflects pressure politics rather than balanced river-system planning. The following sober statement in the Brookings Institution study for Senator Byrd's committee indicates the political procedures which have evolved for inaugurating army projects:

The selection of individual river and harbor projects for federal improvement is made in the first instance by Congress. The procedural sequence is as follows: a local industry, Chamber of Commerce or group of citizens interested in a particular project asks the United States Senator or Congressman representing its section to request a preliminary survey. At this point the National Rivers and Harbors Congress plays an important role. It is a permanent promotional organization established in 1901 to stimulate local interest in river and harbor improvements. In addition to regular officers, this organization functions through a board of directors, state vice-presidents and twelve project committees. It is not unknown for members of Congress to serve as officers of this organization.

Requests for preliminary surveys received by individual Congressmen and Senators are introduced as bills or are submitted in writing to the Rivers and Harbors Committee on Commerce. Generally requests for preliminary surveys are included in rivers and harbors bills without attempt to evaluate the merits of the proposals.

Once the bill calling for preliminary surveys is passed it is ordinary procedure for the district engineer to obtain from the sponsoring Senators, Congressmen or local groups information relative to the character of the improvement desired.⁵

The bureau has evolved a somewhat similar process.⁶

Unification of the work of these two agencies would not necessarily eliminate pressure politics in determining project authorizations but it ought to reduce the distortions that grow out of competition for favors and to give freer rein to system-wide regional needs in determining the order of development. It would in addition release the bureau from the sense of exclusive allegiance to one part of the country which has been an inescapable incident of the restriction of its activity to the seventeen Western states.

It is reliably reported that when it was proposed some years ago that the bureau's functions be expanded from reclamation by irrigation to include reclamation by drainage, that proposal was successfully resisted by the bureau and its Western clients. Whether this fear was related to the prospect of reduced irrigation appeal if interest should be generated in

⁵ *Op. cit.*, pp. 338-339. This procedure still holds except for the change of names of Congressional committees resulting from the 1946 Congressional Reorganization Act.

⁶ See chapter iii, pp. 11 and 12.

large-scale drainage projects (most of which would be found in the eastern half of the United States) is a matter of speculation. There were according to the estimates of the Land Planning subcommittee of the National Resources Committee in 1934, 95,000,000 acres of land unfit for cultivated crops or improved pasturage until it should be drained. One-third of that amount with fertility ranging from good to high could then be drained at an estimated average cost of \$30 per acre. Since the army program has already been pushed into the first stages of a drainage program this water-engineering activity may well be included within the jurisdiction of a unified river-development construction agency.

The suggested unification of river-management functions also involves the duties of the Bonneville Power Administration. At present the national government's hydroelectric operating duties are divided between the Corps of Engineers, the Bureau of Reclamation, the Tennessee Valley Authority, the Bonneville Power Administration, and the Southwest Power Administration. The production of large blocks of power will increasingly become a by-product of reclamation works. Similar volumes of hydroelectric by-product will be developed within the Pacific Northwest (and probably elsewhere) by the army's big navigation and flood-control structures.

Whatever comes of the current demand for a political retreat from federal transmission of electric energy thus produced, the long-run trend is clearly for federal construction and management of the transmission lines to carry federally generated hydroelectric energy to load centers. There must, accordingly, be transmission-grid plans and operating systems which treat each major subdivision of the national area thus served on the basis of consistent principles, (*a*) for determining the physical plan of grid construction, (*b*) for deciding the interregional connections and transfer policies, and (*c*) for basic rate policies. As the situation at Grand Coulee illustrates there must also be a common administrative superior for supervising generation and transmission—in design, construction, operation, and maintenance.

Most of the friction between the Bureau of Reclamation and Bonneville Power Administration is the result of splitting between two independent operating entities tasks that inherently need unification. Some of it is due to the absorption of one agency with the interest of a single region, while the other must have regard to policies affecting a number of Western regions. Some of it is due to the differing clientele groups which organize behind each because each has only a part of the responsibility for the whole river-development and operating programs.

The unification of national administration on the water-resource front should, therefore, include within the same operating agency the generation

and transmission of electric energy through a grid system designed from the standpoint of both national and regional interests. If power revenues are to bear the largest share of reimbursable cost for major river projects, then it is crucial that the power branch of federal administration be in on the basic planning activities which determine those costs. These should include not only participation in the design of power features but the choice of locations as these relate to market centers and the need for new economic power supplies, the construction policies affecting unit-power costs, the timing of construction, and so forth. The more complete the control over the waters of a river system, the more intricate will be the relations between all uses, including power. Thus on the operating side, power needs must be effectively but not dominantly represented. This can be best assured if within the "water in the channel" administrative agency one division is assigned the power phase of its unified multiple-purpose water responsibility.

If the central task of a unified water-development organization is to make the most of river-system potentialities within the limits of statutory policy and funds, there seems little reason for preserving the present duplicating and checking river-planning duties of the Federal Power Commission. While theoretically that commission's legal concern is with the best use of all river resources in water planning, actually it is equipped for and interested chiefly in hydroelectric energy. These duties should be stripped from the commission and transferred to a national unified river-development agency which should supply the commission's need for information relating to river planning for deciding private-power applications. So, too, with its present partial responsibility for making power-cost allocations for major river structures. An agency charged with all major river interests would be more fully and objectively equipped to balance these competing cost factors than one which in practice is chiefly concerned with hydroelectric power. The commission's job with regard to water resources under such a proposal could safely be shrunk to that of regulating private interstate sale of energy and public information on matters relating to the distribution and sale of energy.

We do not suggest the inclusion of the REA in the proposed national water agency. The lending policies of the REA as applied to local distribution coöperatives and public utility districts in the Pacific Northwest have at times vitally influenced certain programs of the BPA. Such relations should be as harmonious as possible. But REA also lends to distribution coöperatives which buy power from private utilities. In fact the greater part of its funds are so directed. Until the federal hydroelectric development and sales function is more fully developed beyond the seventeen Western states, as it may be some day, it is probable that REA should

be left where it is—but without prejudice to a future relocation in a revamped Department of the Interior whenever the latter has a major functional segment which gives attention to all forms of energy resources.

Continuance by Army of Civil Engineering Not Justified

We have been assuming in this discussion that the proposed new administrative river entity would be civilian in control and outlook. That clearly implies that the army would lose its civilian engineering and development functions. Only the accidents of history, social inertia, Congressional and army coöperation in the complacent continuance of pork-barrel politics, and the selection for the Corps of Engineers of able military personnel gifted with great public-relations talent, can account for the retention by the Department of the Army of these domestic civilian duties.

The army has lost most of the civilian engineering duties such as road, canal, railroad, and lighthouse building with which it was largely concerned during the first half of the nineteenth century. These were transferred to other federal civilian agencies or left to private enterprise.

There is no peculiar relation between its civilian river-development functions and military engineering experience or training. The concentration of activity in the hydraulic phase of engineering misses the mark widely for military engineering demands in time of war. Yet the special and limited engineering training received by the West Point graduate assigned to the Corps of Engineers for civil-works duty is largely confined to hydraulic engineering. His work experience is also chiefly limited to hydraulic enterprises. But the military engineering tasks with which the army is confronted in war time involve a very different range of skills and experiences. One branch is concerned with combat engineering. That is directed toward the improvisation of physical facilities needed to get troops to their forward positions, to clear the military path of physical obstacles, to build rafts or temporary bridges at river crossings, and the like. The second aspect of military engineering uses a great variety of civil engineering skills in order to build and operate the service facilities for the army.

During the Second World War that program was the most extensive and varied ever experienced by the American army. Its performance by the Corps of Engineers alone, without the recruitment of thousands of civil engineers and other specialists from civilian life, would have been utterly impossible. The corps numbered but 750 officers in 1939. The fundamental engineering tasks confronted during the war are briefly indicated by General Eugene Reybold in a summary published in 1945 which read in part:

The range of the engineering and construction specialties called upon to build everything from airdromes and sea coast batteries to chemical warfare and munition plants, from troop cities to ports of embarkation, made it necessary for us at that early period of the war to marshal much of the engineering and construction talent of America. . . . By 1943 we undertook a nation-wide job that was a natural sequel to the domestic construction achievement; the recruiting of skilled specialists for military duty from the ranks of construction industries and engineering professions. . . . These specialists were needed to fill key jobs in the engineer troop units then undergoing training to carry on over seas the task of building the great bases from which to launch our all-out attacks against the enemy. . . .

To date, more than half a million engineers have been trained, including over 20,000 officer candidates and many thousands of technicians in more than 250 specialties from instrument repair men to saw-mill operators, from drivers to well drillers.

Reybold then points out that in developing this huge training program the assistance of hundreds of manufacturers and many civilian agencies was enlisted. Among the major tasks accomplished by the corps up to that time were the building of the Alaska Highway, the Ledo Road in Burma, and 56,000 miles of supply routes all over the world. It had also erected airdromes in Alaska, North Africa, and the Pacific Islands. In England it had built airfield runways, a hundred thousand buildings, hundreds of miles of roads, and when the Normandy invasion was started the engineers organized the invasion beaches and supply headquarters and then kept the armies moving and supply lines open.⁷

Since 1867, when the army first began the employment of civilian engineers, there has been a steady trend toward the use of civilians for the civil engineering work required by the civil-work jurisdiction of the Corps of Engineers. Only a fractional percentage of the professional talent used to design, build, and operate the army's civil-works programs consists of military officers and personnel.⁸

Moreover, the officer corps performs primarily administrative work. It is not trained in the mastery of the specialized engineering techniques required for these river works. The latter skills are furnished by the permanent civilian engineering staff and by consulting civilian engineers whom the army liberally employs. Continuity in engineering knowledge and insight into the technical problems of a river system come from these permanent civilian engineers. Military personnel rotate at least once in four years. They operate throughout their careers on the executive and not the technical engineering level.

⁷ Major General E. Eugene Reybold, "The Role of the Army Engineers in World War Two," in *The Military Engineer*, XLVII (February, 1945), pp. 39 ff.

⁸ The data summarized in 1936 by the Brookings Institution (*op. cit.*, p. 388) showed that the entire corps employed in civil works then had a total of 227 military officers under whom worked 57,461 civilians.

This monopoly of positions of administrative responsibility by the military class cannot avoid a depressing effect upon the civilian engineer staff. It has held down the classifications for top engineering personnel as compared with engineers in the Bureau of Reclamation. No matter how outstandingly able a civilian engineer may be or how talented for the administrative leadership of a district or division or the chief's office, he cannot aspire to these positions of leadership. He must often stand by while a young military officer, a short time out of West Point and still ignorant of many important engineering and administrative problems associated with the work, gives the orders and takes the rewards of public recognition. If the civilian engineer sufficiently craves these rewards of recognition and higher salary for his talents, a normal aspiration for all men, he must transfer to a civilian engineering agency where no similar ceiling on engineering ambition exists.

These remarks are made with no intention to disparage the military members of the Corps of Engineers. They are undoubtedly a very able group, probably the cream of the West Point graduates. But there is just as much reason to turn over to the army the control of the Public Roads Administration or the whole Public Works Administration or the Civil Aeronautics Administration, in each of which significant administrative and engineering experience might be gained by its officers, as to leave within the jurisdiction of the Corps of Engineers the planning, construction, and operation of river programs. There is slight special military application of the engineering experience involved in this kind of work. The huge river dam is one type of structure that the army did not build in theaters of war during the recent conflict. On the other hand, a great deal of the engineering work in war is concerned with road and air transport and the erection of buildings. The whole question of utilizing civilian engineering facilities for military engineer training in time of peace needs complete reconsideration.

A New Administration in the Interior Department

The argument for the administration of the "water in the channel" resources thus moves to the conclusion that the best structural arrangement for handling the multiple-purpose river-development program would necessitate the amalgamation within the Department of the Interior (which for this and other reasons needs a new name!) of the following functions: The civil functions of the Corps of Engineers; the river planning, cost allocation, and federal hydroelectric rate-fixing duties of the Federal Power Commission; the hydroelectric transmission functions of the Bonneville Power Administration and of the Southwestern Power

Administration; and all the engineering-construction functions of the Bureau of Reclamation. All these should be fused into a National River Development and Management Administration.

By such a realignment and concentration the organic character of the total job might be much more continuously and consistently recognized in administrative action, and some of the basic opportunities for encouraging jurisdictional fights and blockages would have been removed. *Within such a national agency, it would be clearly desirable to provide for decentralized, quasicorporate regional operating organizations which would initiate the planning, perform the construction, and operate the facilities within the several river basin regions.* One of these units should be the Columbia River Administration. Its physical jurisdiction should include not only the drainage of the Columbia and its tributaries but the coastal streams of Oregon and Washington and the interior drainages of Oregon. Our account of current tendencies in federal field administration of physical resources indicates a decided drift toward decentralization of administrative responsibility. That drift should be accelerated and refined until the river-basin units of the proposed National River Development and Management Administration are freed under national supervision to do an effective planning, construction, and operating job. It is unnecessary here to blueprint a program of decentralization within such a national agency. Federal resource-management agencies (including the TVA) are already enough experienced to suggest the lines upon which this harmonization of the needs of decentralized management with central supervision, guidance, and ultimate control can be carried through.

The fish and wildlife functions of the Fish and Wildlife Service should not be included in the Columbia River Administration. It is true that in the unification of "water" functions under the TVA the task of planning for fish and wildlife is included; but in that region no problem of anadromous fish (such as the salmon and steelhead) necessitates the provision of costly aids to pass over the dams. In the Tennessee Valley no valuable fishing industry existed likely to be sacrificed by the powerful urban and rural interests identified with power, irrigation, and navigation. The fishing industry that subsists on Columbia River salmon needs the special voice of a separate agency which can shout loudly if due consideration is not accorded the salmon in the plans of river administration. Here is an example where "planned friction" is justified. The Columbia River salmon are fighting the prospect of extinction as a consequence of the kind of civilization which demands multiple-purpose dams. The salmon industry needs an independent champion able to produce sufficient administrative friction, to present its case, to illuminate the issues, to bring out the facts, and when possible to solve its problems.

As a regional entity the Columbia River Administration should have authority to plan initially, and design, schedule, build, and operate all major river structures and the electrical transmission facilities. This would also include the operation of navigation locks on the Columbia, the Willamette, and the Snake. No adequate reason exists for providing separate lock-operating and maintenance crews under the army's jurisdiction at the Bonneville, The Dalles, McNary, and the four Snake River dams. As the TVA situation demonstrates, this leads to additional unjustifiable cost even though total amounts involved are not large. When these structures are completed, there will be slack-water navigation to Lewiston so that relatively light river-maintenance work will be required, but whatever there will be should be the function of the administration. It should also care for whatever local flood-control works may be needed to supplement control through reservoir regulation. Channel marking now performed on the upper Columbia by the coast guard should also be handled by the maintenance staff of the administration.

Should a unified national river-development agency be created, it would probably be wise to transfer to it the U.S. Geological Survey's function of collecting water data. This proposal runs counter to the view that the task of water-data determination should be lodged in an independent, nonconstruction agency to afford assurance that construction will be soundly based on hydrological information. But this whole conception is drained of reality when that independent agency stands helpless to furnish sufficient information to make sound plans. The large gaps in the Survey's information, as we have pointed out above, are a constant handicap to the river-development agencies. It has become a chronic necessity for the Bureau of Reclamation and the Corps of Engineers to purchase from it additional information for specific jobs and to finance the operation of stream gauges of their own in order to care for special data needs which the Survey had not had the staff and funds to provide.

Congress has never been enough interested in the scientific agencies to provide the funds required to obtain as complete information as is essential to the developmental projects of the engineering agencies. Ideally, as the Brookings study concluded, it would be advantageous to have an independent check by the Geological Survey on the propensity of the construction agencies to build whether water is available or not. The facts seem to be, however, that the Survey never possesses enough information to exercise that check effectively. The construction agencies are constantly placed in the position of making decisions about projects for which data are inadequate because no one has gathered them. There are no signs to indicate that this prevents the habitual authorization by Congress of proposals inaugurated largely on speculative estimates of water yields.

The famous Sloan plan for the Missouri Valley which Congress, after compromise with the Pick plan, authorized in 1913, lacked necessary information concerning the water yields of many of the tributaries of the Missouri system. The collection of water data is likely to be more complete and continuous if it is made part of the total responsibility of a National River Development and Management Administration. To master its problem of river control, the TVA has found it necessary to create a very elaborate gauging system along with its weather-reporting and hydrologic facilities. Congress will be inclined to view the research needs of a development agency much more sympathetically than those of a scientific bureau devoid of construction tasks.

At least one further function should be accorded the regional unit of the proposed river administration; namely, research in the problems of river development and utilization. This should include the right to make grants-in-aid for these purposes to state, private, and other federal agencies. The planning of a river program should take place within a framework of social objectives for the region which are based upon full knowledge of its needs and resources. For example, almost no aspect of the economy of the Pacific Northwest can escape the influence, good or bad, of its developed hydroelectric resources. These may become the foundation for an untold variety of uses, domestic, rural, and industrial. In the effort to realize the potential social benefits of the comparable resource in the Tennessee Valley the TVA was given the right to conduct research not only to stimulate the direct use of power but to encourage the balanced development of the region's resources.

In the Columbia Valley region, the potential hydroelectricity available from full river development is enormously greater than the energy that can be drawn from the waters of the Tennessee. Moreover, the Pacific Northwest is a region in which neither anthracite nor high-grade bituminous coal in large quantity is present. The "white coal" of the river bears a potential relation to the utilization of the other resources in this valley similar to that of the coal fields of the Appalachian region to the industrial development in the Atlantic and North Central states. But in the Columbia Valley practically all of this potential energy is in public ownership and will be released as the result of public investment, chiefly federal. From the standpoint of realizing the greatest return, financial and social, on that public proprietary interest it seems clear that a broader research program should be authorized to the administrative agency in charge, and financed adequately. Any private enterprise with so large an invested capital in river works and transmission systems (already close to the half-billion-dollar mark and ultimately destined to be many times that sum) would undoubtedly establish an extensive research department to insure the

fullest return on that investment. A public program has not only that reason for comparable support of a well-financed research program. It has the added justification that it should use its investment to aid the people of the region to utilize their resource base in such a way as to build a firm foundation for a good and stable standard of living—a foundation without which in the long run federal investment from even the strictly financial point of view will be jeopardized.

This is the most promising method by which a river-management agency may help to improve the prospect for employment in the Pacific Northwest. For it is a region subject to wide variations in seasonal employment and in cyclical employment. These arise from the present dependence of the population upon the extractive vocations, farming, lumbering, fishing, and mining. The discovery, through research, of profitable opportunities for the further fabrication and processing of these regional raw materials which at the same time will make increased use of electric energy is a function that ought to be accorded the proposed Columbia River Administration.

We must not lose sight of the further fact that even before the Second World War a number of subareas in the valley were already depressed, because of the virtual liquidation of their basic timber resources. Other areas faced a more delayed but certain decline unless the rate of cutting and losses from fire, pests, and plant diseases could be reduced and the growth of timber stimulated to bring depletion in balance with growth. Great inroads on this resource were made during the war and are continuing. They make the future prospect for some parts of the region much darker than before unless through research new ways of utilizing and reducing timber wastes, more complete fabrication of raw materials, and the use of new mineral and agricultural resources heretofore not important in the regional economy are substituted. The performance of the research function requires the enlistment of many agencies—state, private, and local as well as federal. Either the administration or the regional representative of the Office of the President (which we propose below) ought therefore to be empowered and financed to grant appropriate funds to any organization that is or may be most effectively equipped with personnel or plant to do the needed job. It should not supersede the other federal agencies that already have responsibility for research in the use of timber and minerals but it should be able to supplement their work in order to accelerate desired results.

A special phase of the research task has to do with the market prospects for hydroelectric energy. Undoubtedly a danger exists that such investigations may be deflected from factual realism by the construction drives which habitually characterize an engineering development organization

and which have certainly not been absent in the history of the Bureau of Reclamation and the Corps of Engineers. This is particularly true of these public-construction agencies which are not challenged by the "balance sheet" with respect to all of the multiple uses of river structures except electric power and irrigation (and not fully by the latter). Yet to locate this function outside the proposed administration would deprive the agency of an essential tool for doing its utility job.

However, a number of checks against this tendency should be incorporated in a program of regional river administration.

One is the systematic use of the commercial audit to show at the end of each fiscal year precisely where the hydroelectric phase of the river functions stand. That practice has already been inaugurated by the Bonneville Power Administration for its transmission system, the power investments, direct and joint, at Bonneville Dam and Grand Coulee, and the agreed subsidy to irrigation of the Columbia Basin project with which power revenues are charged.

A second deterrent to flights of fancy in market calculations could be provided if within a central staff of the new Department of the Interior a section of market economists were established to review the forecasts of the Columbia River Administration (and of other similar river-basin units) before construction budgets are submitted.

The third deterrent consists in continuity of administrative responsibility. If the officer heading up the regional river administration is expected to function as a top career official, holding through successive presidencies, his interest in the long-time financial health of the power operations can be expected to provide caution against over- or too-rapid expansion of transmission and generating facilities. The temptation to yield to construction boosterism should be moderated by his knowledge that such errors will rise to confront him.

A final checking influence on unwarranted construction of all kinds, including power facilities, should be sought in the creation of direct field representation in the Pacific Northwest, and in the other regional river subdivisions, of the Executive Office of the President, which under the review and guidance of a presidential national-resources-planning staff would take charge, as we show below, of the over-all regional planning function for the totality of federal resource-management programs. The Columbia River Administration would be subject to its reviewing, balancing, and coördinating influence.

There is a special problem connected with the construction and operation of irrigation works. This function has needed but escaped a revision of duties as between the Bureau of Reclamation and the agencies in the Department of Agriculture. This revision would apply to the several uni-

fied regional river agencies including the Columbia River Administration. The determination of areas suitable for reclamation by irrigation or drainage is essentially an agricultural function, and should not be left to the judgment of an agency primarily concerned with engineering and construction. Many errors have been made in the choice of lands to be watered because the Bureau of Reclamation was not fundamentally oriented toward the welfare and stability of farming communities.

The bureau's program of soil and market analysis, and of repayment charges, in its plans for the Columbia Basin project, has exhibited genuine sensitivity to the agricultural outcomes of its construction work. Despite this, the best assurance that all irrigation projects whether built by the bureau or the proposed National River Development and Management Administration and its regional units will be directed toward a stable agriculture is a redefinition of functions which will transfer to the Department of Agriculture (1) the determination of the agricultural feasibility of proposed irrigation projects, (2) the division of the land into economic family-sized farm units, (3) the selection of new settlers, (4) the guidance of farmers in matters of farm-distribution systems and farm practice, and (5) the collection of repayments. This division of duties will leave with river-basin units of the National River Development and Management Administration—such as the proposed Columbia River Administration—the planning and construction of the dams, canals, laterals, and drainage works required for each reclamation project. This suggested realignment of functions is patterned after that worked out by the president and Congress for Wheeler-Case projects. It would not only give an essential control over the danger of engineering distortions noted above, but would resolve one of the most irritating jurisdictional problems which, as we have explained, increasingly plagues the relationships between the reclamation agency and the Department of Agriculture.

Realignment of Land-Management Agencies

Thus far we have been trying to find an answer to the need for eliminating jurisdictional conflict and for unifying the development and management of the "water in the channel" river tasks. But this is only a part of the regional resource job for Uncle Sam. The watershed and land-management agencies also call for scrutiny to see if realignments of traditional structure would simplify and harmonize the performance of the many programs. Our description of the interagency relations suggests these programs affect numerous joint interests. The chief organization problem centers in the present split management of the wild lands owned by the federal government which constitute so high a percentage of the total land

mass of the Pacific Northwest. The latest official figures give federal ownership about 64 per cent of Idaho, 53 per cent of Oregon, and 35 per cent of Washington. There are no available figures for that part of Montana west of the Continental Divide but it probably resembles the Idaho situation. This vast landed estate is now managed by four bureaus in the Department of the Interior—the Bureau of Land Management, the National Park Service, the Fish and Wildlife Service, and the Office of Indian Affairs; and by two in the Department of Agriculture—the Forest Service and the Soil Conservation Service.

Some fundamental administrative differences in the arrangement are essential to handle the wild-land resources as compared with the "water in the channel." The latter source is a common physical substance moving more or less rapidly, in a constricted pathway varying in volume and force with the climatic changes throughout the year, confining to its pathway the energy it creates (except for hydroelectricity), the freight it bears on its surface, and the fish it nourishes in its depths. With one possible exception it needs a common administrative master to organize and direct the relationships between these uses. Nothing comparable to that complexity and intimacy of physical relations ties one part of the land surface in the region to all other parts. Timber on a local watershed can be liquidated without interfering with the practice of sustained yield on another tributary. It is possible to exercise good grazing control and maintain excellent forage and ground cover in one pasture even though across the fence ill management has destroyed the grass and produced a sagebrush waste. To be sure there are problems of wild-land management such as fire control, pest or insect control, and occasional erosion problems that necessitate coöperation between adjacent land units. But even these issues for joint administration are not coincident with a whole regional area. The situs of active wild-land management is a local area, a grazing district, a ranger district or a forest, a spectacular snow-capped mountain rich with localized scenic grandeur. Each has its peculiarities of topography, soil composition, forest and ground cover, temperature, and precipitation. This infinite variability of the wild-land resources requires many differences in local management even while certain general social goals are being pursued in common. The regional headquarters of a land-management agency should only rarely be called upon to "direct" operations. It is a coördinating, supervisory, facilitating, advising, and occasionally a checking unit in the field. Unlike the river administration it does not need to order an action at some location high on the watershed which will be felt in a physical management sense at every other point throughout the whole region. Its plans for physical structures are for localized management purposes, not designed as part of an integrated service tied together in prospective daily operations for a whole

regional system. This is true even for a forest road system in the rough and broken terrain of the Pacific Northwest.

It is because of these differences that existing land-management agencies can appropriately use differing regional boundaries.

This is not intended as a full explanation of the great diversity in existing regional areas of the land-management agencies. Many other factors such as volume of work, transportation facilities, administrative inertias, and the accident of past decisions are also undoubtedly expressed in current area boundaries. The latter may be much more complexly conceived and still work well for the several land-management functions than is the case for the river agencies. Yet there is one physical unifying fact which points to a single regional administrative unit possessing the same boundaries as the river administration. That is the total watershed-management result conceived in terms of water yield for the river system. If the problems of water yield are important either because of destructive excesses or of deficiencies (as true in some parts of the Pacific Northwest), then the land-management job will require consideration from an administrative vantage point which gives clear vision of each unit in the total watershed. On this account plans for modifications in management policy ought to begin from that standpoint regardless of who ultimately will administer them when the plans take the form of specific administrative programs. If a river drains a region generally and rather uniformly subject to accelerated soil erosion, that too would necessitate system-wide plans and regional managerial direction.

Most of the considerations, however, that justify a common regional boundary as between a river administration and land-management agencies, are broad social objectives rather than common physical objectives of the two resources. Social goals may be as important or even more important than physical objectives, depending upon the peculiar circumstances of the regional area. Our analysis of the Pacific Northwest and its resource problems indicates that these social objectives also call for a regional administrative unit for land resources roughly identical with that needed for the Columbia River Administration. But because the federal land agencies must carry on their work in association with or through the states the use of whole states in locating boundaries is more important than it is for the river administration. If, therefore, Washington, Oregon, Idaho, and western Montana were combined to make a regional area for the land agencies we would have a boundary allowing relatively easy coordination in the planning and programming of land and river development and management. The minor river areas extending into Wyoming, Utah, and Nevada would occasionally necessitate joint consultation with field offices and with states lying outside such a region. But it is better to accept occasional incon-

venience or difficulty than to compel the land-management work to adhere to watershed boundaries *in toto*.

We conclude that watershed planning must be geared with plans made for the "water in the channel" and that the land-management programs, just as those for the river proper, should be developed within the framework of social and economic plans for all federally owned natural resources in the Pacific Northwest intended to maximize their social usefulness. This clearly indicates a common regional planning center and an over-all regional planning agency, but as we explain below, it does not require the amalgamation of the proposed Columbia River Administration with a land-management administration. Common planning can be accomplished under the coordinating direction of a presidential representative situated in the region.

Operating consolidation of federal land-resource management tasks with water resources, whether under a valley authority or a single national resources department, is not essential so long as provision is made for *integrating the planning and capital budget phases of land and water programs*. The concept of an organic unity in nature which compels a single administrative entity for both these natural resources is only partly true and may be overstressed. Unity and diversity coexist in the relationships among physical resources as among many other subjects of governmental management. What is important to note is the degree, the frequency, and the character of unification needed, and the varying administrative structures and methods most appropriate for particular administrative objectives. If a group of differing but interrelated activities has constant need of joint attention in their day-to-day functioning, then clearly the administrative structure required is one which will permit day-to-day direction with day-to-day communication up and down the line of command. If, however, the activities are on the whole capable of efficient daily conduct with only occasional consultation about the joint relationships or "unity" matters, lesser organizational closeness of connection is indicated. There are many differing degrees of administrative coordination required for these differing but occasionally related tasks of management. There are moreover "pulsating" changes in the need for relatedness—sometimes much joint attention is required, sometimes slight. The concept of "planning" coordination, as distinguished from "operating" coordination, assumes that effective joint attention shall be given to interrelationships ("unities") when basic policies and programs to implement them are being decided.

We shall examine later the nature of such an over-all planning and correlating structure, under presidential auspices. Here we are concerned with the possibility of simplifying and integrating the work of the wild-land management agencies. One frequently suggested idea is to amalgamate

the functions of the six land-management bureaus, now divided between the Departments of Agriculture and the Interior, into a single agency to be attached to one or other of these departments.

In considering this proposal, which in general we approve, certain exceptions must be noted at once. While this study has made no special examination of the programs of the Office of the Indian Affairs, it is clear that this agency stands on quite a different footing than the other five. Even though its reservations in the Pacific Northwest contain approximately 7,000,000 acres of land the Indian Service uses the resources of that estate primarily for the benefit of its Indian wards. It is basically concerned with assisting a special group of clients who live under a number of serious handicaps as compared with the rest of the American population. It can be described as a client-orientated agency with physical resources merely incidental to a whole range of human services for primitive people not yet equipped to compete effectively with other American nationals. On the basis of this assumption we accept the hypothesis that the Indian Service not only should not be merged with any other land-management agency but might best be relocated within a welfare department whenever the national departmental structure is overhauled and the "etcetera" character of the Department of the Interior changed to one possessing homogeneity of social purpose. This judgment is tentative but, pending more thorough exploration of the Indian Service, it is the best we can offer.

We have said that the Fish and Wildlife Service is both a water-resource and a land-management agency. Its land functions in the Pacific Northwest are exercised over a number of small and a few large tracts but the total acreage involved is not outstanding in size. In discussing the fisheries program we have indicated our belief that this agency which voices the interests of the salmon industry, should remain outside any unified river-development agency. Some of the commercial fishing interests are urging the divorce of the Fish and Wildlife Service from any department and the creation of an independent commission to handle these resources. If we are to master the problems of "big" administration such a proposal should not be seriously entertained. Nevertheless, there is some cogency in the view that the part of the present organization which derived from the former Bureau of Fisheries should either be handed back to the Department of Commerce or (preferably) transferred to the Department of Agriculture where are found the other major biological agencies, whose work may contribute greatly to commercial fish culture and where fish as a major food supply would be brought within the ambit of other food-policy thinking. The fish regulatory functions of the Fish and Wildlife Service are confined to Alaska and these relate solely to commercial fishing. Fisheries research is at present overwhelmingly directed toward the commercial species along

the Atlantic and Pacific coasts and the anadromous fish—chiefly salmon. Marketing services and utilization work are wholly commercial activities.

Yet to tear the commercial fishery tasks away from the other fish and wildlife programs would probably increase the overhead costs of administration. Judgment of experienced officers in the present agency is that considerable savings were made in overhead when the two small bureaus were combined. A further complication is the fact that the anadromous fish such as the salmon which have high commercial value, are involved in the inland-water programs associated with the reservoirs developed by the Bureau of Reclamation and the Corps of Engineers. The sport fish and the wildlife resources are of course also greatly involved. To split anadromous-fisheries programs away from the present combined service would require duplication in river-basin-planning work, and would probably make somewhat more difficult the balancing in such plans of conflicting interests both between fish and other forms of wildlife and between commercial and sport-fish species.

There is the further difficulty that under a single-purpose agency, conservation is likely to receive minor consideration. The commercial fishermen have characteristically been very tardy in recognizing the need for proper regulation in the interest of preserving a continuous high yield of fish. That fact has been amply demonstrated in the Pacific Northwest by the salmon in Alaska, the halibut along the continental shelf, and the sockeye salmon runs of Puget Sound and the Fraser River. Depletion of the last two species had become very great before effective regulation became acceptable to the fishing industry.

We leave this issue without a conclusive judgment pending a thorough administrative analysis by competent staff.

The wildlife-game functions of the Fish and Wildlife Service are most closely tied with the land-management agencies, and in particular to the Forest Service, which in the Pacific Northwest manages much the largest area; its lands are abundantly supplied with water and feed on which wildlife thrive; its national forests are well managed and sufficiently staffed to give continuous attention to wildlife interests; there is consequently close coöperation between these two agencies in many matters of mutual concern. On the public domain under the Bureau of Land Management there are also some wildlife resources and interests, but the arid character of much of this land makes it a less favorable habitat for those species that are the objects of special bureau benevolence. Thus mutual interests with the Fish and Wildlife Service are less frequent and intensive. The national parks are serviced by biologists from the Fish and Wildlife Service, but the problems of management are of small importance because of National Park Service policies which forbid hunting and man-made disturbances

of nature's balance. The predator- and rodent-control programs of the Fish and Wildlife Service are of continuous concern to all the wild-land agencies and to the farmers living on land adjacent to the wild-land area.

These considerations seem to point to the inclusion of the wildlife and sport-fish programs (whatever may be done about commercial-fish programs) within that department housing the major wild-land management cluster.

The retirement of submarginal agricultural land and its restoration to grazing has placed the Soil Conservation Service in the public-land-management business until such time as the pastures on its land-utilization projects have been brought into full production by good management. The transfer of some of these land-utilization pasture units to the Bureau of Land Management has already been made in other Western regions. Further transfer should be timed with the ability of that agency to administer them for similar agricultural ends free of the distortions created by the livestock-association pressures which have shackled the Grazing Service. When this is accomplished the Soil Conservation Service will cease to be in the Pacific Northwest a public land-management agency.

Amalgamation of Forest Service and BLM

The most urgent organization questions on the land-management resource front center on the relations of the Forest Service, the Bureau of Land Management, and the National Park Service. The latter has always been something of a single-purpose agency even in its land-management tasks. Its orientation toward the national-parks segment of its program is one which stresses the intellectual and aesthetic aspects of recreation. Consequently, it has not been hospitable to mass or multiple use. It is for the "educated" minority who have the naturalist interest or are particularly sensitive to scenic beauty that the national-park program is primarily designed. This emphasis harmonizes with the historical-sites and national-monument programs which in other regions, particularly in the eastern half of the United States, play a prominent part in the work of this agency. Its excursions into the more mundane and physical forms of recreation associated with hunting, fishing, camping, boating, and swimming, which resemble the activities stressed in the recreational phases of the Forest Service multiple-purpose program have been recent and limited. Nor do these kinesthetic experiences seem to have been fully accepted as of equal importance with the older national-park program which jealously guards against any interference by human or domestic-animal use with nature's balance. Even though the Forest Service has set aside its wilderness areas (such as that surrounding Mt. Jefferson) and its special recreation areas (which Mt. Hood illustrates) the recreational ideologies of the two services

are different. The clients of the National Park Service are frequent critics of the utilitarian emphasis inherent in most of the Forest Service activities. To merge these two agencies under present conditions would be likely to lead to unhappy results for the specialized recreational values cherished by the Park Service and its clients.

A much better case could be made for transferring to the National Park Service a limited number of scenic sites in the national forests that have little value for timber or grazing use. The ideal of maintaining nature's balance which is integral to national-park management (except that fires and pests are not left to the blind forces of nature) assures complete harmony of that recreational program with watershed protection. The problems of fire- and pest-control in national-park timber and the protection of entrances to the parks in surrounding national forests are about the principal interagency operation problems which call for coöperative management. If the national parks were retained under separate bureau jurisdiction as at present but inside the same department as the Forest Service interagency matters could be suitably cared for.

The central problem of unified wild-land management therefore boils down to two agencies, the Forest Service and the Bureau of Land Management. Secretary Ickes strove (and former Secretary Ickes still strives) with might and main to obtain the transfer of the Forest Service to the Department of the Interior where presumably an amalgamation with the Bureau of Land Management would take place. There is little doubt that the present split of jurisdiction over federal forest land between the Forest Service and the Bureau of Land Management makes slight organizational sense. The interlacing of the separately administered Oregon and California revested grant lands with national-forest timber is indefensible from the standpoint of good administration. Little more favorable comment can be made for the separation of other public-domain forest land from unification with the national forest. But absorption of this regional division of the Bureau of Land Management by the Forest Service will remain politically difficult if not impossible so long as the statutorily determined contributions to local government from timber revenues (as we explained in chapter vi) are different as between the two bodies of forest land.

Another *prima facie* case pointing to a program amalgamation between the Forest Service and the Bureau of Land Management occurs in connection with the grazing functions of the two agencies. We have noted that most of the Forest Service permittees also use the public land administered through the grazing districts. The sources of best technical knowledge for grazing management come from the Forest Service. Boundaries between the districts and the forests from the standpoint of best forage and timber management, are not accurately drawn. Many necessary small boundary

changes appear to be impossible to obtain so long as the two agencies are separated by departmental barriers.

An aggravated example originated on the Deschutes National Forest in January, 1939, when the regional forester requested a presidential proclamation (the legally required means of modifying national-forest boundaries) to include within that forest area about 1,500 acres of public lands together with a larger area of privately owned lands. These lands were all within the timbered zone, covered with ponderosa pine, larch, and lodgepole pine. They were in scattered tracts, which had to be crossed and recrossed by the Forest Service officers in attending to their duties on the national forest. The Department of the Interior, which is the president's agency for preparing such proclamations, refused to do so on technical legal grounds which the solicitor of the Department of Agriculture and the attorney general affirmed did not exist. The Department of the Interior also alleged that if it were to prepare this proclamation a precedent would be created for extending other national-forest boundaries at the expense of the grazing-district program of land exchanges with private parties. Despite continued requests by the Forest Service and the secretary of agriculture, the Department of the Interior has steadfastly refused to prepare the proclamation.

The interlacing of district and forest boundaries which compels the local officer of each agency to traverse the territory of the other in order to move from one part of his own territory to another part for supervising the grazing permittees seems absurd. The variations in basic policies concerning the use of the grazing areas rest primarily upon statutory differences but are accented by some fundamental differences in administrative policy also. Theoretically, these differences ought not to be based on the fact that one agency operates for the most part summer pasture interspersed with trees while the other manages spring and fall pastures largely devoid of timber. The social objectives for the two grazing programs are markedly different, partly because the Taylor Grazing Act bought the support of the big livestock interests, and partly because the first director of the Grazing Service, with the acquiescence of Secretary Ickes, made the district and state advisory board the determining administrative organs for adjudication and regulation. We conclude that the long-run interest of good wild-land administration points to an amalgamation of the management programs of the Bureau of Land Management and the Forest Service.

Nevertheless the amalgamation by transfer of the Forest Service into the Department of the Interior (as former Secretary Ickes and the late President Roosevelt undoubtedly intended) would be unwise. In the first place such a mode of merger would probably give the key positions to

the Bureau of Land Management personnel. As a newly established management agency with an inheritance from its major constituent unit, the former General Land Office, of a tradition and personnel interested primarily in adjudication, record keeping, and legalisms related thereto, the bureau has yet to shake down into a closely knit, technically competent, driving administrative organism with a set of mature conservation policies and programs essential to the best management of these resources. Were it to continue on the road it has so recently begun it would probably achieve these goals in a period of years. But in the meantime its absorption of the Forest Service would do great immediate damage to the work of that agency, which is, in the writer's judgment, the most competently staffed, the best organized, the most skillfully managed, and probably the socially most sensitive of the whole family of federal bureaus operating within the resource field.

But the case for amalgamation of these two bureaus in an expanded Department of Agriculture rests on more positive grounds. The work of managing the wild public lands now under the jurisdiction of these two agencies except for the area west of the crest of the Cascades in Oregon and Washington must be closely tied to the livestock and irrigated farming phases of Western economy. Public forage resources are combined with private grazing and hay and feed production to make possible integrated livestock farming. This is obviously true for the grazing lands within the grazing districts but it is equally true for all national forests in the Pacific Northwest except those that lie on the humid side of the Cascades in Washington and Oregon.

In such a timbered area as the Ochoco National Forest, for example, about nine-tenths of the timbered surface is also used for grazing. This association with one type of agriculture sets up relationships with the many private and public agricultural institutions that develop from or support livestock farming in the West. It includes many common interests with the state colleges and experiment stations, with the Farm Credit Administration's constituent associations and personnel, with private livestock lending institutions, with the Bureau of Animal Industry, with the Bureau of Plant Industry, Soils and Agricultural Engineering, and with the Soil Conservation Service. Where grazing reductions are to be made on the pastures of the national forests and on the grazing-district lands (as there must be if irreparable soil damage is not to be done to many watershed areas and to some of the productive alluvial mountain valleys that unwillingly receive the sterile silt and boulders) there is a special need for coördination with the Department of Agriculture. The speed with which the highland pastures may be relieved of excess stock depends in large part on coöperative agricultural action on the valley lands. In southern

Idaho, for example, are hundreds of thousands of acres of private sagebrush land which, if cleared of brush and reseeded, could care for most of the stock that should be taken off the national-forest and district pastures.

In other situations (best illustrated in Utah) watershed damage from overgrazing is indissolubly linked with changes in farming programs and methods on the small irrigated valley farms, now bound up in a mistaken primary dependence on range beef cattle or sheep. To solve the watershed management jobs of the national forests and the grazing districts will probably require the combined efforts of a number of federal agricultural bureaus (including those that supply credit) and the state experiment stations.

On the tree side of public-land resources the interagency relationships fork in three directions: (1) the scientific bureaus in the Department of Agriculture—especially the Bureau of Entomology and Plant Quarantine, the Bureau of Plant Industry, Soils and Engineering, and the Soil Conservation Service; (2) the Department of Commerce; and (3) the river agencies—the Corps of Engineers, the Bureau of Reclamation, and the Bonneville Power Administration. The first group has had the most intimate contacts because trees are plants which thrive or languish as soil, insects, or plant diseases are favorable or unfavorable. The basic biological sciences, gathering the information constantly needed by management agencies which increasingly farm the forests, are located in the Department of Agriculture. They also serve private farmers for all farm crops including trees. Problems in utilization of wood have led the Forest Service into various engineering fields paralleling those which have come to be so important to private industry. In this respect then the agency managing national forests or other public-land timber moves toward functions that in a very limited way are being undertaken by the Department of Commerce in the interest of small business. The Forest Service has directed this activity not so much toward utilization of its own timber as toward all timber and timber processors. The precise boundary at which the public-forest agency should restrain its interest in wood utilization and where a Department of Commerce technical service to industry should take over cannot be anticipated. Whatever the relationship may be, few would seriously consider the merger of federal forest management into the Department of Commerce. Ties across to that department will have to be provided but amalgamation would be patently unwise.

The third cluster of contacts, namely with the river agency, points toward a renamed Department of the Interior as suggested above containing all water-development agencies. With watershed management as one of the programs of a forest- and forage-management agency, there will always

be important mutual interests between it and the river agencies. The use of wild-land areas to reduce runoff in flood season, to store the water in the soil for stabilizing river flow, to prevent accelerated erosion with resulting river siltation will be matters of continuing mutual concern to them. That does not demonstrate that agencies performing these different phases of water-resource work should be bracketed together within the same department. Undoubtedly, the greatest sources of siltation which may damage river structures in the Pacific Northwest are not the high watershed areas but tame agricultural lands. The management of crop rotations, of cultivation practices and the like, is of great importance in affecting runoff and siltation but few would argue that federal functions relating to the cultivation of arable land should therefore be tied departmentally to the river-development agency. The skills used in forested and grazing-land watershed management and in river-development work are quite different and the day-to-day management activities are very unlike. The concern of the river agencies is with the net effect of watershed management on the streams. This can be cared for by interdepartmental arrangements which we suggest below.

The nonpublic land-management functions of the Forest Service include its farm-forestry program. While that is not nearly so important in the Pacific Northwest as in the eastern part of the United States, particularly in the southeast and in New England, it will undoubtedly become more significant here as private timber becomes increasingly scarce and farm wood lots gain in value. From the national standpoint, which we are here considering, farm forestry is also likely to become the subject of more effort because so large a proportion of the national timber supply east of the Mississippi River is to be found in farmlands. Whether this program could as well be performed by the Soil Conservation Service is disputed. If it could, the tie between Forest Service activity and the Department of Agriculture would to that extent be weakened. It is clear, however, that whatever agency does that job will need to keep closely in touch with the forest experiment stations, which make constant additions to the knowledge of silviculture that should be applied in farm wood-lot management. Important as are the pulls in the direction of other departments, the evidence drawn from program-operating experience seems to point to a closer link between the organization managing the public wild lands of the Forest Service and the Bureau of Land Management and the Department of Agriculture.

The conclusion would seem to follow that the Bureau of Land Management should at some appropriate time join the Forest Service in that department. When it does it might be shorn of its adjudication functions, which with the disappearance of public land suitable for farming appears

to be concerned largely with the applications of the mineral-law provisions relating to public land use or alienation. The adjudication work is so distinctly different from land-management interests and attracts such different types of skill and personal disposition that some location for it outside the management agency would be appropriate. Perhaps it should be transferred to the Geological Survey, which performs a classification function relating to mineral lands, water-power sites, and so forth. This does not imply that adjudication should be carried on centrally in Washington as has been the immemorial practice. There is cogent reason to insist that the time-consuming processes which central adjudication has built up, and which hamper federal land-management agencies as well as private citizens, be superseded by expeditious determinations. Since the basic records for all cases are prepared and maintained in the field (Washington adjudication has operated upon copies supplied by the field) the job can be better done there, as the Bureau of Land Management is now preparing to do—provided competent personnel displaces the spoils appointees who have since the beginning of time operated the land registry offices; and provided, also, a few experienced adjudicating officers are placed in a limited number of convenient field offices.

The chief objection to this proposed reshuffle of the land-management functions under the Department of Agriculture refers to the balance of power. To augment the Department of Agriculture, already a major civilian department, with the wild-land duties of the Bureau of Land Management at the expense of the Department of the Interior may increase the difficulties of presidential control of the former. But if the president's office were better equipped to exercise grass-roots control by placing in the field a regional representative (as we suggest below) for the Pacific Northwest and for other regions, who will start the process of coördination when plans and programs are first gestating, this objection would diminish.

Moreover the time is ripe for reorganizing the Department of the Interior to manage the federal interest not only in all river resources including hydroelectric energy, together with the public interest in the other major forms of energy essential to American industry—coal, oil, and gas. Quite apart from a growth of direct operating tasks associated with public ownership of some of these resources the national interest will dictate an increased regulation for the conservation in extraction and use, and for expanding research to prolong the life of the three nonrenewable energy resources, and particularly for oil and gas, which are being depleted today at an exceedingly rapid pace. The regulation of the coal industry which after the First World War suffered chronic depression relieved only by another and greater world conflict, is a problem which will undoubtedly call for increased federal supervision if and when normal conditions return.

These tasks along with the unified river-development program, as sketched above, and the mineral, geological, and mapping functions would give the new Department of the Interior a major place in the galaxy of federal departments, with a series of activities possessing a great deal of coherence in functions and technical skills.

A Renamed Department of the Interior

A new and presumably renamed Department of the Interior would supervise the programs and services of:

(1) A National River Development and Management Administration, which in turn would operate through quasicorporate river-basin regional units, including a Columbia River Administration. This would be given the electric transmission systems and duties now embraced by the Bonneville Power Administration, the Southwest Power Administration, and the Bureau of Reclamation. The reclamation of lands by drainage, if and when the large potential areas of good soil thus reclaimable becomes of national interest, would, with respect to its engineering aspects, be also performed by this unified river agency. Because of the increasing importance of hydroelectric energy to industrial and social development, wide latitude for conducting needed research relating to regional development not elsewhere satisfactorily performed—preferably through grant-in-aid methods, to institutions, or agencies able and willing to perform research—would also become a function of the regional units of the National River Development and Management Administration. It would absorb the established research facilities of the Bureau of Reclamation and the Corps of Engineers (for civilian works).

The water-data-collecting functions of the Geological Survey would be transferred to the river agency and suitably geared to its field structure to afford the basis for comprehensive coverage of the various watersheds and rivers with gauging stations and other collecting devices essential to good water planning.

(2) The Geological Survey minus the water-data duties just indicated, but augmented by land adjudication and recording functions, and possibly the cadastral survey and classification activities, of the present Bureau of Land Management.

(3) The Bureau of Mines programs.

(4) Current or new duties relating to the development and conservation of basic energy resources (except atomic) and including coal, oil, and natural gas.

The Office of Indian Affairs would be transferred to the Federal Security Agency which presumably will some day become a Department of Welfare. Where the division of territories should go is not so clear, but it should not be retained in this new Department of the Interior for it has no genuine organic connection with this department's suggested tasks.

The programs relating to the surface resource-management of watersheds and wild lands would be relocated within an enlarged Department of Agriculture (which might also be appropriately renamed). To it would be transferred:

(1) The land-management programs of the Bureau of Land Management. These would be merged with those of the Forest Service, making a new operating bureau called, perhaps, the "Forest and Range Service."

(2) The wildlife and game-fish programs of the Fish and Wildlife Service. The commercial-fisheries programs of the latter should be more carefully examined to determine whether to place them in the Department of Commerce or to include them in the transfer of the Fish and Wildlife Service.

(3) The National Park Service which, for the present at least, should remain an independent bureau in its new department. Some of the wilderness areas within national forests, most valuable for scenery or other phenomena of peculiar interest to the naturalist, should be examined for possible transfer to the National Park Service.

The foregoing realignment of departmental and operating agency programs would greatly reduce the most important sources of major conflict in the management of federal natural resources in the Pacific Northwest. Even more important, probably, it would in addition help to "desectionalize" the Department of the Interior which has always been too closely tied to one part of the country, not only for its own administrative health but for the national interest. The geographic imbalance in its work, now tipped so heavily in the direction of the seventeen Western states, would be redressed by new nation-wide functions.⁹ It would be released from the dominating economic and political pressures of a single section which in and out of Congress now seriously limit the capacity of its bureau and departmental chiefs to make program adjustments which the national interest requires. But unless and until this alliance between the Interior Department and its Western administrative clients is replaced by ties expressive of social forces operative throughout the Union, it would be a grave error to turn over to the old Department of the Interior the functions of the Forest Service.

Yet even if the above outlined rationalization of departments and bureaus were achieved, many positive continuing tasks of inter- and intra-departmental coordination would still remain.

There are two possible alternatives to master the needs of intradepartmental regional coordination. The simplest schematic plan would be to abolish in the revamped Departments of the Interior and Agriculture the present line-authority operating bureaus, and create instead regional departmental administrations to handle within the several major divisions of the nation all the programs of all the resource bureaus, having field opera-

⁹ The historical political tendency to equate the Department of the Interior with one part of the nation only was clearly illustrated during the 1948 campaign for presidential nominations. The two leading candidates for the Republican party nomination not only denounced the Democrats for failing to recognize this historical claim, but promised, separately, during their Western speaking tours that if elected they would appoint a Western man as secretary of the interior.

tions, within their respective departments. The traditional bureau, under this arrangement, would retreat strictly to a staff status. The regional administrator in each department would be responsible, within his area, for planning, programing, budgeting, controlling, and operating all the resource programs of his department. The central Washington staffs of the present bureaus would become program specialists advising the secretary who in turn, through some central deputy in charge of line administration, would direct, supervise, and control the regional departmental administrators.

If we may assume the rationalization of the duties embraced within these two departments, along lines similar to those sketched above, this plan would offer two major administrative structures for resource management in the Columbia River Valley (and all other regions). These two structures would be in contrast to a single valley authority or to the present eight bureaus in the Interior Department plus the four principal action agencies in the Department of Agriculture. The task of mastering the federal programs in the region would seem to be enormously simplified, for there would be left, so far as field correlation is concerned, simply the adjustment of the work of the two departmental administrations. The two secretaries, buttressed by their revamped headquarters' functional staff offices, would set the national standards of performance, carry out the central research services, provide the inspectorates to check performance, furnish the central audits, and decide the interregional resource issues that are bound to arise.

Under such a plan the regional departmental administrators would perforce need large staff establishments at their headquarters to develop and supervise the operation of their programs. Special organizational devices and self-denying practices would be required to prevent these administrators from the typical overabsorption in the day-to-day problems surrounding operating chiefs, at the expense of long-range, integrated, region-wide planning and programing functions so urgently needed.

This suggested design of organization, like that of the valley authority should include, if it is tried, as many vocational, consumer, and state official advisory boards as may be useful in sensitizing the administrators to the impact of federal field programs on those vitally affected by them. Advisory participation in the administrative process was invented long before the valley authority was born, though its full and proper utilization has been very imperfectly practiced.

Attractive as is this partial alternative to the authority plan, obstacles to its political and administrative feasibility seem extraordinary. It would arouse on a nation-wide scale the opposition of every client interest of the extant operating bureaus in the two departments. For this plan would have to be adopted simultaneously on a nation-wide basis. It would call for

drastic reconstruction of the entire current departmental scheme of things. The valley authority has the greater political feasibility in that it can be created in one basin at a time, and thus shear off power from established bureaus piece by piece. Until it has been used to blanket most of the country it leaves existing bureaus functioning elsewhere as before.

To concentrate so much regional authority in a single departmental administrator would also invite the demand that this job be made a political one, with a political assistant secretary to fill it. To staff it in this way would greatly endanger its administrative success. It is probable that a regional administrator would be named by the president (or the national party committee chairman) and that a region like the Columbia River Valley would be administered both in the Departments of the Interior and Agriculture by a lame-duck governor, senator, or congressman. (A similar danger undoubtedly exists for new valley authorities. The unique circumstances attending the birth of the TVA in 1933 which prevented its application in that instance cannot be counted upon.)

The administrative difficulties in perfecting such a drastic reconstruction of operating machinery and practice would be great though probably not insuperable. To pick apart and reassemble the functional divisions of the present (and to-be-transferred-in) bureaus of each of the departments into effective and manageable regional operating entities, and to give them proper functional staff relationships with a reconstituted departmental galaxy of Washington program staff offices will be no easy task. Yet it may be assumed that in time this could be successfully accomplished. While the complexities of developing the appropriate adjustments of functional and line relationships for this monolithic operating departmental regional scheme would be much greater than for even the largest existing bureau, the basic principles developed heretofore could probably be successfully adapted, after some cost in trial and error.

Let the successful replacement of the traditional bureau structure by this suggested new area departmental operating agency be assumed. Would then the regional administrator for the Interior Department be so connected with client-group pressures that adhere to the programs of water development and construction that he could respond adequately to the often complementary or conflicting interests of the other programs in that department? A monolithic operating organization inhibits the presentation of internal conflict issues for secretarial readjustment. These will have been decided within the regional administration. Only rarely will they break through for secretarial observation and decision. If they are resolved in response to the major social forces which adhere to the regional departmental administration, the "minority" interests which we would leave in the Interior Department deprived of separate organizational

status could not so effectively pose issues for mediation and adjustment which run counter to the water-development constellation.

These are the chief considerations which swing our preference toward the second alternative plan for mastering intradepartmental unity issues of resource policy and program in the field: namely, the completion and perfection of the field integrating devices already taking shape within the Departments of Agriculture and of the Interior. This will require at least some essential changes in the status and powers of the regional representatives of these departments. Many problems of discovery and invention in the development of these recently created area-coördinating jobs lie ahead, but we may set down here a few of the essentials already visible which must soon be forthcoming.

Thus far, in both departments, the secretary's field representative has in no sense been "the boss." His authority has been ambiguous, and he has moved with great circumspection. He has moreover been most meagerly staffed for the elementary purpose of bringing to him a free flow of information from the operating agencies and for watching the "follow through" on agreed program activities. Outside the Missouri Basin a system of program reporting is almost undeveloped. To obtain an accurate, prompt, and frequent appraisal of program progress from each operating agency is indispensable to any program-correlation function. It takes not only agency willingness to do this but staff facilities both for it and for the secretarial representative, as well as properly designed reporting techniques.¹⁰

It is clear that where conflicts of agency programs exist or impend, the factual studies and field surveys essential to their resolution and to the building of a really comprehensive departmental plan, either for a sub-basin or for the whole region, should be launched on a departmental basis under the guidance of the secretary's representative.

¹⁰ It is no disparagement of progress made in Interior Department's regional programming and budgeting in the Pacific Northwest, which we have noted in chapter xiii, to observe that the chairman, as the secretary's representative, has been in no position to exercise effective criticism in reviewing the program and budgetary proposals of the several agencies. When a clash between two or more agencies arises, he has been able to suggest compromises and adjustments. But on program budget estimates he has thus far had no authority to question items and no means of knowing when to offer either constructive or negative criticism. Undoubtedly his wide acquaintance with the programs of all the federal resource agencies in the region, his extraordinary knowledge of the region, and his persuasive competence have influenced the content of the departmental regional program in ways difficult to measure. But something more is certainly needed. The least that should be given him is technical staff qualified to aid in furnishing effective criticism. (November, 1949.)

*A Field Representative of the Office of the
President*

Should this second alternative for departmental organization at the field level succeed in its task, the job of interdepartmental coordination would become simpler, but more urgent. Two great resource departments, internally unified, will possess additional strength to battle it out unless there is within the region a superior focus for mediation, cooperation, and adjustment. That can only be furnished, administratively, by the president through his executive office.¹¹

Thus a field representation of the Executive Office of the President is the keystone to the whole arch of regional organization, if it is to be built on the foundation of the traditional functional departmental structure of national administration. No matter how much a better design of bureau or departmental structure may reduce friction and duplication of effort, there will still remain the over-all regional interests of the whole federal government to be synthesized, balanced, and coordinated. Only a center of concern for the total result of all federal programs which Congress and the president have authorized can transcend interest partiality and create that sense of interrelatedness that is the most unique characteristic of the personnel of the Tennessee Valley Authority. That agency in the Tennessee

¹¹ There is of course another way of avoiding most of the interdepartmental conflicts and adjustment needs on the resource front. That would be to adopt a much more revolutionary reconstruction of the traditional departmental system in which a handful of superdepartments would replace the current executive system. Modeled on the new defense establishment, the whole range of resource functions (now scattered in three departments) and the other duties on behalf of agriculture might be combined into a second super-Department of Agriculture and Natural Resources. (Dean Samuel T. Dana, of the Hoover Commission task force on natural resources favored such a combination which he thought of as a "Department of Conservation.") This idea resembles somewhat the departments of conservation adopted in a number of the states for unifying their resource functions, but the states have not usually included the agricultural duties performed by the land-grant colleges or their state departments of agriculture.

Were a general new superdepartmental design adopted, it might be justified on the ground that it would reduce the "span of control" strain upon the president and his management staff facilities. However, it would raise other questions of presidential control because of the aggregation of political power centering in such huge departments. Certainly if such a principle is applied, it should be carried through the entire executive establishment, or else difficult "imbalances" of influence would result, to the detriment of presidential influence. Unless and until such a plan is adopted, which would subsume all the federal resource and related functions under a single great department, we shall have to rely upon a field representative from the president's office to bring all resource programs into proper focus within the Pacific Northwest, as well as other regions. He can, at the same time, handle the occasional federal interests in commerce, transportation, labor, and industry, which are affected by the timing and character of resource development programs. (November, 1949.)

Valley is charged with regional planning duties which may include every recognized national-resource interest in the area, and its operating programs covering water, mineral, and land resources are pulled into focus by a common center of attention and control.

We do not intend to play down TVA's contribution in showing how to unify plans and operating procedures for its "water in the channel" functions. They have been distinctly superior to anything done by the traditional river-development agencies in any other river system. But perhaps TVA's most challenging work has been its use of each phase of this river job, including the power program, to complement and support its programs for the land, for agricultural rehabilitation, for improved health, for more stable employment, and for strengthening the scientific and intellectual resources of the people. Its big achievement has been that of first conceiving what might be done to lift the standards of living of the regional population by the best practicable use of their resources; and second the development of policies for the operating functions of its own divisions as well as for those state and local agencies which it has employed for its operating purposes so that each operating program may yield as many regional social benefits as possible.

This central concern of TVA with the end social results of all federal resource activities within the region, and with the attainment of a number of goals which transcend the functions of any single traditional bureau or departments, should be repeated in the Pacific Northwest. But here that task should head up as the responsibility of a regional representative of the Office of the President. The TVA was established before the Executive Office of the President was elaborated; besides, it was founded before the president was equipped with the interdepartmental coordinating staff essential to the management of the national executive job in Washington. After 1933 presidential staff facilities were greatly developed, particularly for planning, budgeting, and administrative analysis. We have noted the experience of the ill-fated National Resources Planning Board and its regional expression, the Pacific Northwest Regional Planning Commission. Inadequate as was that regional instrument for over-all planning coordination and stimulation, its work clearly indicates the importance of regional planning in the process of federal administrative field coordination.

The National Resources Planning Board was responsible for conceiving a hydroelectric program for federal river structures in truly regional terms, for outlining a regional grid scheme, and for presenting the case for a rate program to spread the benefits of cheap federal hydroelectricity throughout the regional area. Its inquiries into the problems of the forest industries, of land reclamation and conservation, of migration and work opportunities, were not bounded by state lines or agency jurisdictional barriers,

but were concerned with the contribution which all the federal and state agencies might make to the solution of difficulties found in greater or less degree throughout the Pacific Northwest.

On that beginning the regional representative of the Executive Office of the President should build. But there should be no uncertainty about his authority as spokesman for the presidential executive establishment to coördinate on the ground the plans of the several departments and their operating agencies. The regional planning function must be cleared of any lingering suspicion of an avuncular hobby and take its place as a statutorily authorized and continuing presidential staff activity. It is abundantly clear from the limited central planning efforts of the 'thirties and from the experience in field coördination within departments that many of the serious program conflicts, gaps, or duplications can be avoided if at the time when plans are being developed the interests of all agencies affected could be fully made known and recognized. A clearing-house function operative at the early stages of all planning activity could work wonders in forestalling interagency difficulties later. Some agencies in the past have by direction of their national offices kept within their own bosoms their gestating field plans until a strategic time, from the standpoint of agency aggrandizement, should arrive for announcement. It should be a prime task of the regional representative of the Executive Office of the President to end such tactical practices, and instead keep flowing a constant stream of information among the several field establishments of plans in process. It should be his further function to assure that all agencies discovering valid interests in the plans of others would have reasonable opportunity to explore such matters with the initiating agency before a "frozen" situation develops, and frequently to participate in joint surveys and studies for the development of plans.

There is a special need for a regional review at a level beyond the departmental ambit for the plans of the Columbia River (or any other river) Administration. The river-development agencies, with their great dams and other structures that are so easy to dramatize to the public, and with their engineering staffs that inherently thrive on construction projects, require an independent check, not only to see that programs outside their departments are articulated with river development and operating plans when necessary, but to assure that their plans are soundly based from the hydrologic, economic, and social standpoints. The administrative unification of the present competing structure, while eliminating some of the current incentives to hasty plans, does not guarantee that many of the traditional construction incentives to overoptimism about the economic and social justification of particular projects will cease. In some respects greater unity gives greater power for the commission of such errors unless it is

checked by independent review at a sufficiently high level to be effective.

There should be two points within the region where this occurs: first, when the parent departmental regional coördinating mechanism examines development plans and projects, and second at the level of the president's regional office where greater independence of judgment and a wider governmental as well as regional perspective can be brought to bear.

An independent review, from the national standpoint, ought also to be provided for these construction programs. That is now furnished, from the fiscal point of view, by the Bureau of the Budget. But sooner or later there should also be established a central planning agency in the Executive Office of the President which can perform, under more favorable circumstances, the reviewing tasks initiated by the ill-fated National Resources Planning Board. It would also function as the Washington technical advisor and critic of the planning proposals of the regional representative of the president's office.

The clearing-house mode of facilitating the coördination of plans is not enough. Positive guidance and stimulation on a region-wide and, as needed, on a nation-wide basis should ever be available to particular agency regional officials in order to maximize the social usefulness of their plans. This will require some formal arrangements for direct communication from the Executive Office of the President as represented in the region concerning over-all national policies and purposes to be included in the development of plans and programs. It will require sufficient experienced staff in the office of his regional representative to function effectively in a liaison capacity with the several departments and operating agencies, so that there shall be a ready channel for a two-way flow of information and insight.

The staffing of the regional office of the president will provide only a part of the machinery which his representative will need. He will also require, particularly for his regional-planning leadership duties, close working association with a board or council of federal field offices (departmental and agency) engaged in resource development and management, and with state government spokesmen.

A staff can develop information and ideas useful for the regional coördination task, but it will never encompass all the knowledge or insight latent in the region and needed for the job. Much of that essential material must be the direct contribution of the operating agencies and the state government spokesmen in joint consultation. Moreover, decisions, to be actually fulfilled, must rest upon a reasonable degree of consensus. That can only be won by representative group discussion and by the adjustments in preconceived programs which naturally develop therefrom. A planning structure on the resource front must therefore be multimembered: it must

be composed not only of a top representative council, but of many subordinate committees to hammer out the kinds of plans that are built on valid facts and experiences and consider all significant facets of complex situations. The defunct Pacific Northwest Regional Planning Commission was thus moving in the right direction in its projected committee organization. It was unable to attain its goal because of basic defects in top representation, in linkage with the president's office, and in budgetary support from Congress which inhibited the completion of proper staffing, and the activation of representative technical subcommittees. It was also plagued by the inability of the Departments of the Interior and Agriculture to coordinate and properly represent their own agencies and by the political strength and executive uncontrollability of the Corps of Engineers.

If the suggested structural improvements in federal departmental organization (center and field) can be made, then the regional office of the president should become the effective focus for bringing into the vision of every participating agency the impact of its own programs and purposes upon related programs of all the others and of their combined effects on the welfare of the region.

It is to be hoped that with such an integrating center in operation over a period of years, the separatist and "isolationist" bureaucratic tendencies characteristically associated with the functional bureau type of field structure would be displaced by a lively concern for the total impact of each agency's programs. It is this "generalist" characteristic that so distinguishes the TVA. It may be said that TVA's success cannot be fully duplicated in the Northwest under the organization plan here proposed; for the TVA has no Washington-centered divisional heads pulling its divisional staffs toward special capital-oriented functional interests. One of the major tasks which will confront the regional representative of the president's office will be to counteract the particularistic pulls on their field spokesmen exerted by the several bureau heads. But if the incipient movement in the Pacific Northwest toward departmental regionalization is not halted, he will have integrating and regionalizing allies not found in the Tennessee Valley in 1933 or since.

The proposed regional planning organization has a compensatory advantage over the valley authority form which must not be overlooked. That is the inherently superior sensitivity of a presidential regional representative, reporting to the president through one of his civilian chiefs of staff, to the national interest in the regional situation. While this study has constantly discussed the problems involving interrelations at the regional level, it must not be implied that desirable planning machinery and programs for a region can disregard the national interest in any of its major subdivisions. Whenever the president is again equipped to give systematic at-

tion to long-range national resource planning, comparable activity at the regional level will unquestionably profit from a close tie with that central executive staff. Thus, for example, a national water policy with consistent principles applicable to the development of all the river systems, would give an assured basis for river-system planning that now is lacking. This was pointed out in 1941 by the water-resources committee of the National Resources Planning Board which then outlined the essentials of a unified national water policy and proposed a series of recommendations for Congressional and administrative action.¹² Its recommendations have only in slight degree been accepted, and we are still far short of a unified water policy, to guide water planning at the regional level.

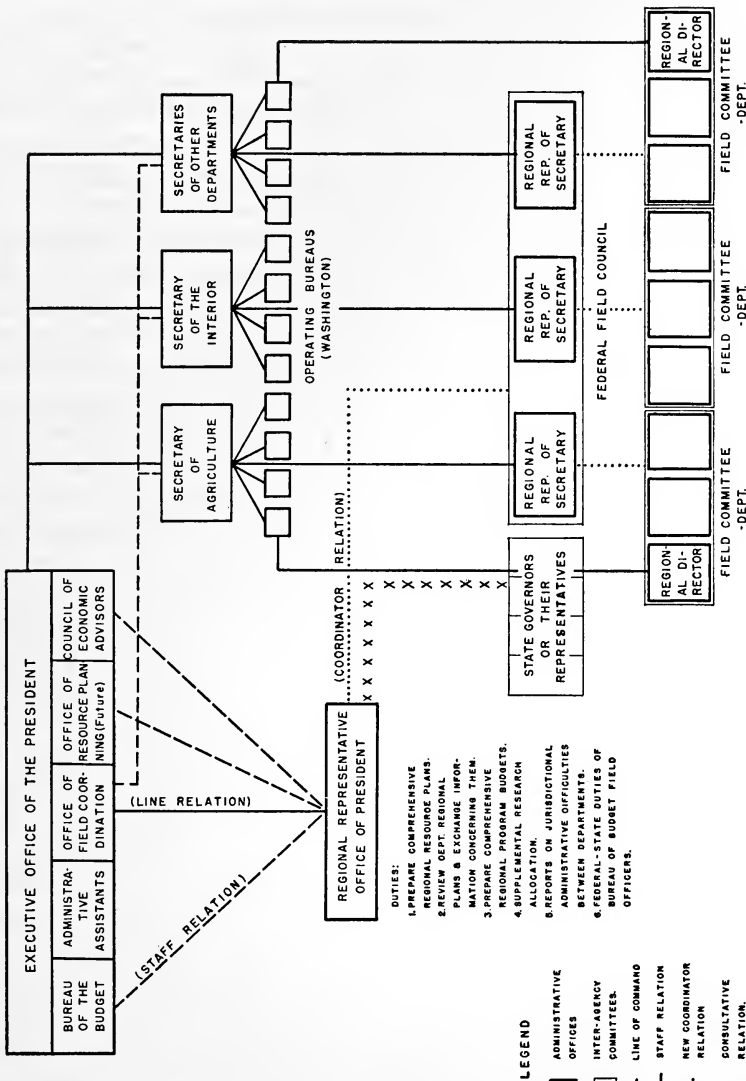
It should be emphasized that one phase of the regional planning task is the correlation of state and local policies with those for which the national government holds major, but by no means sole, responsibility and legal authority. Despite the fact that the government of the United States still has title or legal jurisdiction over so much of the water, land, and mineral resources in the Pacific Northwest, scarcely any policy or program is initiated by Congress or (through delegation) by national administrative agencies that without supplementary action by the state governments can fully achieve its purpose. This fact ought to be abundantly clear from the foregoing discussion of the national soil-conservation programs, of forest resources, and of fish and wildlife.¹³ In each of these as well as in other areas the states share legal control with the national government. There must be coöperation and minimum agreement in legislative policy as well as in administration if federal objectives in the field are to be reached. This is the reason why, apart from political expediency, the states must be included in the planning machinery centering in the regional field office of the president's representative. Provision must therefore be made for state representation in the over-all regional planning process. This will be difficult to do because state government policies may not be expressed accurately by the governors, either on the legislative or the executive levels. But despite that difficulty, the states will need to be included in the over-all regional planning structure.

The present activities of the field offices of the Bureau of the Budget should largely be absorbed by the regional representative of the Executive Office of the President. These have not been strictly budgetary functions,

¹² See the section on water-development policies, in *Development of Resources and Stabilization of Employment in the United States*, Part III: Functional Development Policies, National Resources Planning Board (January, 1941).

¹³ The reader is reminded that the revelation of state interests in federal programs and activities of field resource management has been purely incidental to this study. As explained in the preface, this failure to explore systematically the relationships with the states is due not to a belief in its unimportance but simply to lack of time.

THE PRESIDENT



Proposed Regional Coordination of Federal Resource Administration Through a Presidential Field Representative.

but rather persuasive efforts at mutual understanding of programs and regional needs by federal, state, and even local officials. The functions of regional planning with which the proposed regional office of the president will be charged will greatly strengthen the process for tightening the bonds of understanding between the three levels of government. All ancillary modes of increasing the knowledge and mutual understanding of tasks and problems would come naturally within the same officer's orbit of interest.

However, one strictly federal budgetary task must adhere to the representative of the regional office of the president if his duties as planning integrator are to be effective. The office must participate in the regional budget-programming process, on a review basis, so as to work out an over-all regional budget for program and capital expenditures covering the whole federal resource job. In so doing it may be wise to assign for the period each year when this review is taking place a representative of the Bureau of the Budget to sit in on an advisory basis. This budget man could help translate to the regional representative and the departmental field men the over-all national fiscal policies of the president. In this way he might guide the field officials in their development of budgetary programs in such manner as to minimize conflict when finally the regional budget proposals reach the Bureau of the Budget. In turn he might help the regional people and particularly the field representative of the Executive Office of the President, convey to the Washington offices fuller understanding of the budget problems of the region.

Just how the regional representative of the president should participate in the budget-review process, when field programs are being planned for annual or six-year fiscal estimates, is a more difficult and delicate question. Probably such review should resemble the process of the annual spring budget review now undertaken for all field establishments within the eight bureaus of the Department of the Interior by that department's Pacific Northwest coördination committee. It should be concerned chiefly in such review with interdepartmental interests; review should be limited to program essentials and capital expenditures. It should attempt to synchronize related programs that cut across departmental lines, filling gaps if such occur, and infusing into each program the greatest degree of regional utility compatible with prudent expenditure. If there are interdepartmental conflicts which transcend efforts of persuasion (as there may be in a few instances) the regional representative of the president should be equipped with authority to take the matter directly to the Executive Office of the President in Washington for adjustment. The existence of such an administrative right would probably resolve most interdepartmental difficulties without the need for its exercise.

Just as the effort of departments to bring about integration of agency

programs has run at once into the differences in field authority and in budgetary timetables and processes among agencies, so will this problem plague the work of the representative of the president unless and until the departments and the Bureau of the Budget shall resolve it.

The regional representative of the president might also be of great aid in helping to persuade the Congress to change the fiscal-year dates, and the Congressional timetable for budgetary action, so as to bring to an end the universal waste and disorganization in field-work planning that is a direct consequence, particularly for the resource-management agencies, of the delay in appropriation action until the end of June, or even, as in 1947, the end of July. The summer season—the time of greatest potential accomplishment not only for construction but for management tasks—is a third or half gone before field officers can make firm commitments or launch many of their summer programs. Normally they must hold off starting their full-scale summer programs until Congress has acted for the new fiscal year.

Finally, the new position we suggest should fill out any gaps in federal research needs for the region, not cared for by the several operating bureau and departmental field stations. Such gaps should emerge in the processes of planning and budget review. If appropriate locations for these duties cannot be found in federal or state operating or research agencies, the regional representative should be financed to obtain their performance.

Were the office for which we have argued created, it should be given a small but well-trained and experienced staff. This will be needed not for the making of operating decisions, which must be left with the operating bureaus within the several departments. But the task of keeping closely in touch with agency programs and plans, with leadership in regional planning, with the interdepartmental coordinating process, and with the supplementary resource policies and administrative programs of the Columbia Valley states will necessitate a small corps of highly qualified men to act as eyes and ears and to perform special assignments for the presidential regional representative. That official and his staff will be challenged by the unprecedented job of working out coordinating procedures in such manner as not to reach over into the day-to-day operating process. This presents a problem in "dual supervision" never heretofore undertaken in our national administration, but the fact that some of the most efficient national bureaus have themselves solved a parallel problem in bureau administration gives hope that it can be successfully accomplished. It will require a sensitive and sharp mind to distinguish the essential "policy" issues to which coordination should apply from the "administrative" decisions that must be left to operating judgment. But help on this pioneering job should be forthcoming from the departmental regional coordinators who, as we have indicated above, face a similar set of issues. It is good that they are already un-

der way, for their experience should help short-cut the "trial and error" process which is inescapable, in learning how to perform an entirely new function.

There will of course be the task of obtaining Washington support and assistance for resolving issues which by agency and department practice or by Congressional law cannot be decided by the several field officials. This should be less true in the future once the system we have been outlining were under way, because the whole impact of such a regional coordinating structure will force the reconsideration of the present distribution of authority within operating agencies in favor of greater delegation of discretion to field officials. Agencies which because of the encrustations of tradition and routine have refused to reexamine seriously the question of how best their management job might be done will be compelled, however reluctantly, to reconsider their internal structure, delegations of power, and procedures. Otherwise they will be subject to continual complaint because their own officials in the field will be unable to act on matters of joint interest with the field officers of other agencies. They will be accused of "holding up the show" so that their own field officers will be unhappy and embarrassed, and the other agency officers, clothed with more ample power to solve field problems, will be increasingly vocal in their protests, using the new sounding boards made available through the departmental and presidential regional coordinating offices.

Just as the regional coordinating officers of the departments are linked directly to a post or a committee in the secretary's immediate office assigned to assist the work of the department's field representative, so within the Executive Office of the President some high official will be needed to supervise and respond to the work of the regional representative of that office. It will be his job to see that difficulties of an interdepartmental or over-all character in the region which cannot be resolved solely by regional action are processed by the president's office with the several departments affected. It will thus be the regional representative's task to resolve interregional issues not susceptible of department adjustment, and to prevent regional distortions from defeating or impairing national standards and objectives. He will undoubtedly work closely with the director of the Bureau of the Budget on these matters, and whenever a presidential planning board or office is reconstituted will maintain an intimate liaison relationship with it, for it will unquestionably be concerned, as was its only American predecessor, the National Resources Planning Board, with the development of long-range plans at the regional level.

This scheme for organizing the federal administration of natural resources so as to combine the values of the integrated regional approach to

resource development with the traditional functional pattern of national administration may seem complicated. But so are the tasks of responsible democratic government for our kind of civilization. These we must learn to master. We must not forget that the multiplication of valley authorities would quickly introduce numerous complications in national administration for which new layers of organization structure would have to be provided. Complicated or not, we shall either have to adopt some structure comparable to the one here outlined or court the risk, if we use the valley-authority mechanism without new complexities of structure for its control, of nine or a dozen competing regional agencies defying effective administrative guidance and supervision by the only office, the presidency, which can be ultimately responsible for federal resource administration.

CHAPTER XVIII

Prospects and Conclusions

Agency-Client Obstacles to Changes

WHAT IS THE outlook for a revision and completion of the traditional bureau, departmental, and presidential units in the national administrative system along the lines we have suggested? Are we justified in drawing, from the signs of administrative fermentation which we have reviewed, the optimistic conclusion that the yeast of experiment, discussion, and fear of public criticism for existing inadequacies will in reasonable time bring forth the necessary basic changes? An affirmative answer cannot be given with assurance. There are deep-seated obstacles to change on such a scale, quite apart from the natural hesitation to embark on a course of structural organization of the national executive for which there is no full precedent.

The resistance of any agency or department to the loss of its identity, or to the divorce of an important program, or to internal redistribution of authority which the agency heads wish to retain will always be the starting point of opposition. In addition the agency quickly enlists powerful allies in and out of Congress. Geographic or vocational interest groups take alarm at the possible loss of influence over an agency which may owe its creation or expansion to their influence on the Congress, the president, or the secretary. Let a proposal be made which disturbs the *status quo* to the apparent disadvantage of officers in charge of a single unit, and the word that danger threatens is quickly passed along to its clients and, in turn, to its "friends on the Hill."

Agencies in the resource field are regularly expected to work with and to aid particular client groups: the sportsmen who hunt in the forests, the fishermen who whip the mountain streams for trout, the cattlemen who graze the federal range, the farmers concerned with soil losses from floods or erosion, the shipping industry which wants deepened channels for bigger boats, the businessmen who boost for more irrigated acreage to furnish more customers, more freight, more raw materials to be processed, the miners looking for more profits from new ore bodies or improved processes. To these must be added all the other groups in our society which want or

have obtained recognition among the multifarious programs in which federal resource management is expressed. The secretary of a department and even the president benevolently encourage their operating bureaus to use these agency-client relationships to win Congressional support for policies which the secretary or the president approves. But when they want changes in organization that may disadvantage a bureau or a group of operating units in order to create a more effective administrative instrument for managing their full responsibilities, these same agency-client relationships are naturally called into opposition.

A secretary or a president who turns on these forces to obtain what he wants from Congress thereby lays himself open to similar combinations in opposition to changes which the operating bureau heads dislike. And this covert incitation of opposition by the official who passes information along to his clients and to their political spokesmen in Congress and in state government can usually be conducted without effective discipline from above. Field officials, who must be skillful in their public relations and in their contacts with members of Congress, may with similar impunity build effective backfires occasionally against their superiors in resistance to bureau-initiated changes, or in support of bureau resistance to secretarial or presidential policy. The price of succor, even occasionally sought, is conformity to client desires. While agreement in all things may not be exacted, marked deviations from strongly held purposes may lead to quick and vigorous chastisement of the agency or its leaders by the group-congressmen elements of this triangular alliance.

Relations between Bureau of Reclamation and National Reclamation Association

The operation of these client-agency alliance forces in the administration of federal resources is illustrated by the relationships between the Bureau of Reclamation and the National Reclamation Association. Relations were marked for years by great harmony that later was broken by changes in agency leadership as well as in the leadership and composition of the group. The National Reclamation Association was organized in December, 1932, at Salt Lake City. While the precise story of its creation remains to be written, it is evident that a dominant part was played by the fear of Dr. Elwood Mead, then director of the Bureau of Reclamation, lest the opposition of Midwestern and Eastern agricultural interests in Congress should kill support for his agency and for further irrigation work. In the keynote address at the organization meeting, Dr. Mead's close friend, John Haw, director of agriculture for the Northern Pacific Railway, presented the

case for action on behalf of the bureau and of reclamation. He said, in part:

Federal reclamation of arid land is facing a crisis, a financial crisis, because of drastic shrinkage in its normal revenues wholly or in part attributable to the depression and a policy crisis arising out of a widespread challenge of its economic soundness and general national benefit or that it should continue to remain as a part of the Interior Department. Make no mistake, Federal aid to existing irrigation districts now in difficulty, to say nothing of irrigated area expansion at some more opportune time in the future, is faced with interruption for financial reasons or outright abandonment for policy reasons, unless there immediately rallies to its support a militant organization from those areas directly benefited. Apparently the West alone is able to correctly appraise its contributions to national well-being, and if such areas are not willing to assemble and analyze the facts and marshal and publicize the arguments for federal reclamation, it will not be done. The bureau itself is equipped and invested with authority to conduct its work, but not to battle for its existence . . . The time has arrived when action from Western interests rather than oratory is required.

Haw pointed with especial alarm to the hostility of Congress, which had not only refused a loan of \$5,000,000 from the Treasury to the depleted reclamation fund but had exhibited "open, vicious, organized and finally victorious attacks on reclamation appropriations in the spring of 1932. No bureau of the Federal Government was given so little chance to defend its position or was treated with more harsh and arbitrary appropriation curtailment. This display has at last made every pro-reclamationist put on his fighting clothes."

In an analysis of the reclamation situation at the time, replete with detailed figures undoubtedly furnished by the bureau, Haw presented a persuasive case for the continued financial support of the program begun in 1926 to bring supplemental water to projects on which the supply had not been sufficient, and to rehabilitate many of the early private projects that were in distress and on the verge of disaster. He asked for loans to the reclamation fund "to put our irrigation works in shape to deliver dependable water in sufficient volume to assure maximum crop production and to engineer and superintend the construction of these works." He challenged the Congressional appropriation policy which, by stripping the bureau of money, would disintegrate the engineering staff which the bureau had built up over a period of thirty years.

Finally Haw pointed out the menace to reclamation if the bureau were to be transferred, as was then rumored in Washington, to the Department of Agriculture which, as indicated by critical statements made in that department, would prove a veritable stepmother. He said: "The stand of the West should be for retention of the Bureau in the Interior Department where the policy now proving satisfactory has been developed and estab-

lished, rather than its transfer to another department of extremely doubtful jurisdiction, unfamiliarity with its problems and lack of sympathy, if not actual hostility.”

These sentiments were embodied in the initial program adopted at this organization meeting.¹

The National Reclamation Association was launched with the help of the Western Governors' Conference then meeting at Salt Lake City. Its original impetus came from the several Pacific railways, perturbed by the threat to their traffic implicit in the disintegration of the distressed irrigation communities and the cessation of new development; from local business leaders of the irrigated areas, similarly menaced; from private contractors idle through lack of public works; from irrigation-district officials seeking escape from bankruptcy; from farmers desperately hanging on to their land in the hope of rescue; from officials of the bureau who then and since have attended and actively participated in its conventions; and from state political and civic leaders concerned with this general economic crisis.² With this backing and with the special aid of Senator McNary, its first president, Marshall Dana, of the editorial staff of the *Oregon Journal* of Portland, obtained from President Roosevelt allocation of funds for the distressed and incomplete irrigation projects which in a few years ran up to a grand total of nearly \$200,000,000. The bureau expanded, but remained in the Department of the Interior.

In the years since those distressful times, the program of the association has undergone marked expansion and new emphasis, while at the same time, the Bureau of Reclamation and the Department of the Interior underwent important changes in personnel, policy, and organization. The long tenure of Secretary Ickes introduced with the passing years a new issue in reclamation—that of cheap publicly distributed power as a by-product of irrigation projects. Ickes ordered the bureau to apply the same power policies, within limits of its amended law, that were being expressed by the Southwest Power Administration and the Bonneville Power Administration. He established within his Washington office a staff unit, the Division of Power, to watch for the fulfillment and harmonization of these power policies. As we have already noted he broke the hold of the older engineering outlooks upon top bureau direction and policy when he pushed the bureau into regionalizing its field work and bringing out of Denver and into Washington some of its central staff services. He encouraged the selection of some regional directors who, as in the Central Valley of California,

¹ See *Proceedings of the National Reclamation Association*, Salt Lake City, Utah, December 5-6, 1932.

² One of the bureau's high officers was named one of the two governor's delegates from Colorado at the organization meeting of 1932.

would stand out against the private-power companies and commercial farming groups in the formulation of basic policies concerning the fruits of public reclamation enterprises. One of his latest administrative acts was to break the tradition by appointing as commissioner of reclamation, not an engineer, but a former newspaper man who shared his views on power policy.

Within the National Reclamation Association the power question and the valley-authority issue came into increasing prominence. The membership was expanded to include the seventeen Western states. Reciprocity of support was established with Eastern and Midwestern water-lobby groups, also interested in stopping the valley-authority idea and in obtaining bigger appropriations for the old-line construction agencies. Chief among the association's Eastern allies was the National Rivers and Harbors Congress, which is now always represented at its conventions. At the 1947 convention, in a paper prepared by Fred D. Beneke, secretary-treasurer of the congress, an exposition of this alliance was presented which indicated that it dated from 1936 when the National Reclamation Association backed the program of the National Rivers and Harbors Congress for an expanded and gratuitous national flood-control program in return for help with reclamation appropriations. Together they backed the Pick-Sloan compromise for the Missouri and Congress authorized it. They "saw eye to eye on the valley authority issue" and helped organize some thirty regional and sectional associations to further that opposition.³

While the railways (whose agricultural agents had been key members and officers in the early association) continued their support and interest, the chambers of commerce, and other special economic groups—including those attached to private power distribution—have become increasingly active in the state associations as well as in National Reclamation Association gatherings.

No quantitative method of estimating this shift of influences within the association and no publication of specific contributions to its annual budget exist. Each state is given an annual quota of funds which the state director, who is elected by the delegates to the convention from that state, is expected to raise. Whom he may tap is left to his judgment. In Oregon the bulk of the money has been obtained from local chambers of commerce. The Washington director, who for nine years served also as treasurer of the association (resigning in 1947), was throughout that time secretary of the Spokane Chamber of Commerce which furnished free space, free postage, bookkeeping, and secretarial services for his treasurer functions. In view of the fact that the largest contributors to the Spokane Chamber of Commerce (and

³ See *Proceedings of the Sixteenth Annual Meeting, National Reclamation Association*, Phoenix, Arizona, October 29-31, 1947, pp. 137-139.

customarily to other chambers) have been the private utilities, it is fair to assume that their views would have great weight in an organization so financed and supported.

The need of a considerable treasury grew as the association established a full-time secretary-manager in the national capital to lobby for its program.

Toleration of the association for private-utility orientation is indicated by the active and prominent part of E. W. Rising in its work. Not only has he been active in its meetings as a member from Idaho, but he has been a member of its study committee of five. During the past several years this committee has been the spark plug behind legislation (incorporated first in the Robinson Bill and later in the Rockwood and Rockwood-Lemke bills) intended to make power revenues pay into the treasury interest as well as repayment and irrigation subsidy charges. When the association's first full-time secretary-manager resigned to take the secretaryship of the Seattle Chamber of Commerce, Rising was named temporary secretary-manager. This is the E. W. Rising who was the subject of special documentary exhibit in the famous report of the Federal Trade Commission on the electric-utilities methods of lobbying. He was revealed therein as an undercover employee during the later 'twenties of the Idaho Power Company which on behalf of its parent organization, the Electric Bond and Share Company, was waging a fight to stop the incipient municipal-ownership movement in Idaho. (See *Utility Corporations Report*, No. 65, 70th Cong., v. 12, Sen. Doc. 92, Part 65.)

How important the power issue had become by 1945 and how strained the relations with the Department of the Interior and the bureau's leadership is indicated by the emphasis given to power by the secretary-manager in his annual report to the association's national convention in November, 1945. There he called attention to the danger from the advocates of cheap public electric power who, he felt, were pushing their interests at the expense of irrigation and the general taxpayer. Said he: "It is my judgment that unless this can be overcome it will result in greatly retarding, if not completely stopping the federal reclamation program throughout the West at a time when its expansion and continuation is of the greatest importance. . . . There is no issue before the Association of greater importance, and none that shrieks so loudly for your immediate understanding and prompt action."

As early as 1942 the association had become suspicious of the influence of the department, and particularly of the Division of Power, on the bureau's program, as distorting it from a purely reclamation agency to a power-producing agency, and had instructed its officers by formal resolution to guard against this danger. Two years later it was more pointed, and de-

manded that the Division of Power be returned from the secretary's office to the bureau, and stripped of the power functions formerly resting in the bureau. In 1945, however, the secretary-manager reported that so long as the Ickes administration prevailed it would probably be of little avail to put the Division of Power back in the bureau.

Thus far criticism by the association of the behavior of its protege agency was centered on the department, rather than on the bureau, which it seemed to regard as reluctantly acquiescent in the power-policy heresies. But in 1944-1946 two events produced a head-on clash with the bureau leadership. These were: (1) the solicitor's opinion concerning the legal obligation on power revenues under the Reclamation Project Act of 1939, particularly the obligation with regard to the payment of interest (see chapter iv for full discussion); (2) the espousal by the new commissioner, Straus, of the cause of low-cost power in his opposition to the association's efforts to obtain Congressional reversal of the solicitor's opinion and to fix on power revenues the legal burden of repaying an interest component to the general fund of the Treasury.

Throughout 1946 and much of 1947 the association, through its secretary-manager and other officers, and through its special study committee, waged a fight before the House Committee on Irrigation and Reclamation against the bureau and the department on this power-revenue problem, with the association striving for a general Treasury return of interest charges, and the bureau insisting that the interest after collection go into the reclamation fund and become available for irrigation subsidy and thus be reflected in the making of power rates. The officers of the association found themselves in the uncomfortable position of demanding legal changes which would apparently make new irrigation projects less economically feasible than they would be under the policy advocated by the commissioner and the department. Perhaps because of the criticism that it was acting as a mouthpiece of the power interests, the association modified its stand. The bureau and the department, on the other hand, were in great need of political support after the elections of 1946 had left the West with slender representation on the House Committee on Appropriations, and particularly on the subcommittee handling the bill of the Interior Department. During the next year a compromise on this power-revenue question was worked out under Congressman Rockwell's leadership, so that the bureau and the association reached agreement concerning the interest issue and on a number of other important modifications in reclamation law which would extend the repayment period, reduce the interest rate, and add a number of new nonreimbursable project costs.⁴

⁴ See the *Hearings before the Committee on Irrigation and Reclamation*, 79th Cong., 2d sess., on H. R. 5124, Parts I, II, and III. The statements of Floyd Hagie and Judge Stone

While the acrimony of the last few years has been superseded by a period of greater conversational calm, the association is still critical of several bureau policies, including its new water-contract terms. The range of critical items endorsed by the association seems to increase, but this may not imply an increase in friction, but rather the expanded area of the association, the incorporation of local issues in its resolutions, and a great ease in obtaining association endorsement. (Only one out of 25 resolutions adopted at the 1947 convention received any discussion on the floor.)

There can be little doubt that the cleavage between the association and the Ickes-Krug power policies has had a part to play in the drastic curtailments of funds for the Power Division and in the rider on the 1949 Interior Department appropriation act which, unless removed by the next Congress, will terminate within a year the commissionership of Straus.⁵ Throughout the long contest over the interest component matter, the association officers continually justified their position by espousing the views of the appropriation committee. The rider and the cuts in secretarial staff funds were doubtless viewed as pleasing punishment in association circles. They were warnings to a department that differences on substantive policies between it and a client group carry over into questions of administrative organization and personnel. The sixteen years of client-agency relationships also show that displeased as the client group may become, it clings to the traditional bureau-department structure and will be most reluctant to accept either a valley authority, or any other new agency which threatens to disturb established relations. The 1947 convention in resolution no. 16 opposed the continuation of the Southwest Power Administration as "tantamount" to a valley authority, and as likely to interfere with the feasibility of potential reclamation and flood-control projects in the Southwest.

It should be emphasized that reclamation projects have lost their old dependence on the reclamation fund. The bulk of the bureau's activity, since the end of relief allocations, has been dependent upon direct appropriations from Congress. Thus in the future the association's potential role in determining bureau activity and policy through its influence with Congressmen will be even more important than was possible under the old system of expenditures from a fund built automatically on specified revenues. Therefore, its opposition to presidential, secretarial, or bureau policies cannot be lightly disregarded. There is no doubt that it will fight any proposal for administrative reorganization that might weaken its hold

for the association give the views of the association, and the testimony of Straus is of most value for giving the bureau attitude. See also Commissioner Straus' speech at the 1947 convention of the association as reported in its *Proceedings*, pp. 180 ff. and the report of Judge Stone, pp. 72 ff.

⁵ The 81st Congress did remove the rider, and Straus is still commissioner. (November, 1949.)

over reclamation by irrigation. It is highly probable, therefore, that a plan to unify all river-planning and development work in a single operating bureau, organized on a river-basin basis for all the continental United States, would meet with the association's strenuous opposition. For such a change would destroy the identity of the bureau with a single section of the country—the seventeen Western states.⁶

Ties between Bureau-Client Groups and Congress

The tie of client groups with operating bureaus or departments runs both direct and via Congress. Opportunity for close association with Congress flourished under the system of fragmentized committees and subcommittees, in which seniority and sectionalism ruled the selection of members in both Senate and House. Men from particular districts or states have always sought posts on committees of importance to their localities. The public-lands committees of both houses, for example, are always dominated by Western representatives and senators. Under the Congressional reorganization act following the turn of the political tide in 1946, change in personnel in the House committee reduced the strength of Western members. Still, in the Eightieth Congress, second session, 16 of the 27 members of the House Committee on Public Lands came from states and territories west of the Mississippi. The new Senate Committee on Interior and Insular Affairs, which handles public lands (including minerals thereon, and some of the forest and water-resource problems), is, with a single exception, a senator from the "far east" of Nebraska, composed of Rocky Mountain and Pacific coast senators.

With the consolidation in each house of separate committees for all river projects into a single Public Works Committee, there may be opportunity for a wider consideration of organization issues than sectional or client-group interests would dictate. There is still reason to doubt the fruits of this change because subcommittee selections and assignments tend to break up the unity of broad assignments, as has been notorious in the House Committee on Appropriations. If that happens, the same old ties between committees, client groups, and administrative agencies will continue.

⁶ At its 1949 annual convention at Salt Lake City the National Reclamation Association disregarded the recommendations of the Hoover Commission for a new unified river-development agency. The resolution which reaffirmed its opposition to valley authorities included in its ban all federal regional "commissions or administrations" as well. The preamble of this resolution recited its support of "the programs of existing federal agencies for the development of land and water resources of the West." See resolution no. 5. (November, 1949.)

The allegiance of members of the old river-and-harbor and flood-control committees of the House, and of the corresponding Senate committees, to the Corps of Engineers and to the client-pressure groups which support it and its expanding programs is well known.

The oldest and most powerful of the pressure-group organizations tied to the Corps of Engineers on behalf of its civilian works programs is the National Rivers and Harbors Congress. Its membership is made up of chambers of commerce, waterway and shipping associations, business firms, municipalities, and individuals in every state of the Union. All members of the Senate and House of Representatives are honorary members and many of them are active in the organization. Likewise, officers of the Corps of Engineers engaged in rivers-and-harbors and flood-control work are *ex-officio* members. During 1947 Senator McClellan of Arkansas was president of the congress. Senator Wherry of Nebraska was a vice-president, so were Congressman Whittington of Mississippi, Clason of Massachusetts, and Case of South Dakota. The chairman of the board of directors was Senator Overton of Louisiana, who had been chairman of a subcommittee of the Senate's Committee on Commerce which conducted with open prejudice the hearings on the Missouri Valley Authority proposals.

The attitude of this organization toward the traditional agencies was well expressed in 1947 by its secretary-treasurer, Fred Beneke (simultaneously secretary-treasurer of the Mississippi Valley Flood Control Association):

These several Federal agencies—the Corps of Engineers, the Reclamation Bureau, and the Department of Agriculture—involved in the development of comprehensive plans for our river basins work in cordial and effective cooperation. While misunderstandings and differences of opinion arise from time to time on the best means of accomplishing desired ends, the final result is always the same—mutual respect and thorough coordination. Any failure along these lines exists only in the minds of selfish pressure groups which seek to gain their own narrow ends by trying to excite a rivalry which does not exist. . . . For nearly a century we have worked with the Corps of Engineers of the Army. We understand them and they understand us. We want none other than the Army Engineers tampering with the Mississippi and tributary streams. We know that the Army Engineers will take care of us—just as they will take care of the people on tributary streams.

Beneke gave this further detail of the client-congressman-agency process:

Several years ago we discovered that many proponents of meritorious projects had not the slightest idea of how to process them. Thereupon we created a Projects Committee to hear them and coach them. The Committee is composed of an expert from each of the engineering divisions of the Corps of Engineers. These experts receive no compensation for their services and even pay their own expenses to meetings. They have placed many a community on

the trail to success. Representative Sid Simpson of Illinois is presently Chairman of the Committee.⁷

So strongly cemented is this three-way relationship that every measure adopted by Congress during the past twelve years authorizing the president to make limited rearrangements of administrative bureaus has exempted the Corps of Engineers from such interference.⁸

Any proposal to desectionalize the Bureau of Reclamation by fusing it into a new, unified civilian river-management agency operating throughout the United States, which at the same time wrenches from the army its delivery of gratuitous civilian works to nearly every Congressional district in the country, will be fought with great vigor by a client-congressman-agency combination of great political strength.

Congressional Resistance to Integration

Looking at the second basic proposal developed in this study, we must candidly recognize that there is no evidence that the present Congress is interested in regionalizing the administration of even the present operating units or departments. It is possible that the revival of Herbert Hoover's political prestige might give to the commission, of which he is chairman and which is now exploring the organization of the national administration, the strength to carry through Congress some of the drastic changes in the structure of federal resource management which are required for effective performance.⁹

Yet even if this commission should agree upon a rearrangement into more coherent administrative clusters of certain resource-management tasks, and should recommend the welding of these larger groups at the region and field levels into the framework of comprehensive regional plans for development and conservation, that contribution to administrative thinking runs the danger of being lost in controversy over social policy. For the Hoover Commission is directed not only to study and report on better ways of organizing and performing federal administrative tasks, but also on

⁷ Paper of Fred D. Beneke, read to the convention of the National Reclamation Association, October 30, 1947. *Proceedings*, pp. 135 ff.

⁸ The Organization Act of 1949, urged by former President Hoover and President Truman, as finally enacted apparently broke this spell. But because, at the insistence of Senator McClellan's committee, the act includes a provision permitting either house to veto a presidential reorganization plan, the corps is probably not in danger of losing its civilian engineering duties through a presidential reorganization plan. (November, 1949.)

⁹ The Hoover Commission's report has helped the president obtain some important revisions of national administrative structure. But thus far none of its recommendations touching the rearrangement of the resource-development and management agencies has been incorporated by the president in a reorganization plan and presented to the Congress. The strength of client-agency pressure in resisting change remains to be tested. (November, 1949.)

the desirability of doing the tasks at all. The latter is basically a political assignment. It is the kind of duty which political parties and politicians (in the good sense of that abused term) should perform. It is probable, therefore, if the Hoover Commission responds fully to the directives of the law which created it, that any improvements in administrative arrangements it may bring forward will be overlooked and lost in the battle over public policies relating to the functions of the federal government.¹⁰

Congress has looked with general favor on the voluntary creation of the Federal Inter-Agency River Basin Committee and its two regional subcommittees. Yet in the last two years it has shown suspicion of the regionalizing efforts of the Department of the Interior. That phase of organization needed to improve resource administration in that department has already met with hostile cuts in funds and special conditions inserted in appropriation bills to halt it. This opposition again is probably related to the ties between unwilling bureau heads, their pressure-group clients, and their friends on Capitol Hill.

We must see that the absence of party responsibility for the administrative results of its substantive Congressional policies gives priority of influence to local or special-group pressures in Congressional decisions affecting administrative structure. Pressure groups are inevitable and essential in a democratic society. But the adjustments between them that are required in the general public interest, under our system of divided powers, are achieved without the mediation of responsible party leadership capable of a national-interest viewpoint. We have recognized this truth in the making of substantive policies, but we are prone to overlook its impact upon the administrative process and the problem of rationalizing our executive departmental structures, as time and new conditions require. As a result we are compelled to rely on the chance occurrence of a happy combination of local or vocational forces for the structural and procedural adjustments required to master the "big administration" of today. Such favorable occurrences are unpredictable and rare.

Presidential and Departmental Management

We have of course come to recognize that in time of great national emergency, such as war and depression, the particularisms of Congress must give way before national interest in good administrative performance. Grants of authority to the president were thus made in 1917, 1933, 1939, 1941, and 1945 which allowed him, for brief periods and within strict limits, to rearrange the administrative instrument through which national effort

¹⁰ See Postscript, pp. 653 ff., for a discussion of the recommendations of the Hoover Commission relating to resource-management functions.

at work performance must be exerted. There has been some genuine residual gain from these temporary revisions of structure, but it has hardly kept pace with the need for constant revision due to the rapid creation of new agencies in the early days of the New Deal and the period of the Second World War. Still, the Reorganization Act of 1939, which reduces the role of Congress in relation to the president's reorganization efforts to that of affirmative joint disapproval, is a recognition that under our constitutional system the presidency is the only political center which can effectively mediate between conflicting bureaucratic, Congressional, and lay pressure groups in this matter of administrative structure.

If a future election should bring into office a president and a Congress controlled by the same political party and the president should make a major point of administrative reorganization, he might have sufficient prestige in the early days of his administration to obtain new authority for administrative reorganization free of the limiting restrictions with reference to the revamping of whole departments and the reallocation of agency duties (such as the civil functions of the Corps of Engineers), that have been jealously imposed by Congress upon former reorganization programs.¹¹

The revision of executive machinery and practice which we have sketched in this study could not, under even the most favorable circumstances, be accomplished by one drastic law or order. Many of the ideas broached are suggestions for directions in which the executive process should experimentally move. They call for inventiveness, capacity for objective evaluation of experimental results, and willingness to make further modifications. For this process both the departments and the president, through their staff agencies, should have a continuous right of experiment in molding their administrative instruments to their responsibilities. This will require also the coöperation of Congress, particularly through appropriations for staff facilities at field and center.

It may not have been made sufficiently clear that along with the suggested regional integration of departmental and interdepartmental programs must go better mastery, through departmental and presidential management, of interbureau and interdepartmental interests in Washington. If the secretaries and the president cannot manage their official families at the capital, all the field machinery for coördination will grind out little integrated grist.

There was a period, toward the close of the New Deal phase of the Roosevelt administration, when a few departments showed much promise of a permanent corps of departmental managers by which secretarial mas-

¹¹ See Postscript, p. 653, for a summary of the 1949 law which renews the president's power to initiate administrative reorganization.

tery of the powerful client-oriented operating bureaus might have been reasonably attained.¹² But the kaleidoscope of secretarial changes and the absence of genuine appreciation by national political leaders, in and out of Congress and in the departments, of the crucial importance of a permanent managerial corps for the secretaries has washed out much of that apparent advance. Unless this tendency revives and is carried further by statutory authorization and by the growth of mores of political neutrality on the part of secretarial management staff, we shall rock back and forth from indifferent to good but temporary success in the effort to pull and keep together those plans and programs for resource development and management that transcend single units in the national functional administrative structure.

Great as are the obstacles to the changes we have suggested, they must be overcome if the federal responsibility in resource management, in any region, is to be met by means of the traditional functional pattern of executive organization. The time for this accomplishment is probably running out fast. It may be limited to the current period of economic prosperity. The next great economic depression may revive in greater force than ever the demands in the Columbia River Valley, the Missouri River Valley, and elsewhere, for the establishment of regional agencies organized and empowered along lines modeled by the TVA as set forth in the Murray and Mitchell bills. For by comparison with the complexities inherent in the improvement of the traditional administrative system, the valley authority seems wonderfully simple, and its attainment waits merely on a single act of Congress.

It is this simplicity, and the example of an outstandingly able board in charge of the Tennessee Valley Authority, the drama of whose great projects and programs for regional resource utilization and development has captured the imagination of a large segment of the American public, that give the valley-authority concept of administration a widespread and continuing public appeal. That appeal is without parallel in the history of national administration, and it will probably revive with renewed force if and when the current boom is succeeded by general economic crisis. Regardless of the real and profound political and administrative difficulties in managing federal administration upon a responsible national basis which the blanketing of the nation with valley authorities is likely to generate, the valley authority may be destined to displace much of the traditional federal organization in charge of natural resources in the West and the South whenever the public mind is again haunted by the need to find work and security of income. While the writer prefers the more com-

¹² See Arthur W. McMahon and John D. Millett, *Federal Administrators* (New York: Columbia University Press, 1939).

plex but, in the long run, more responsible mode of administration advocated in this study, its indefinite postponement would push him to the acceptance of the valley-authority plan. That plan is greatly to be preferred to the present situation. The ultimate administrative and political difficulties which it would generate are far preferable to the frozen tangle of historical accidents that afflicts the administration of our natural resources today and which inhibits the synthesizing of the total federal purpose in the region and the effective development of departmental and presidential staff agencies in the field and at Washington.

A Temporary Plan for the Columbia River Valley

Since this study has had for its central focus the resource situation in the Pacific Northwest, let us briefly inquire into the possibility of changes that might be applied to this region alone, which at the same time would be in harmony with the ultimate preferred pattern of structure for the whole national area which was outlined in the preceding chapter. The most immediate benefit could be obtained by centering effort on river-development problems. It would be administratively workable to establish for the Columbia River system alone a regional agency concerned solely with tasks related to the "water in the channel." This should be given jurisdiction over all multiple-purpose river developments and river management above tidewater, including the distribution of electric energy (but excluding fish and wildlife matters, lock operation at Oregon City, and such channel work on the main Willamette as navigation needs may require). The latter, together with all river construction for navigation (including dredging) on the Columbia below Bonneville Dam, and the harbor and channel construction work on the coastal streams of Oregon, Washington, and Alaska could be left to the Corps of Engineers. Such territorial division of jurisdiction (subject to refinement on more careful analysis) would leave to the Corps of Engineers practically all of the work it performed prior to 1933. (While the army built the Cecilo Canal and the locks at Cascades near the site of the Bonneville Dam, these had been for a generation only small maintenance jobs serving the tiny trickle of traffic to which upriver transport had declined.)

On the main Columbia the tasks which call most loudly for unified construction and operation lie upstream from Vancouver because there are no dam sites below Bonneville. The development and operation functions on the main stem from that dam to the Pacific Ocean are now concerned solely with navigation and a limited amount of flood control through diking. The job there is one of channel maintenance by dredging, small channel structures, and periodic jetty maintenance at the mouth of the river.

Only after a huge development of upper tributary storage will there be an appreciable effect from the upper river upon the water flow on the lower Columbia which might control bottomland flooding during the June freshet. There is always an ample flow for ocean navigation between Portland and the sea. The chronic flood problems west of the Cascade Mountains result from high water on the principal tributaries, the Willamette, the Cowlitz, and the short Puget Sound streams, and occur during the winter months when the rainfall is intense. Consequently the manipulation of the water runoff from those watersheds, so far as floods are concerned, is quite independent of water control on the Columbia and its east Cascades tributaries. The Columbia is lowest during the time the Willamette is high. The stretches of the Columbia River system east and west of the Cascades are functionally unified chiefly with regard to power and fisheries, and not for navigation, irrigation, or flood control.

This proposal would transfer to a new Columbia River Administration the planning, programing, building, and operating of all river structures from the Bonneville Dam east to the headwaters of all the Columbia's tributaries, and to the Canadian border for the main stream itself (plus the function of participating with the International Joint Commission on the international problems of the river system) and of the flood-control and multiple-purpose dams on the western tributaries and coastal streams. This regional agency would report to the secretary of the interior. It would take over the programs within this region of the Bureau of Reclamation, the Bonneville Power Administration, the Corps of Engineers (subject to the exception just noted), and the river-planning and power-market studies of the Federal Power Commission and its duty of reviewing hydroelectric installations. Hitherto river pollution has not come under the jurisdiction of the federal government except as it concerned injury to navigation. In so far as it may be made the subject of federal interest, it should be the duty of this proposed administration, jointly with the U.S. Public Health Service, to give it attention and to recognize it in plans for structures and water operations.

Such a regional river administration would combine most of the duties that now, under the separate jurisdictions of several agencies, give rise to the principal jurisdictional conflicts and operating frictions. By placing them under a single regional administration, with responsibility centered in a single administrator, these frictions could be abated on the ground. Plans and policies could be adopted without the distortions of special loyalties to traditional programs. But it would be necessary to grant the administration sufficient autonomy to exercise full initiative in the development of coördinated river-system plans, in the selection of priorities for prosecution, and in the designing of structures (river, canal, and electric

transmission). In its electric-marketing functions it should exercise the same fiscal freedoms as TVA enjoys; it should also be given wide powers of utilization research. Regional review of its plans should, however, be a regular function of a field representative of the secretary of the interior (flanked by a field committee) and by a field officer representing the Executive Office of the President. This implies (1) that the experiments in departmental field coordination in the Departments of the Interior and Agriculture in the Pacific Northwest should be continued and improved and (2) that at least for the Pacific Northwest an experimental presidential coordinating center should be established. Here could be tried out ways and means of operating such a presidential office so as to give interdepartmental, region-wide coordination of resource policies and plans while keeping this position out of the direct line of day-to-day operations. Success here would lay the foundation for the ultimate extension of these area coordinating arrangements to other regions.

For the administration of land resources no compromise scheme for a single region is readily available. Until the whole existing pattern of allocating such tasks is rationalized, the most hopeful prospect for the Pacific Northwest lies in the further perfection of the departmental and interdepartmental coordinating machinery noticed above. Much can be done which offers promise of increased success, but it will take more funds, a clearer recognition of secretarial and presidential responsibility in the field situation, and much better staff work in Washington. So we return to the recognition that good regional resource administration, even on the basis of a "second best" choice, cannot be divorced from good administration in Washington.

The issue of local representation on the proposed Columbia River Administration and in the work of the field representative of the president must be faced. There is every reason to encourage, on a strictly advisory basis, the participation of state and local and vocational interests in the activities of a river-management agency, which needs to sense keenly how the consumers of its plans and services feel about them. It needs to see the relation of its work to the functions of the states and the localities, so as to maximize the utility of the total effort of all public agencies dealing with river resources. But responsibility for the work of the Columbia River Administration must in final analysis rest on decisions of the administrator and of his superiors. Were the states to share in the cost and the management of development works, a mixed federal-state administration (probably of corporate form) would be appropriate. But the contingency of such financial partnership is remote. Unless and until it becomes a reality, the nation through its political and administrative organs must pay for and manage these river programs. It would defeat responsible government to

give the states a participating right, without corresponding financial obligations in the making of administrative decisions by this agency.

On the other hand, the regional planning leadership of the representative of the president should be exercised in conjunction with the states of the region. Since parallel or complementary state (and sometimes local) action is often essential to the fulfillment of federal resource plans, a union of planning machinery between the two levels within the region is clearly called for. The development of planning arrangements, building upon the experience of the defunct Pacific Northwest Regional Planning Commission and of the Columbia Basin Inter-Agency Committee, should move ahead as soon as the president is given a regional representative.

What we propose for the Pacific Northwest would thus be fully in line for incorporation within a nation-wide system of resource administration and planning whenever the time is ripe for such a comprehensive administrative revision. It would, in the meantime, immensely improve the prospects of getting on with the many jobs involved in solving the resource problems which confront this region today.

POSTSCRIPT

Major Developments June, 1948, to November, 1949

FOUR EVENTS since May, 1948, may greatly influence the story of federal resource administration in the Columbia River Valley. First of these was the great May-June flood which we have already noted, whose waters did not fully recede so as to expose all the havoc wrought until well into mid-summer. From this disaster came new stimuli to the activities and thinking of all the federal resource-managing agencies, to the coördinating devices of the Department of the Interior, and to the CBIAC. The flood experience was reflected in the second important occurrence, the "308" comprehensive review report on the Columbia River and its tributaries, which was completed by the division engineer for the army on October 1, 1948. The third event was the unexpected election of President Truman in November, which brought with it a revival, with increased political potency, of proposals for a Columbia Valley Authority. And finally came the report of the Hoover Commission on the Organization of the Executive Branch of the Government, with its divergent recommendations for drastic changes in departmental responsibilities for resource management and its energetic support of wide presidential power to rearrange administrative structures.

The Army's "308" Report and Agreement with the Interior Department

While the flood waters were raging, the resources and equipment of the federal resource agencies, and of the representatives of the Departments of the Interior and Agriculture, were directed toward flood relief. This was quickly followed by efforts to assess fully and carefully the extent of flood damage to public and private interests and to set machinery in motion for rehabilitation. There can be little doubt that the huge costs of the flood, which furnished a new basis for increasing the economic justification for flood control on the main Columbia, modified in the last months of the army's "308" study its proposals for river control. At any rate when the

report was released the proposals for operating the Hungry Horse and Grand Coulee reservoirs differed from previous notions theretofore discussed, and the heart of the report centered on what was termed the "Main Control plan." The great drama of the flood, which had so disrupted the lives of the thousands of people and the many communities living on the flood plain, had been watched in the press and listened to by radio on every farm and in every hamlet in the region. A climate of regional political opinion quickly developed which was intensely interested in the prosecution of a comprehensive program for mastering the waters of the river.

The army's report, therefore, made its appearance at the most favorable moment. Local criticism of that agency for its alleged complicity in the failure to warn the city of Vanport of its impending doom, and for the crumbling of other dikes on the lower river, were drowned by the enthusiastic praise of the army's bold and comprehensive plan for the main Columbia. (We pass over its proposals for the sub-basin systems.) The Main Control plan was an interlocking system of multiple-purpose reservoirs, involving seven new great dams in addition to Hungry Horse and Grand Coulee, a levee-construction and -renovation program for supplemental flood protection on the lower-river flood plain, and river-channel improvements (together with certain turning basins and approach channels) for barge navigation as far east as Lime Point, Idaho (thirty miles above Lewiston). The army report recommended for immediate authorization by Congress dams and reservoirs at Libby (Montana) on the Kootenai, Albeni Falls on the Pend Oreille, Priest Rapids on the Columbia, Hell's Canyon on the Snake, and John Day and The Dalles dams on the Columbia. It also proposed a dam at Glacier View in Glacier National Park, provided the Department of the Interior would concur.

These great structures, together with changes in outlets and operating plans for Hungry Horse and Grand Coulee, would provide an estimated flood-control storage aggregating 27,000,000 acre-feet. With that volume of water under control the greatest Columbia flood on record, that of 1894, would have been reduced at The Dalles from a flow of 1,240,000 cubic feet per second to 800,000 cubic feet per second. Translating this program to flood stages on the lower river, it would mean that the 1948 flood at Portland, which reached a height of 29.95, could have been held to 24 feet. At that stage levees could be economically reconstructed so as to reduce flood damage on the lower Columbia to small proportions, giving assurance to the towns, cities, and industries, in this most urbanized section of the valley, against the recurrence of disasters like those of 1894 and 1948.

On top of this provision for main-river flood prevention, other sections of the report relating to the sub-basins of the Willamette, Kootenai, Snake, Pend Oreille, Clark Fork, the Yakima, and the Spokane, though primarily

directed toward local flood problems, would also afford supplementary aid to the main control reservoirs.

But in addition to their flood-prevention and navigation functions the dams would also furnish 6,000,000 kilowatts additional installed capacity for hydroelectric generation, bringing the total federal generating capacity to 11,700,000 kilowatts.

These purposes, the army found, could be attained without interfering with the water and electric power needed for the irrigation program under construction or proposed by the Bureau of Reclamation, which the report endorsed. There would also be incidental benefits in the way of recreation with full utilization of the reservoirs. The plan likewise included provision for conserving the salmon runs by appropriate design of dams and by other facilities. It included the associated programs of the Fish and Wildlife Service and the states for the rehabilitation and development of the lower-Columbia tributaries for salmon.

The total estimated cost to the federal government of the Main Control plan and the sub-basin plans, together with the bureau's irrigation proposals, the lower-river fishery plan, transmission facilities for carrying the new power to market load centers, and a hydrometeorological network for operating the reservoirs, was almost three billion dollars.

Looking beyond the projects proposed for immediate authorization the report included many potential projects which the corps has investigated in detail for later development as needed. These did not exhaust the ultimate development possibilities of the river, for there appeared to be some 150 other suitable sites for dams and reservoirs that at some future time might warrant development whenever maximum control of the water resource should be economically and socially warranted.

On December 11, two months after the release of the army's comprehensive report, came the completion by the field committee of the Department of the Interior of its review of long-range plans for the development of the Columbia, in the light of the newly emphasized flood-control needs. This was a formal response to the president's request to the Department of the Interior made during the height of the flood. In the meantime the Bureau of Reclamation began discussions with the Corps of Engineers to harmonize the two separate comprehensive reports for the river system which the departments had prepared.¹

On December 7 agreement was reached in the field between the division engineer of the corps and the regional director of the bureau on all

¹ Shortly after the release of the army's report, the Corps of Engineers accused the National Park Service, before the CBIAC and with apparent justification, of organizing public opposition to the proposed Glacier View Dam. The CBIAC passed this complaint along to its parent committee in Washington.

technical and engineering matters, and the two agencies announced their intention next to pursue policy questions until agreement should be concluded on them also. When this news reached Washington, the Department of the Interior, through the assistant secretary, intervened in order to assure full consideration of all departmental interests. It was alleged in certain quarters that this action was taken to forestall a "shot-gun wedding" like that signalized in the "Omaha Treaty" which had "harmonized" the famous Pick and Sloan plans for the Missouri; others, with an opposite bias, asserted that the assistant secretary was merely "grandstanding" on behalf of a Columbia Valley Authority. In any event, while the bureau's regional director was soon authorized to continue discussions with the engineers to reconcile their respective programs, the ball was recovered, so far as the Interior Department was concerned, by the field committee and its departmental superior, the secretary's program committee.

Secretary Krug had himself foreclosed independent action of the field committee with reference to the proposed Glacier View Dam, for on December 3 he had sent a letter to Secretary Royall of the Department of the Army asking him to remove that project from its recommended list. Krug's argument rested on the damage to recreational and wildlife values in Glacier National Park. Yet, not content to make the specific case in this instance, he took the position that Congress in its statutory provisions governing national parks intended to exclude from them large flood-control and power projects "unless the need for such projects is so pressing that *the economic stability of the country, or its existence, would be endangered without them.*"

The field committee, it will be recalled, had been charged as a result of the president's order to the secretaries of the army and the interior, with reviewing for the latter department its long-range plans for basin development and in discussion with the army, with proposing modifications indicated as a result of the May-June flood. The committee had also been particularly enjoined by the assistant secretary on June 16 to use its leadership in this assignment to formulate recommendations that would attain the desired objectives "regardless of narrow bureaucratic or jurisdictional prejudices."

During the summer and autumn of 1948 the committee, its officers and staff, had given intensive and continuous attention to this assignment. The committee's proposals were crystallized out of discussions not only among its eight agency members, but in consultation with field officials of the Corps of Engineers. Its report was practically complete and ready for transmission to Washington when the premature agreement between the bureau's regional director and the division engineer was announced. The field committee sent this report on "Coordinated Plans for

the Development of the Columbia River Basin" forward to the departmental program committee on December 11, 1948.

This document urged an initial river-development program which followed in most respects the Main Control plan of the army. But it proposed that the president be given a general authorization by Congress to allocate responsibility among the several agencies in carrying it out and to decide the details of programs and schedules. It dissented from the proposed Glacier View Dam and instead recommended a structure at Paradise, on Clark Fork.

This change was based on the view that not only would the substitute location afford greater power benefits both at the site and downstream, but that it would also give greater flood-control benefits. In addition, its operation in conjunction with certain other tributary reservoirs would give greater time for trying to solve the salmon problems, and finally the Paradise site would not destroy the wilderness and wildlife values inside Glacier National Park. It also urged the inclusion of three possible run-of-the-river power plants on Clark Fork to meet electric-power needs before the completion of the Main Control plan. It proposed the inclusion of the Kooskia project on the Clearwater River as a unit in the Main Control plan, to permit both greater leeway in scheduling the main-river flood-control reservoirs and to improve the control of runoff from one of the principal watershed areas. It made other suggestions about the scheduling of dam construction on the main stem so as to afford more time to solve difficult fisheries and Indian-rights problems, while not jeopardizing the other purposes of the control plan. It urged the renewal of investigations to try to solve the mining problems, believed to be involved in one of the alternative sites (the Boundary Dam) suggested in the army report. It offered certain refinements in the plans for the use of Grand Coulee and Hungry Horse reservoirs for flood control. It stressed the inadequacy of the engineer's proposals for dealing with Indian rights to be destroyed by the Main Control plan and the need for time in which to make adjustments when the aboriginal fishing facilities (for which no real substitutes can be found) should be destroyed.

The Interior Department's field committee proposed expansion of the army's program plans for watershed protection, soil and moisture conservation, and general water-supply and pollution problems. It also proposed to include in the authorization to the president thirteen irrigation projects which the Department of the Interior had included in its Columbia River Basin plan of 1947. Committee concern with recreational interests was expressed not only in relation to possible damage to Glacier National Park, but constructively in getting under way a basin-wide survey for the preservation of natural recreational resources and in linking to water-control

reservoir projects, programs to investigate, develop, and safeguard the recreational and archeological features associated with them.

The field committee supported with some elaborations the chief recommendations in the "308" report for the hydroelectric aspects of the development program. With respect to the pooling of irrigation costs to be repaid from power revenues, its support was coupled with a condition that only irrigation projects within the Pacific Northwest be given aid from the proceeds of regionally generated power.

The committee found itself unable to support unconditionally the proposal of the army for payments in lieu of taxes to states and local government, and urged further study and refinement before nationwide adoption.

The program committee of the Department of the Interior sent the field committee's report to the secretary with its general endorsement and with the further recommendation that the department resume its effort to reach agreement with the army on the elements of a comprehensive river plan and the division of responsibilities between the two departments in carrying that plan forward. The program committee's concurrence carried with it a few conditions and amplifications which, while important, did not change the essential ideas or purposes incorporated in the field committee's recommendations.

On February 2, 1949, Secretary Krug approved the reports of both committees and instructed the Bureau of Reclamation, on behalf of the department, to take up negotiations with the Department of the Army, keeping in mind that these reports expressed the position of the department.

The outcome of this involved story was the publication on April 11, 1949, of a letter to the president signed by the secretaries of the interior and the army, the chief of engineers, and the commissioner of the Bureau of Reclamation. The letter announced that the plans of the two departments for the Columbia River Basin "have been fully coordinated, not only with regard to the physical features to be included in the plan of development, but also with regard to the policies and scheduling of the work to be done." The letter further noted that the agreement covered not only the plans for a comprehensive program to meet current needs, but would provide "a basis for incorporation of further projects into the program as they become necessary. It provides also for the inclusion, when prepared by the appropriate agencies, of plans for forest management, land treatment, protection and propagation of fish and wildlife, recreational development, meeting rights and needs of Indians, and interagency procedures for coordinated operation of river control projects."

The conflict over which agency should build Hell's Canyon Dam, when authorized, was settled in favor of the Bureau of Reclamation, but the army retained its rights to all projects authorized to it or which it has specifically

recommended. Accordingly it will build Chief Joseph and the mid-Columbia dams, those on the lower Snake, and Lucky Peak on the Boise. For future peace, the principles agreed upon, which cover new investigations and new projects, are: the corps will retain responsibility for activities relating to navigation improvements, and storage projects exclusively for flood control, while the bureau will cover "all federal irrigation and related drainage and domestic water developments." The more troublesome problem of future multiple-purpose projects was solved by a territorial division in which the army will get the main stem of the Columbia River below Grand Coulee, the main stem of the lower Snake below the mouth of the Grand Ronde, the tributary basins of the Willamette and Kootenai, the Spokane, the Pend Oreille (below the confluence of Clark Fork) and, to boot, the Kooskia project on the Clearwater. The bureau will take over the middle and upper Snake and most of the tributaries of that stream as well as of the main Columbia, east of the Cascade Mountains. This territorial division and all other items in this agreement between the Departments of the Interior and the Army must still receive the approval of the president to give them sanction.

The Glacier View versus Paradise issue was resolved by withholding recommendations for both, and deferring to future study the discovery of satisfactory substitutes.

The agreement accepted the Interior Department's proposal for pooling all revenues from power generated in the Pacific Northwest (including the coastal streams) and their use for subsidizing irrigation in accordance with reclamation law. The Interior Department will make specific recommendations of the irrigation projects to be so aided. The in-lieu-tax issue was left for study on a national basis by the Federal Real Estate Board. Finally, the corps and the bureau are to proceed with their studies of an operating plan, utilizing a jointly financed staff and the assistance of other federal and state agencies in order "to obtain full integration of all individual project operations to insure the essentially best system operation."

Six months after the agreement was signed, we find the secretary of the interior writing the chief of engineers, General Pick, complaining that a report on the lower Snake River dams prepared a year before but sent forward in July, 1949, did not conform to the substance of the bidepartmental agreement. Krug asked for amendment of the report in conformity with the agreement. This may illustrate mere oversight on the part of the general, or it may indicate the difficulty of maintaining peace in one river basin while feuds continue in other geographic sectors.

All during the time that the negotiations between the Departments of the Interior and the Army were under way the Columbia Basin Inter-Agency Committee was given reports of each completed stage. It had set up

a subcommittee to examine the coördination issues in resource development and policy for the Columbia Basin not covered by the agreements between, first, the corps and the bureau, and later, between the two departments. It is probable that the discussions and interest stirred up within the CBIAC had value in inducing a broader outlook concerning the requisites of a bidepartmental agreement. But the CBIAC was not the principal vehicle for the coördination finally achieved or indeed for working out a river program to deal with the problems revealed by the great flood. The broadening of its subcommittee program, already noted, may in time produce additional results of genuine importance to a comprehensive resource plan for the region. But it is not at present endowed with authority or structure to go beyond the stages of discovery, and of voluntary consent.

A New CVA Proposal

While the agreement between the Departments of the Interior and the Army was being hammered out and the CBIAC was talking and listening, the organs of news and propaganda in the region were again starting a din about a CVA. On the opening day of the Eightieth Congress the issue sprang fully to life. Congressman Jackson, a Democratic New Deal member from Washington, who had weathered the political recession of 1946, seized upon the Fair Deal tide brought in by the November elections, to reintroduce the second Mitchell Bill for a Columbia Valley Authority. But this time the chief executive took the leadership. In his "state of the Union" and budget messages to the Congress he referred to the need to apply the lessons learned in the Tennessee Valley to the other great river basins. In a special message on April 13, 1949, President Truman urged the establishment of an authority for the Columbia Valley watershed. Shortly after inauguration he had notified his department heads that one of his aides, Charles Murphy, was to lead in developing for him a specific legislative plan which would express the best experience within the executive branch, for the Columbia Valley Region. Closely associated with Murphy in preparing an "administration bill" was Assistant Secretary Davidson, whom Secretary Krug had deputized to represent the Department of the Interior. Together they marshaled the knowledge and skills within the Bureau of the Budget and the departments to produce a draft bill, S. 1645 (introduced by Senator Magnuson and seventeen other senators on April 19, 1949), which quickly took the center of the stage in valley-authority discussion both in Congress and in the Pacific Northwest.²

² No effort will be made to review Congressman Walt Horan's revived Columbia Interstate Commission plan, introduced as H. R. 3636 on March 21, nor any of the other valley-authority bills, since public discussion has centered on S. 1645—the administration

S. 1645 differs in some important particulars from earlier Columbia Valley Authority plans. The fact that the proposed agency is to be called, not an authority, but the "Columbia Valley Administration" may be of political but is not of functional importance. Of genuine significance, however, is the limitation imposed on its proposed nonwater (that is land and minerals) functions.

As a regional resource-development and -management agency its *operating* responsibilities are shrunk primarily to the "water in the channel" and power-generation and -transmission functions. Unlike its predecessors this measure confers no power to take over the land agencies of the Department of Agriculture (such as the Forest Service and Soil Conservation Service or the AAA programs of the Production and Marketing Administration) or the wild-lands and minerals agencies of the Interior Department (Fish and Wildlife Service, Bureau of Land Management, Indian Service, National Park Service, Bureau of Mines, and Geological Survey). If, however, Congress should appropriate funds, it would be possible for the Columbia River Administration to engage in program activities that would supplement and possibly duplicate the activities of existing federal-land and mineral agencies. These activities are made possible by its general grant of powers (Section 6*b*) which includes these phrases: "for the conservation and reclamation of land and land resources; for the development and conservation of forest, mineral and fish and wildlife resources . . . for the conservation and development of recreational resources."

These supplementing activities might also relate to the new grant-in-aid bill. The administration draft, minus a preferred personnel section, was presented in two identical bills by Congressmen Jackson (H. R. 4287) and Mitchell (H. R. 4286) on April 14, 1949, and curiously enough, by Senator Cain (S. 1631) on April 18. Cain also introduced as S. 1632 a bill identical with Horan's Columbia Interstate Commission proposal. The Magnussen Bill, S. 1645, also rejected the president's preference for use of the regular civil service system but corrected a number of unintended personnel difficulties left in the personnel sections of the Mitchell-Jackson-Cain bills. This is the only matter of substantive difference from the Jackson-Mitchell-Cain bills. It may be explained that Congressmen Jackson and Mitchell (the latter having staged a comeback from his Senate defeat of 1946) had participated actively in the discussions with the Murphy-Davidson group during the gestation of the administration plan for a Columbia Valley Administration. They had traveled with Murphy, Davidson, *et al.* throughout the Pacific Northwest and had joined them in holding private conferences with editors, business, labor, and farm representatives and other interested citizens of the region, soliciting ideas and comments about the authority question.

The primacy of the Department of the Interior in defending the administration program was enjoined by the president on the eve of the introduction of his plan (March 21, 1949) when he wrote Secretary Krug asking him to "take the lead for the Executive Branch in presenting the bill to Congress, including arranging for supporting testimony." At the same time he formally notified the secretaries of agriculture, commerce, and the army, and the chairman of the TVA to be ready to assist Secretary Krug in this task. Assistant Secretary Davidson has been the principal official expositor of this proposed legislation both before Congress and before the public of the Pacific Northwest.

stream-pollution control of the Public Health Service because the CVA may also develop projects for "the promotion of sanitation and pollution control." Recreational and pollution control are limited to the incidental development of the water, land, and mineral resource projects.

A gesture of conciliation toward existing federal agencies is the provision which allows or, if the president so directs, requires the administration to conduct any of its activities "through or in cooperation with other departments and agencies of the United States." The same permission operates in relation to the possible use of state, local, cooperative, scientific, and other public and private bodies. That such a subdelegation would probably be freely used is indicated by the TVA's well-developed practice of working through other agencies.

In performing its research functions also the CVA may utilize other federal, state, or private agencies. It should be noted here that the research powers are linked as implementing means to its general resource powers. These resemble in scope those enjoyed by the TVA and are broader than those enjoyed by any other federal agency operating in this region. These functions are: "to conduct economic, scientific and technologic investigations and studies, to establish, maintain and operate research facilities, and to undertake experiments and demonstrations." (Section 6c.)

The immediate operating duties of the proposed CVA are those now performed by the Bureau of Reclamation, the Bonneville Power Administration, and the Corps of Engineers. The first two would cease to exist in the Columbia Valley region. The army would give up all civilian river works except "channel and harbor improvement work in tidal waters tributary to the Pacific Ocean." This exception would leave to the corps the chief navigation tasks it performed before it started upstream about forty years ago to build the Cecilo Canal. In the plan to amalgamate these three construction agencies within six months after the board is chosen the Truman administration is following for one region one of the major proposals of the Hoover Commission for unifying the "water in the channel" work of Uncle Sam.³

But S. 1645 goes much beyond the Hoover Commission principles, not only in endowing the CVA with supplemental or alternative activities in land and mineral resources, but by giving it central responsibility for natural-resource planning for the Pacific Northwest. For this latter purpose all natural resources come within its purview. The administration is to prepare for their "conservation, development and use" plans which recon-

³ The region is defined to mean "those portions of the Columbia River, its tributaries, and its watershed areas which are within the boundaries of the United States, and those portions of the states of Washington and Oregon (except the Klamath River and Goose Lake Basins) which are not within such watershed areas." (Section 2a.)

cile "to the greatest practicable extent" their multiple purposes and which foster the underdeveloped or depleted resources. These plans are not only to be unified as to regional objectives but are to serve the president and Congress in "guiding and controlling the nature, extent and sequence of federal programs, projects and activities in the region, and in coordinating them with related national policies and plans." Planning as defined in the bill includes the development of concrete programs for major projects and activities, including cost and benefit estimates for each. Timing sequences and particular methods for accomplishing projects must also be recommended.

Further force to the regional planning functions is suggested by the requirement that the CVA submit annually in connection with its budget program and in concert with other federal agencies "a statement and explanation of the anticipated program, for the current year and such ensuing periods as the President may determine, for initiation and prosecution by the Administration and other Federal agencies of all major Federal projects and activities having to do with the conservation, development and use of the natural resources of the region." This incorporates into the budget report of the CVA the related planned programs of other agencies. Presumably implementation of the estimates of the other agency programs will be through the Congressional acts applicable to the several departments. It may logically be presumed that the review process within the Executive Office of the President would be modified; it would permit presentation before the Bureau of the Budget of a complete regional resource program such as was made first in the autumn of 1949 by the Department of the Interior for all its programs in the Pacific Northwest. Whether the Congress would so reorganize its committee system as to give unified consideration to a regional budget program affecting many agencies is a more doubtful question.

In the handling of reclamation functions the bill places some important substantive limitations on the administration. In general these are the existing requirements of reclamation law, including the reimbursement to be made by water users, the limitations on the sizes of farm units, deferment of charges for irrigating Indian lands, veteran preference in the settlement of irrigation projects, and recognition of state laws concerning water rights. The last requirement goes even beyond the current limitations upon the Bureau of Reclamation by safeguarding private water rights created by state law and administration as against CVA irrigation projects. For the CVA, unlike the bureau, is forbidden to "condemn any water right except as it may be appurtenant to land acquired incident to construction of dams, reservoirs, or other projects or facilities." (Section 6c.) This stipulation, in the sober judgment of the chief counsel of the Bureau of Reclama-

tion, would give the CVA less freedom of action than the act of June 17, 1902, affords the Bureau of Reclamation.⁴

To be sure existing federal law generally recognizes the dominant use of rivers for navigation, to which private water rights for other purposes are subordinated. Yet S. 1645 follows the precedent created by the Flood Control Act of 1944, which for Western rivers placed other uses before navigation. It declares "the doctrine of beneficial consumptive use of water shall be recognized, and in the event of any conflict between the purposes for which the waters of the region may be used, preference shall be given to atomic energy requirements for national defense and to domestic, irrigation, mining and industrial purposes." (Section 2*b*, 4.) So tender of the water laws of the states are these requirements that the president of the Wildlife Institute has protested that his organization feels the fish and wildlife interests will not be properly protected by the laws of some of the states in the Columbia Valley.⁵

Another substantive directive to the Columbia Valley Administration expresses the cause of the salmon fisheries. The general grant of powers provides:

"That in the location, design, and construction of any dam, or other facility, or any series of dams or facilities, the Administration shall endeavor to foster, protect, and facilitate the access of all anadromous fish to and from their spawning areas throughout the region." (Section 6*b*.)

This would give generous legislative recognition to the salmon resource, even though it might turn out that notwithstanding the best of provisions a series of dams will bring the extinction of salmon on the upper-river tributaries.

The electric-power functions of the CVA are identical with those now performed by the Bonneville Power Administration, except for the added right to acquire, primarily for resale, electric-utility systems in the region. Such acquisitions must be made on a negotiated purchase basis because the right of condemnation is expressly denied. In handling its transmission function, the new administration would be subject to the principles now legally governing the Bonneville Power Administration—encouragement of region-wide consumption, prevention of power market monopoly, preference to public and coöperative agencies. To remove legal doubt, federal agencies are explicitly included in the list of preferred public agencies.

In the provision permitting acquisition of utility systems lies probably a major source of private-group opposition to the proposed law. While the public-preference provisions and the contract limitations on power sales to

⁴ Memorandum from Clifford E. Fix, chief counsel, Bureau of Reclamation to Assistant Secretary Davidson, dated July 1, 1949.

⁵ Letter from Ira N. Gabrielson to Assistant Secretary Davidson, dated June 1, 1949.

private utilities are heartily disliked, they are already part of the federal law governing the policies of the Bonneville Power Administration. But thus far all efforts to give that agency power to acquire entire private-utility systems in the interest of public and cooperative ownership of electric distribution have been defeated.

Another substantive feature would be a system-wide cost-allocation plan for water-control projects and hydroelectric transmission lines (in contrast to the project-by-project cost-allocation practice which has heretofore governed all such developments). This is the principle which the recent agreement between the Departments of the Army and the Interior has endorsed. There can be little doubt that with the completion of Hungry Horse, McNary, Chief Joseph, and the other authorized dams on the Columbia a system-wide accounting plan will have to be used regardless of the kind of administrative organization through which they are built and managed. This policy needs to be considered in association with a second substantive financing provision, namely, the authorization (Section 12g) to use the interest payments on capital investments chargeable to power (direct and joint) to pay for irrigation to the extent permitted by the federal reclamation laws. This is intended to make possible the use of the "interest component" for subsidizing reclamation.⁶

Turning to the structure and administrative practices of the proposed administration, we find the three-member board common to valley-authority proposals. Two of the members must be regional residents when appointed. The president would appoint the board (with senatorial consent), would designate the chairman and supervise the board. Terms would be for six years, compensation \$17,500 a year. Members must profess belief in the wisdom and feasibility of the act and must be free of financial ties to the electric-utility business. Unlike the TVA statute, this bill requires an executive director and stipulates that the board is to concern itself with policy and general supervision. If there is to be a board on the TVA model, the only part of this design warranting serious criticism is the local-residence requirement. The case for it is purely a political one. If better qualified members can be obtained from some other part of the nation there should be no barrier to their appointment.

The demand for local participation is recognized by the statutory obligation of the administration "to seek the advice, assistance, and participation of the people of the region and their state and local governments and organizations, public and private, to the fullest practicable extent. . . ." The board is to arrange consultation with representatives of local public agencies and with persons representative of the "agricultural (including reclamation and irrigation), labor and business interests and of the general

⁶ See chap. iv, pp. 81 ff. and chap. xviii, pp. 9-10 for a description of this general problem.

public of the region." To this end the administration must establish advisory boards—at least four—for irrigation, power, fisheries, and navigation. Any advisory board is given the right to have its comments on administration policies incorporated in the annual report which the board is required to make to the president. The administration is also to pay travel and subsistence per-diem costs of the members of these advisory councils.

These provisions keep local participation on the advisory level, as should be the case with regard to federal responsibilities. Because advice is no better than the insight of the people who give it and is ordinarily most useful to administration when related to specific questions of policy, it is desirable to create a pluralistic advisory system, and to permit its elaboration as need is demonstrated. This S. 1645 would do. The right of publication in the annual report is insurance against administrative "brush-off" of consumer or local views widely or justifiably entertained.

The administration is given the usual characteristics of a public corporation, the most important of which are financial. It is expressly brought under the provisions of the Government Corporation Control Act which, as amended by the Eightieth Congress, requires annual budget submissions as from noncorporate agencies, but allows the budget to be of "a business type," ". . . with due allowance given to the need for flexibility, including provision for emergencies and contingencies, in order that the corporation may properly carry out its activities as authorized by law."⁷ But before these corporate budgets become effective, they must be sent to Congress which must enact the necessary legislation "making available for expenditure for operating and administrative expenses such corporate resources or limiting the use thereof as the Congress may determine and providing for repayment of capital funds and the payment of dividends."⁸ These limitations would not inhibit the authority to make contracts and other fiscal commitments "without reference to fiscal year limitations." The accounting and auditing arrangements of the Government Corporation Control Act would also be applicable to the CVA.

In the financing of the activities of the administration, revenue functions, as well as those not producing revenues, would depend basically upon appropriation authorizations. It is true that the revenue-yielding functions, such as power production and transmission, are paid from a special Columbia Valley Administration fund set up in the Treasury. This fund would depend on deposits from the revenues of the corporation and on direct Congressional appropriations. The administration would be allowed to retain each year (as is the Virgin Island Corporation) from its receipts a

⁷ *Public Law* No. 248, 79th Cong., Section 102.

⁸ *Ibid.*, Section 104.

necessary working capital sum. But the balance of its receipts from its projects would go to the special fund in the Treasury. The Congress would control the withdrawals from this fund through (1) its review and approval of the annual budget program and (2) its required approval of major projects prior to their initiation. Presumably, however, for its revenue-producing activities financed from this special fund the CVA would not be as circumscribed by detailed and specific limitations, as it would be for its activities not producing revenues (research, forestry, pollution control) which would be financed under the traditional appropriation conditions and limitations. The program of river development, therefore, can move ahead no faster than Congress permits by its annual authorizations. It is specifically provided that the CVA may *not* initiate "construction of any major water-control or electric-generating project or major transmission line into a new service area or undertake any major type of activity authorized by this Act unless such project or activity has been included in the annual budget program, or amendment thereof, approved by the Congress" (Section 12c). The question of what is a "major" project or activity is not likely to open a cavern for evasion, because the Congressional appropriation committees will easily determine the distinction which the administration must follow, on pain of refusal of funds.

Those who wish a river-development program to move ahead as fast as, in the judgment of the administration, regional requirements warrant, will look in vain to this bill for authority to proceed either through debt operations or through the utilization of surplus funds. The use of revenue bonds, which has been under considerable discussion in the West as a means of financing river projects producing power independent of Treasury financing, is not mentioned.

The in-lieu-tax provisions are governed by this statement of policy: "The finances of the state governments and subdivisions thereof shall not be impaired through the removal of taxable property from their tax rolls or through the creation of special requirements for state and local government services." The local governments must make application for payments in place of property taxes and the administration in considering these requests is to be guided by data reflecting tax charges appropriate to that part of its property formerly in private ownership, the increased tax resources for the localities arising from the activities of the administration, and the special local government service requirements caused by the functions of the administration. The experience of this in-lieu-tax program is to be reported upon to Congress and evaluated at the end of five years.

The personnel system contemplated is a combination of the ideas incorporated in the TVA and Bonneville Power Administration statutes. The civil service laws (except for the veterans-preference provisions) and

the classification act do not apply, but political tests for employment are forbidden (with penalties of removal for board members), and a merit system of its own is enjoined on the administration. Employees are eligible to the benefits (and the administration is obligated to its share of the costs) of the civil service retirement and disability funds. The current participation by the Bonneville Power Administration in the old-age-annuity and workmen's-compensation programs of the federal Social Security Act is extended to construction, operation, and maintenance employees of the administration. Collective bargaining is authorized for any or all employee groups.

The last provision in S. 1645 to which we shall call attention requires the administration to use contracts for construction work. Since the Eightieth Congress the use of appropriation riders to prevent the Bureau of Reclamation and the Bonneville Power Administration from using their own forces in construction work has become a Congressional habit. Perhaps because of this, and of a wish to draw the fangs of contractor opposition, the bill lays down this contract requirement. Even though an exception is made to allow the use of "force account" in emergencies, this stipulation is to be heartily deplored. Neither the Bureau of Reclamation nor the Corps of Engineers is hampered by such a substantive statutory limitation. In fact the Corps of Engineers is forbidden to do work by contract if the contract price exceeds by 25 per cent the estimated cost of the job. The basic statute governing construction work under that agency states the correct principle, for it says: "It shall be the duty of the Secretary of the Army to apply the money appropriated for improvements of rivers and harbors other than surveys, estimates and gaugings, in carrying on the various works, by contract or otherwise, as may be most economical and advantageous to the government." ⁹

It is reasonable to doubt the validity of the political calculations involved in this concession to the contractors, since their opposition toward valley-authority legislation shows no sign of softening. The administrative unwisdom is clear. Good management necessitates the lodging of discretion in the administration to choose how it shall do its work. The experience of Bonneville Power Administration makes this clear. Some of the mountainous terrain crossed by its transmission lines is so rough that contractors could not properly estimate costs and consequently have either refused to bid or have put in fantastic figures. Sometimes no bidder has been really qualified to do the specialized kind of job required. There have been frequent occasions when energization dates for customers could not have been met if the delays inescapably required by the contracting procedures had been allowed. This would have meant not only default on administrative

⁹ *U.S. Code*, title 33, paragraph 622.

obligations but the loss of large amounts of power revenue, and, during the war, failure to serve the defense programs.

In the building of the big multiple-purpose dams which are always contracted by the Bureau of Reclamation and the Corps of Engineers, there is also the possibility that construction by the administrative organization of the CVA may at times be the best method. If speed is essential, as it was when, during the war, the TVA built Douglas Dam, the use of force-account methods may be imperative. Actually the contracts utilized for the great structures like Grand Coulee customarily relieve the contractors of many of the risks which are normally associated with the contracting method, so that from the standpoint of cost to the government, the contract system is practically as uncertain as would be direct construction by Uncle Sam.

A sober evaluation of S. 1645 must conclude that it is the most desirable "authority" measure thus far proposed for the Columbia River watershed and the Pacific Northwest. It provides for three objectives that urgently need achievement: (1) unified planning, construction, and operating of the "water in the channel" structures of the Columbia River save for the tidewater harbor and channel works; (2) integrated regional planning and budget review of all federal resource programs; and (3) supplementary research to round out and complete research activities in the resource field now scattered and limited among the many federal agencies. These tasks are urgent. Their performance by the proposed administration would not materially impede an ultimately rationalized administrative structure for the handling of federal resource functions for the entire nation. The fourth function—the right to engage in activities for the conservation of land, minerals, forests, and other nonwater resources—is a much more doubtful assignment. Its principal justification, pending a redesign of the structure and management practices of federal administration to meet more adequately the national and regional needs in these fields, is its potential usefulness in reinforcing the regional planning function. If used as a threat to invade the jurisdiction of these other agencies, it might greatly improve the prospects of their acceptance of regionally sensitive and integrated plans calling for modifications in their own programs.

The most justifiable doubt about the fulfillment of the objectives envisaged under this measure relates to the regional planning function. The political strength and public prestige likely to mass behind an established CVA will come from its combined river-construction programs. The bulk of its personnel will be engaged in those activities. With the public attention and pressures focussed on these water construction and operating jobs, can the administration attain sufficient detachment in its perspective to build a balanced plan for all resource interests? If it cannot, it should be a short and relatively easy step to transfer this regional planning function to

the regional office of the president for which we have argued above. With the retention of operating responsibilities for nonwater resources in other federal agency hands, the "unscrambling" of the administration organization incident to detaching its regional planning duties would be simple and relatively easy. This would not be true were there established a CVA on the full-fledged TVA model.

The new administration CVA plan was not the only major attack launched during the past year on the existing structure of federal agency organization and practice. From another quarter of great respectability came drastic proposals for change, almost as unpalatable to some local pressure groups and some federal agencies as is a CVA. These were the recommendations released by the Hoover Commission early in 1949.

The Hoover Commission Report and Natural Resource Management

Before the proposals of the Hoover Commission for federal resource functions were transmitted to the Congress, that group had strongly endorsed the proposition that the president's power to initiate rearrangements of the machinery of the executive branch should be renewed and so broadened as not to exempt any agencies of that branch of the government. The influence of the report, and of Herbert Hoover, undoubtedly strengthened the forces in Congress which ultimately obtained the enactment of the statute under which six reorganization plans were submitted by President Truman to the first session of the Eighty-first Congress and five became effective. For the first time an act of this character did not exempt the Corps of Engineers from a presidential order. But this is likely to have been a Pyrrhic victory because Senator McClellan, a member of the Hoover group, saw to it that the Congress, through the disagreement of either house, could kill any presidential proposal. It should be recalled that Senator McClellan has been president of the Rivers and Harbors Congress, thus exemplifying what former Governor Leslie Miller, chairman of the Hoover Commission task force on natural resources, was to call "an incestuous relationship" between pressure groups and congressmen.¹⁰

In February, 1949, came the commission's report on the Department of Agriculture, followed the next month by its program for the Department of the Interior. Together, they (particularly the latter) contain the program for improving federal management of natural-resource functions. Unfortunately the Hoover Commission was not of one mind on what to do; in fact it was of four minds. Seven of the twelve members signed what pur-

¹⁰ See his article "The Battle That Squanders Millions," *Saturday Evening Post* (May 14, 1949), pp. 30-31.

ported to be a majority report, but since one of the seven, the late James Forrestal, disagreed or remained silent on a number of important proposals, it is scarcely legitimate to consider "the report" as the decision of a majority. The other five members were split into two camps, presently to be described.

Briefly, the program of the "majority" would reconstitute the Department of the Interior without renaming it, so as to give it:

(1) the civil functions of the Corps of Engineers, reorganized with those of the Bureau of Reclamation, the Bonneville Power Administration, the Southwest Power Administration, and the Division of Power, into a Water Development and Use Service; (2) some construction-engineering functions of the present Federal Works Agency, hospital construction (except hospitals under grant-in-aid programs), civil-airport construction and land construction for the coast guard; (3) the existing functions relating to mineral resources (Bureau of Mines, Geological Survey, Division of Oil and Gas, Administration of Mineral Leases, Title Records, and Reservations) plus certain mineral-leasing duties of the Department of Agriculture, the natural-gas investigation work of the Federal Power Commission and the tin smelter at Texas City now run by RFC; (4) a group of recreational services (the National Park Service duties and the non-commercial fishing functions of the Fish and Wildlife Service) and (5) the Division of Territories (on a temporary basis).

To the Department of Agriculture the majority would transfer the major tasks of the Bureau of Land Management, and would merge them with those of the Forest Service and the Soil Conservation Service into an Agricultural Resources Conservation Service. This service is so sketchily defined that it is very difficult to see precisely how the Soil Conservation Service would be merged. It is clear that the report envisages an amalgamation of the administration of the public domain and the Oregon and California revested lands with the national forests. It would pull out of this latter unit the water-development functions now performed by the Soil Conservation Service—the Wheeler-Case projects. (But what of the snow survey and forecasting work?) It would transfer these functions to the Water Development and Use Service in the Department of the Interior. As a partial corrective to the construction bias of the Water Development and Use Service in the Interior Department, the report recommends that the "Department of Agriculture be required to report to the President and the Congress on all irrigation or reclamation projects about their use and timeliness."¹¹

The most striking contributions by the majority toward the goal of better arrangements for resource management are found in their program for a unified "Water Development and Use Service" in the Interior De-

¹¹ The Commission on Organization of the Executive Branch of the Government, *Department of Agriculture, Report to Congress* (February, 1949), recommendation no. 12, p. 21.

partment and for regrouping the wild-land management functions (except for Fish and Wildlife) together in the Department of Agriculture. Save for the dissent of Commissioners Senator McClellan and Congressman Manasco, who filed a vigorous protest against tampering with the civil functions of the Corps of Engineers, and the silence of James Forrestal on this proposal, all of the commission were agreed on the urgency of a unified "water in the channel" administration. The supporting argument for this proposal is the most extensive and the most convincing. The task force on natural resources is quoted at some length for cogent data and reasons. These resemble the kind of information and analysis of the current situation presented in this study for the Columbia River system. But the task force had found in the Missouri Valley, the Central Valley, and elsewhere plenty of other confirmatory evidence for its disillusionment with the fragmented and wastefully competitive structure now handling these water functions. The majority and the major dissenting minority were in full agreement with the task force and with each other that the effort to secure coordination through interdepartmental committees had not been effective in "reconciling conflicting opinions and programs." The report quotes with approval the task-force statement:

The [interagency] committees have failed to solve any important aspects of the problem . . . because the dominant members, the Corps and the Bureau, have been unwilling to permit inter-agency committees to settle their differences. The result has been neglect or avoidance by the committees of virtually all major areas of inter-agency conflict, and concentration instead on technical studies and publicity. . . .

The development agencies sometimes compromise their differences. After sharp clashes over plans for the development of the Missouri Basin, the Corps and the Bureau announced complete agreement on the Pick-Sloan plan. Analysis of the plan reveals the fact that it contains many projects which previously had been subjected to devastating criticism by one or the other agency. The "compromise" consisted for the most part in a division of projects, each agency agreeing to forego the privilege of criticising projects assigned by agreement to the other. The result is in no sense an integrated development plan for the Basin, and there is serious question in this case whether agreement between the two agencies is not more costly to the public than disagreement. . . .

There is simply no escaping the fact that so long as the present overlapping of functions exists with respect to the Corps of Engineers, the Bureau of Reclamation, and the Federal Power Commission, costly duplication, confusion, and competition are bound to result. . . .

Nine members of the commission certainly accepted its conclusion that "the consolidation of these agencies is the only remedy."¹² Neither was

¹² Note, however, should be made of the unwarranted assumption by the commission implied in its statement (p. 23, *Department of the Interior*): "An inquiry into the disastrous flood at Portland, Oregon, in 1948 might show the nature of this conflict in the use of reservoirs." Only one reservoir existed at the time which might possibly have been

there disagreement among the nine that in the organization of the new unified water agency it should adopt a regionally decentralized type of internal structure, using river basins as the units for planning, construction, and operation.

As a check on the economic soundness, timeliness, and technical features of river projects, a "board of impartial review" composed of five outstanding men in this field of competence is proposed for the office of the president. To this agency the Department of Agriculture would send its reports on all proposed irrigation or reclamation projects, thus buttressing the commission's intention to allow that department to play a greater role in irrigation matters than it has in the past. For tying together in the field plans of the Water Development and Use Service with those of the Agricultural Resources Conservation Service and of the states, the majority propose the creation of "drainage area advisory committees" for each major drainage area.

In the light of experience with comparable committees, both of these devices on which the majority would rely for interdepartmental coordination seem to fall short of the goal which the commission has accepted. This is one of the many trenchant criticisms made by Commissioners Acheson, Pollock, and Rowe.

That trio vigorously denounce the "majority" for failing to create a unified Natural Resources Department in which should be vested not only the unified Water Development and Use Service, but all the public-land administrative tasks. They would transfer to it from the Agriculture Department the Forest Service and would retain without dismemberment the Fish and Wildlife Service. They argue eloquently for the indivisibility in management of all natural resources, land, water, and minerals—and especially of the first two. In their opinion this can be achieved either by an inclusive national Department of Natural Resources or, on the regional level, by a series of valley authorities for major river basins. There is some doubt as to which plan this minority would really prefer, but they hold the opinion that if a single national "department comprising all natural resource activities is not soon created several regional authorities will become inevitable."¹³ They believe that a board of review which they also favor—but with wider jurisdiction not unlike that aspired to by the late

used to hold back flood waters—Grand Coulee. Had it been emptied in advance of the flood—with appalling effects on power supply at a critical time of energy shortage—its influence on the crest in the lower Columbia flood plain would have made only a few inches difference in the flood crest and that influence would have been so brief as not to have prevented the ultimate high levels which overtopped the dikes and flooded the cities in that highly urbanized part of the valley.

¹³ The Commission on Organization of the Executive Branch of the Government, *Department of Interior, Report to Congress* (March, 1949), p. 56.

National Resources Planning Board—could coordinate the Department of Natural Resources and whatever valley authorities might be created with other departments like the Department of Agriculture and the national military establishment.

It is pertinent to note here that no task force of the Hoover Commission and no subcommittee of the commission made any intensive study of the methods and results of the Tennessee Valley Authority. In view of the willingness of the task force on natural resources and of the commission itself to allow the TVA to continue while opposing the extension elsewhere of the authority idea, this must be a case of judgments arrived at by "hunches." It is the most glaring fault in its study of resource administration that the commission felt unable to perform an objective and thorough appraisal of the experience of this unique mode of administering federal resource functions.

The dissenters also objected most strenuously to the incorporation in the Department of the Interior of a collection of "Public Works slivers." They charge the majority with the violation of one of their major principles by this plan, for as they (correctly) assert, the commission had avowed its intention to constitute departments along major purpose lines. "To combine," they say, "in one agency 'works and resources' emphasizes too largely the construction aspect. The *purpose* of construction, which varies greatly from one agency to another, is lost, as it were, in this effort to build a department of many unrelated purposes." They chide the majority with inconsistency even with this inconsistent application of their principle, for the majority omitted from the Public Works unit of the department all those engineering-construction activities that are performed through grants-in-aid to states and localities, such as public roads and public buildings erected by the military establishment.

The minority also proposes to transfer to their Natural Resources Department for incorporation into the Water Development and Use Agency, the Federal Power Commission's duties which relate to river-basin and power-market surveys, the installing of power facilities in federal projects, and the allocation of costs and fixing of federal-project power rates.

The case against the Public Works recommendation of the majority of the Hoover Commission seems on the basis of their own premises irrefutable. Why this alien segment is included in their proposed water, energy, and minerals department is difficult to explain on grounds of logic or national administrative experience. Certainly the majority would not rest their case on Robert Moses' grandiloquent cliché about the administrative importance of the "sea-green incorruptibles of the engineering profession." Both the Department of Agriculture and the task force on natural resources opposed the idea. Could it have been that this was a consolation

prize to the Interior Department for stripping it of the Bureau of Land Management, commercial fisheries, and the Bureau of Indian Affairs? There is legitimate ground for considering in the "logic" of national administrative structure the question of "balance of power," but there is no hint in the report that this was the basis for the majority proposal.

On the other hand the minority (Acheson, Pollock, and Rowe) seem unduly influenced by the concept of unity in natural-resource relationships. They reiterate the notion that there is a unity in nature which constitutes a kind of "natural law" to which administration must conform (see page 69 *op. cit.* particularly). There are of course many "unities" in the relationships of water, land, and minerals, but so are there many diversities. The unity between "wild lands" and some aspects of water-resource management is no greater than with cultivated lands. It is "tame lands" that are depleting our underground water supplies in the Central Valley, and in the northern and southern Great Plains. It is "tame lands" in the humid parts of the United States (a goodly section) that are producing great quantities of silt for stream channels and river structures. It is to be recalled that a large part of the land-use program of the TVA is directed toward the land in *farms*—fields, pastures, and farm wood lots.

To use another illustration, in a reverse direction, it is the precious cultivated, irrigated valleys in the Great Basin region that are threatened by ruin from mud-rock siltation and the drying up of the water supply because of abuse of the mountain watersheds by livestock and deer. Dozens of small irrigation systems—not the great construction projects of the corps and the bureau or of any valley authority—are at stake, and so is the way of life of the farmers and of the village communities in these arid ribbon-valley areas unless the national forests (with their intermingled private lands) and the grazing-district lands are keyed in management with the farms below, and unless the farming pressures on the forests are relieved by *changes in farming practices*. The latter are likely to be made feasible only by the technical and credit resources of the Department of Agriculture and the state colleges. Here is a unity-of-policy need. It ties as tightly between "wild" and "tame" land-management plans as between plans for handling water and soil on public wild lands and developing "water in the channel" projects.

The conception of unity as applied to the issues of administration under consideration means relationships so intimate as to require the same agency to guide them properly. But there are varying proportions of activities requiring joint mastery, and there are differing kinds of common mastery necessitated in the administrative process.

The first conclusion should be self-evident to anyone familiar with public administration. The second may need explanation. If a group of

differing but interrelated activities has such constant need of joint attention in their day-to-day functioning in order to achieve an integrated administrative result, then clearly the structure required is one which permits day-to-day direction and day-to-day communication up and down the line of command. If, however, the activities are on the whole capable of efficient daily conduct with only occasional consultation on the joint relationship or "unity" matters, lesser organization closeness of control is indicated. Many differing degrees of coordination are required for these differing but occasionally related tasks of management. Moreover there are "pulsating" changes in the need for relatedness—sometimes much joint attention is required, sometimes slight. The concept of "planning" coordination as distinguished from "administrative" coordination assumes that effective joint attention shall be given to interrelationships (unities) when basic policies and principal programs to implement them are being decided. Our criticism of the stimulating Hoover Commission minority thesis and proposals is that they do not sufficiently distinguish between those "unities" that must have the identical "operating" structure and the same directing superior from those "unities" that can be satisfied by a common planning mechanism.

Much correlation is needed in planning social objectives and developmental programs for land (wild and tame, public and private), water, and minerals. Whether we put the Forest Service in the Department of the Interior (Natural Resources), as the minority wants, or transfer the Bureau of Land Management to the Department of Agriculture, as the majority recommends, this problem will still evade solution unless there is at the regional and the national level an authoritative focus directly representing the presidential office to see that the needed unities in planning and in programming are attained. This does not require, as we have argued at length in chapter xvii, amalgamation of operations. The minority is proposing a board of review with interdepartmental coordinating functions at the national level, but neither group has grappled with the problem at the regional level save as the minority ambivalently reaches out to the valley authority while clinging to a Department of Natural Resources. If we are to keep the departmental system and make it work, this gap must be effectively closed.



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The initial chapter summarizes outstanding resource characteristics and problems of the Pacific Northwest. The author describes, in subsequent chapters, the principal federal agencies engaged in the development and management of the Northwest's resources, tracing their history, functions, and interrelationships. Recent attempts to coordinate these agencies in the Northwest are also surveyed and evaluated.

Mr. McKinley analyzes critical issues and proposals for a Columbia Valley Authority, modeled along the lines of the TVA. A separate chapter discusses the programs and administrative structure of the TVA. Finally, the author presents a case for reorganizing our present federal administrative system in the Northwest of multiplying valley authorities. Prospects for succeeding in such a program are carefully appraised.

Charles McKinley is a member of the faculty of Reed College. As a Westerner, he knows intimately the area under study. He has had usually extensive experience in government administration dealing with resource programs, having worked for a number of the organizations discussed in this study. For ten years he served as consultant to the Northwest Regional Planning Commission and participated in the development of several of its special studies. He was a consultant to the Hoover Commission task force on National Water Resources. Recently he served as a member of the research staff of the President's Water Resources Commission.

• *Text maps and jacket drawings by Bendix*

THE POWER POLICY OF MAINE

By **LINCOLN SMITH**

This study in political and legal history considers Maine's power policy—its growth, the legislation passed to implement it, and its economic aspects within the state. Moreover, the conservatism and isolationism reflected in this policy have had serious regional and national repercussions.

The doctrine, "Maine power for Maine people," emerged from the localism that characterized early New England. Power is private property; the development, distribution, and control of power should be through private initiative. This doctrine has been supported generally throughout the state. In 1929, when power companies wanted to transmit surplus power, the Maine electorate flatly refused to permit it; its vote was antitransmission, anticorporation, anticoöperation. The Fernald Law, passed in 1909, is the central tenet of this policy. It prevents corporations from transmitting hydroelectric power outside the state.

By now the other New England states have developed much of their hydroelectric power, whereas from 50 to 65 per cent of the remaining underdeveloped power is allegedly in Maine. Maine's embargo has forced southern New England to steam and marginal hydroelectric developments.

Thus Maine's power policy transcends state lines and assumes regional and national interest. There is a growing interest on the national level in developing and utilizing all potential water-power resources in the country. The author shows that regionalism offers a middle way between national and state control, and that modification of the Fernald Law would help to reconcile state and national interests.

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