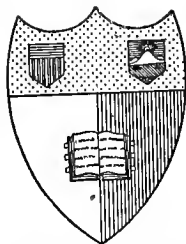


**STATE SOCIALISM
PRO AND CON**

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STATE SOCIALISM

PRO and CON

OFFICIAL DOCUMENTS AND OTHER AUTHORITATIVE
SELECTIONS—SHOWING THE WORLD-WIDE REPLACEMENT
OF PRIVATE BY GOVERNMENTAL INDUSTRY
BEFORE AND DURING THE WAR

EDITED BY

WILLIAM ENGLISH WALLING

AND

HARRY W. LAIDLER

WITH A CHAPTER ON

MUNICIPAL SOCIALISM

by EVANS CLARK



NEW YORK

HENRY HOLT AND COMPANY

1917

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PREFACE

THE tendency toward collectivism is probably the most portentous movement of the twentieth century. Despite its importance no book has heretofore been published in the United States dealing adequately with this subject. The two admirable though exceedingly brief English publications, Emil Davies' *Collectivist State in the Making* and the Fabian Research Bureau's *State and Municipal Enterprise*, a supplement of the *New Statesman*, are the only attempts thus far made to give a comprehensive idea of the extent and purport of collectivism in Europe and America. The present volume differs from these studies in that it is primarily a source book, presenting authoritative selections either written by experts or selected by experts from official reports, and is not in any way an expression of the personal views of the editors.

The book is in no sense a brief for State Socialism. The editors are well aware of many of the inadequacies of the present governmental industries and of other economic activities of governments. The object of the volume is simply to portray the extent of this new governmental phenomenon and to suggest its probable future development. It is, of course, impossible in a volume of this nature to include a description of all collectivist enterprises, or to determine to a nicety the proper space to allot to each activity, and we can lay no claim to completeness or finality.

The scope of our work will be seen from the table of contents and the number of pages we have been able to allot to each topic. Attention is to be centered rather on the chapters than on the five parts into which the work is divided, purely for the purpose of convenience. This division into parts is meant to be not dogmatically rigid but only suggestive. It will be found that a considerable portion of our space, though not the larger portion, has been given to the United States. We have not

sought, however, to put American conditions in a leading or central position. In some cases we have given America first or even sole consideration because of her leadership in certain directions. On the other hand, in cases where little or nothing is going on in this country, we have sometimes ignored American conditions.

The title chosen, "State Socialism—Pro and Con," should not be taken to mean that the editors have sought to reproduce partizan *arguments* on either side. Our object has been rather to provide the reader with the most important *data*, so that he may be equally free to reach a conclusion for or against collectivism. Only in the Introduction have we tried to give a summary of what we regard as the more important arguments.

Besides the special editor mentioned on the title page, the general editors were largely guided in the selection of material by consultations with experts, such as H. Parker Willis, Secretary of the Federal Reserve Board; Harry A. Slattery, Secretary of the National Conservation Association; I. M. Rubinow, author of *Social Insurance*; Carl Vrooman, Assistant Secretary of Agriculture; Professor E. R. A. Seligman, and W. Jett Lauck, of the Bureau of Railway Economics—though the editors alone are responsible for the selections finally chosen. We are also indebted to J. G. Phelps Stokes, Alexander Trachtenberg, James W. Alexander, Caro Lloyd Strobell, Frederick Kirby, M. Louise Hunt, and other members of the Intercollegiate Socialist Society—upon the initiative of which the work was undertaken.

CONTENTS

	PAGE
PREFACE	iii
INTRODUCTION:	
I What Is State Socialism?—Relation to “War Socialism” and to the Military State	vii
II State Socialism Before and After the War	ix
III State Socialism and Related Governmental Policies: Police Power, “Subsidiary” Enterprises, Regulation, Subsidies, Taxation	xvii
IV State Socialism and Democracy	xxi
V State Socialism and Socialism	xxvii
VI State Socialism and Nationalism	xxxvi

PART I

FINANCE

CHAPTER	
I CENTRAL BANKS	3
II SAVINGS BANKS	24
III AGRICULTURAL BANKS	42
IV PROPERTY INSURANCE	60

PART II

AGRICULTURE AND THE CONSERVATION OF NATURAL RESOURCES

V LAND RECLAMATION	69
VI LAND DEVELOPMENT	81
VII AGRICULTURAL COLLECTIVISM	93
VIII AGRICULTURAL SCIENCE	102
IX THE UNITED STATES DEPARTMENT OF AGRICULTURE	114
X LEADING BUREAUS OF THE UNITED STATES AGRICULTURAL DEPARTMENT	132
XI FORESTRY	186
XII ROADS	215
XIII FISHERIES	227
XIV WATER POWER	243

PART III

TRANSPORTATION AND COMMUNICATION

CHAPTER		PAGE
XV	INTERNATIONAL WATERWAYS—THE PANAMA CANAL	251
XVI	INLAND WATERWAYS	264
XVII	SHIPPING	276
XVIII	RAILWAYS	296
XIX	TELEORAPHS AND TELEPHONES	341

PART IV

COMMERCE, INDUSTRY, AND MINING

XX	MINING	367
XXI	PETROLEUM	381
XXII	GOVERNMENT "MONOPOLIES"	392
XXIII	MANUFACTURING	410
XXIV	"SUBSIDIARY" INDUSTRIES	422
XXV	INDUSTRIAL SCIENCE	427
XXVI	STATE AID TO COMMERCE	469

PART V

COLLECTIVISM AND THE INDIVIDUAL

(AS CITIZEN, CONSUMER, PRODUCER, AND TAXPAYER)

XXVII	PUBLIC HEALTH AND SOCIAL INSURANCE	487
XXVIII	NATIONAL AID TO RECREATION	536
XXIX	MUNICIPAL OWNERSHIP	546
XXX	THE FOOD SUPPLY	581
XXXI	HOUSING	607
XXXII	THE TAXATION OF CAPITAL AND INDUSTRY FOR SOCIAL PURPOSES	617
	INDEX	637

INTRODUCTION

I. WHAT IS STATE SOCIALISM?—ITS CAUSES—RELATION TO “WAR SOCIALISM” AND THE MILITARY STATE

THE terms “State Socialism” and “collectivism” are employed with several meanings. But they are chiefly used to mean the policy of extending the economic functions of the State. When the larger and more important economic functions of a nation are operated by its government that nation has adopted State Socialism. When a nation has consistently and deliberately enacted measures leading in this direction, and when the régime of State Socialism is so near that no radical turning aside is probable, that nation may be said to have adopted a State Socialist *policy*.

Is every economic activity of a government to be viewed as a step in the direction of collectivism or State Socialism? Certainly not. Every sovereign government has military and police functions, and these always have an economic aspect. All military departments produce at least some part of the munitions of war. Most of them produce a large part of their military supplies. A government which changes its policy of producing only a small part of these supplies, and undertakes—as the United States is doing today—to produce a somewhat larger part is merely adopting the usual custom of governments. This is certainly not collectivism.

There are also certain purely economic functions which—though they have occasionally, or for brief periods of history, remained in private hands—have usually been considered ordinary functions of the State, such as the provision of roads, currency, lighthouses. It is true that such functions are more largely governmental now than they were a century or two ago, but this may be taken equally well either as indicating an orderly development of individualistic government or as a development towards collectivism.

Many governmental functions have a mixed character. We must examine each activity from the point of view of its *object*, and of the *method* by which it is carried out. Those economic activities only are wholly collectivist as are (1) financially supported by government, (2) operated by government, and (3) directed to governmental rather than to private objects. State Socialism means a preponderance of economic activities "of the government, by the government, and for the government." But an economic function may be operated by government, with government money, for the specific purpose of giving a relatively greater strength to private property or private industry, as, for example, nearly all the great land development projects, such as irrigation, etc. Or a business may be operated by government and directed to governmental objects, and yet pay a perpetual tribute to private capital, as when a government operates a railroad, but does not pay off its private bondholders. Moreover, the economic operations of government are closely related to one another, as, for example, taxation, loans, and the profits and charges of governmental industries. It is only by first weighing the above-mentioned three aspects of each governmental activity separately and then considering all governmental activities together that we can say whether a government has adopted a State Socialist policy.

State Socialism is often confused with the régime of the Military State. The economic functions of ancient Sparta and Peru, not to mention numerous other instances, were in large part under direct governmental control or operation. But these societies were held together more largely by the sheer coercion of arms than by this economic control. On the other hand, with the development of military technique, i.e., with the growing importance of the industrial aspect of military power, the economic element of such military societies becomes more pronounced. Thus it is probable, in the present war, that even in the Military States there are more persons engaged in supplying armies than there are persons under arms. And when we look at that still more modern branch of warfare, highly developed only by the most advanced commercial nations, namely, sea-power, the disproportion is far more marked. While only 300,000 seamen are in Great Britain's Navy, it is estimated that more

than a million other persons are employed to keep it going, to say nothing of the supply of food and clothing.

Military expenditures are not usually considered an element of collectivism; they lead rather to the ancient military state. But they are more closely related to collectivism than to the régime of private property, commercial competition, and political individualism. The same proposition holds true of governmental expenditures through private contractors. Such contractors work for governmental objects and are under governmental control. If these two developments—military expenditures and governmental expenditures by private contract—grew up along with the continuation of private capitalism in all other fields, they might, after all, tend to strengthen private industry. But there is developing at the same time an immense amount of collectivism proper, the direct undertaking by the government itself of industrial and social (i.e., non-military) functions. As all these tendencies are working together to-day we may see a very highly developed State Socialism in several countries of Europe within a decade—as soon as the processes of reorganization which must inevitably follow the war will have had a reasonable time to achieve their logical results.

It is certain that all the leading nations of continental Europe were advancing steadily in the direction of State Socialism long before the war and that both Great Britain and the United States had begun to move, though later and more slowly, in the same direction—extending the economic functions of government, taking over economic activities formerly in private hands. If this tendency continues until the larger part of the economic functions of a community are nationalized or municipalized we shall have collectivism or State Socialism. For then a majority of the population will be occupied either directly or indirectly in governmental employments. Indeed, the State Socialist period may arrive earlier.

II. STATE SOCIALISM BEFORE AND AFTER THE WAR

The momentous and almost immeasurable significance of the new State Socialism has been recognized, since the war, by

almost all of the world's leading public men. A few examples will be sufficient to remind the reader of this fact.

One of the leading spokesmen for American finance is Mr. Frank Vanderlip, President of the National City Bank. Speaking before the National Bankers' Association at the Chicago Bankers' Club, in 1916, Mr. Vanderlip said:

"State Socialism in Europe may develop problems the like of which have never concerned our minds. We may have to meet collective buying, state-aided industries, forms of government control of ocean-borne commerce, and novel factors in international finance. There may come out of the war changes in the forms of government that will have profound and worldwide influence."

In Great Britain, so conservative a leader of public opinion as the London *Times* published a series of articles called "The Elements of Reconstruction"—articles later reprinted with an endorsement of Viscount Milner, one of the five war "dictators" of England—which even more definitely acknowledge the trend towards State Socialism.

"The bulk of reasonable men in the Empire," say the *Times*' experts, whom Lord Milner blesses, "have come over to the primary Socialist assertion that food production, transport, all the big industrialism, are matters not for the profit-seeking of private ownership, but for public administration."

In Germany the most popular and influential work since the war is said to be Naumann's *Middle Europe*. The trend towards State Socialism has been strongly evident in Germany for the last half century and has been warmly welcomed by the majority of progressives for many years. Naumann's analysis and conclusions are therefore especially mature and valuable. Our English authorities, just quoted, expect State Socialism to invade only a part of industry, covering perhaps no more than half of industry and half of the people of Great Britain. Naumann outlines a State Socialism which would embrace by far the larger part of German industry. He says (*Central Europe*, English edition, pp. 153 and 155):

"A willing people with an economic dictatorship voluntarily endured, can do infinite things. The dictatorship was incomplete, for here too previous mobilization was lacking, but it became effec-

tive by degrees. What we see around us is certainly not exactly what, in Karl Marx's phrase, is termed 'the Dictatorship of the Proletariat,' but we are yet reminded of the expression in some respects: a step towards Socialism under the leadership of the government! It is an economic dictatorship of Government Offices advised and supported by those most nearly affected."

"That we Germans have glided into this State Socialism, or into this national economic business (for that is strictly what it is), as if it had always been our natural habit—that is what we have learnt about ourselves during this war."

"There is in this a certain reconciliation between the economic conception of national citizenship and that of Socialism."

The collectivist tendency has been notable not only in Germany but in every country of the world for fully half a century. We have only to mention the strides in municipalization made in Great Britain and even in America to show that these, among the most individualistic of nations, have been no exception. The evidence given in the present volume will show that this trend, if somewhat slackened in municipalities at the present moment, continues in other directions, especially in new activities of the United States government. It may also be pointed out that in the United States we seem to be entering upon an era of agricultural collectivism in a number of Western states, taking as a point of departure, no doubt, similar experiments across the border. In the Northwest the Farmers' Non-Partisan Political League has just captured the State of North Dakota with its policy of State elevators, State flour mills, State cold storage plants, State packing houses, State hail insurance, State-owned coal mines, and a State rural credit system. An organization no less powerful than the National Grange endorsed on November 24, 1916, the municipal ownership of slaughter houses and the establishment of State and Municipal milk distributing agencies. The Non-Partisan League is at present spreading rapidly in eight of the leading states of the Middle West. Finally, it must be recalled that Australia and New Zealand have developed these collectivist tendencies even more strongly perhaps than has Germany.

Let us briefly consider, in a more concrete manner, the collectivist activities in the leading countries prior to and following the outset of the war.

Considering, first, the increase of collectivism since the war commenced, we find Germany, which began the war with the greatest amount of collectivist control, increasing such control on every hand. It has taken entire charge of the leading raw materials, dictated the maximum prices for many commodities, and undertaken the distribution of food. Many municipalities have gone into farming and other productive enterprises. Dr. Edmund Fischer, Socialist member of the Reichstag, in 1915, published an estimate that at that time no less than fifty-five per cent of the total population of Germany received their means of living directly or indirectly from the State.

Individualistic England has, temporarily at least, placed a governmental commission in charge of the railroads, shipping, and mines. It has obtained a monopoly over sugar and has fixed maximum prices. It has, through the government of India, monopolized the entire export wheat trade, taking for one year from the grower whatever wheat the government thinks fit at prices which it fixes, shipping it in vessels which the government provides for sale in London on account.

The English government has requisitioned the entire meat supply from Australia and New Zealand for army use and to prevent speculation in prices. It has established a dye research laboratory, expending \$500,000 thereon, and has purchased most of the crop of natural indigo. It has doubled the income tax and has passed the first national housing act, appropriating \$20,000,000 for the construction of governmental houses.

Sidney Webb has this to say about the effect of the war:

“To speak only of this country, the war has brought us appreciably nearer to the Nationalization of the Railways, Canals, and Coal supply, if not also of merchant shipping. Agriculture will not escape some local and experimental national intervention, for discharged soldiers and otherwise. The government will inevitably be driven to reclaim for collective administration a quite unexpectedly large proportion of the tribute incomes of rent and interest that the landlords and capitalists fondly thought to be their own. The public control of mobile capital (which will certainly not again be quite free to flow whither it pleases), and of such requisites of increased national production as indispensable minerals, the plant and organization of ‘key industries’ and ‘essential trades,’ is evidently destined to be greatly increased. Finally, although the gov-

ernment will long feel poor, the conviction that the nation must augment its virility will lead to a steady development of the Collective Provision for maternity, infancy, and the physical as well as the mental training of youth, if only to insure that as small a proportion of the population as possible shall be found to be non-effective in the hour of national strain. From this point of view, both the prevention of accidents and disease, and the adequate treatment of sickness, plainly impossible to the individual, will acquire a new importance. In short, merely as a means of national security, the coming generation is going to see a rapid increase in Collective Ownership and Administration, in Collective Regulations, in Collective Taxation, and in Collective Provision. But this was defined a quarter of a century ago, as the 'Fourfold Path' of 'Socialism itself.'"

H. G. Wells in *What is Coming?* has this utopianized:

"I believe that the end of the war will see, not only transit, but shipping, collieries, and large portions of the machinery of food and drink, production and distribution, no longer under the administration of private ownership, but under a sort of provisional public administration. And a very large part of the British factories will be in the same case. Two years ago no one would have dared to prophesy the tremendous rearrangement of manufacturing machinery which is in progress in Britain today."

This tendency toward collectivism, augmented during the war, had been steadily going forward for many years preceding. The Fabian Research Bureau pamphlet, "State and Municipal Enterprise," published as a supplement to the *New Statesman*, says:

"The population in governmental employment today certainly exceeds the whole existing population of the United Kingdom," declares the Bureau. "Their annual income which we may take as some sort of valuation of their services or product, exceeds the entire wealth production of all the inhabitants of any but the half-dozen richest nations of the world; whilst the capital thus administered is more than double the entire wealth of the essentially individualist England that welcomed the world to the 1851 exhibition—is as great, indeed, as Giffen's estimate for the entire wealth of the United Kingdom as recently as 1885."

The State is being silently transformed from a mere government of men, in which the exercise of the police power is the

most important function, into an administration of things, engaging in industry and administering extensive services for the use of its citizens.

A good method by which the collectivist wave can be measured is by studying the rate at which the number of government employees has been increasing recently. About 1900 a great stir was made when the number of civil employees of the Federal Government of the United States passed 300,000. In 1915 the number was already 476,000. If we add to these the 200,000 soldiers and sailors we have two-thirds of a million Federal employees. It is more difficult to estimate the number of State and city employees, since a large part of their work is done by contract. But State and city expenditures are approximately twice those of the Federal Government. It is therefore a fact that approximately twice as many persons are *directly dependent* upon these expenditures. We may therefore conclude that approximately two million persons are directly *dependent* upon governmental expenditures in the United States, out of a total number employed of 30 million. This proportion (nearly 7 per cent) is probably twice as great as it was twenty-five years ago.

The distance traversed on the road to State Socialism may be better measured in another way. The Russian government, before the war, received about half of its total income from State monopolies and State domains, the alcohol monopoly alone accounting for nearly one-fourth of the total government income. In 1913 some of the leading sources of State revenue were:

Telegraphs and telephones	41 million rubles
Vodka	890 " "
Mines	26 " "
Bank profits	45 " "
Railway profits	199 " "
Rent for domains	41 " "

(See *Statesmen's Year-Book*, 1915.)

The Prussian Budget of 1914 showed an income in profits from governmental enterprises, railways, forests, mines, and domains (land) of 448 million marks, and the income from taxes was only 523 million marks, thus indicating that approxi-

mately half of Prussia's income is secured from State properties. This total was produced as follows:

Railroads	244	million	marks
Forests	82	"	"
Mines	18	"	"
Domains	16	"	"

The effect of these State enterprises in Germany is well summarized by Elmer Roberts in his *Monarchical Socialism in Germany* (1913):

"The imperial government and the governments of the German states took profits in 1911 from the various businesses conducted by them of \$282,749,224. Estimating the capital value at 4 per cent ratio, the value of the productive state-owned properties is \$7,068,729,600. Roundly, the governments operate dividend-yielding works, lands, and means of communication worth \$7,000,000,000, and the governments continue to follow a policy of fresh acquisitions. Taking the federated states together, 38 per cent of all the financial requirements for governmental purposes were met last year out of profits on government-owned enterprises. Including the imperial government, a newcomer with relatively few possessions, about one-quarter of all the expenses of the state and the imperial governments for the army, the navy, and for all other purposes, were paid out of the net profits on government businesses. Among the takings are no tobacco, spirit, or match monopolies."

"Bavaria pays 39 per cent of all the administrative costs from public-owned properties; Saxony, 31 per cent; Württemberg, 38.7 per cent; and Prussia, 47.36 per cent. Prussia, which forms about five-eighths of the empire, has a constantly increasing revenue from state-owned enterprises.

STATE-OWNED ENTERPRISES IN GERMANY (1911)

	Values	Net Incomes
Farms	\$198,122,725	\$7,925,309
Forests	730,898,200	29,235,928
Mines	128,907,725	5,116,309
Railways	4,757,579,750	191,943,190
* Telegraphs		
* Telephones		
* Express packages	694,816,650	27,792,666
Other works	435,184,900	17,407,476

* These services are government monopolies.

“Upon no department of industry do any of the state governments lose except upon steamers. The grand duchy of Baden runs its internal navigation lines at a loss of about \$15,000 yearly. Saxony, Württemberg, and Mecklenburg-Schwerin gain on their lines some \$7,000 annually, so that on the whole of the state-owned steamer lines there is a loss of \$8,000.”

The French Budget for the years before the war, 1911-1913, showed a revenue from State monopolies and industries, the chief of which was the tobacco monopoly, of more than 200 million dollars, or nearly one-quarter of the total budget.

Japan produced one-third of its revenue from monopolies, without including the profits from the governmentally owned railroads. Thirteen out of 48 millions were produced from her monopolies in tobacco, salt, camphor, etc.

In fact, the State Socialist trend in industrial and in governmental finance had gone so far in some countries that they may be said to have adopted a State Socialist policy even before the war. It is somewhat doubtful whether a country like Russia should be included in this category, since the total property of the government was considerably smaller than the national debt, but with a number of other governments the very reverse was the case. Just as the typical individualistic governments, those of Great Britain and the United States, showed national debts considerably larger than their comparatively small governmental properties, so governments like Prussia, Hungary, Denmark, and several others showed surplus assets. Emil Davies in his *Collectivist State in the Making*, has made a special study of these cases.

Davies estimates, on the other hand, that the national assets of Great Britain in 1913 were only 173 million pounds, whereas there was an indebtedness of 750 million, leaving a deficiency of 577 million pounds. Compare this deficiency with the asset value of Prussian State railways, placed by the Prussian government at 11,633,000,000 marks, a sum almost identical with the British deficiency.

France occupied a middle ground.* Her heavy debt left over from the War of 1870 loaded her with a balance of liabilities. But she was to fall automatically into possession of the

remaining railroads between 1950 and 1960, which would have given her a handsome asset balance.

The careful study of the probable development of collectivism in Great Britain and other countries, made by the Fabian Research Bureau,* leads it to the conclusion that, even without the stimulus of the war, collectivism might be expected within a generation to absorb the majority of the population of the world. They declare:

“That the scope for extension of State and Municipal management of industry seems almost limitless; that even if no more were accomplished in the next thirty years than the bringing under public administration, in all the countries of the civilized world, those industries and services which are today already being governmentally administered in one or other of the countries, the aggregate volume of State and Municipal capital and employment would be increased probably five or six fold; that such an increase, without adding a single fresh industry or service to those already successfully nationalized or municipalized in one country or another, would probably bring into the direct employment of the national or local government an actual majority of the adult population; and along with the parallel expansion of the co-operative or voluntary associations of consumers in their own sphere would mean that probably three-fourths of all the world’s industrial capital would be under collective or non-capitalistic administration, whilst three-fourths of all the households might then be enjoying the permanence, the social dignity, the security and the incomes deliberately adjusted to the cost of living that mark the best examples of State employment.

III. STATE SOCIALISM AND RELATED GOVERNMENTAL POLICIES — SUBSIDIARY ENTERPRISES — REGULATION—SUBSIDIES—TAXATION

The present volume is not prepared as an argument for State Socialism. No effort is made, for example, to claim that the development of the ordinary functions of the Post Office as it has existed for a generation should necessarily be called an illustration in State Socialist progress. Many reasons may be given why the Post Office—in its older functions—is an example

* “State and Municipal Enterprise,” a Supplement to *New Statesman* May 8, 1915.

of collectivism. But the argument to the contrary is almost, if not quite, as valid.

Neither is it the intention to claim that all governmental industries subsidiary to conventional and traditional public enterprise are examples of collectivism. The criterion has already been stated. If a government digs coal for its war-ships, this is not necessarily to be taken as an example of collectivism. But if it goes further and uses this coal to regulate coal prices or for industrial activities that have ordinarily been left in private hands in the recent past, then the governmental mining undoubtedly tends in the direction of State Socialism. The Fabian Society's study, above quoted, shows that these subsidiary governmental industries are already extremely important. They say:

“We place in a category by themselves a whole array of the most varied government enterprises, among which we find the greatest range and variety of manufacturing industry actually productive of material commodities. We group them together because it is specially significant of the advantages found in the *organization of industry by the consumers of the product* that everywhere, in every department—alike in highly evolved capitalist enterprise and in the government service—we find a persistent tendency to produce for its own use, in lieu of purchasing, almost every article required in the enterprise or service in question. Thus, when a large municipality takes to running its own tramway service, it finds it convenient, just as the capitalist tramway company does, to erect its own works and carsheds, generate its own electricity, build and repair its own cars, and even print its own tickets, rather than pay an unnecessary profit. The government administration of railways—in this respect exactly like the most enlightened capitalist direction—leads to the government administration of carriage building works, locomotive engine works, printing offices, whole staffs of painters and carpenters, and engineers of every grade, the manufacture of everything required by the line. When the government builds ships in its own dockyards, it finds it convenient at the same time to make all the innumerable fittings that are required by a modern battleship, from big guns and electric dynamos down to the netting that keeps off the enemy's torpedoes. Similarly, in the administration of the innumerable institutions of the world—from prisons to infant nurseries, from hospitals to universities, from astronomical observations to asylums—it is found convenient and economical, in many cases, to produce for use, instead of purchasing to somebody's profit, every conceivable article

of food and clothing, and every imaginable kind of furniture and appliance that is required. And thus we have, on a larger or smaller scale, government mines and quarries and brickworks; government iron and steel and tin and copper works; government tanneries and saw mills and leather and wood works; government flour mills and bakeries, and slaughter houses and distilleries and breweries; government clothing factories and saddlery and boot-making establishments; government furniture factories and scientific instrument workshops, and the manufacture, in one place or another, of every conceivable commodity, directly under the control, and for the use of, the consumer himself. Moreover, one government department manufactures for another. In England, the Post Office gets the bulk of its mail sacks made by the Prison Department, and even obtains some of its telegraph poles from the Commissioners of Woods and Forests. This is, of course, far more common in other European countries, where the government mines of coal, iron, petroleum, salt, and what not, and the government forests, farms, vineyards, fishponds, and horse and cattle breeding establishments supply the needs of many different departments, and where the government steel works and engineering shops, shipyards, and leather works, printing offices, and clothing factories aim at executing as many as possible of the government orders for manufactured articles. Finally, we have the further development that, in order to exclude the capitalist, one government will now, occasionally, supply another. The Italian municipal administrations engaging in industry have even formed a national federation, for purchasing in common the materials they require, for using each other's manufactures, and for utilizing co-operatively their several by-products—a characteristic twentieth-century form of Hanseatic League! The Western Australian government is supplying from its own forests a huge lot of railway sleepers to the Australian Commonwealth railway department; the government of India supplies the raw opium worked up by the Straits Settlements Government Monopolies Department; both Austria and Hungary regularly supply other governments with salt and tobacco; the Hungarian government lately tendered in competition with the world—as it happened, unsuccessfully—for the supply of locomotives to the Roumanian government.”

It is evident that a great many of these governmental activities have the tendency to expand and so to cease being merely subsidiary to non-collectivist government functions—as most of them still are today.

Governmental regulation often proceeds to a point where national or municipal ownership is greatly facilitated and per-

haps made inevitable. In certain special cases we have discussed regulation of this character. Regulation sometimes begins by merely placing external limits as to prices in an industry, but proceeds gradually to such extensive organization of the industry as a whole, as to facilitate ultimate community management. Illustrations of this kind of regulation may be found in the field of the governmental control of banking and of railways; and also—to a lesser degree—in the technical regulation of industry along scientific lines which is involved in the fixing of “standards,” especially for governmental contracts.

It is undeniably true that governmental regulation may conceivably mark a development of government aid to private industry rather than an early stage in the development of governmental control. As the editors of the present work have no thesis to prove, we do not undertake to decide this question. We have been forced, however, to deal with it sufficiently to exclude from the volume that phase of regulation which clearly does *not* seem to have any close connection with collectivism. On the other hand, we cannot guarantee that we have not included some instances of regulation which history may show had no intimate relations with State Socialism. In every case of serious doubt we have discussed regulation and left it to the reader to decide in which direction such regulation points.

The granting of *subsidies* by governments to private industries usually implies regulation of a collective sort. In the first place, the mere continued granting of subsidies, if there was any sound economic reason for them in the first instance, indicates that the industry is really dependent upon the government. This being the case, governments ordinarily do not grant subsidies without demanding a certain definite measure of control. If we wish to ask, then, whether a given subsidy has a collectivist character or not we must first answer this question: Does the element of governmental *aid* or the element of governmental *control* preponderate? When we answer this question we can say whether the principle of private enterprise or that of governmental enterprise is being relatively strengthened. In order to throw more light on this problem we have included a few selections, summarizing briefly the shipping subsidies in the leading countries of the world.

The question of *taxation* from the point of view of the student of collectivism must be handled on the same principles. Taxation is immediately connected with collectivism in one case only, namely: the taxation of private industry or private capital for the benefit of governmental industry. If private industry or capital were taxed for the purpose of public roads of such character that these roads immediately increase the profits of private industry more than proportionately to the tax, then this might be regarded as an example of an individualistic governmental policy, rather than of collectivism. On the other hand, if such taxes were used for the purpose of developing the public schools, even the technical and trade schools which furnish valuable human material to private industry, this could hardly be regarded as a collectivist policy, since the benefit of private industry from such expenditures is indirect, slow to materialize, and very uncertain—in view of the fact that the children educated cannot be forbidden to emigrate to other countries than those in which the taxes were paid. A large part, and sometimes a greater part, of the benefit of such expenditures goes to the individuals educated rather than to their future employers.

IV. STATE SOCIALISM AND DEMOCRACY

It is, perhaps, the prevailing view, since the war, that State Socialism has been chiefly exemplified in Germany, Russia, and other countries with anti-democratic or only slightly democratized forms of government. Any one at all familiar with the experiments of Australia and New Zealand will realize that this is not the case. These countries developed their present collectivist tendency about as early as Germany and have continued it quite as far. They have been equally successful, and the collectivism of Australia is quite as noteworthy as that of Germany, though it is necessarily handicapped because restricted to a considerably smaller scale. The extent to which this State Socialism has proceeded is well summed up in a recent article by Elwood Mead in the *Metropolitan Magazine*, from which we quote the following highly significant paragraphs:

“We have only to compare the limited governmental activities of this country with those of democratic Australia and New Zealand to realize that it is not political freedom, but our crude and unworkable legislative methods and organization that are most at fault. Popular control in those countries is more direct than here, but there the political side of government has been subordinated to its industrial and social activities.

In those countries the Government (State or National) owns and operates the railways, the telegraph and telephone systems. It owns and operates nearly all street-car systems, all express lines and the letter and parcel posts. It owns and operates nearly all irrigation works and a large number of water works which supply cities and towns. It exercises control over and finances water works operated by the State or by municipalities—almost none are privately owned. *The State also owns and operates coal mines, and saw-mills in State forests.* This is a recent extension of State activity, arising out of the need of placing a check on the prices charged by coal and timber monopolies. The State owns many of the wharves and docks of the seaports. It owns and operates ship-building yards and cold storage warehouses, thus placing the small producer of fruit, meat, and butter on an equality with the great shippers. It makes contracts with the steamship lines for the transportation of perishable products to Europe. It inspects all shipments of butter and meat and fresh fruit and requires them to conform to certain standards. This is done so that the unscrupulous shipper may not destroy the market of the reputable one. As a result of this activity, freights have been lowered and service improved until now the Australian producer ships butter 12,000 miles for 1 cent per pound and fresh meat the same distance for three-quarters of a cent, and the owner of a dozen eggs living miles in the interior can transfer them to government cold storage, have them sold in London, and get the proceeds. Australia is three times the distance from London that Eureka, California, is from New York, but the Australian dairyman can ship his butter to London for one-third what it costs the one in California to get his to New York.

One of the fields where the credit and co-ordinating influence of our government ought to be exercised, is in the planning and financing of works for municipal water supplies. A study of the Australian system and its results would leave no doubt about this. Here each little town has to plan and finance its system. There the State maintains a body of expert engineers who help to prepare plans and estimates of cost and of revenues needed to meet expenses and sinking fund requirements, and *when these plans are perfected a State bond issue provides the money needed by all the towns and cities of the State.* As a result, there are no commissions to bond

brokers, no discounts on bonds, and the interest rate has for many years been only 4 per cent. Only those who have financed water works bond issues of towns with from 2,500 to 5,000 people can fully realize how much the people of Australia save and how much the people of American towns pay as a result of this difference in governmental policy.

State forest areas are numerous and widely distributed. New areas are being planted. Coal mines are leased, not sold. Thrift is encouraged by a State Savings Bank, where, in addition to the interest paid, *depositors share in the profits*. What this means to wage-earners is shown by the fact that nearly one-half of all the people in the Commonwealth are depositors. Out of a total population of 1,400,000 in the State of Victoria, 735,000 are depositors in the State Savings Bank. Each State has a comprehensive, generous, and successful system for aiding poor men to buy farms and clerks and mechanics in cities to pay for homes. In the city of Victoria 4,000 families have been able to secure farms in the country, and 6,000 workmen their homes in the city who could never have attempted this without State aid and direction."

The best part of this State activity is that it has not been handed down from above like that of socialized Germany; it has been created and is maintained by the free vote of the people. They have incurred this great responsibility and heavy expense in the belief that there can be no really free society, no genuine democracy so long as want and misery exist in the midst of abundance."

But the most remarkable illustration of State Socialist policy in Australia was at the time of the drought in 1914, an experience that continued until after the war. We see through this example that other calamities than war may be equally effective in urging a government into State Socialism. Mr. Mead also gives us an account of this experiment. The drought was one of exceptional severity, so that the people were faced with starvation and economic ruin for the future. The State railways undertook to move the starving stock to other parts of the country where it could secure feed, to provide employment for the farmers and their families on the irrigation works, and, by extending State railway lines and State roads, to finance the farmers who had returned to their home by furnishing hay and grain, in part imported from North and South America. For this purpose "the State chartered ships and transported fifty thousand tons of hay from America over 7,000 miles, spending three million dollars for the purpose." In the meanwhile, the

war had begun and it was difficult to secure the shipping to sell the harvest when it was ready. The government therefore undertook the marketing of the whole wheat crop, involving the purchase of 150 million bushels.

On the other hand the summary we produce of the Socialistic attitude towards the Bismarckian State Socialism of Germany (see the following section of this introduction) will indicate not only that State Socialism in general has no necessary relation to the Socialism of the International Socialist Movement, but that the German government adopted it largely through anti-democratic motives. Thus Bismarck explained the German State railroad policy as follows:*

“I do not regard railways as in the main intended to be an object of financial competition; according to my view, railways are intended more for the service of traffic than of finance, though it would, of course, be foolish to say that they should not bring financial advantages. The surpluses which the states receive in the form of net profits, or which go to shareholders in the form of dividends, are really the taxation which the states might impose upon the traffic by reason of its privilege, but which, in the case of private railways, falls to shareholders.”

State Socialism has no *necessary* connection either with democracy or with Socialism. It is true that if a so-called State Socialist policy is so undemocratic as that of Bismarck, we may decide, on strict examination, that it is not State Socialism at all, but merely the ancient use of the State for the purpose of the ruling classes. On the other hand, if those ruling classes feel sufficiently secure in the control of the State they may systematically increase its industrial functions and its control over industry without demanding any direct or immediate profit to their private industrial enterprises, i.e., they may adopt a genuine State Socialist policy. They may feel sufficiently secure in other special privileges offered to them by the State, such as subsidized educational opportunities beyond the economic reach of the masses or even of lower middle class (except in relatively rare instances), followed by admission to the enormous and varied Civil Service, which is open to those who have secured

* Quoted in Elmer Roberts' *Monarchical Socialism in Germany*, pp. 11, 12.

such educational privileges. Educational privileges may automatically be granted, the most expensive being practically open only to the well-to-do classes, while the next most expensive are almost exclusively open to the upper middle classes, etc.

On the other hand, a so-called State Socialist policy under the control of a democratic government consisting of small private producers, such as that of New Zealand, may be used chiefly as a means of subsidizing these small producers at the expense of the State and other social classes; this, of course, would mean that this "State Socialism" was being used in order to increase the relative strength of private as compared with governmental industry. But, again, the same policy of extending the economic functions of the government carried out by the same State of small producers might indeed become an example of genuine State Socialism, for the small producers might feel that they were in sufficiently secure control of the government and that their economic status was sufficiently certain so that a satisfactory major share in the benefits of government industry would come to them automatically without any subsidy, even in the most indirect form, for it might be their belief that the offices and other emoluments of the State would fall largely into their hands.

The Fabian Research Bureau, however, contends that, when all countries are considered, the influence of State and municipal management of industry on the governmental organization of each country, though still very incomplete, seems so far as it goes, to be on the whole democratic, and that, with the alteration of function, governments tend to change in spirit, progressively discarding the authoritarian conception of dominion with its correlative of obedience to coercive law; and adopting, instead, the more modern conception of National Housekeeping, with its correlative of conformity to the common rules designed only to secure the common comfort.

It also reaches the conclusion that there is a steady trend through the world toward increasing political democracy and that the more a government engages in industrial activities as contrasted with functions merely of police and national defense, the more essentially democratic does the administration tend to become.

The well-known fact is here emphasized that there is by no means as great a range in salaries in public service as there is in private enterprise. The highest salary received by a public official in the United Kingdom, for instance, is \$15,000, while the head of the railroad or telegraph department in Germany obtains scarcely as large a reward as a Berlin banker "would think sufficient for his chef or his head gardener."

Nevertheless, the public brain worker has several advantages over his brother in private business. In most countries his tenure of position is permanent; his initial salary is comparatively high, the increases in his remuneration are regular, and he usually receives an old-age pension, etc.

The manual worker in public employ, the Bureau admits, is by no means so secure in his job as is the brain worker, though he has somewhat greater security of tenure than has the manual worker in private concerns. Governments, generally animated with the capitalistic viewpoint, have on the whole given him scant consideration, and it has only been since 1888, when the London School Board took a hand, that even the more democratic governments have begun to change their attitude. Generally the manual workers are taken at current rates, although several governments now are establishing a minimum higher than prevailing wages. In Germany certain municipalities, with the growth of the Social Democracy, have recently established the rule that their manual workers, after a few years of service, shall be promoted to permanent service and this tendency is growing.

Very little democracy in the control of public industries is thus far observed. In the French government printing shop some of the employees who are paid by the piece work, choose their own foremen, select their fellows, take responsibility for discipline and determine the rate of speed, and the method of sharing the profits. This is most exceptional, however, and in many cases all organization among the workers is prohibited. This lack of democracy and of regard for the conditions of labor of the workers—due largely to the class control of governments—is one of the things that distinguish most of the collectivism described here from the democratic collectivism which the majority of Socialists are advocating.

Of overshadowing importance is the discussion in the report of the utter failure of the governments to adjust their political machinery to the new industrial functions which are being assumed to an ever greater degree.

“Constitutions,” the Fabian report admits, “have grown up according to political circumstances, without regard to the industrial functions that the governments now undertake, and have been determined by all sorts of different considerations, dynastic or racial, revolutionary or philosophic. Even where the government is really a democracy, this democracy has been organized to fulfil the aspirations of the people as a whole; it has not been designed to represent the specific interest either of the consumers or of the producers of any of the commodities or services provided by the government.”

The democratization of governments through collectivism, then, lies rather in the future than in the past or present.

V. STATE SOCIALISM AND SOCIALISM

Nor should State Socialism or government ownership be confused with the Socialism advocated by the International Socialist Movement. Morris Hillquit, the official spokesman of the Socialist Party in America, thus distinguishes government ownership or State Socialism, as we usually find it to-day, from Socialism (*Socialism Summed Up*, pp. 73, 74) :

“Government ownership is often introduced not as a democratic measure for the benefit of the people, but as a fiscal measure to provide revenue for the government or to facilitate its military operations. In such cases government ownership may tend to strengthen rather than to loosen the grip of capitalist governments on the people, and its effect may be decidedly reactionary. Similarly government ownership is often advocated by middle-class ‘reform’ parties, for the main purpose of decreasing the taxes of property owners and reducing the rates of freight, transportation, and communication for the smaller business men.

“The Socialist demand for government ownership of industries of a public or quasi-public nature, spring from different motives and contemplates a different system than the similar demands of other parties. The Socialists advocate government ownership primarily for the purpose of eliminating private profits from the operation of public utilities, and conferring the benefits of such indus-

tries on the employees and consumers. Their demand for national or municipal ownership of industries is always qualified by a provision for the democratic administration of such industries and for the application of the profits to the increase of the employees' wages and the improvement of the service. Furthermore, it must be borne in mind that when the Socialist platform declares in favor of government ownership of certain industries, the Socialist Party at the same time nominates candidates for public office pledged to carry out these measures in the spirit of that platform. In other words, what the Socialists advocate is not government ownership under purely capitalist administration, but collective ownership under a government controlled or at least strongly influenced by political representatives of the working class."

The use of collectivism as a form of indirect taxation of the masses of the population is bound to be greatly increased as a result of the war. Not only will Russia and Germany, Japan and France doubtless continue along this well established line, but it is highly probable that Great Britain will nationalize her railroads and perhaps also her mines, largely from similar motives and with a similar policy in view. Already the "majority" Socialists of Germany (those who support the government in the war) are beginning to advocate State ownership of coal mines with this end in prospect. Both majority and minority (the latter faction has continued openly to oppose the government since the outbreak of the war) prefer that the graduated direct taxes against the wealthy should first be placed as high as possible and that the needed governmental revenue should be raised chiefly in this way. But Cunow and other members of the pro-government faction say that it will be impossible to pay all the interest on the enormous war debt in this manner without entirely crippling German industry. They do not wish to protect the individual capitalists from high taxes, but they do not care to attack them to the point of seriously weakening industry.

The British Socialists of both wings also prefer graduated taxes. But both wings urge even more strongly the nationalization of railroads, shipping, land, and mines. They do this on the assumption that the British government, while not democratic, is sufficiently democratic to make it certain that the Bismarckian "State Socialist" policies above referred to cannot be

followed in Great Britain. But the majority faction (i.e., the Labor Party, which supports the government in the war) further recognizes, as an additional argument for nationalization, the fact that graduated, direct taxes on the wealthy will probably not produce enough money to pay the war debt. On this point Sidney Webb is reported as saying (in a lecture of November 17, 1915) that the taxation of the idle rich class even to the point of extinction would be a benefit to the nation, and that a large measure of such taxation was indispensable. There was no complete alternative, but there was a *partial* alternative in "Socialism," the national control of alcohol, tobacco, railways, coal mines, banks, insurance, and the investment of new capital.

As government ownership is a policy of many years standing in Germany, in which country also the Socialist movement had its earliest development, the historically developed position of the German Socialists will indicate the traditional Socialist view on the question as to when State Socialism is helpful to Socialism and when it is not. We quote from an authoritative article published in *Die Neue Zeit* in 1913 ("Social Democracy and Government Ownership," by H. Laufenberg):

"Bismarck made public the tremendous scope of his monopoly plans. The railroad project alone was of vast importance to German parliamentary government. He who believes that it is a question of private or state railroads misjudges the situation entirely, declared Eugene Richter. 'It is a matter of centralization for which there is no precedent in all Europe.' The power of the government derived from the railroads would be transferred to other departments. With the railroad project of the government accomplished, budget control by the Reichstag would be but idle mockery. What effective criticism could be made of a railroad budget of 800 millions that extended credit to a minister and the power to make loans, exempted him in his financial operations from the consent of the Reichstag, and limited the authority of the Reichstag to the approval of laws?

"It is true that when the project arose several of the Rhenish social democratic leaders approved of the state ownership of railroads. The second Socialist congress at Gotha also declared itself as a matter of principle in favor of the government ownership of railroads, as the private system was creating an unjusti-

fiable monopoly by means of which the private owners were able to exploit the public at their pleasure. On the other hand, the actual realization of the proposed project would not only grant the Imperial Treasury control over new tracts of public property, but the government also, once in possession of all railroads, would promote chiefly the interests of the aristocratic and military classes, apply the revenue to unprofitable ends, and beyond that obtain a new predominance unfavorable to the masses. For these reasons, the congress was not able to favor the plan.

“But Bismarck’s plans went far beyond the railroad project. Already at the time of Camphausen’s proposed tax bills in 1878, which aside from the introduction of a national stamp revenue, provided for a considerable increase in the tobacco tax, he declared, to the amazement of all, that he regarded an increase in the tobacco tax as a transition to a tobacco monopoly. Here also the position of the party was indicated in the resolution of the congress of 1876. Fritzsche addressed the Reichstag on behalf of the party. The proposed tax on weight, he asserted, would strike the poor consumer all the more, as the cheapest grades would be burdened the most and the greatest obstacles put in the way of their manufacture. The monopoly was not a socialistic measure as was being falsely asserted by liberals. Government ownership and Socialism were entirely different. Social democracy was demanding co-operative organizations of production and consumption as well as state regulation of the distribution of property. ‘We could not expect that the present government would be able to effect, in a just way, the distribution of that which had been produced in a branch of business monopolized by the State. Social democracy, on general principles, would have to express itself as opposed to such monopolies for the very reason that it desired not governmental but rather co-operative regulation of labor. But that would be an entirely different matter than if we desired to grant to a definite government the sole right of labor contract. We do not wish to put a new employer in place of the many present employers, and one indeed who could abuse his control over the employees in a most reactionary manner.’ . . .

“The point of view of the social democrats was presented

next by representative Schuhmacher. The alcohol monopoly would be unsuitable for essentially limiting the consumption of liquors. 'Under certain conditions, we would even help the present government towards State control, if it were a question of common welfare institutions. But with regard to spirits, if by means of State control it is designed to draw millions upon millions out of the lower classes, we cannot help.' The main speech at the second reading was again delivered by Vollmar. 'After the complete failure of the bill, the chancellor had spoken unusually provokingly against the Reichstag, designating the necessity of looking to the representatives of the people as an unparalleled humiliation and even threatening, if the opposition continued, that the German princes would regret having surrendered part of their rights and the "eternal union" of the empire would have to be revised by higher authority. These were not the words of a constructive statesman but rather those of a dictator. Moreover they would have liked to have had the social democrats present the bill. Arguments were not lacking which sought to convince me and my associates that the liquor monopoly was something entirely socialistic and consequently it was our duty to act in behalf of the same; and that if we were to do this, we could very well attach our own terms to it. Our terms would be met as far as it was possible to accept them. . . . But my party once and for all cannot be had for such makeshifts. From the very beginning we shall meet the proposals of the government with the greatest distrust, and shall hardly ever be able to accept them, as long as the government opposes us in the way it now does. The social democrats will never shake the hand which oppresses the people.' "

The Erfurt program (of 1892), to be sure, does not yet take this problem into consideration. The question whether, and in how far, the basis for the co-operative production can be laid during the present system by means of State control, is not touched upon. It contains, on the other hand, several demands, the consequences of which would result in State control. Free dispensation of medical attendance must become a part of State control of medical science, free legal advice must lead from a partial to a complete government monopoly of the whole

legal system, and the taking over by the government of all labor insurance must lead to the socialization of the whole insurance system.

The possibilities therefore of a difference in opinion on the question of State ownership are contained in the program itself, as was already apparent in the early nineties at the time of the debate between Vollmar and Kautsky. According to the former's version, as he expressed himself in a speech on the tobacco monopoly, much stress was to be laid on the sovereignty of the State in controlling the whole system of political economy, "so that not only the regulating of the whole relation between employees and employer belonged to the State, but also the taking over of the manufacturing industry under its own management for its own immediate operation. Social democracy, therefore, had no reason to fight against the principle *per se* of State ownership. On the contrary, had not a series of regulations for a gradual preparation of a better social organization been inspired by us and finally adopted, which might very well be designated as government ownership." Against this Kautsky's rebuttal was directed. Vollmar's statement might very well apply to such interferences by the State as are intended to end the class struggle between the bourgeoisie and the proletariat and to bring about social peace and the reconciliation of classes, while an independent and powerful monarchical government ruled over the classes, giving to each its due. In fact no matter how the problem is viewed from the standpoint of legal philosophy, government ownership is possible, for the present, not according to labor's viewpoint, but only according to the bourgeois viewpoint and in capitalistic form. Just as stock exchange transactions already separate management from ownership, just so a State monopoly is the last and to a certain extent the highest form of production and ownership in the capitalistic system, and by its destruction of the legality of private ownership in products it truly spreads Socialism effectively. Yet on the other hand it allows interest and rents to remain untouched, thereby not wiping out the basis of class rule but only postponing it. The problem, therefore, resolves itself into a practical question of politics for the labor class, whether in an individual case and in the near future, government ownership of a part of production would or

would not affect favorably the social position and economic movement of labor.

The drafts which contained the additional proposals inserted by the Frankfurt faction demanded the complete State ownership of all important branches of industry. The government also was to take over all insurance on personalty and realty, as well as all mortgages and realty debts, and the plan advanced by the South German committee proposed the systematic organization of food supply under the progressive regulation of the government (asserting that its authority over agricultural products and the disposition of these products would also gradually give the State control of agricultural production). Vollmar's most determined critic, Kautsky, makes a series of proposals of government ownership in his agrarian discussion, as, for example, State control of hail and cattle insurance, of school, charity and road systems, of medical attendance, of water power and forests, and recommends a series of regulations, for example, the fixing of lease rentals by the courts, the dissolution of estates and hunting preserves, and the general limitation of private rights; all of which would be in preparation for government ownership of all real estate.

The social-democratic division of the Reichstag repeatedly supported the idea of government ownership of pharmacies. Likewise they advocated government control of the private insurance system. . . . Social democracy, furthermore, at the time of the discussion of the bill providing for cattle and meat inspection, advocated that the expense of inspection be taken from the public funds and that an obligatory government cattle insurance system be introduced. . . . Social democracy intervened in the field of transportation in behalf of an expansion of operation by the State and centralization of the provincial monopolies into a central government monopoly. It opposed the subsidizing of ocean steamship lines, which would be of advantage to the stockholders alone. On the other hand it voted for the bill which gave the government the power to regulate the telegraphs.

In contrast to the attitude at the close of the seventies, social democracy favored the taking over of the railroads by the government, at the party congress in Mainz (1900). As the transportation policy in Germany lacked a uniformity in organiza-

tion and was being conducted without effective influence by representatives of popular opinion, and with reference to the financial point of view only, and since all relief in transportation was being denied by other methods, a uniform German Transportation policy was proposed for the taking over of the railroads by the government, effecting the overthrow of the administrative principle which had been chiefly fostered in Prussia. On the other hand the development of a river transportation system was advocated only in case of necessity, as there were no reasons for operating the business of the Rhenish-Westphalian industrial magnates. . . .

The Potassium Chlorate Law originated in the war of competition in the trustified industry. At the time of the failure of the old potassium chlorate syndicate, which was primarily caused by the intervention of American capital, the government attempted to put into operation a compulsory syndicate. The bill which came before the Reichstag, in January, 1910, was designed principally to give compulsory validity to the syndicate statute. Social democracy could point out in its proposal of complete State ownership which was presented to the commission, that the government had pursued the same aim for Prussia in 1894. But the middle-class parties declared that they would have to reject this proposal on account of the enormous amount of damages involved. The government monopoly proposed by the social-democratic members of the committee was rejected also.

The bill accepted, valid until 1925, takes the place of a compulsory syndicate. The maximum price for the domestic market, which at the same time represents the minimum price for foreign sale, has been fixed. In pursuance of a social-democratic proposal, receipts and expenditures would have had to appear in the budget estimate. Social democracy had also proposed a series of resolutions for the protection of labor. For this reason the federal council was to be obliged to demand the making of rate agreements fixing minimum wages and maximum hours, the schedule of which was to be determined by an appeal commission, provided for in the law. As finally passed, the measure decided only that those manufactories which, in comparison to the average of 1907-1909, had lowered the annual average wage or lengthened the working hours,

had to submit for the next year to a proportionate curtailment in profits.

It was a tax law which hastened the formation of trusts in the industries dealing with articles of consumption—especially liquor and cigarettes. The same was true of the match industry. The government at the time of the tax robbery in 1909 proposed for a second time a spirits monopoly. Purchase and sale of spirits and in connection therewith the refining and denaturing of it—in fact, the entire commission business—were to be taken over by the government; on the other hand, the production and further manufacture of that disposed of by the government was to be left to the outside trade. The revenue derived from the spirits tax would have been increased a hundred millions annually, while the old dole would have remained in force for the landed proprietors. The project, like all the tax robberies, met with the determined opposition of social democracy. State ownership of the designated industries carried with it the danger that the past profits of the manufacturer would be transformed into secure State taxes, and, according to Bismarck's usage, the doors would be opened to usurious practices against the consumer. Yet, on the other hand, government control could also serve to unburden from taxes the important necessities of life and to provide for a real widows' and orphans' insurance law. It might happen, as at present is the case with petroleum and threatens to be in the cigarette industry, that the domestic market would fall under the control of foreign capital and the price be fixed. One way or another, social democracy will not reject government control so long as assurance is given that in fixing the price the interests of the consumers will receive due consideration, and that labor organization will not be restricted.

The intellectual leaders of the two wings of the party today take the same view. Like Bernstein, Kautsky admits that nationalization, and still more municipalization, usually means progress: "In general it can be said that government monopolies present considerable advantages over private monopolies."

Kautsky shows how little may be expected from the impending nationalization of certain private monopolies. If the coal mines, for example, were bought out without any confiscation,

the State would have to pay a colossal price. This would force it to continue the present monopoly prices for coal. And it might even have to raise them, for it would have to pay the present market value for the mines, which is based upon the expectation of a still higher price in the future.

Now if nationalization were carried through for the express purpose of furnishing *additional* governmental income, the prices would have to be raised higher yet. "Such an increase of prices would have the same effect as an ordinary tax on consumption when placed on a necessity or on an indispensable means of production."

"The situation at the close of the war will be of the very kind to increase all the dangerous sides of governmental monopoly and to prevent all its good sides from going into effect. We must certainly expect attempts to introduce governmental monopolies. We shall have to use all our power, if they cannot be prevented, to see to it that their features which are opposed to the interests of labor and of the consumer are restricted." [Karl Kautsky in *Die Neue Zeit*, March 7, 1915.]

VI. STATE SOCIALISM AND NATIONALISM

Does State Socialism, hitherto always on a national basis, lead in the direction of nationalism or in the direction of internationalism? State Socialism undoubtedly tends to make of each nation a single economic unit. At the present time, a certain number of the separate economic interests of each country are still international, since the above-mentioned process of unification is still in an early stage. If any nation finally becomes a single economic unit, it is obvious that the existing international interests will disappear. As private capital would be largely nationalized, this process would nationalize also that part of private capital which is at present more or less international. Thus one-half of our question is readily answered. The effect of State Socialism *negatively* is to increase the area of national capital and so—automatically—to decrease the area of international capital.

On the other hand, a part of the capital that is being abolished by State Socialism is, in private hands, among the most aggressive of the nationalistic forces of the present period. For one of the chief foundation causes of modern international conflicts has been the pressure which big business interests, investing in undeveloped countries, have brought to bear on the governments of their respective lands to dominate these territories politically in order to further such investments. The nationalization of *this* private capital can scarcely make it more nationalistic than it is today. On the contrary, such nationalization would remove one of the chief sources of aggressive nationalism. Moreover, the capitalistic interests that manufacture armament and favor wars to capture foreign markets do not as a rule pay a large part of the costs of such armament and wars. Even if a war is successful and does not cost too much, so that it results in temporary economic gain, in some measure shared (especially through the nationalized industries) by the whole nation, these particular private interests lose less and gain more than anybody else.

Nationalization in certain industries, then, tends to lessen economic nationalism, namely, in the exporting and armament industries, while in the other industries nationalization tends to increase nationalism—since it is obvious that to give all the people a somewhat larger share in the profits of the nation's business will make many of them more ready to support the nation in its economic struggles against other countries.

Does State Socialism set on foot any new economic tendencies leading *positively* (i.e., without regard to its negative effect on private capital) either in the direction of internationalism or in the direction of nationalism? In the volume on *International Government*, published by L. S. Woolf and Fabian Society (1916), the claim is made that there are already certain tendencies—rather feeble—it is admitted, in the direction of International State Socialism. For example, the railways of the various countries are very intimate and the international traffic large. Therefore a series of international agreements as to this traffic has arisen which Mr. Woolf suggests may be the nucleus of still further agreements of the same, or of a similar, character. Woolf says (*International Government*, p. 216) :

When two States with a common boundary have reached the stage of civilization which France and Germany had attained in the last century, complete independence of railway administration is incompatible with the modes of life and the requirements of the men and women who are called Frenchmen and Germans. An imperious Franco-German interest accordingly arises which requires the abolition of the national frontier so far as the railway traffic in men and goods is concerned. That "through traffic," under such conditions, should be impossible would be felt to be an absurdity and an anachronism. And this applies to nearly the whole of continental Europe. "Through traffic" becomes an international interest. But this international interest is not compatible with many "vital national interests," for it can only be properly served by the internationalization of railway administration and the substitution of international for national government.

The first step towards such a substitution was taken in 1878, when an international conference met at Berne. A second conference was held in 1881, a third in 1886, and a fourth in 1890. The fourth Conference resulted in the signing of a Convention internationale sur le transport des marchandises par chemins de fer by nine States—Germany, Austria-Hungary, Belgium, France, Italy, Luxemburg, Holland, Russia, and Switzerland. The Convention internationalizes the administration of railways so far as concerns the transport of merchandise, and effectually abolishes the independence of national administration. This can best be shown by giving some of its more important provisions:

(1) The acceptance and transport of all merchandise, other than certain defined class, is obligatory on all railways, provided that the consignor conforms with the requirements of the Convention.

(2) A uniform system of through transport is established under a "lettre de voiture." Detailed uniform regulations as to the form of the "lettre de voiture," and as to the packing, transport, etc., of certain articles, the recovery and payment of charges, the settlement of accounts between railways, are imposed upon all administrations.

(3) The responsibility of administrations for loss or damage is established. The amounts recoverable from railways for delay are fixed.

(4) The court competent to try cases is the court of domicile of the railway, but all judgments are executory in all the signatory States.

(5) Disputes between railways are, on the demand of the parties, subject to arbitration of the Bureau.

The Convention has thus applied international administration to the transport of merchandise. The results have been so satis-

factory that a proposal was soon made to extend the international system to passengers and baggage, and a draft Convention was under consideration when the great war broke out. But in another direction the further internationalization of railway administration has been found to be both necessary and possible. On the Continent modern conditions of through traffic require some uniformity of gauge and rolling stock, and in 1882 a Conference for the "Unité technique des chemins de fer" met in Berne. Two further Conferences were held in 1886 and 1907. Conventions have been concluded at these Conferences, and have been ratified by nearly all the Continental States, regulating for all railways:

- (1) The maximum gauge.
- (2) The construction of rolling stock.
- (3) The loading and marking of wagons.
- (4) The type of lock on carriages used in the international service.

Woolf presents in further support of his argument the example of certain navigable rivers which it has been found necessary to internationalize more or less. The chief examples are the Rhine, the Danube, and the Scheldt, which were supposedly internationalized in part by the leading European treaties of the nineteenth century. Many others of the world's largest rivers were also covered by various international agreements, including so many of the most important commercial rivers that it is not important to list them. However, we see in the present war that the status of some of these rivers is one of the chief causes of international hostility and of the increasing economic nationalism which we observe in all directions.

Similarly, Emil Davies, another leading member of the Fabian Society, in his *Collectivist State in the Making* (1914), gives us examples of the international trading of State enterprises, allowing us to infer that a more rapid development of the same character lies immediately ahead of us. Mr. Davies says:

The growth of State monopolies and State manufactures has led, and is inevitably leading further, to a certain amount of international trading. The Post Offices, of course, do a vast amount of international exchange, and the Universal Postal Union in Berne acts as clearing house. Reference has already been made to the export of the agricultural implements manufactured by the Hungarian State Railway workshops. In this connection it is interesting

to note that in 1911, when the Roumanian State Railway administration called for tenders for a large number of locomotives, the competition was international, offers being submitted by British, American, Belgian, and German manufacturers. Among these tenders was one from the Hungarian State Railway workshops. As it happened, the order went to Germany, but the fact that the Hungarian State Railway workshops are actually competing in this manner with the world's locomotive builders is significant. International collectivist trading, however, goes further than this. In 1909 the Austrian State tobacco monopoly signed a contract with the Roumanian State tobacco monopoly, whereby the latter undertook to supply the former with 2,000 tons of tobacco annually. The Hungarian State salt monopoly in 1909 contracted to supply the Servian State salt monopoly with no less than 7,000 tons of salt per annum for 10 years, and this same Hungarian salt monopoly does a large export trade with Russia, West Africa, and Brazil.

On the other hand it may be said that, whereas private capitalists often transfer their capital from one nation to another, and even change their place of residence, a nation as a whole does not usually invest its capital in a foreign country, unless it is a colony, a political or economic dependency, or an ally whose military and economic strength it is purposed to develop. As an example, the foreign investments of France might be cited. These have usually been placed largely with a view to political considerations, a very great part going to Russia and very little to Germany, Austria, or other political antagonists—other countries being favored largely in proportion to their political and economic importance to France.

Similarly, the railway policy of practically all countries where the roads are under governmental control is developed with the idea of encouraging, or practically subsidizing, export business, so as to be able to capture foreign trade from other nations. Such subsidies must of course be paid for in some way by the whole nation making them. For example, we read in Elmer Roberts' *Monarchical Socialism in Germany* the following summary of the German railway policy:

The Bundesrat in railway matters acts under general instructions agreed upon by the federated governments as follows:

1. The advancement of the internal industrial and agricultural production by cheapening the cost of raw materials or equipment for production.

2. To facilitate the export of German products.
3. To support the trade of German commercial centers.
4. To favor German railway lines against competing foreign waterways and railways.

The other countries where railroads are under governmental control have acted similarly. Such subsidies may be considered either as a bounty on exports or as a subsidy to shipping, for it is usually arranged that goods shall be carried on the ships of the exporting nation.

Government ownership, or even government control, of shipping by means of subsidies and regulations, acts still more evidently to intensify the spirit of economic rivalry between nations, and consequently increases (inevitably) economic antagonism. We have quoted in our section on shipping the criticism of the Senate minority opposing the Ship Subsidy bill, showing a clear recognition that governmentally owned ships would be far more likely to draw a nation into war over shipping rights than would privately owned vessels. If the shipping of the world becomes even more closely controlled by governments than at present—possibly it will be partly owned and operated by governments—the danger of military conflict will be increased, unless, or until, some new economic organization of the world intervenes by which effective international economic control can be exercised.

If government ownership is further extended in the directions indicated by the evidence in the present volume, a very considerable amount of goods may soon be exported from government factories, as is already the case in Hungary and other countries. But it seems highly probable that such exportations will be sent only to allied or dependent countries until some international economic organization comes into existence of such a widespread character as to dominate the world as a whole.

General international organization and control of shipping seems very far away, but it may be pointed out, parenthetically, that there have appeared since the beginning of the war certain limited but very definite and concrete examples of a tendency in this direction. For example, Great Britain has responded to the demands of France and Italy and others of her allies by permitting them to share very largely in the benefits of her

present rigid governmental control of shipping—which amounts almost to governmental ownership and operation. The present British control is to last only during the period of the war, but we have to note that the Entente Economic Conference (Paris, June 14 to 17, 1916) decided that one of the most important of “permanent measures of mutual assistance and collaboration among the Allies” after the war would be the common establishment by their governments of “direct and rapid land and sea transport service at low rates.”

In fact, a large part of these economic recommendations of the Allies point clearly in the direction of International State Socialism. We may quote:

“The Allies have recourse either to enterprises subsidized, directed, or controlled, by the governments themselves, or to the grant of financial assistance for the encouragement of scientific and technical research and the development of national industries and resources; to customs duties or prohibitions of a temporary or permanent character; or to a combination of these different methods.

“Whatever may be the methods adopted, the object aimed at by the Allies is to increase production within their territories as a whole to a sufficient extent to enable them to maintain and develop their economic position and independence in relation to enemy countries.

“In order to permit the interchange of their products the Allies undertake to adopt measures for facilitating their mutual trade relations both by the establishment of direct and rapid land and sea transport services at low rates, and by the extension and improvement of postal, telegraphic, and other communications.”

There have already appeared some signs of an international economic organization, beyond all question. If this economic integration of the nations develops more rapidly than State Socialism on a purely national basis, then such State Socialism would be working in the direction of internationalism—but apparently not in any other case. The probability seems to be that we shall have a period of aggressive economic nationalism intensified by nationalistic State Socialism, followed by a gradual development of economic internationalism. At present we are still confronting the former development. Thus the National Foreign Trade Council seeks to arouse the economic nationalism of America by the following accurate summary of the economic

after-war policies already outlined by the European belligerents:

[From report on "World Trade Conditions After the European War," by National Foreign Trade Council, submitted to the Fourth National Foreign Trade Council, Pittsburgh, Pa., Jan. 25, 1917.]

"The present fact is that two European economic alliances have been created, for the war abrogated the most favored nation relation between the powers which are now enemies. If the members of either the proposed Entente or Central economic alliance seek by differential tariff duties to prefer each other and their respective colonies, a discrimination against the products of the United States will automatically be created.

"If special shipping arrangements are carried so far as to artificially group lower rates for Allies than for neutral commerce, the parity of ocean freight charges to and from American ports, as compared with to and from European ports, which has been one cause of toleration of American dependence upon foreign carriers, will be disturbed. Co-operation replacing individual effort may be the general industrial result of the war in Europe.

"To shorten the period of reconstruction the following policies have been proposed or discussed:

"1. Rebuilding destroyed buildings and factories with governmental aid in money and materials.

"2. Supply of necessary machinery and raw material for industry by government.

"3. Allocation of labor through governmental employment agencies.

"4. Monetary assistance to manufacturers and artisans.

"5. Distribution of seeds, animals, and machinery to farmers.

"6. Restriction of imports to necessity, and control of shipping in conformity with such policy.

"To carry out this program governments will have to make reconstruction loans. To secure best results for the money expended, necessary foreign buying of materials will be done on a national co-operative basis. To rectify their foreign exchanges and secure an income for their industries, independent of the home market, European nations have generally announced their intention to further support the foreign trade of these industries by a program including the granting of rebates in buying raw materials, and for transportation, co-operative exporting by groups of manufacturers and special financial assistance to exporters. Steps already taken indicate the following tendencies:

"Exclusion of as much as possible of the profit of the foreign exporter.

"Elimination of the necessity of buying raw materials from

enemy countries and replacement, where possible, of manual labor by mechanical energy and a larger employment of machinery."

The only confusion in this statement is that it uses the word co-operation in two senses—(1) the voluntary co-operation of business interests, and (2) collectivism—a tendency that the writers evidently fear, even to the point of avoiding the word. However, the meaning is clear upon careful reading. And even the Foreign Trade Council proposes to combat this collectivism, in the case of shipping, by a counter-collectivism. It proposes to answer economic nationalism by economic nationalism, *though it also favors a "bargaining tariff" which is the basis of tariff reciprocity and of economic internationalism.*

Finally, "State Socialism" has certain indirect but extremely important psychic effects that should also ultimately greatly hasten the development of internationalism. It suppresses anti-social individualism most thoroughly. In developing the principle of national solidarity, "each for all and all for each," within the nation, it may pave the way for international solidarity. When the economic basis for internationalism (international trade) will have been sufficiently developed, this psychic preparation may hasten the advent of international State Socialism.

PART I
FINANCE

CHAPTER I

CENTRAL BANKS

A LARGE number of different financial functions are undertaken by banks of various types; only a few of these functions are undertaken by all banks. It is difficult to say whether governmental banking before the war had made more progress in the narrow sense of the word, or in regard to certain financial operations related to banking, or in specialized types of banks. We give special attention to savings banks and agricultural banks because governmental progress in these fields has been most obvious. But the great central banks of Europe, such as the Bank of England and the Bank of France—though in practice largely restricted (before the war) to banking functions in the narrow sense, together with functions in which they serve as fiscal agents for the government—have a field of *potential* operations almost without limit. In some directions this potential field was clear in existing pre-war legislation, a summary of which we produce. In other directions additional legislation is necessary—though the war has shown that it may easily and quickly be provided—in view of the already enormous power of these banks.

Sometimes the power of a government over banking is exerted without the establishment of any definite institution. For example, the governments of France and several other European nations exercise a strong control over the foreign investments of their citizens by regulating the admission of securities to their Stock Exchanges. The largest private banks of France, such as the *Crédit Lyonnais*, undertake (separately or together) loans to foreign governments. But they must first secure the consent of the French government—which is controlled by political and military, as well as financial, considerations—or the securities cannot be listed and the French investors will not purchase the loan. Thus the surplus capital of France is nationalized and prevented from following a free international course—certainly

a governmental banking regulation of the first magnitude, and one that largely determines from day to day the policies of the largest "private" banks of France.

Perhaps it is unnecessary to remind the reader that the business operations of central governmental banks, however large, are of secondary importance when compared with the direct control and indirect influence they exercise from day to day over all other banks. The following quotations should be read with this fact in view. It should also be noted that the largest powers of these banks were in most cases only partly exercised—until the war.

THE UNITED STATES

[SOURCE: *The Federal Reserve Board*, by H. Parker Willis (Secretary of the Board), pp. 124, 125, 160, 161.]

Of the central banking systems, so-called, the French system may be taken as a fair example. In these a central banking institution acts as the holder of reserve money and usually as the sole issuer of notes for a nation. Such a central institution may have a good many branches or may not. It usually deals, however, in the largest measure, with other banks, leaving these banks to do the business with individual customers. This latter point is not a universal characteristic, as seen in the case of the Bank of France, which loans to individuals in very small amounts. Whether it does its work through direct loans to individuals or through intermediation of other banks, however, central banks of the kind already spoken of directly influence the market and *practically control rates of interest*. [Our italics.]

In two important respects the Federal reserve bank organization is peculiar. These are as follows:

(1) Owing to its close relation with the government each Federal reserve bank has a special officer representing the government, who is chairman of its Board of Directors and who is designated as "Federal Reserve Agent."

(2) Every Federal reserve bank confines its discount business to other banks, a fact which at once alters the type of organization of the institution in some important particulars.

We may now survey the outline of organization of the Federal reserve bank as such. The fundamental control of the institution is in the hands of the Board of Directors, consisting of nine members. This Board of Directors consists of three classes, each con-

taining three members and each class being designated by a letter, as A, B, and C. Class C directors are nominated by and represent the government. Class B directors are business men not engaged in banking, who are presumed to represent in a general way the industrial, commercial, and agricultural interests of the district in which the bank is situated. Class A directors are directly representative of the banks. Both Class A and Class B directors are chosen by the banks, and for the purpose of this selection the banks in each district are divided into three groups: group one chooses one Class A and one Class B director, group two the same number, and group three the same. In group one the voters or electors are the banks of large capitalization, *group two those of medium capitalization*, and group three the small banks. The chairman of each Board of Directors divides the banks of the district into these three groups in such a way as to place an approximately equal number of banks in each. Each bank has one vote, irrespective of its size. The group division, however, prevents the small banks from electing men who represent them exclusively and insures *approximately equal representation to banks of somewhat greater size*. [Our italics.]

[SOURCE: Address of W. P. G. Harding, Governor Federal Reserve Board, before the Forum of the New York Chapter, American Institute of Banking, N. Y., Nov. 1, 1916, pp. 3, 6, 8, 9, 13, 14.]

An intelligent treatment of this subject seems to require a brief review of our banking history during the past two years and an analysis of present conditions, out of which reasonable deductions as to the future may be based. The fundamental principle of the Federal Reserve Act is the mobilization, in a scientific and effective manner, of the banking reserves of the country, not in one central reservoir, but in a number of them, distributed throughout the various sections. This process has not yet been fully accomplished, but is approaching completion. The next installment of reserves, which is the last that will be obligatory, and which will amount to about \$60,000,000, will be paid in on November 16. According to the most recent statement, October 28, 1916, the twelve Federal Reserve Banks held \$407,955,000 in lawful money, while the national banks of the reserve and central reserve cities, on September 12, 1916, held \$515,690,000. These last named institutions held \$671,768,000 according to the last statement issued before the organization of the Federal Reserve Banks. There is, of course, no basis for comparison between these figures and those applicable at the present time, owing to the great industrial and financial changes which have taken place

during the past two years; and, as bank deposits are subject to the influence of external changes of various kinds, it is obvious that any attempt to isolate the effect of the establishment and operation of the Federal Reserve System upon these holdings of cash would be useless. We can, however, say with certainty that there is to-day a co-ordinated and efficient system of reserves available for the ordinary requirements of member banks, as well as for their necessities in times of stress.

Methods have been provided whereby legitimate and conservative borrowers all over the country can obtain accommodations at rates approximating a standard on the kind of paper they have to offer and are relieved of the necessity of paying more in the proportion that they are able to demonstrate their own responsibility and solvency. The advantage of this reduction has been most appreciated by the small business man, who in the past may have been unable to obtain the rate of interest to which the character of his paper and his own personal standing, efficiency, and general condition of solvency entitled him. Besides meeting the needs of the general public and of the business community, the Federal Reserve System has rendered also a direct and important service to the banks themselves, not only in making it safer for them to do business, but in actually extending their field of operations and their avenues for profit. Three distinct lines of business are now open to national banks from which, before the passage of the Federal Reserve Act, they were absolutely barred. As you are well aware, national banks are now permitted to do an acceptance business, making their acceptances either against transactions involving the importation or exportation of goods, or against certain domestic transactions, as provided by the Federal Reserve Act and defined by the regulations of the board. Then again, wherever not contrary to State law, national banks may, by conforming to certain regulations, exercise fiduciary powers, which functions were formerly forbidden them. Finally, the new law has enabled a large proportion of the national banks to make loans under safe and conservative conditions upon real estate, not only upon farms, but also for periods not longer than 12 months upon other kinds of improved property.

We are no longer a debtor nation. Our current obligations to Europe were liquidated many months ago. We have already absorbed the larger part of the American securities that were held in Europe when the war broke out, and our advances to other countries now exceed \$1,900,000,000. Furthermore, our exports to foreign nations are now in so vast a volume as to render full and immediate settle-

ment in gold impossible. We are absorbing every month more than the world's total new production of gold, and we are receiving large sums from the hoarded stocks of nations now debtors to us. But even with this, large credits are necessary to sustain our exports. Through force of circumstances the United States is now the world's banker and must continue to act in that capacity for a long time to come, and if we make proper use of our opportunities we can remain permanently at least as one of the bankers of the world. We must expect to be called upon abroad to render much of the service that has hitherto been performed very largely by England in extending those short-term credits which the world requires in the production and transportation of all kinds of goods. The nature of the acceptance business is such that it can best be carried on by those countries that have the lowest discount rates and have the freest and most reliable gold markets.

Hitherto the country enjoying these facilities to the greatest degree has been England, and partly for that reason and partly because of her command of the carrying trade she has been able practically to monopolize the short credits which her bankers had handled through the medium of acceptances. While we have an opportunity now to extend our business with all nations, including particularly those neutrals whose accustomed credit facilities have been cut off or curtailed, the services we render must necessarily redound to our own benefit from a banking standpoint, not only because the extension of proper credits is a sound and profitable business, but also because the establishment of an acceptance market, made up of traders and bankers from all over the world, will bring to us a new element of great strength. The proper financing of our foreign trade ought to prove a most efficient means of protection for us, whenever the golden tide now flowing so strongly toward our shores begins to ebb and finally to turn the other way, running out perhaps so fast as to reveal rocks and shoals whose existence we had forgotten. *Under such circumstances, by the simple process of raising our discount rate we should be able to force foreign debtors to finance themselves elsewhere and to pay us off.* [Our italics.]

The law empowers the Federal Reserve Banks, with the consent of the Federal Reserve Board, to open and maintain banking accounts in foreign countries and to appoint correspondents and establish agencies in such countries for the purpose of purchasing, selling, and collecting bills of exchange, and to buy and sell with or without their indorsement, through such correspondents or agencies, bills of exchange arising out of actual commercial transactions hav-

ing not more than ninety days to run, and which bear the signature of two or more responsible parties.

The business of the Federal Reserve Banks as fiscal agents for the United States Government is not yet fully developed. So far they are acting in a limited way only as fiscal agents, but in the future financial operations of the United States Government the Federal Reserve System will stand ready to discharge the duty of providing for issues of bonds, arranging for the retirement and refunding of existing indebtedness, and such other financial operations as may be necessary from time to time. Its functions in the handling of routine business for the United States Treasury and the subtreasuries will no doubt be extended, as the Federal Reserve Banks become better able to render this service.

One important result of the clearing system has been to bring the member banks into more frequent and intimate contact with their Federal Reserve Banks, so that the Reserve Banks are now regarded more and more *as active and potential factors* in the banking field and not so much as storage reservoirs for use only in emergencies. Very largely, no doubt, because of the abnormally low rates for money that have prevailed during the past 18 months, which have made it difficult for member banks to make satisfactory earnings, there has been a *feeling in some quarters that the Federal Reserve Banks are dangerous competitors, actual or potential, of their own member banks*, but with the development of our foreign trade and with the constantly increasing activity of our domestic business, this feeling is gradually passing. [Our italics.]

[SOURCE: "Bank of England is Named Agent by U. S. Reserve Board." Newspaper Dispatch, Washington, Dec. 25, 1916.]

The government to-day took its first formal step through the Federal Reserve Board, looking to the establishment of financial connections abroad through which it hopes to strengthen the position of the United States as a world banker and to maintain the American dollar as the standard of exchange.

Under a section of the Federal Reserve Act, the board authorized the appointment of the Bank of England as a foreign correspondent of the Federal Reserve Bank of New York, and announced that the eleven other reserve banks might participate in the agency relations.

Connections with other governmental institutions, such as the Bank of France, is foreshadowed, officials say, by to-day's action. The Bank of England is the first foreign correspondent whose ap-

pointment has been authorized since the operation of the new financial system in this country.

In a statement announcing its action the board said:

“In granting the authority to establish this agency the board has authorized the Federal Reserve Bank of New York to maintain accounts for or with the Bank of England, so that operations both in England and in the United States are possible.”

It is understood that authorization of this appointment is a part of general plans for establishing financial connections that will strengthen the United States as a creditor nation in the commercial competition which probably will result when the war closes, and to provide a ready means to offset any tendency on the part of foreign bankers to withdraw the huge supply of gold accumulated here during the war.

The action marks a radical departure from the previous financial policy of the country, inasmuch as it places the governments of the United States and Great Britain, for the first time, in direct, continual financial relationship.

The first effect, it is thought, will be noticeable in transactions which might otherwise involve the exportation of gold from this country, as the connection with the Bank of England will afford a channel through which American banks can readily purchase British notes and securities to meet any tendency toward gold exportation.

It also will tend, officials believe, to bring about a better feeling and understanding between the bankers of the two countries.

[SOURCE: Official Statement of Federal Reserve Board, March 8, 1917.]

From statements which have been published from time to time, both in the American and foreign press, there appears to be a misunderstanding of the attitude of the Federal Reserve Board with respect to investments in foreign loans in the United States. On more than one occasion the board has endeavored to remove this misunderstanding.

So far from objecting to the placing of foreign loans in the American market, it regards them as a very important, natural, and proper means of settling the balances created in our favor by our large export trade. There are times when such loans should be encouraged as an essential means of maintaining and protecting our foreign trade.

The board has already stated that its announcement of November 28, 1916, did not deal with the finances of the credit of any

particular country, but only with banking principles which it seemed desirable to emphasize under the conditions existing at that time.

The objection then made by the board was to the undue employment by our banks of their funds in the purchase of foreign loans and not to the merits of foreign loans as investments.

The board was then, and is now, of the opinion that the liquid condition of our banks should not be impaired through undue or unwise use of their resources for investment operations.

The position of the board with respect to this principle has not changed. It still takes the view that foreign borrowings should appeal primarily to the investor and not involve the use of banking resources beyond the limits of sound practice.

In view, however, of existing conditions, especially as they affect our foreign trade, the board deems it desirable and in the public interest to remove any misconception that may be left in the minds of those who read the statement issued on November 28, 1916. Since that date the country's gold reserve has been further materially strengthened and supplies a broad basis for additional credit.

The board considers that banks may perform a useful service in facilitating the distribution of investments, and in carrying out this process they may, with advantage, invest a reasonable amount of their resources in foreign securities.

So long as this does not lead to an excessive tying up of funds and does not interfere with the liquid condition of the banks, there cannot be any objection to this course.

The board did not, of course, undertake to give advice concerning any particular loan. It desires, however, to make clear that it did not seek to create an unfavorable attitude on the part of American investors toward desirable foreign securities, and to emphasize the point that American funds available for investment may, with advantage to the country's foreign trade and the domestic economy situation, be employed in the purchase of such securities.

THE BANK OF ENGLAND

[SOURCE: National Monetary Commission, Senate Document No. 492, 61st Congress, 2d Session. *The English Banking System*, by Hartley Withers, pp. 3-22.]^e

The distinctive functions of the Bank of England consist in its acting as:

1. Banker to the British Government.

2. Banker to the joint stock and private banks.
3. (a) Sole possessor of the right to issue notes which are legal tender in England; (b) sole possessor, among joint stock banks with an office in London, of the right to issue notes at all.
4. Provider of emergency currency.
5. Keeper of the gold reserve for British banking.
6. Keeper of the gold reserve which is most readily available for the purposes of international banking.

These various functions fit into and supplement one another, and though their diversity is sometimes pointed to as throwing too much responsibility onto one institution, it in fact enables the Bank to carry out its duties with extraordinary ease, and with the least possible disturbance to the financial community. By the fact that it keeps the balances of the other banks, the Bank of England is enabled to conduct the payment of the interest on the British debt largely by transfers in its books. By the fact that it keeps the balances of the government and has the monopoly of the legal-tender note issue, the Bank has a great prestige in the eyes of the general public, which it communicates to the other banks which bank with it. There is an impression that the government is always behind the Bank, and that the Bank is always behind the other banks, and this feeling has certainly done much to foster the confidence of the British public in its banking system.

A credit in the books of the Bank of England has come to be regarded as just as good as so much gold; and the other banks, with one exception, habitually state their "cash in hand and at the Bank of England" as one item in their balance sheets, as if there were no difference between an actual holding of gold or legal tender and a balance at the Bank of England. It thus follows at times when an increase of currency is desirable, it can be expanded by an increase in the balances of the other banks at the Bank of England, since they thus become possessed of more cash to be used as the basis of credit.

Examining these functions of the Bank of England in closer detail, we find that its first and most obvious one, which originally brought it into being, of financing the British Government and acting as its banker, is now perhaps its least difficult and important duty. It also, when the government has to borrow to a greater extent, manages its issues of treasury bills, or any loan operation that the government may have to undertake, such as the creation of fresh debt in time of war, or the periodical borrowing recently necessitated by the requirements of the Irish land-purchase scheme.

The variations in the amount of the government's balance at the Bank of England are a question of great importance to the outside money market, because when this balance is big the result is that a large amount of money is in the control of the Bank of England, and the resources of the outer market are thus curtailed.

The second of the Bank of England's distinctive functions—its acting as banker to the rest of the English banking community—is the one which throws upon it its most serious responsibilities and gives it most of its actual power and ease in working. The government gives it prestige in the eyes of the multitude, which considers that governments are omnipotent; the other banks give it the power of providing emergency currency by making entries in its books, and so acting as the easily efficient center of a banking system in which elasticity and the economy of gold are carried to a perfection which is almost excessive. *Nevertheless, it pays heavily for its apparently privileged position as bankers' bank.* [Our italics.] At first sight it would appear that these customers, keeping a regular balance of twenty-odd millions, which varies little and on which the Bank of England pays no interest, were a source of comfortable income and no anxiety to it. But in the first place it is obvious that a liability which is regarded as cash by the rest of the banking community requires special treatment by its custodian, and in practice it is so specially treated that the Bank of England maintains a proportion of cash to liabilities which is fully twice as high as that of the strictest of the other banks. This proportion rarely is allowed to fall below 33 per cent and generally ranges between 40 and 50 per cent, and it need not be said that this high level of cash holding tells heavily on the earning power of the Bank of England. Moreover, it is its position as bankers' bank that exposes the Bank of England to the responsibility of maintaining the gold reserve for English banking and being prepared to meet, in gold, any draft on London that any one abroad who has acquired or borrowed the right to draw wishes to turn into metal to be shipped to a foreign country.

Much more important is the Bank of England's duty as custodian of the gold store for international banking. *London is the only European center which is always prepared to honor its drafts in gold immediately and to any extent.* [Our italics.] The Bank of France has the right to make payments in silver, and uses it by often charging a premium on gold, sufficient to check any demand for it; and in other centers measures are taken which make apparently free convertibility of credit instruments optional at the choice

of the central bank. Consequently the Bank of England has to be prepared to meet demands on it at any time from abroad, based on credits given to foreigners by the English banking community, and it has thus to observe the signs of financial weather in all parts of the world and to regulate the price of money in London so that the exchanges may not be allowed to become or remain adverse to a dangerous point. The difficulties of this task are increased by the extent to which the English banking community works independently of it, by accepting and discounting finance paper, and giving foreigners credits at rates which encourage their further creation. For the low and wholly unregulated proportion of cash to liabilities on which English banking works, enables the other banks to multiply credits ultimately based on the Bank of England's reserve, leaving the responsibility for maintaining the reserve to the Bank. This it does by raising its rate when necessary, and so, if it has control of the market and its rate is "effective"—raising the general level of money rates in London.

When its rate is not effective, the Bank of England finds itself obliged to intervene in the outer money market—consisting of the other banks and their customers—and *control the rates current in it*. This it does by borrowing some of the floating funds in this market, so lessening their supply and forcing up the price of money. By means of this borrowing it diminishes the balances kept with it by the other banks, either directly or indirectly—directly if it borrows from them, indirectly if it borrows from their customers, who hand the advance to it in the shape of a check on them. The result is that so much of the "cash at the Bank of England," which the English banking community uses as part of its basis of credit, is wiped out, money—which in London generally means the price at which the bankers are prepared to lend for a day or for a short period to the discount houses—becomes dearer, the market rate of discount consequently tends to advance, the foreign exchanges move in favor of London, and the tide of gold sets in the direction of the Bank of England's vaults, and it is enabled to replenish its reserve or check the drain on it.

Finally, the position of the Bank of England, and its relation to the English money market, as a local and insular affair, may be summed up by saying that the Bank, by means of the prestige which makes a credit in its books as good as gold, enables the banking community to expand credits and make check currency as long as it is prepared to lend credit. *And the extent to which it is prepared to lend credit is only regulated by its own discretion and*

consideration for the proportion between its cash and liabilities.
[Our italics.]

Money in England is thus to a great extent a convention based on the assumption by the community that a credit in the Bank of England's books is as good as gold. This assumption the Bank cultivates by means of the high proportion of cash that it keeps in normal times.

At the same time the Bank of England is obliged by the pressure of external conditions frequently to regulate the price of money in London. This necessity for regulation is a fact which is only dimly grasped by the London money market as a whole, which frequently resents the operations of the Bank of England and contends that the price of money ought to be left to the natural laws of supply and demand. The position of the London money market, however, as the only one in which gold can at all times be obtained, to any extent and without question, clearly makes some regulation of the rates at which it is prepared to work inevitable. *None of the various items which compose the market can be expected to conduct their business with a view to the necessities of the market as a whole.* [Our italics.] If a banker wants to increase his holding of bills, he naturally does so at the market rate, without considering whether his doing so is likely to turn the foreign exchanges against London and so cause a demand on London for gold. Consequently the exigencies of their daily business, and the strong competition between them, impel the banks and discount houses to do business at rates which may sometimes be dangerous to the general interest, and it is thus clearly necessary that some institution with a commanding position at the head of the machine should occasionally intervene and regulate its operations.

GERMANY

[SOURCE: National Monetary Commission, Senate Document No. 508, 61st Congress, 2d Session. "Miscellaneous Articles on German Banking," 1910, pp. 15 to 23, inc.]

The German Reichsbank came into being on January 1, 1876, absorbing at the same time the Bank of Prussia (note bank).

The tendency, which had existed from the beginning, to centralize the note issues more and more in the Reichsbank, was furthered in a great measure by the provision which authorized the Bank to establish branches all over the Empire.

As far as its legal organization is concerned, the Reichsbank is neither a government institution proper, nor a mere private cor-

poration. The capital, divided into shares, has been furnished by private individuals, and the shares are dealt in on the exchange; they circulate indorsed in blank; the Reichsbank acknowledges only those as share owners whose names are registered on its books. *The shareholders, however, have no influence whatever on the management and administration of the Reichsbank.* [Our italics.] The Reichsbank is under the supervision and direction of the Imperial Government, which, however, is not liable for its business results. The direction is exercised by the Imperial Chancellor (appointed by the Kaiser, without confirmation by any other governmental authority) and under him by the Reichsbank directorate. The governmental supervision is exercised by a bank curatorium, composed of the Imperial Chancellor and four other members, one of whom is named by the Emperor and three by the Federal Council (the majority of which body is appointed by the Kaiser without consultation). The Reichsbank directorate is the managing and executive board, representing also the Reichsbank in dealings with third parties. The president is the head of the directorate. The president, the vice-president, and the members of the directorate are appointed by the Emperor upon the recommendation of the Federal Council. The shareholders are represented by the central committee, which is, however, essentially an advisory rather than a decreeing board. At the principal branches of the Reichsbank advisory subcommittees have been formed, composed of local shareholders. The Empire participates in the profits of the Reichsbank.

At the expiration of the first period of 15 years, the Empire deemed it sufficient to demand a larger share in the net profits of the Reichsbank. January 1, 1901, was the second term at which the privilege of the Reichsbank might have been withdrawn. Neither at that time did the government deem it advisable to make fundamental changes in the charter of the Reichsbank. The combination of private capital and state management was found to work so well that the government offered decided opposition to all efforts toward nationalizing the Reichsbank through the acquisition of the share capital by the Empire. But in view of the experiences of the past decade and the progressive economic development of the country it was deemed advisable to strengthen the given structure by increasing the operating funds of the Bank and to devise means of rendering more effective its discount policy as against that of the private banks of issue.

Beginning with January 1, 1901, the Reichsbank must not dis-

count below its official rate whenever this rate has reached or exceeded four per cent.

Beginning with this date *the private note banks are not permitted to discount below the official rate* of the Reichsbank whenever the same has reached or exceeded four per cent. [Our italics.] Moreover, their rate must not be more than one-fourth of one per cent below that of the Reichsbank whenever this rate is less than four per cent. In case the Reichsbank discounts at a rate below its official rate, at a so-called "private rate," the rates of the private note banks must not be more than one-eighth of one per cent below that rate. In case a private note bank acts contrary to this provision, its privilege of issuing notes may be withdrawn by judgment of the court.

RUSSIA (Before the Revolution)

[SOURCE: Senate Documents, Vol. 37, 61st Congress, 2d Session, 1909-1910. "Organization of Banking in Russia," by Professors Idelson and Lexis, pp. 18-23, 36.]

The main provisions of the new statutes of the Imperial Bank, which received the imperial sanction on June 18, 1894, are as follows:

Any deficit that the bank may sustain is to be covered by the surplus, and in case the surplus is exhausted the amount is to be charged to the imperial treasury, which, on the other hand, is to be credited with the amount of the net profit remaining after the above-mentioned percentages have been assigned to the bank and after deduction of bonuses and pensions to employees. The bank is under the direct control of the minister of finance, who is at the head of the management. The central administration consists of a council of the bank, a governor, and two deputy governors.

The bank is allowed to take notes not resting on a consummated commercial transaction but put forth with reference to the prospective needs of some mercantile or industrial undertaking. The rate of discount has to be fixed at least once every quarter of a year, and it may vary in the case of different kinds of business and different localities. The minister of finance may exceptionally grant an extension in the case of protested or non-protested bills or leave to pay in installments, but only if a mortgage or other pledge deemed sufficient by the council of the bank is offered as security.

The bank grants so-called industrial loans against promissory notes bearing merely the signature of the debtor, such notes being

secured either by mortgages on real estate, by mortgages on the appurtenances of farmed lands or of industrial plants, by the guaranty of third parties, or by some other collateral which the minister of finance deems sufficient. When the amount of the loan does not exceed 300 rubles the managers of the branch office concerned may resolve to grant the credit even without such special security. The industrial credit must be intended for some specific purpose indicated by the person applying for the credit and can only be granted in order to afford the borrower working capital or to enable the agriculturist or manufacturer to provide the necessary outfit for his farm or factory, or in order to afford similar assistance to the artisan, the retail merchant, or to the worker in some house industry. The machines and implements that serve as security must be of Russian manufacture. Exceptions may be made in certain cases by the finance minister, or conjointly by him and the minister of agriculture. The amount of credit allowed in the case of any individual industrial undertaking is not to exceed 500,000 rubles, and in the case of the owners of small workshops the maximum amount is 600 rubles. Loans for the purpose of procuring machinery, implements, etc., shall not run for more than three years. When the time of the loan exceeds six months, provision must be made for the repayment in regular installments. Loans shall not exceed 50 per cent of the appraised value of the articles mortgaged. Those loans which are granted for the purpose of providing working capital are not to exceed 75 per cent of the amount required in the way of such capital. The borrower must bind himself by a special document to use the money only for the particular purpose indicated and to keep up the articles that serve as security to their full value. In the case of loans of this kind the bank is authorized by paragraph 8 of the regulations to permit (with certain precautions) the articles mortgaged to remain in the hands or in the safe-keeping of the borrower.

Persons enjoying the implicit confidence of the bank may be granted credit on the security of goods other than those contained in the list prepared by the council of the bank. The security may, furthermore, be left in the possession of the borrower, and the amount loaned may run as high as 75 per cent of the value of the security.

The bank grants six months' loans on government securities and securities guaranteed by the government up to 90 per cent of their value. In the case of mortgage debentures the ratio is 80 per cent and in the case of other securities allowed by the council

of the bank it is 75 per cent. The term for which the loan may be renewed shall not exceed three months. Special accounts current are opened against the deposit of securities, the depositor being permitted to draw up to a certain sum, paying interest only on the amount that he owes to the bank. The bank may also, as far as it has any available resources left, grant credit to the governments (main administrative divisions), circles (districts), and cities. It may, in addition, by means of intermediaries, grant credit to small agriculturists, peasants, leaseholders, and artisans on the security of the products of their industry, and it may also advance money for the purchase of machinery, implements, or other equipment, or the creation of a working capital. It may likewise make advances on merchandise in transit or about to be shipped. The intermediaries may be the provincial or district assemblies, the credit institutions, loan associations, or the artels (associations of workmen) in so far as their statutes have received the sanction of the government and they are willing to subject themselves to the prescribed conditions and the supervision of the bank. Private individuals also, residing in the same place as the borrower, in whom the bank has confidence, may be made use of as intermediaries. In the case of goods in transit the intermediaries are the railways and transportation companies. The intermediaries assume full responsibility for the sums advanced to them by the bank. The zemstvos (government and district assemblies) may, however, with the sanction of the minister of finance, limit their liability to the preservation or maintenance of the goods assigned as security.

The bank takes both deposits repayable on demand and deposits repayable only at the expiration of a certain time. The conditions relative to the taking of deposits are fixed by the council of the bank with the sanction of the finance minister, and any changes must be announced a month in advance. The depositors dispose of their credit balance by means of checks and drafts.

No other state institution has hitherto attempted to grant credit to agriculturists and manufacturers so readily and with the exercise of such leniency in the event of difficulty of repayment. [Our italics.] In addition to the kinds of loans authorized by the statutes of the bank, long-term loans have been granted "by virtue of special provisions" up to large sums (even 6,000,000 to 9,000,000 rubles) for various purposes, as the support of banks, industrial undertakings, a hotel company, etc., and in aid of such undertakings as mines, harbor improvements, etc. *There is no special account of*

such loans figuring in the statements of the Imperial Bank. [Our italics.]

Schmoller remarks justly (*"Grundriss,"* II, 221) that "*the great banks that formerly existed in Russia, as well as the Russian Imperial Bank, were and are merely subsidiary organs of the ministry of finance.*" It would be a good thing if the statements of the bank were submitted to the Imperial Duma for inspection. According to the legal provisions now in force, they are examined by the second department of the council of state in closed session. [Our italics.]

[In the year 1907, deposits in the Imperial Bank were 567,000,000 rubles, in Municipal Banks 109,000,000 rubles, and in private banks 748,000,000 rubles. If we take into account the deposits in the governmental saving banks in the same year (256,000,000 rubles), we see that the government controls by far the larger part of the bank deposits of the nation.]

HUNGARY

[SOURCE: Senate Documents, Vol. 37, 61st Congress, 2d Session, 1909-1910. "The Austro-Hungarian Bank," by Professor Zuckerkandl, pp. 103, 108, 109.]

The charter of the Austro-Hungarian Bank was renewed in 1899 (by legislation in Hungary and by imperial decree in Austria) for a term extending to the close of 1910 (or, under certain conditions, to the close of 1907). The term of the charter had expired in 1897, but its provisions had twice been declared to remain in force for another year. The statutes were amended in important respects and the modifications expressed the full recognition of the claims of Hungary.

The sphere of activity of the two directorates was extended. The Austrian and Hungarian directorates were to consist, respectively, of the Austrian and Hungarian vice-governor and deputy vice-governor and of the Austrian and Hungarian members of the general council. To each of the directorates was to be attached a "central inspector" appointed by the general council, who was to be a member of the "management."

The new arrangements relative to the participation of the State in the profits of the bank were less favorable to the institution than the previous ones. Out of the net annual earnings a sum was first of all to be distributed among the shareholders equal to four per cent of the paid-in capital; after that 10 per cent of the net earnings was to be allotted to the surplus and two per cent to the pen-

sion fund; of the remainder, in so far as the total dividends did not exceed six per cent of the paid-in capital, one-half was to be assigned to the shareholders and one-half to the joint governments; of what remained after that, one-third was to be distributed in dividends to the shareholders and two-thirds were to go to the two governments.

It was provided that the joint governments should have the right (the sanction of the two parliaments having been previously obtained), on the expiration of the term of the bank's charter, or in the event of the dissolution of the corporation prior to the expiration of the charter, to take over the whole banking concern that constituted the object of the charter (with the exception of the mortgage department, which was to be left to the company) in the shape and form in which it existed on the balance sheet and according to the valuation expressed by the balance sheet. The shareholders were to receive 1,520 crowns for each share and, in addition, the amount of the surplus. This joint right of acquisition was, however, not to be regarded as involving an agreement between the two governments for the preservation of a single bank of issue for the two halves of the monarchy.

JAPAN

[SOURCE: U. S. Senate Documents, Vol 37, 61st Congress, 2d Session, 1909-1910. "The Banking System of Japan," by Marquis Katsura, Premier and Finance Minister of Japan, Baron Sakatani, Ex-Finance Minister, and Professor O. M. W. Sprague, pp. 136-140.]

The Agricultural and Industrial Bank is a joint stock company established in every prefecture. These banks have for their object the advancing of loans for the purpose of improving and developing agricultural and industrial interests. Their business is similar to that of the Hypothec Bank, only on a small scale. The banks are also placed under the same restrictions and government supervision as the Hypothec Bank. They are authorized to issue agricultural and industrial debentures to an amount not exceeding five times the paid-up capital. The government delivered a sum of about 10,000,000 yen to the prefectural authorities for taking up the shares of the agricultural and industrial banks of their localities, and on this amount the Bank is exempted from paying a dividend.

The two banks above described being exclusively engaged in making long-term loans on the security of immovable property, the need arose for a financial organ which could advance long-term

loans on the security of government bonds, shares, and movable property. It was also deemed advisable to combine in such an organ the business of a trust company. The institution born of these requirements is the Industrial Bank of Japan, organized under the law relating thereto and enacted in March, 1900, as Law No. 70.

The Industrial Bank is a joint stock company, and the governor and deputy governor are appointed by the government. The capital of the Bank is 17,500,000 yen, and foreigners own no small portion of the shares. It acts as a medium for the introduction of foreign capital, and is thus engaged in adjusting and facilitating circulation of capital at home and abroad. The Bank is authorized to issue debentures to an amount not exceeding ten times its paid-up capital, provided the amount of such debentures does not exceed the total amount of outstanding loans and negotiable instruments actually in hand.

The Bank has a government subsidy to the extent of guaranteeing a five per cent dividend for five years after its establishment in case its profit fails to come up to that dividend.

The system and working of different kinds of banks in Japan, and the reasons for their adoption, are as briefly stated above. The table on page 140 shows the number, the amount of capital, etc., of these banks. It is based on actual conditions prevailing in December, 1907.

[The statistics on page 140 show that the governmental banks accounted for approximately one-third of all the deposits of Japan.]

THE BANK OF NEW ZEALAND

The total deposits of all the commercial banks of New Zealand in 1915 were £32,186,000. Of this amount the Bank of New Zealand (nationalized only in 1895) held more than one-half, namely, £17,646,000. (See Year Book of Australia, 1916, pp. 671-672.) This was not due to war conditions, as the same proportion prevailed (approximately) before the war. Besides this, the Postal Savings Banks held deposits of over £19,048,000. (See the following chapter.) Governmental banks, therefore, held £36,692,000 deposits, while private institutions held £14,540,000, or only two-sevenths of the total.

THE COMMONWEALTH BANK OF AUSTRALIA

This bank was founded in 1912. Owing to the fact that Australia had so long consisted of a number of separate governments,

it was still "in competition with the savings banks of the various States" (Year Book of Australia, 1915, p. 669) in 1914. In that year it agreed to give up its savings bank business to the States, and the States agreed gradually to transfer their banking accounts to the Commonwealth Bank. An amendment passed in the same year provides that "debts due to the Bank by any corporation carrying on the business of banking shall have the same priority as debts due the Commonwealth." Power was also given, in certain contingencies, to take over any State savings bank.

By 1915 the Bank had secured the accounts of South Australia, West Australia, and Tasmania, besides a number of municipalities including Melbourne. As regards general mercantile business the progress of the Bank continued to be moderate. "The power to take over other banks" had not yet been exercised. (Year Book of Australia 1916, p. 669.) The remaining three state accounts, including those of the two wealthiest, New South Wales and Victoria, also continued to stay in other banks. At a conference in 1914, Premier Holman, of the former State, had said: "It is not practicable for the New South Wales Government to transfer the whole of its business to the Commonwealth Bank and terminate its arrangements with trading banks, until the Commonwealth Bank is in a position to give some tangible assistance in a loan flotation if required. (Year Book of Australia, 1915, pp. 669, 670.)

Commonwealth Bank of Australia

(on December 31st)

	1913	1914	1915
Assets	£5,055,000	£11,361,000	£23,933,000
Deposits	2,388,000	4,971,000	14,714,000
Savings Bank	3,733,000	6,078,000	8,186,000
	[Year Book of Australia, 1915, p.670; 1916, p. 669.]		

Comparison of Private Banks and Commonwealth Bank

Deposits for December Quarter

	1913	1914	1915
Private	£149,000,000	£153,000,000	£161,453,000
Commonwealth Checking Accounts		* 3,619,000	10,107,000
Commonwealth Savings Accounts		5,662,000	7,804,000
	[Year Book of Australia, 1915, pp. 670-672; 1916, pp. 669-671.]		

Profits of the Commonwealth Bank of Australia

Half Year Ending	June 30, 1913	.....	Loss—£47,000
	Dec. 31, 1913	.....	Profit— 1,500
	June 30, 1914	.....	“ 8,000
	Dec. 31, 1914	.....	“ 13,000
	June 30, 1915	.....	“ 26,000
	Dec. 31, 1915	.....	“ 51,000

CHAPTER II

SAVINGS BANKS

THERE is no doubt that by far the larger part of the savings banks of the world are now nationalized or municipalized, as our quotations show. The significance of this fact lies not only in the intimate financial relation it makes between the masses of the population and the governments, but also in the further fact that governments in this way control a very large part of the financial resources of the world. It will be seen in many nations that when we add together the central banks, savings banks, and agricultural banks by far the larger part of the capital of the country lies in the hands of the government.

As with the central banks, so with savings banks, the effort is constantly made by private banking interests to restrict these government agencies so as to interfere as little as possible with private banking. But our selections show that such restrictions are being gradually removed. The maximum limits of savings accounts are constantly raised and in some cases have been altogether removed. In many instances depositors in savings banks are allowed to withdraw their deposits by check without notice—and sometimes no maximum sum is mentioned.

Though we do not attempt in the present volume to reach any conclusions, the evidence we have adduced strongly suggests that, if the larger part of the world's financial power is not already permanently in the hands of governments, it probably soon will be. At any rate, it is clear that the movement is steadily in that direction and that no halting place has been indicated. Therefore it is possible, if not probable, that not only the larger part but nearly all of the concentrated financial and banking power of the world will be directly in the control of governments before very many years.

GROWTH OF POSTAL SAVINGS BANKS

[From U. S. Public Document, "Notes on Postal Savings Banks."]

UNITED KINGDOM			
Year ended December 31	Depositors	Deposits	Average Deposit Account
1887	3,951,000	\$262,664,000	\$66
1897	7,239,000	564,011,000	77
1907	10,692,000	766,474,000	71
FRANCE			
1887	950,000	\$ 43,139,000	\$45
1897	2,861,000	162,932,000	56
1907	5,034,000	276,655,000	54
ITALY			
1887	1,570,000	\$ 46,365,000	\$29
1897	3,141,000	103,562,000	32
1907	4,904,000	273,702,000	55
RUSSIA			
1897	556,000	\$ 34,402,000	\$61
1907	1,788,000	128,873,000	72
NEW ZEALAND			
1887	79,000	\$ 8,823,000	\$110
1897	159,000	23,091,000	144
1907	319,000	56,077,000	175
CANADA			
1887	90,000	\$ 19,497	\$216
1897	135,000	32,380	238
1907	167,000	47,453	283

POSTAL SAVINGS IN THE UNITED STATES

[SOURCE: Report of the Postmaster General of the United States, 1916, p. 28.]

On March 1, 1913, there were approximately 310,000 depositors, with \$30,026,325 to their credit; on June 30, 1916, there were approximately 603,000 depositors, with \$86,019,885 to their credit. During the intervening period of three and one-third years, there-

fore, the number of depositors has doubled, while the deposits have increased threefold.

An amendment to the organic postal savings act, approved on May 18, 1916, marks an important epoch in the history of the Postal Savings Service. By the terms of the amendment a person may now deposit at interest any number of dollars and at any time until the balance to his credit amounts to \$1,000. Moreover, the board of trustees is given discretionary authority to accept additional deposits to the amount of \$1,000, but upon which no interest shall be paid. By the terms of the original act no one could deposit more than \$100 in any one calendar month or have more than \$500 to his credit. The effect of the liberalizing legislation was an immediate increase in postal savings deposits, which has continued unabated and unquestionably will result in restoring a large part of the hidden money of the country to the active channels of industry and commerce.

[SOURCE: *The Annalist* (Pub. by N. Y. Times), New York, Jan. 15, 1917. Article by Hon. Alexander M. Dockery, Third Assistant Postmaster General. "Uncle Sam's Billion-Dollar Business."]

The fiscal year 1916 marked the beginning of a new era in the history of the postal savings service. Under the organic postal savings law of June 25, 1910, no one was permitted to deposit more than \$100 in any one calendar month or have a balance to his credit of more than \$500. These limitations greatly retarded the growth of the system and restricted the scope of its usefulness, it having been estimated that as much money was refused at the Post Offices because of the limitations as was accepted. An act of Congress of May 18, 1916, amended the law. By the terms of the amendment a person may now deposit at interest any number of dollars, and at any time, until the balance to his credit amounts to \$1,000.

On June 30, 1916, at the close of the fiscal year, postal savings deposits amounted to \$86,019,885, standing to the credit of 602,937 depositors, an average of \$142.67 for each depositor. Compared with the returns for the service at the close of the previous fiscal year, there was a gain of \$20,335,177 in the amount on deposit, 77,523 in the number of depositors, and \$17.65 in the average for each depositor.

The effect of the new law increasing the amount that may be accepted from a postal savings depositor was immediate and pronounced. As it was not passed, however, until May 18, a month

and a half before the close of the fiscal year 1916, the returns from the service for that year do not show its full effect. The growth of the service since July 1, 1916, the beginning of the current fiscal year, has been phenomenal. In July, the deposits increased \$3,792,414, notwithstanding that \$906,700 of deposits were converted into postal savings bonds during that month; in August the deposits increased \$4,842,422; in September, \$4,888,308. In October the increase is estimated at \$4,700,000 and in November, 4,250,000. The increase in deposits for the five months since July 1 has been almost \$22,500,000, more than \$2,000,000 in excess of the increase for the entire fiscal year ended June 30, 1916. It is estimated on reliable data that on November 30, 1916, there were 660,000 depositors with \$108,500,000 to their credit, an average of \$166 for each depositor.

BRITISH POSTAL SAVINGS BANKS

[SOURCE: U. S. Government Document, "Notes on the Postal Savings-Bank Systems of the Leading Countries."]

The United Kingdom was the pioneer in establishing the postal savings-bank system. The law was passed May 17, 1861, and became effective September 16, 1861.

The interest rate of two and one-half per cent is uniform on all accounts, and has never been changed.

The extent of the postal-bank system of the United Kingdom may be appreciated by noting certain figures in the report for the year ending December 31, 1908, as follows:

Accounts opened in 1908	1,657,131
Accounts closed in 1908	1,331,435

[SOURCE: *How to Pay for the War*. Edited by Sidney Webb. Published by the Fabian Society at the Fabian Bookshop, 25 Tothill Street, Westminster: and by George Allen and Unwin, Limited, 40 Museum Street, London, W. C. "The Development of the Post Office," pp. 16-28, 33, 34, 35, 39.]

In the Post Office Savings Bank—together with the so-called Trustee Savings Banks, which are now equally under government supervision and constitute virtually an allied department—there are now over £260,000,000 of deposits, repayable on demand, being about one-fifth of all the banking deposits in the whole kingdom.*

* The Trustee Savings Banks now have 72 millions of deposits, held by two million depositors. The Post Office Savings Bank alone has 190

This banking business has become extremely profitable to the government, which gets the use of the huge sum lent by the poorer classes at little over two per cent interest, as compared with four and one-half or five per cent which it now pays to its capitalist creditors. But owing to the jealousy of the capitalist banks, which do not like this government competitor, the Postmaster-General is checked at every turn in expanding his business in such a way as to increase the services to the public, and at the same time earn a larger profit. In the bank kept by the Postmaster-General no one is allowed to deposit less than an even shilling. No one (other than a Trade Union, Friendly or Charitable Society, etc.) is allowed (why?) to deposit more than £50 in any one year. No one (with similar exceptions) is allowed to increase the balance to his credit above £200. The Postmaster-General himself complains that he is steadily losing business to the extent of £100,000 a year by transfers to other Savings Banks not subject to this ridiculous limit. (Imagine any other banker arbitrarily limiting the amount deposited with him!) These absurd restrictions have been temporarily suspended for the duration of the war. They should be forthwith definitely abolished.

The Postal Check System

In Austria-Hungary, since 1896, any depositor having a balance of not less than £4 may obtain a check-book by means of which he can draw against his account, and thus pay his bills by checks for any amount up to £500. Any one wishing to make a payment to him may pay it into his credit at any post office. He is advised by post of every amount debited and credited to his account. An even cheaper way of making payments is by mere transfer from one account to another.

But this extended use of the Post Office Savings Bank is even more useful to societies of all kinds, and their members, than it is to individuals. In Austria, Hungary, Bosnia, Herzegovina, Germany, Switzerland, Belgium, Luxemburg, and Japan any member of a society allowed by law, such as a Trade Union or Friendly Society, Insurance Office or other association, can pay his subscription, whether large or small, weekly or annually, at any post

million pounds of deposits, estimated to be held by over nine million separate depositors. The next largest bank in the United Kingdom is the London City and Midland which has 147 million pounds of deposits, which it is estimated are held by fewer than a quarter of a million separate depositors.

office in the kingdom, *without charge to either society or member*. The amount is simply credited to the account of the society; and the Central Post Office supplies the society daily with a list of the amounts paid in to its credit on the day before yesterday at all the post offices in the kingdom, with the names and addresses of the payers—thus saving all the buying of postal orders, all the despatch of letters, all the burdensome opening and sorting at the head office of thousands of communications, and all the risk of loss and mistake. Such a system would save literally thousands of pounds a year to many of our large Friendly Societies and similar organizations. The Post Office elsewhere gets the profit of handling this constant stream of deposits. Our Post Office refuses it.

In Austria all societies of every kind, practically all business firms large or small, and many thousands of heads of households, rich or poor, use this Post Office banking system, of which the transactions run into (literally) *thousands of millions of pounds annually*; because (unlike any other bank) it puts them all in direct financial communication with practically every other depositor in Austria—just as the government telephone puts us in speaking communication with every other telephone user. The same system has been adopted in Switzerland (1906), Germany (1909), and Belgium (1913); and an international agreement, concluded in 1914, makes all these countries (in times of peace), for postal checks and transfers, one country only. Thus, from Geneva to Memel, from Ostend to the last village in Transylvania, the poorest as well as the richest person enjoys the utmost facility for safe, cheap, and expeditious remittance. Even distant Japan—more up-to-date than our own country—adopted the same system in 1906. In Austria the number of postal check accounts open now reaches nearly 150,000, and the numbers in Hungary and Germany are rapidly approaching 100,000 each. The Central European Post Offices in alliance for this service, from Ostend to Serajevo, have now altogether some 300,000 holders of current accounts in financial intercommunication, with a yearly turnover of postal checks aggregating something like six thousand million pounds sterling! This is a national and international convenience, from which this country is excluded. Even during 1915, a year of war, the German postal check business continued to increase, showing an aggregate turnover of 2,350 million pounds sterling in the year (47 milliards of marks), being a rise of 26 per cent over 1914.

The Traveler's Letter of Credit and Circular Notes

The German Post Office issues, for cash on demand, a Letter of Credit in the form of a neat stiff-covered booklet, available for four months, entitling the owner, on proof of identity, to obtain payment at any post office within the Empire, of one or more of the ten coupons (which may be for 5s. each, or for as much as £15 each) which the booklet contains. For this convenience the charge is sixpence, together with a penny or two for each coupon cashed. This is found of great use to hawkers and peddlers, to artisans on their travels, to workmen sent to distant jobs, to agents and commercial travelers, and to tourists and holiday-makers. The Italian Post Office started a similar system as long ago as 1873, but has not developed its use.

The Post Office as Common Debt Collector

For over a quarter of a century other Post Offices have, to their own exceeding profit, done the public this debt-collecting service and saved them great expense. In 1897 the service was even made reciprocally international—the United Kingdom, Sweden, and Denmark, alone among European countries, standing out!

We may describe the system as it works in France, where it is called *service de recouvrements*. The trader or doctor who wishes to apply to his customers or clients for the amounts they owe, the society wishing to collect the contributions due from its members, the newspaper or journal desiring to obtain renewal subscriptions, hands in at the nearest Post Office a list of the persons to be applied to, their postal addresses, and the several sums due, together with a receipted invoice for each amount. This invoice is inclosed in a sealed envelope (any number of invoices for sums due from the same person being permitted), for which 2½d. must be paid. One account, or any number of accounts, will be thus collected, up to a maximum of 1,000 francs (£40), for any one debt. If the debtor is not at home when the postman presents the invoice, it will be presented again. If it is not then paid, the postman deposits it at the local Post Office, where it is held at the disposal of the debtor for 48 hours, in case he chooses to call and pay. The sums collected, for which the government accepts complete responsibility, are remitted back to the Post Office of origin, which transmits the total sum (less the commission) to the trader or doctor, society, or newspaper, accompanied by the original form, now

marked by the Post Office so as to show which persons have paid, and which have refused (with the receipted invoices returned in the latter cases). The cost is 25 centimes (2½d.) paid in advance for the stamped envelope inclosing the invoice for each person to whom application is to be made, together with a commission deducted from the amount actually recovered at the rate of 30 centimes per 20 francs, but in no case more than 50 centimes (3d. per 16s., with a maximum of 5d.). Bills of exchange or other accounts payable on a fixed date may be thus presented, if given to the Post Office five days beforehand (a fee of 10 centimes being charged on any bill not honored on presentation).

The Post Office as the Common Investing Agency

In France every post office puts up each morning the prices at which it will buy or sell the well-known *rentes*, corresponding to our Consols; and the transaction is carried through over the counter as a matter of course. From every post office throughout France is telegraphed daily to Paris the amount of *rentes* locally bought or sold; and *the government broker simply buys or sells on the Paris Stock Exchange the net balance of these innumerable local dealings.*

• *The Post Office as the Common Remittance Market of the World*

Why should not the British Post Office take the lead, and either include in the Treaty of Peace, or at least lay before the next Congress of the International Postal Union (which has been postponed until after the war), a definite proposal for the creation, by the 103 postal administrations of the world, or by such of them as come into the scheme, of an effective means of *unlimited* international remittance.

The Post Office as the Common Agent

Foreign Post Offices receive subscriptions, not only for the periodical publications of their own, but also for those of other countries. The German Government (which started this service as long ago as 1823!) now has no fewer than 14,500 periodicals on its list, of all kinds, in all languages, published in all countries—nearly 4,000 of them, in fact, being published abroad.

CANADIAN POSTAL SAVINGS BANK

[SOURCE: "Notes on Postal Savings-Bank Systems," p. 12.]

Post-office savings banks were authorized by the Canadian Parliament in December, 1867, and the system began operations in April, 1868.

Until 1892 the amount deposited by one person in one year was limited to \$300 and the total deposit might not exceed \$1,000; but in 1892 these amounts were changed to \$1,000 and \$3,000, respectively. The average account is between \$200 and \$300, indicating a well-to-do rather than a working-class patronage. In Great Britain the average is about \$75 and in Belgium about \$65.

For more than twenty years the rate of interest was four per cent, but it was reduced in 1889 to three and one-half per cent, and in 1897 to three per cent, where it now stands.

In 1906 there were 30 depositors for each 1,000 population, while Great Britain had more than 200 depositors for each 1,000.

THE NEW ZEALAND POSTAL SAVINGS BANK

[SOURCE: "Notes on Postal Savings-Bank Systems."]

The maximum account is fixed at £600 for an individual. There is no other maximum for a single deposit. Funds may be withdrawn on demand without notice. The legal field of investment is government securities. [From replies of Consuls to questions of the U. S. Government.]

[SOURCE: New Zealand Official Yearbook, 1915.]

Total deposits in all commercial banks [including the	
Bank of New Zealand] in 1914	£27,640,000
In P. O. Savings Banks	19,048,000

The securities standing in the name of the Postmaster-General on account of the Post Office Savings Bank on the 31st December, 1914, represented a nominal value of £18,830,380 11s. 2d. Most of this fund is invested in securities of the New Zealand General Government. A summary of the investments is as follows:

In New Zealand Government securities	£17,737,741	11	1
In local bodies' securities	1,021,250	0	0
In other securities	71,389	0	1
Total	£18,830,380	11	2

PUBLIC SAVINGS BANKS IN AUSTRALIA

[SOURCE: Yearbook of Australia, 1916, p. 69.]

	Number of Depositors	Total Deposits	Average Deposits
New South Wales	756,000	£35,563,000	£47
Queensland	192,000	10,664,000	55
South Australia	282,000	9,595,000	34
Tasmania	80,000	2,301,000	29
Victoria	768,000	26,986,000	35
Western Australia	107,000	4,618,000	43
All Australia	2,185,000	£87,727,000	£41½
	About	\$438,500,000	\$207

RUSSIA

[SOURCE: "Notes on Postal Savings-Bank Systems," p. 17.]

The postal savings-bank system of Russia was not established until 1889. The people were, however, somewhat prepared for it through the formation of numerous popular credit associations based on mutual help, the first of these having been established at St. Petersburg in 1862. In 1908 about 300 of these associations had deposits of \$104,000,000, all belonging to their own members.

In 1907 the postal savings bank, after 18 years of work, had deposits of \$128,873,169, representing 1,788,990 accounts and averaging \$72. This average is about equal to that of the United Kingdom and is larger than in other European nations, but the number of depositors is only 12 to each 1,000 of the population, apparently indicating that thus far there is not an enthusiastic interest in the system. In Great Britain, Italy, Austria, France, Holland, and Belgium the number of depositors is from 75 to 291 to each thousand of population.

As all savings banks in Russia are government institutions under control of the Imperial Bank, the interest of four per cent is uniform, and includes the postal savings. The same rate is paid on all deposits large and small, whether for individuals, churches, or associations.

The minimum deposit is 25 kopecks (12.87 cents) and the maximum for individuals is 1,000 rubles (\$515).

It is provided that losses, if any, shall be paid by the Imperial Bank.

Deposits are invariably invested in government notes and bonds, and deposited with the Imperial Bank of Russia.

AUSTRIA

[SOURCE: "Notes on Postal Savings-Bank Systems," pp. 19, 20.]

All funds exceeding the probable amount to be drawn by depositors are invested in interest-bearing Austrian securities. Out of the dividends on these securities is paid the interest to depositors and the expense of management.

When an account exceeds 2,000 crowns it is invested in Austrian securities. On December 31, 1907, the savings bank had in its possession stocks valued at 172,000,000 crowns, belonging to 24,700 depositors.

The incorporation of the check and clearing system in the post-office savings bank was effected on October 29, 1883, the whole of the post-offices being gradually brought into the system and authorized to receive deposits and make repayments for the account of owners of check accounts. Any one can participate in the check service on depositing a fixed nucleus capital of 100 crowns. In the check service a fee of four heller is charged for every transaction, and a commission of one-fourth per 1,000 for cash withdrawals up to 6,000 crowns and one-eighth per 1,000 for all that part of the withdrawal which exceeds that amount.

HUNGARY

[SOURCE: *Idem*, pp. 20, 21.]

The royal post-office savings bank of Hungary came into existence February 1, 1886. In 1908 its depositors numbered 33 to every 1,000 population. On the 31st of December, 1908, out of a population of 20,000,000, there were 684,299 depositors. The total amount on deposit was \$18,803,991, or an average of \$27.47.

Showing that deposits are made chiefly by those of small means, it is noted that of the deposits in 1915:

61 per cent did not exceed	\$2.00
12 per cent were between	\$2.00 and 4.00
9 per cent were between	4.00 and 8.00
9 per cent were between	8.00 and 20.00
4 per cent were between	20.00 and 40.00
5 per cent were in excess of	40.00

In the matter of interest Hungary, following the lead of Sweden, fixed the rate at 3.6 per cent, but later reduced it to three per cent. From 1886 to 1906 the interest paid amounted to 14,000,000 crowns (\$2,842,000).

JAPAN

[SOURCE: Senate Documents, Vol. 37, 61st Congress, 2d Session, 1909-1910. *The Banking System of Japan*, by Marquis Katsura, Premier and Finance Minister of Japan, Baron Sakatani, Ex-Minister of Finance, S. Naruse, Financier, and Professor O. M. W. Sprague, of Harvard University, pp. 134, 135.]

In 1890 ordinary bank regulations were enacted by Law No. 72, which was followed by savings banks regulations Law No. 73.

The savings bank, above all other banks, requires most careful supervision by the government. In Japan the government has a Postal Savings department and also a deposit section in the Department of Finance. But the amount of the deposit being found too small when compared with the population and the standard of economics in general, the government enacted a new regulation for savings banks, with a view to increasing the amount of the deposit by initiating a method for supervising, controlling, and improving the business of the private institutions.

The Hypothec Bank and the Agricultural and Industrial Bank were organized and established by the law issued in 1895.

The Hypothec Bank of Japan, created by the law relating thereto, has for its object the advancing of funds for the purpose of improving and developing agricultural and industrial enterprises, and the Bank is organized on joint-stock principles, with the president and vice-president appointed by the government. Its principal business is to advance loans on mortgage of immovable property which shall be redeemable by annual installments, the Bank being placed under severe restrictions in other lines of business. It is authorized to issue mortgage debentures bearing premiums to an amount not exceeding ten times its paid-up capital, provided the amount of such debentures does not exceed the total amount of outstanding loans redeemable by annual installments. The Bank enjoys a government subsidy to the extent of guaranteeing five per cent dividend for ten years after its establishment, in case its profits fail to realize that standard of dividend.

Statistics follow showing that by 1907 the comparatively new savings banks already accounted for 11 per cent of the total deposits of the nation.

GERMAN SAVINGS BANKS

[SOURCE: Report of British Board of Agriculture on Agricultural Credit in Germany, by J. R. Cahill, 1913, pp. 14, 75-78.]

There are no post-office savings banks in Germany. The great majority of public savings banks are institutions established, man-

aged, or supervised and guaranteed by the communal, district, or urban authorities, apart from whom they do not exist as legal entities. At the end of 1910 there were 2,844 public savings banks in Germany (excluding Brunswick) with 7,404 branches or agencies, and 228 other savings banks with 294 branches. The total deposits of all these banks reached the substantial sum of £840,000,000; in 1890 and 1900 the corresponding figures were £257,000,000 and £442,000,000. It may be noted in passing that the deposits of English savings banks, post-office and other, did not amount in 1909 to 30 per cent of the German total. While German public savings banks do not usually accept deposits of less than one shilling, the maximum deposits receivable in respect of any one account often reach a very high figure. In Prussia in 1909 there were 395 out of 1,506 public savings banks which fixed no limit, and for 291 banks the limit ranged from £500 to £2,500. As a result, these banks tend to be used as deposit banks by the well-to-do classes. Their attractiveness consists not only in the security afforded, but in the relatively high rate of interest paid. Being institutions independent of a central authority they are not obliged to accord a rate of interest fixed for all savings banks, but can fix and vary their rates according to the local circumstances. Thus, some find it necessary and profitable to pay three and three-fourths or four per cent, while others obtain ample deposits at three and three and one-fourth per cent. The magnitude of German savings bank deposits is also to be explained on other grounds. Although private banks, both large and small, are very numerous in Germany, great joint-stock deposit banks have not as yet attained the same development as in the United Kingdom, where, at the end of 1910, the number of branch banks amounted to 7,151, whereas the total of branches, agencies, and deposit offices of large banks in Germany in 1911 amounted to about 1,200. Investment by small capitalists in the shares of joint-stock and limited liability companies being less easy owing to the fact that shares of the former may not be less than £50 or of the latter £25, their money is deflected to savings banks. Private insurance, so common as a form of investment of savings in England, does not appear to have developed to the same extent in Germany.

History.—The earliest German savings banks were founded to serve as institutions for safeguarding the poorer classes against absolute poverty by providing a place for the safe deposit of small sums of money until such should be required in bad times. Established in connection with the efforts to reform the poor laws,

they were to be regarded rather as philanthropical institutions. The first was founded at Brunswick in 1768, and the second at Hamburg in 1778, these being followed by banks at Oldenburg (1786), at Kiel (1796), at Altona, Limburg, and Gottingen (1801), at Carlsruhe, Baden, Schleswig, and Limberg-on-Lohr (1816), at Glucksburg, Lubeck, and Kappeln (1817), and at Berlin, Stuttgart, and Apenrade (1818); further urban banks were established in rather rapid succession. But the savings banks lost this character of philanthropy early in the nineteenth century, and have developed along the more general lines of institutions for the furtherance of thrift. They have been established usually by and under the guaranty of public authorities, and in normal cases do not aim at profits beyond the obtaining of an adequate interest upon money deposited with them and the payment of the expenses of management. *Any surplus remaining after meeting these charges and making suitable appropriations to reserve are applied to objects of public welfare.* In primary aim they are distinguishable from banks in the ordinary sense of the term—they seek deposits not in order to be in a position to grant credit for their own profit, but to foster thrift and only to utilize deposits for investments in the interests of the depositors themselves. But while there is this distinction in their aims, German savings banks constitute, by reason of their unexampled development and freedom of investment, credit sources of great importance. Not being obliged to deposit their funds at interest with the State treasury or invest in stocks and shares only, as such banks are constrained to do in some other countries, but seeking to obtain on investments the best returns consistent with the absolute security of their funds, they have lent a very large percentage of their deposits on mortgages, a considerable proportion of which have been on rural property.

Kinds of savings banks, Prussia.—In Prussia there were at the end of 1910, 1,711 savings banks; in 1909, when the number was 1,692, 1,500 were comprised within three groups, 268 being communal, 465 district, and 767 urban banks. There are six other banks which have been also established by public provincial organizations.

The communal and district banks serve the rural classes more directly than the urban banks, and it is interesting to note the part played by the public agricultural authorities in the extension of these institutions in rural districts. The first rural district savings bank was opened in 1831, a few more being established in the succeeding 20 years. In 1850 the national advisory council to the

Prussian ministry of agriculture recommended the extension of the savings bank system, and a ministerial circular to the local officials of the central government issued shortly after supported their recommendation. A commission which at this period was conducting an inquiry into the credit institutions of Prussia also included in their investigation the question of savings banks. The report of the commission, published in 1851, was followed almost immediately by a ministerial decree urging the establishing of such banks, and from this time the communal and district savings banks increased rapidly in Prussia, their extension being promoted by the provincial and district governors. The course of development in Bavaria, Saxony, Wurtemberg, and Baden was affected by similar influences.

In addition to the 1,506 public savings banks mentioned above as existing in Prussia in 1909, there were 186 banks described as "association or private" savings banks, which are not guaranteed by any public authority. The great majority of these were in Schleswig-Holstein, the Rhine Province, Silesia, and Hesse-Nassau, which possessed 75, 45, 25, and 13, respectively at that date. In Schleswig-Holstein there were also 135 public savings banks, but the others, many of them dating from an early time in savings bank history, are highly important, and since the passing of the civil code a large number have submitted to State supervision by acquiring the legal status of corporations. In the Rhine Province and Silesia a considerable proportion of those existing have been established by industrial concerns (mines, ironworks, textile mills). Besides these factory, mine, and other savings banks, there are various groups, such as rent, taxation, old age, school, and children's savings banks and not a few of these are worked in close connection with the public savings bank of the locality. Some great private savings banks, however, exist, e. g., those at Aix-la-Chapelle (founded in 1834), at Altona (1801), at Frankfort-on-Main (1822), and at Hanover (1875), but the majority are relatively unimportant.

As to the highest amounts receivable from a single depositor, the special laws or State regulations generally leave this to be settled by the body guaranteeing the deposits of the bank. Deposits of public money or of trustee funds are usually not restricted in amount. In Prussia the public savings banks tend to distinguish between ordinary and extraordinary maxima; that is, the highest amount that may be accepted in respect of one private account in ordinary circumstances and the absolutely highest amount that may

not be exceeded under any circumstances. In 1909, out of 1,506 Prussian public savings banks the ordinary maxima receivable from depositors was under £50 in 30 banks, from £50 to £150 in 257 banks, from £150 to £500 in 533 banks, and from £500 to £2,500 in 291 banks, no limit being fixed by 395 banks; as extraordinary maxima the amounts fixed by 16 banks ranged from £150 to £500, by 291 banks from £500 to £10,000 (in 60 of these the range was from £1,250 to £3,000), but in 1,199 cases no limit was fixed. The Saxon government restricts the total deposits of a single depositor to £150, or to £250 for certain categories of public institutions and trustees. The Alsace-Lorraine act of 1912 also fixes the limit for deposits by individuals at £150.

The articles of the great Wurtemberg Savings Bank and the model articles issued for the Wurtemberg district savings banks fix the maximum at £250 per depositor and prescribe that "a husband, wife, and children under 14 years residing together shall be regarded for this purpose as one depositor."

The early German savings banks limited deposits to certain classes of the population, or, by refusing to accept considerable sums, restricted their business, in fact, to the less well-to-do classes. It will be observed from the foregoing figures that large deposits are now accepted, especially by Prussian savings banks, and these institutions accordingly have become deposit banks also for the well-to-do classes. Large deposits, costing less for management and investment, the banks are unwilling to reject them, and the danger arising through sudden and extensive withdrawals by large depositors is guarded against by regulations *requiring fixed periods of notice, which vary according to the amount to be withdrawn*. Thus the specimen articles for savings banks in the Province of Hanover prescribe on this point that, in the absence of specific arrangement, no claim for the immediate withdrawal of any sum exceeding £2 10s. will be recognized, and that claims to withdraw up to this limit may not be made more often than once in two weeks. Withdrawals up to £5 may be made after two weeks' notice, up to £25 after four weeks, and up to £50 after three months' notice; for the withdrawal of all larger sums six months' notice is required. These regulations, while not usually applied in normal conditions, constitute a useful weapon of defense in times of monetary pressure.

The attractiveness of the savings banks consists not only in the security afforded, but in the relatively high interest paid. Being autonomous institutions they are not obliged to accept a rate fixed by the central authorities for all savings banks, but can fix and

vary a rate according to the local circumstances. Thus some savings banks find it necessary and profitable to pay $3\frac{3}{4}$ or 4 per cent, while others obtain ample deposits at 3 and $3\frac{1}{4}$ per cent. A partial explanation of these enormous deposits is also to be found in the fact that great joint stock deposit banks have not as yet attained the same development as in England, although private banks, small and large, are very numerous; and the fact that shares of German joint stock companies may not be less than £50, or those of limited liability companies less than £25, may also influence the deposits. Investment by small capitalists in such concerns being less desired, or owing to their large share units less facile, their money is deflected to the savings banks. Private insurance also does not appear to have attained the same development in Germany.

[SOURCE: National Monetary Commission, Senate Document No. 508, 61st Congress, 2d Session. "Miscellaneous Articles on German Banking," 1910, pp. 389, 390.]

As the case is all over Germany, the savings banks in Prussia may, upon the consent of the president of the provincial council, use for public purposes those surpluses which must not go to the reserve fund. The president can withhold his consent only when backed by the district committee.

The savings-bank regulations do not define what is meant by public purposes. It is the custom of the authorities, however, to use the surplus not for paying taxes, but exclusively for extraordinary needs. (Ministerial decree of the 24th of August, 1847.) There are also many statutes that stipulate that the surplus can be used only for public and legally permissible ends, and not for purposes of mere luxury.

INVESTMENT OF GERMAN STATE INSURANCE FUNDS

[SOURCE: Report on Agricultural Credit and Co-operation in Germany, published by the British Board of Agriculture.]

Under the imperial invalidity insurance act 31 insurance institutions (Landes-Versicherungs Anstalten), apart from 10 recognized funds (Zugelassene Kasseneinrichtungen) of insured persons drawn mainly from railway, mining, and sea-faring groups have been established. Such institutions, which are public corporations, each with an independent legal status, have been created for each of the Prussian Provinces and for the Berlin district; in Bavaria there are eight, and elsewhere each institution serves a single State or groups of States. All insured persons occupied within the area assigned

to each of these corporations must pay their contributions to and receive their benefits from them. The funds received by these corporations must be invested especially in readily realizable securities as laid down in the act, which recommends Imperial and State stocks, stock of State-guaranteed railways, communal bonds and mortgage bonds, after which loans to communes and finally mortgages, but which authorizes a certain proportion to be invested for purposes of general social welfare within the districts of the various institutions. At the end of 1909 over 50 per cent of the total invested funds (£78,705,550) of the 31 institutions and 10 recognized funds were invested in undertakings of this character, £14,025,900 being in respect of houses for workingmen, and £5,143,600 being devoted to agricultural purposes. Under the latter heading are granted loans for light railways in rural districts, for land improvement, and for the improvement and construction of roads; while for the housing of the working classes loans are granted to building societies, to communal organizations and to employers, and, indirectly, that is usually through local authorities or co-operative societies, to insured persons for the purpose of building or improvement of dwellings.

Conditions for loans.—The conditions to be fulfilled in order to obtain the grant of loans for “agricultural” purposes need not be given in detail here, as such loans are made only to communal or other public or semipublic corporations. Loans are granted for the improvement of housing or for new erections, whether for the benefit of rural or urban workpeople. They are, however, rarely granted to individuals, being, as a rule, accorded only to non-profit-seeking co-operative societies or to employers or to communes.

CHAPTER III

AGRICULTURAL BANKS

Just as governments have tried to serve the small investor through savings banks, and in many other ways, so they have tried to serve the individual producer by several methods. By far the most important means of reaching the individual producer, however, has been through agricultural or land banks—since individual agriculturists or small agriculturists compose by far the larger part of the total of all individual or small producers.

We have concentrated our attention chiefly on Germany because there can be no question that this form of governmental banking is more developed in that country than elsewhere. As with so many German governmental activities, there is a combination between voluntary co-operation at the bottom and governmental aid at the top, but it is clear that all the larger and more vital issues are decided by the government and that the supreme power rests wholly in governmental hands.

We also give a brief account of the new agricultural loan banks in the United States, since this is the newest as well as one of the most important experiments the world has seen in the direction of governmental banking. Like the Federal Reserve Board, the Federal Farm Loan Board seeks to leave as much control as possible with the farming and business community. Probably it may be said that the element of governmental control does not yet preponderate, but it is already very great, and there are certainly strong, though perhaps not decisive, reasons for thinking that the evolution of these banks will be similar in this country to the development that has taken place in Germany.

GERMANY

[SOURCE: "Agricultural Credit and Co-operation in Germany," Report to the British Board of Agriculture, by J. R. Cahill. Senate Document No. 17, 63d Congress, 1st Session, 1913, pp. 11-25, 85-87, 96, 293-297.]

In the number and variety of the agencies through which they can obtain long-term mortgage credit or relatively easy conditions,

landowners in Germany, both large and small, enjoy signal advantages as compared with the corresponding classes in this country (Great Britain). Setting aside for the moment the joint-stock mortgage banks, the whole of these agencies are in the nature of governmental, nonprofit-seeking institutions—using the word “governmental” in a sense that would comprise the State, provincial, district, municipal (or communal) authority as well as those corporations of landowners which rank as public bodies. The various agencies may be divided into three main classes according to the purposes for which their loans are granted. In the first class there are four groups of institutions, namely, the land-mortgage credit associations (*landschaften*), the State, provincial, and district mortgage-credit banks, the joint-stock mortgage banks, and the savings banks, all of which grant mortgage credit without requiring, in ordinary circumstances, any declaration as to the purpose of the loan. The second group comprises the land improvement funds, the land improvement annuity banks, the provincial aid banks, and the imperial insurance institutions, all of which grant loans, mainly for specific land improvement or building undertakings. The third group is that of the rent-charge banks, which are concerned with loans in connection with the creation and equipment of small holdings.

By far the most important class is the first: At the present time the total value of the outstanding loans granted on landed properties by the institutions comprised in it approaches £400,000,000. The land mortgage credit associations and the savings banks are represented in this total by about £170,000,000 each. With the exception of the savings banks and of the relatively unimportant Prussian land improvement funds, all these mortgage credit organizations obtain funds mainly (when not exclusively) by the issue of land mortgage bonds. Thus the German landowner, by virtue of his institutional mortgage credit, is enabled to mobilize, as it were, a high proportion of the value of his landed property by the creation of bonds that flow into the general system of securities, so that instead of only being able, like the English landowner, to provide an individual mortgage security of very limited currency, he possesses facilities for converting a mortgage charge into a security realizable at any time in the general market.

The land mortgage credit associations, 23 in number, of which six were founded in the period 1770-1790, and the remainder between 1825 and 1896, are associations of borrowers for the purpose of procuring loans by the issue of bonds secured by the collective mort-

gage charges registered against their landed properties. These bonds are not secured by specific mortgage charges, but by the body of mortgage charges of each particular association, supplemented by its reserves and the accumulated sinking-fund payments of mortgagors. They are nonprofit-seeking organizations, and, except in two cases, they possess no share capital. The Prussian associations limit their operations to a single Province, extending them occasionally over portions of an adjoining Province or State; the areas of the non-Prussian associations coincide with those of their respective States.

These associations rank as public corporations (in Prussia their officials have a status similar to those employed by provincial authorities); they are subject to State supervision through a royal commissioner, and their articles of association and regulation require the sanction of the Crown or the minister of agriculture. They possess certain special privileges, such as the authority to distrain without having recourse to the ordinary civil procedure. They are administered by a central board, which includes at least one permanent salaried official who has passed the State examination qualifying for the office of judge. This board is subject to the control of a committee or council of administration, and of a general assembly, both elective bodies. Directors are also elected for the chief divisions of the areas of the associations, and a further decentralization is secured by the district committees.

A landowner becomes a member of an association when such an association acquires a mortgage on his land; membership ceases with the cancellation of the mortgage. Landowners living within the area covered by an association, and fulfilling the conditions imposed by its articles of association, may not be refused loans; and they may claim them up to the amount for which their estates after valuation furnish the security required by the particular regulations. The earliest associations admitted to membership only large owners holding under specific tenures, but, especially within the last generation, and particularly as a result of the great Agrarian Conference of 1894, and the subsequent action of the Prussian Government, which urged the individual associations to devote more attention to the needs of the smaller proprietors, small landowners have been brought within the range of eligibility. That quite small owners may now obtain loans is evidenced by the fact that one association, lending up to half the value of estates on first mortgage, fixes the minimum loan at £15, some others fixing it at £25; at the end of 1911 one association had loans outstanding upon 284 prop-

erties of under $12\frac{1}{2}$ acres; another granted (in 1911) 34 loans upon properties of less than $2\frac{1}{2}$ acres, and 1,480 loans on properties of over $2\frac{1}{2}$ acres, but not exceeding 25 acres. The maximum limit to the amount to be loaned upon estates is fixed by most Prussian associations at three-fifths or two-thirds of their value as a first-mortgage charge; in the non-Prussian associations one-half is the usual limit.

The loans are, as a rule, made not in cash, but in bonds, which the borrower either realizes independently or takes to the loan bank of his association (if such a bank has been established), the latter selling them on his behalf or making him an advance on their security. Intending borrowers may choose the rate of interest to be paid, the rates most usually open to their choice being 3, $3\frac{1}{2}$, 4, and $4\frac{1}{2}$ per cent; at the present time bonds in circulation carry predominantly $3\frac{1}{2}$ and 4 per cent. Bonds of various denominations are issued; there are bonds of £3 15s., £5, £7 10s., £10, £15, £20, £25, and up to £150, some associations issuing those of £250, and the central association those up to £500. These bonds, which are not redeemable by holders, have consistently maintained a strong position in the market; thus at the time of the Napoleonic wars, when Prussian 4 per cent stock sank to 20, Silesian land bonds never fell below 50.

The loans granted by these associations are not subject to recall; the rate of interest is as moderate as possible, being closely related to the prevailing market rates for money, and can not be raised; and while annual payments are required until at least a certain percentage of the capital debt has been accumulated in a sinking fund, repayment may be made by additional installments at the mortgagors' convenience.

Of the 16 mortgage credit banks, which have been established for the whole of a State, Province, or district within a Province, and whose liabilities are guaranteed by the public authority of such areas, only one, namely, that at Hanover, restricts its mortgage loans on rural property. The original purpose of many of these institutions was to assist medium and small landowners, by loans on reducible mortgages, to redeem burdens or servitudes which still attached to the possession of their holdings at the time when the emancipatory legislation declared such charges to be commutable. They have lost this special character, and have all developed into institutions for mortgage and communal credit. The total of their outstanding loans amounts to about £100,000,000, of which half has been lent on mortgage security. Funds are mainly obtained by

the issue of bonds, which are recognized as trustee securities, but working capital is also provided by deposits, payments by borrowers into sinking-fund accounts, accumulated funds, and grants or loans from the State or other authority concerned. The bonds of these banks are, in most cases, redeemable by the banks themselves (but not by the holders) by drawings, but as a rule a certain period must elapse after the issue of bonds before a bank may include them in a drawing. Most banks pay their loans in cash, not in bonds, as in the case of the *Landschaften*.

These banks have served in an especial manner the needs of medium and small landowners, and afforded them facilities for obtaining loans at moderate rates of interest, not subject to recall, and repayable in small, fixed annual installments (with power to make additional repayments on giving notice of from three to six months).

German savings banks are mortgage credit institutions of very great importance for farmers. In 1910 their total investments in rural mortgages may be estimated at £170,000,000. At that date Prussian savings banks alone, out of the total of their invested funds, which amounted to £579,000,000, had £115,000,000 outstanding on the security of rural property. They are pre-eminently, especially in western Germany, the sources of mortgage credit for small and medium farmers, whom they accommodated also at a time when no other mortgage institutions were open to them, and they now provide, in effect, nearly every district with a public mortgage credit institution.

Under a Prussian act of 1850 seven rent-charge banks were created, each to serve one or more provinces, and authorized to issue bonds to landowners in settlement of charges and servitudes due to them (but declared by an act of the same year to be commutable), and to collect from landholders thus relieved annuities composed of interest and sinking-fund payments. The special duties thus assigned to them appear to have elapsed with the redemption of the liabilities involved, and the banks were suspended in 1881. Ten years later they were re-established for the special purposes of the new policy of settling small and medium holders on the land. Their present functions are: (1) To issue bonds on certain conditions to vendors upon the sale of their property for conversion into small holdings up to three-fourths of the selling price and to collect the annuities due thereon; (2) to make advances in connection with the creation of small holdings (for paying off charges, erecting dwellings and farm buildings, etc.); and (3) under certain conditions

to settle by cash payments with coheirs to properties coming under the small-holdings acts.

These banks are, in effect, the financial departments of the State organizations, known as the general commissions, in connection with the creation of small holdings. The small-holdings act, by virtue of which State credit (that is, through these banks) is granted, allow any person or body to undertake the division and settlement of a property, but require, before State credit is granted, that plans for division, equipment, settlement, etc., must be approved by the general commission having jurisdiction. It should be observed, however, that these banks, which from 1891 to 1909 had issued bonds of the total value of £5,600,000 in respect of small holdings, do not represent the entire extent of State action in Prussia as regards land division and settlement. In the Provinces of west Prussia and Posen, where these banks do not operate, the settlement commission—a State organization with some 600 officials which was created in 1886 and has been amply endowed with funds—started at £30,000,000 down to 1911—purchases, divides, and distributes estates, and undertakes all the necessary financial transactions connected therewith.

From the foregoing summary of the organization of German mortgage credit it will be seen that German landowners, both large and small, are amply provided with credit agencies which, mainly of a public character and nonprofit seeking, grant loans up to one-half or two-thirds of the valuation on first mortgage at moderate and unchangeable rates of interest, not subject to recall, and repayable by small annual installments to sinking funds, with facilities to make additional repayments on giving short notice. The joint-stock mortgage banks form an exception in respect of profit seeking, but the mortgage-bank act secures certain important advantages for landowners; and the savings banks, although in theory they are debarred from granting loans not subject to recall, do in fact lend a considerable amount against reducible mortgages (which are not subject to recall), and, as regards the balance, are seldom forced to exercise their right of recall. Although not aiming at profits, these organizations are able to realize surpluses, the State and other provincial or district institutions, as well as the savings banks, contributing considerable sums annually to their guaranteeing authority for public purposes, while the *Landschaften*, especially as a result of ancillary business (e. g., their loan banks), are able to apply substantial sums to the relief of the indebtedness of their members.

The organization of German mortgage credit presents the further important feature of decentralization. The savings banks provide nearly every district with a public mortgage credit institution, and the special organization or organizations for mortgage credit in each Prussian Province or in each State bring their services within the convenient reach of farmers throughout their areas by their system of local representatives.

The most important improvements in connection with agricultural land are concerned with drainage, irrigation, the construction and maintenance of dykes, and protection of river banks. Most landholders must seek credit for the execution of these often costly undertakings, which, however, when carried out properly upon suitable land, yield a large return. Credit for land improvement may be said to stand midway between personal and mortgage credit. Its basis rests upon the capacity and reliability of the borrower and upon the additional value which the land is expected to acquire through the improvement. Owing to the nature of agricultural production, it is desirable, in the interests of the landholder, that such loans should be of adequate amount, should bear a moderate rate of interest, and should not be liable to be called in, while sinking-fund payments should be obligatory. Private capitalists, whether individuals or institutions, are rarely justified in lending money for this purpose on these conditions; they are not usually qualified to investigate the plans and probable return of such works, nor are they in a position to supervise the property at a later period. Private persons rarely, and ordinary banking institutions almost always rarely, are ready or able to waive the right to call in a loan or to accept repayment in installments spread over a number of years. These requirements can only be satisfactorily met by co-operative organizations or by public authorities working alone or in conjunction with such organizations.

In Prussia a State central land improvement fund was established in 1850, and its total resources amounted in 1875 to about £175,000. In 1876 the bulk of this sum was handed over to the administration of the Provinces, the majority of which now possess land-improvement funds. In 1879 an act was passed authorizing each Province to establish a land-improvement bank, and up to the present time five such institutions have been established. Similar banks have been erected by law in Saxony (1861), Bavaria (1884), Hesse (1880 and 1890), and Oldenburg (1885).

Prussia.—(1) Land-improvement funds: It will be convenient to deal, first, with the Prussian land-improvement funds, and, i

the second place, with the Prussian land-improvement banks. These funds, which are usually administered either by the committee of the Province or by the governor of the Province, are obtained and supplemented by money raised by the Province in accordance with its budget, or by endowments (e. g., the amount allotted by virtue of the distribution of the central fund in 1876), or by raising capital by loans subject to gradual redemption. There are considerable divergencies in the conditions as to interest, sinking fund, repayment, and security in the different Provinces, but the chief points may be noted. The application for loans must set out the amount, the exact purpose of which it is required, and the method of repayment proposed. In some Provinces the amount loanable is limited; thus in East Prussia not more than £100 may be granted in a single loan; in Brandenburg a sum over £750 requires the assent of the committee of the Province; in Saxony and Westphalia (Paderborn fund) it must not exceed three-quarters of the cost of the improvement. There is sometimes a condition that landholders may only obtain loans when they show that they can not carry out the improvements by their unaided resources, or that the holdings must exceed a certain value.

The Prussian act states that land-improvement banks may be established for lending money toward:

(1) The furtherance of land cultivation and especially the execution of drainage and irrigation works, the laying out and maintenance of roads, forest cultivation, the reclamation of land, and the founding of new farm holdings.

(2) Works for the protection of river banks.

(3) The construction, widening, and maintenance of dykes, and the security and improvement of works appertaining thereto.

(4) The establishment, use, or maintenance of water courses or basins, the construction or improvement of waterways, and other works of construction in connection with navigation.

The privileges accorded to the Prussian banks are: (1) The right to issue bonds of £250, £100, £50, £25, and £10 up to the amount of the loans granted, the bonds being irredeemable by the holders, but redeemable by the bank by periodical drawings; (2) freedom from all stamp duty; (3) freedom from fees for registration in the registry of title; and (4) the right to proceed to summary execution for recovery of debt without the intervention of the courts.

Personal (Short-Term) Credit

Under this heading is considered credit based mainly on the security of the general standing of the borrower, or of the borrower and his surety, as well as on an implicit estimate of his or the assets in the event of ultimate default, as distinct from credit based on the definitely assigned security of real property. The former credit tends to have the further distinction of being sought and granted for relatively short terms.

Yet while commercial banks have become less satisfactory from the standpoint of the farmer, his need for working capital has greatly increased. More scientific and intensive farming, made necessary by competition which has been facilitated by improved and cheapened transport, refrigeratory processes, and other causes, requires more capital expenditure on labor, fertilizers, feeding stuffs and machinery; payment in kind is being gradually entirely superseded by payment in currency, while money wages are higher; another expenditure, including cash payments to the State and other public authorities, has increased.

German farmers have advanced very far toward the solution of the problem of obtaining adequate credit at moderate rates of interest and on convenient terms of repayment by means of the 17,000 local co-operative banks established and conducted by themselves, such banks being further organized in central co-operative banks. The membership of 14,993 local banks existing on January 1, 1910 totaled 1,447,766 persons, a figure which represented one-sixth of the agriculturally occupied population of Germany in 1907. The total turnover in 1910 of 14,729 societies amounted to £261,665,000 and at the end of that year the loans outstanding for fixed period together with overdrafts, to £93,034,000, while at the same date the savings deposits totaled £92,429,000, and the deposits on current account £10,865,000. At the end of 1911 there were affiliated 137 central banks (omitting the Prussian State Co-operative Bank) 17,668 societies of all kinds, of which 14,508 were credit societies and the total turnover of these central banks in that year amounted to £410,391,000.

Different German co-operators employed the same phrase in giving to the writer the reason for the growth of rural credit societies: "They are the children of necessity (die Kinder der Not). Individual small farmers must, in fact, rope themselves together with more or less stable bonds in order to be able to present to lenders and depositors a security which the latter can accept as

guarantee that their money will be repaid in the ordinary way and without the exercise of legal pressure. And such local associations can lend money to persons not providing "banking security," as they know their trustworthiness and can judge their business capacity, while supervision is automatically brought into play within their restricted areas of operation. In ordinary commercial banking facilities it is probable that German farmers of the present day are better off than British farmers. As in England the great German joint-stock banks tend to become greater and their branches or agencies more numerous, but banks working only in one locality, one district, or one province are far more numerous in Germany. There are over 200 small joint-stock banks, besides the urban co-operative banks, about 1,200 in number, and private bankers are estimated by leading writers on German banking to number from 4,000 to 6,000. In nearly every country town in Germany may still be found one or more substantial banking firms; and from these, if only by reason of proximity, freedom of action of managers, relatively good knowledge of agricultural matters and persons (as being often established in country district centers) and of competition among themselves, it might have been expected that farmers could have obtained credit on suitable terms.

Despite this multitude of Raiffeisen banks, their large membership and business, Prof. Riesser, the most eminent authority on German commercial and industrial banking, writing in 1912, observed that much still remained to be done and must be done in this direction, as "agriculture requires a credit system adapted to the special nature of the conditions of its production." And a distinguished Prussian minister of finance, in the course of a parliamentary debate on the budget of the Prussian State Central Co-operative Bank, for whose foundation he was directly responsible, declared: "This must be our goal—to have a co-operative loan bank in practically every parish of the whole monarchy."

But it may be asked, What course is taken when deposits are insufficient (or even non-existent, as upon the establishment of a society) or when they are overabundant? As a rule credit is obtained, or any excess of deposits over current needs lodged, at a central co-operative bank. From the beginning Raiffeisen recognized the necessity for combination among rural credit societies so as to provide them with a permanent center at which depositing and borrowing might be advantageously transacted by nonprofit-seeking organizations which at once understood and took account of the special financial structure of co-operative societies and of the con-

ditions of their business. At the present time over 90 per cent of the rural credit societies are shareholders or members of co-operative central banks, of which there are nearly 50 (including as separate banks the 12 branches of the Raiffeisen Central Loan Bank) in Germany.

These central banks are organized according to Provinces or States. The German Agricultural Central Loan Bank, founded by Raiffeisen in 1876, extends its operations over the whole of Germany, but it has decentralized its business by the creation of 12 branches, which limit their operations to fixed areas coextensive with a Province, part of a Province, or adjoining Provinces, a State or congeries of small States, and which form in fact provincial banks. The other central banks in Prussia are attached to the Prussian State Central Co-operative Bank, which occupies in regard to them in some respects the same position as the Raiffeisen Bank occupies in regard to its branches. The scheme of organization for Prussian societies is, therefore: (1) Local societies, balancing as far as possible monetary supply and demand among their members (2) provincial banks, adjusting similarly the needs of their constituent local societies; and (3) larger organizations at Berlin (namely, the State Bank and the Raiffeisen Central Loan Bank) balancing supply and demand among the central banks, obtaining necessary credit, and making necessary investments on the money market for them.

Outside Prussia no State central co-operative bank has been established, but in all the larger States the central banks are in receipt of State advances or credit to assist them when the monetary demands of the local societies are in excess of the deposits of the latter and of other available capital.

Among the chief agencies which promoted the movement, apart from the State (including the Emperors William I and William II who showed their approval by donations to the Raiffeisen Central Loan Bank, and rulers of Federal States) and the co-operative unions, which have acted in their several districts as the intelligent organizers and advisers of co-operative effort in all its branches may be mentioned: (1) The agricultural organizations, and especially since their creation under the Prussian act of 1894, the chambers of agriculture in Prussia, and similar bodies in other States; (2) clergymen; (3) teachers and communal officials in rural districts; (4) larger landowners; and (5) various educational institutions.

Raiffeisen, the mayor of a small, remote district, was first give

the opportunity of putting his ideas into practice outside his own restricted area by the Agricultural Association of the Rhine Province. His book describing his system appeared in 1866, when he had already founded five credit banks, and attracted in the same year the attention of the association which was considering means for improving credit facilities for the farmers of the Province. In 1868 Raiffeisen was commissioned by the association to establish credit societies within its area, and within a year he founded 12 new societies. Shortly after he was placed in charge of the aid department for loan banks established by the association as a branch of its work. Similar associations throughout Germany took up gradually the active furtherance of the credit society movement.

Unlike Schulze-Delitzsch, who conceived his societies as purely business organizations, Raiffeisen always laid stress upon the moral as well as the material aims of his societies, which "rest upon a Christian foundation," and "aim at promoting the moral and material welfare of members."

When the question of State intervention definitely arose in Prussia in 1894 the organizations created by the co-operative societies to serve as central banks had not attained a strong position.

The Imperial Bank, owing to its special position, is obliged to take care that its assets are easily and immediately realizable. Such a condition of extreme liquidity is not guaranteed when credits are given, for the greater part or solely, upon the basis of the collective liability of persons organized in co-operative societies, although the security thus furnished may be irreproachably sound. Settlement of accounts in case of default would require time, which may not be available.

The large private banks showed no eagerness to undertake the small and rather unusual kind of business that rural societies offer and want done at low rates. The special conditions of agricultural credit are not readily met by commercial banks aiming at profits through the quick and frequent turning over of their funds. The absorption of German capital in commerce and industry, which were in course of an almost unexampled expansion, and the consequent profitable employment always open to their funds, go far toward explaining their preference. The principle of co-operative credit, based on collective and individual liability, with only small share and reserve capital as visible assets, had not as yet become familiar in the banking world, nor been recognized as supplying a solid credit foundation.

The only solution seemed the establishment of a special State

bank, adequately equipped with capital, to meet the needs of the small man requiring working capital. State intervention had been demanded in many quarters at various times, but the first positive stimulus was given by the great agrarian conference which met in the spring of 1894. In the following year the government introduced and passed the bill constituting the new bank and providing it with share capital.

Aiming at no profit beyond the moderate interest of 3 per cent upon capital, the new institution was to act as the co-operative banking center; it was to balance supply and demand among the central societies, and bring them into touch with the money market. As the individual credit society aims at adjusting the money supply and demand among its members, and the provincial central society between its constituent societies, the bank was to adjust supply and demand between the central societies by lending the surplus money of the one to the other; and, when its funds were inadequate, to use its credit in the outside market. In a word, it was to regulate the needs of the various central societies, and when necessary to obtain outside credit.

THE FEDERAL FARM LOAN BANKS OF THE UNITED STATES

[SOURCE: Article by Herbert Quick, Member of the United States Farm Loan Board, in *The Saturday Evening Post*, Jan. 27, 1917.]

The American farm is wretchedly underequipped. Farmers need twice the equipment they now possess and they are soon to be ready to buy it. What do they need? Everything—almost.

The American business man should study the purposes for which money may be borrowed under the Federal Farm Loan Act. The first purpose is for the funding or refunding of outstanding indebtedness; the second is for the buying of land by the farmer who has none, or the purchase of more by the farmer who has too little—and of these latter there are thousands. If the farmers of the country had been able last year to accept the advice of the farm papers, the agricultural extension workers, the county agents, the farmers' institute lecturers, and of rural economists generally, they would have swamped the business world with orders. They did not accept this advice—not because they were not conscious of its correctness, but because they had not the money to buy, and could not get it at living interest rates or for a time sufficiently long to enable the investment to pay itself.

Thousands of farms in the United States have been studied for

the purpose of determining how much equipment in the forms of power, buildings, machinery, live stock, fertilizers, fencing, and the like, is essential in order that the farmer may earn the best possible income.

Every survey of farms hitherto made shows that there is an optimum ratio between equipment and the whole value of the plant. These investigations show that the money invested on a fully equipped and not over-equipped farm not only pays interest at 5 per cent on the money necessary fully to equip it, but adds to the labor income of the farmer. The facts prove that if he can get money at 5 per cent, or even 6 per cent, and spend it in the proper equipment, he will make a profit on his debt.

The farmers know this; and they are preparing to take advantage of the new Federal Farm Loan Act by thousands in order that they may carry out the projects recommended to them by their own experience and urged on them these many years by economists and by the farm press.

Outside the Corn Belt every state has abundant opportunity for the opening up of more farms. The Federal Farm Loan Act is apparently perfectly adapted to the financing of these. Much of this land is covered with stumps and brush—an area larger than all the Corn Belt thus awaits settlement. It is already supplied with railroads, towns, markets, and settled government. No pioneering in the old sense is called for. The great landowners have, as a rule, acquired these tracts for purposes other than agricultural—purposes that have, in the main, been accomplished. They are ready to sell; and they must sell at low prices, because the character of the land is such that its value is low. It is low because it is hard to clear and the men who go upon it will be home-makers rather than money-makers, and will have to wait and work for the profits which alone justify high prices for an acre of raw land.

Both the landowners and their prospective land buyers are looking to the Federal Farm Loan Act for the financing of the purchase.

The cut-over lands of the United States need for use in their reclamation more explosives than the munitions factories can make; more machinery than can be absorbed by all the agriculture of Russia, now in the world's eye as a great coming market; more building material than ruined Belgium, Northern France, Poland, Serbia, Montenegro and Rumania combined—and our farmers can pay for them.

There will be no need of going abroad for safe and sound securities in the future. The farmers of the United States will offer to

the investors of the United States and the world from now on a constantly increasing volume of bonds, issued under government supervision and based on first mortgages, that should take the place of those securities for which one has to go far afield. They will be eagerly sought for by investors—if one may judge by indications that are multiplying at this writing.

The investing public comes in on these loans by the opportunity that will be offered them to buy the Federal Farm Loan bonds. These bonds will be secured by these conservatively placed farm mortgages, dollar for dollar. They will be supported by a government supervision of both loan associations and land banks, and by the stocks of both, and the double liability on the stock of the farm-loan associations—this last item amounting to a primary investment of one dollar for every twenty dollars of loan, and a secondary liability of the same amount on the stock of the local associations.

Each of the 12 Federal Land Banks guarantees its own bonds, principal and interest, and each of the 12 land banks is liable on the farm-loan bonds of every other land bank.

The bonds will be engraved and printed by the government, will be protected against counterfeiting by the Secret Service of the United States, and are declared to be instrumentalities of the government, and *exempt from all taxation—local, county, municipal, state and national—including the income derived from them.* [Our italics.] They will, therefore, rank with government bonds as securities; and should rank higher than many government bonds, since each of them is secured by every farm mortgage in the system.

As a matter of fact, land bonds in Germany and other foreign countries have for many years sold at a rate of interest about as low as and sometimes lower than the bonds of their respective governments. At first, of course, they sell at a rate somewhat higher than the ultimate rate predicted here.

It is not, however, as an opportunity for the investor or the farmer that I am here considering this new system. I am presenting it as a plan for financing the greatest volume of new business for the American industrial world ever offered to a people. The farming world of the greatest agricultural people on earth will be issuing governmentally supervised securities to get the money for a buying campaign hitherto unprecedented.

It will be a buying campaign, not for luxuries, not for unproved things, but for instruments of production that will swell high the tide of commodities in future years; for the carrying out, in the

main, of projects of production which have been shown advisable by both farm experience and the researches of experts and specialists.

[SOURCE: Circular No. 1 issued by the Federal Farm Loan Board, 1916.]

Organization

A national farm loan association may be organized in any community where 10 citizens owning land desire to borrow an aggregate of not less than \$20,000. The land must be unincumbered or the proceeds of the loan must be used, in part, to remove any lien. Loans may be as small as \$100, or as large as \$10,000.

They must first make application, in writing, for a charter to the Federal land bank of the district in which the association desires to do business. This application must be signed by all those desiring to form the association, stating specifically the name under which they desire to do business, the amount each one desires to borrow, the estimated value of the security each one offers, the territory in which the association desires to do business, how the proceeds of the loans are to be used, and other details set forth in the blank forms which are furnished.

The application having been signed, together with another blank form furnished, called an "organization certificate," the applicants become a tentative organization and elect an agent to represent them, called a "secretary-treasurer"; they also select a committee of three, called a "loan committee." This agent will then receive, from each of the applicants, a subscription to the stock of the association they are forming equal to 5 per cent of the loan they severally desire, which is not required to be paid unless the loan is granted. That is, each borrower must subscribe for such stock to the amount of 5 per cent of his own loan and no more.

The application for the charter having been signed, the signatures must be acknowledged before a notary public or other officer qualified to administer oaths, and then it must be forwarded by the secretary-treasurer to the Federal land bank of the district.

Upon its receipt the bank will send its agent to examine into the representations made in the application, and, if found satisfactory, a charter will be granted.

Upon the granting of the charter, the individuals signing the application become a body corporate, which gives it the right to do the business authorized by the farm loan act, to extend its benefits to others by taking in new members from time to time, and to have succession indefinitely. New members must be borrowers whose loans may be as small as \$100 or as large as \$10,000.

Management

After the charter is granted the applicants no longer act in their individual capacity, but become merged as shareholders into a corporation, which has a separate existence created by law, under the same name which has been chosen and set forth in the original application and organization certificate. This corporation will have directors and officers selected by the shareholders to do its business in accordance with the by-laws which the shareholders make for their guidance. The active executive officer of the association will be the secretary-treasurer.

Powers

These associations are organized for the primary purpose of giving to each borrower the benefit of the combined credit of all its members to the extent of the capital contributed and the limited liability they each incur, and hence the associations are required to indorse every loan made to members. It is also through these associations that the borrowers will ultimately become the owners of the Federal land banks. The association decides whether any loan shall be made or not by refusing the application for every loan which is considered unsafe or even doubtful. No loan can be made unless it is approved by the loan committee after examination of the land offered as security.

The national farm loan associations are not limited as to the number of their members. After one is organized it may serve an entire neighborhood by receiving new members. Each association may obtain in loans for its members 20 times the amount of its stock in the Federal land bank, no matter how large its holdings of stock may become by the growth of the association.

Limitations

1. No loan may be made except upon the security of first mortgages.

2. The amount of the mortgage can not exceed one-half the appraised value of the land and 20 per cent of the permanent improvements thereon, which must be insured.

3. The proceeds of the loan must be used for the extinguishment of pre-existing indebtedness or for productive purposes, which includes the purchase of live stock, fertilizers, equipment, and improvements (see section 12, farm loan act).

4. Every mortgage must contain an agreement to pay off the

debt (principal and interest) in fixed annual or semiannual installments.

5. The amount of each installment may be fixed by the borrower, but can not be less than sufficient to pay off the debt in 40 years, nor greater than to pay it off in five years.

6. The rate of interest charged any borrower can not exceed 6 per cent per annum.

7. The borrower can not be called upon to pay the debt except by the installments he originally fixes, unless he defaults, but after five years he may pay off the whole or any portion at his option at any installment period.

CHAPTER IV

PROPERTY INSURANCE

I. FIRE INSURANCE

[SOURCE: Emil Davies, *The Collectivist State in the Making*, pp. 111, 112, 113.]

IN most of the Swiss cantons the insurance of buildings and furniture against fire has been a State monopoly for many years; in other cantons the State and the companies are in competition, particularly as regards the insurance of movable property. The canton always wins easily, its tariffs being much lower than those of the companies.

In New Zealand, the government has most successful Fire, Life and Accident Insurance Departments, which compete throughout Australasia with the companies, their advertisements being found in most of the important Australian journals. The following extract from the *New Zealand Official Year-Book* (1912), page 744, gives full details (the italics are mine)—

“In the year 1903 an Act was passed ‘to establish a State Fire Insurance Office and to make other provisions for the insurance and protection of insurable property in New Zealand against loss or damage by fire.’

“The statute provides for the establishment of an office to be administered by a General Manager appointed by the Governor, and for the necessary staff—not subject to the laws regulating the Civil Service.

“There is provision for the constitution of a Board, to consist . . . of the Minister of Finance, the General Manager, the Government Insurance Commissioner, and two other persons (not being in the Civil Service) appointed by the Governor. The latter hold office for two years, with eligibility for reappointment, and are to be remunerated according to appropriation by Parliament.

“In order to provide capital for the business, the Minister of Finance, on being authorized by the Governor in Council, is empowered to raise from time to time such sums as he thinks fit, not exceeding in the whole £100,000, any of which may, if found convenient, be raised in New Zealand.

“In the event of such capital not being found sufficient, the Minister of Finance, on being authorized by the government, is empowered to raise additional capital as required. To enable this to be done the General Manager must, if the Board approves, apply to the Minister for supplementary capital (not exceeding £20,000 at a time) to carry on business until the pleasure of Parliament is signified.

“The rate of interest on debentures, scrip, or other security issued in respect of any sum raised under the Act may not be higher than $4\frac{1}{2}$ per cent.

“All moneys payable to the General Manager are to be paid to the credit of the State Fire Insurance Account, out of which shall be payable, without further appropriation than the Act under notice, all costs and expenses, salaries, fire losses, and other outgoings of the business—including interest payable on securities issued.

“Provision is made for the General Manager, with consent of the Board, to buy, sell, or lease land, with or without buildings, for the purposes of the office.

“On the 4th of January, 1905, the State Fire Insurance Office opened for public business, and at the end of that year the public support accorded resulted in insurances therein to the extent of £3,000,000. At the end of the year 1911 the gross amount at risk had increased to £11,764,209.

“As a consequence of the operations of the State Fire Office, the rates on trade risks and the like have been reduced by 10 per cent, and those on dwellings, offices, and similar risks by $33\frac{1}{2}$ per cent.

“The premium income, after deducting premiums on reinsurances during the 7 years, 1905-1911, was as follows:

Year	Amount of Premium Income
1905	£13,128
1906	20,962
1907	23,195
1908	26,657
1909	33,281
1910	40,552
1911	47,745

“The premium rates have remained unaltered during the above years. Only £2,000 of the authorized capital has been raised, and the office has the sum of £25,000 invested in Government securities.”

The most instructive example I know of State fire insurance is that of one or two of the French departments which have their fire insurance departments. Take the case of the Department of the Marne. Its rates are lower than those of the companies which it has vanquished, its ratio of loss is considerably less than that of the companies, and *out of its profits it presents each year to the little villages and hamlets within its area free gifts of fire apparatus for fighting and preventing fires.* This, of course, is in its own interest, as it reduces its loss, but the most enlightened manager of a fire insurance company would not dare to suggest such a thing to his directors, much less to his shareholders.

II. HAIL INSURANCE

[SOURCE: Emil Davies, op. cit., p. 118.]

The Act passed by the Province of Saskatchewan (Canada), enables municipalities subscribing to the Insurance Commission to pass by-laws imposing a tax of four per cent per acre on all the lands in the municipality, in consideration of which loss of crops by hail is insured to the extent of five dollars per acre. Thus a farmer with 160 acres under crops, is insured for \$800 for a premium of \$6.40. A similar insurance with private companies would cost about eight times as much. In 1913, 115 municipalities had exercised their powers under the Act, and the tax produced about \$800,000. The claims numbered 5,300 and the payments amounted to approximately \$740,000.

A remarkable feature of the scheme is the small ratio of working expenses, which, including salaries and all other expenses, amounted to three per cent.

III. LIVE STOCK INSURANCE

[SOURCE: "Agricultural Credit and Co-operation in Germany," Report to the British Board of Agriculture and Fisheries, by J. R. Cahill. Senate Document No. 17, 63d Congress, 1st Session, pp. 308, 310, 311, 312, 313, 314, 315, 316.]

Two main branches.—There are two main branches of German cattle insurance—life insurance and slaughter insurance. By the former is meant the insurance of cattle owners against loss of their stock by death or by compulsory slaughter. The whole question of cattle life insurance in Germany, as well as in other countries, has been immensely simplified in recent times by the veterinary measures adopted by the State to prevent the introduction and extension of cattle disease, as well as by the fact that compensation

is paid by the State for losses incidental to the execution of these measures. Under the imperial cattle-diseases act, which came into force in 1912, compensation for cattle slaughtered on account of tubercular disease is, under certain conditions, to be paid by the State. Cattle life insurance is, therefore, now concerned with compensation only for the less serious risks to which cattle are exposed. By slaughter insurance is meant the insurance against loss arising through the condemnation of the whole or of part of carcass as unsuitable for food. This branch of insurance has assumed increased importance as a result of the stricter modern requirements as to the suitability of meat for human consumption. In many parts of Germany it is becoming more common for local societies to unite the two kinds of insurance in the same policies.

Bavaria.—Since 1896 the State has undertaken the organization of cattle life and slaughter insurance in Bavaria. In that year the cattle insurance act provided for the establishment of a public cattle insurance institution and the organization of cattle insurance upon the following lines: (1) The institution to be a mutual insurance undertaking, whose management was to be intrusted to the royal insurance chamber; (2) the institution to be formed of those local mutual cattle insurance societies throughout Bavaria which have adopted the model articles of association approved by the institution and voluntarily attach themselves to the latter; (3) only the insurance of cattle and goats to be undertaken; (4) the institution to take over the payment of half the losses as duly established, the funds for this purpose, so far as other funds were not available, to be distributed over the affiliated societies in proportion to the amount of the value insured by them; (5) an annual State grant to be made to cover partially the annual expenditure, in addition to a single foundation grant to be written to the reserve fund of the institution.

The State made a grant of £25,000 in 1896; and since 1899 the annual grant has been fixed at £5,000. In addition (since 1900), a sum of £1,250 has been placed at the disposal of the ministry of the interior for assistance to local societies, especially those whose payments to the institution regularly exceed the compensation received by them.

The administration of the institution has been intrusted to a newly constituted department of the Bavarian Fire Insurance Institution, which receives, under the act, an annual payment of $\frac{1}{4}$ d. per £5 of the total insured value from the societies concerned. The fire insurance institution—fire insurance is obligatory and

universal in Bavaria—undertakes on the same terms the administration of the Bavarian Hail Insurance and of the Bavarian Horse Insurance Institutions. As regards cattle insurance, the sum paid under this head to the fire insurance institution in the year 1908-1909 amounted to £861. On the expiry of the insurance year, which is fixed, for the sake of convenience, as November 1 to October 31, the proportion of all expenditure falling to each society is determined and is collected by the inland revenue by the same procedure as that for the collection of ordinary taxes.

Notification—Veterinary assistance.—Immediate notification is obligatory upon members. The committee must then examine and give necessary orders as to treatment; if necessary, veterinary assistance is to be obtained. The insured must pay for the prescribed treatment as well as for the first visit of the veterinary surgeon, unless the society, by resolution of a general meeting, undertake to defray wholly or partially this expenditure. Owners may not slaughter their animals without instructions from the committee, except in very urgent cases, and its necessity must be subsequently recognized by the committee before compensation is paid.

Results of State action.—It is generally recognized in Bavaria that, although cattle insurance is still far from being as widely practised as is desirable in the interest of Bavarian farmers (only about 10 per cent of their total stock being insured), the majority of which are small holders, yet the institution administered by the State has greatly contributed to the spread of insurance. In 1894 there were 542 local societies in Bavaria with which 126,400 animals, valued at £1,310,000, were insured; in 1911, 1,661 societies were affiliated to the institution and insured 294,246 animals of a total value of £4,190,677. In addition to these societies there were, in 1911, 370 cattle insurance societies which have not become affiliated; a large number of the latter are small associations whose members undertake mutually to buy the sound portions of animals which die or are compulsorily slaughtered.

The net payments as compensation have not reached two per cent of the insured value in any year, although the tendency in recent years appears to be toward a higher percentage than in earlier years. Since 1897 the institution has paid a total of £1,113,551 in 154,356 cases of compensation. The insured have had to pay no contribution toward the cost of its management; the grants of the State sufficed to cover this expenditure, which was cheaply and efficiently carried out by virtue of the co-operation of the fire insurance institution.

The Bavarian scheme affords an excellent and successful example of State cattle insurance, resting on a basis of local societies grouped voluntarily for the purpose of providing reinsurance to the extent at least of half of the amount of compensation payable to the insured.

Horse insurance in Bavaria.—Bavaria appears to be the only German State which has passed special legislative measures in respect of horse insurance. Proceeding upon the principles already put into practice in 1896 for the organization of cattle insurance, the Bavarian Government introduced and passed a horse insurance act in 1900. As a result of the imperial act concerning insurance agreements this act was amended in 1910; and in 1912 some further amendments were incorporated. In 1911, of the total number of horses existing in Bavaria, about 24 per cent were insured under this act. It is unnecessary to go into detail regarding the provisions of this act, as the general organization and procedure formulated follow very closely what has already been detailed as regards Bavarian cattle insurance; but certain points may be noticed.

The institution received upon its foundation a capital of £25,000 from the State, which also undertook to provide a yearly grant of £2,000. The latter sum was subsequently raised to £3,000, and the State budget places at its disposal a further annual sum of £2,000 to be "employed for making extraordinary grants to individual overburdened horse insurance societies for the purpose of reducing the contributions" of their members. The interest of the capital is to be applied to the formation of a reserve fund, into which is also to be paid the entrance fees of members of local societies. In 1909 this fund already stood at £19,418.

The institution meets half of the compensation due to insured horse owners; like the cattle insurance institution it pays, however, such claims in full, and recovers from the societies concerned at the end of the insurance year, October 31. These societies are subject to inspection by the institution, which may examine all their books and documents, may impose fines up to 10s., and may exclude them from the institution. The committee and arbitration board are elected on the same lines as those attached to the cattle insurance institution. Similarly all correspondence in insurance matters is post free, and no fees payable to the state are leviable on insurance transactions.

Baden.—State scheme: Baden was the first German State to undertake the organization of cattle insurance. Under the act of 1890, as finally amended in 1910, every communal (that is

roughly, parish) authority is obliged to establish and administer a mutual cattle insurance institution, when at a meeting of those cattle owners resident within its area two-thirds of those present vote therefor, and the district authority subsequently gives its approval. All cattle owners within the area of the communal authority may then be obliged to insure their stock. These communal institutions form a central institution or union, which (since the amended act of 1898) undertakes responsibility for half of the amount due as compensation. Local insurance societies existing previous to January 1, 1891, and whose articles and rules conform to those approved by the union, are eligible for affiliation to the union. It is also provided that if the requisite two-thirds majority just alluded to be not obtained for the establishment of a communal institution, the ministry for home affairs may sanction, for affiliation to the union, a society covering the same area, if it be formed within one month and comprise at least one-third of the cattle owners of the area. The amount of compensation payable is fixed at seven-tenths (or eight-tenths in case of compulsory slaughter) of the value of animals, taking as basis the current market prices of their class. Compensation is also payable in respect of animals discovered unsound after slaughter. To meet this expenditure the union levies contributions upon its constituent communal institutions, but when such annual contributions exceed $2\frac{1}{2}$ d. per £5 of the total insured value the balance is made good by the state treasury.

Although there is the important difference between the Baden and Bavarian systems of cattle insurance as organized by the State that the one is built upon mutual local insurance institutions with limited compulsion, and the latter upon mutual local insurance societies voluntarily formed, the general regulations and procedure bear the very closest resemblance. Details of the Bavarian scheme, which was drawn up some years after the Baden system had been in operation, and was modeled in the light of the Baden experience, have already been given.

[NOTE.—For governmental insurance against death, sickness, accidents, old age, maternity, unemployment, etc. (social insurance), see our Chapter on Health and Social Insurance.]

PART II

**AGRICULTURE AND THE CONSERVATION
OF NATURAL RESOURCES**

CHAPTER V

LAND RECLAMATION

LAND reclamation by government takes chiefly two forms: the irrigation of dry land and the drainage of wet or swamp lands. Historically, Holland has been the chief country for the reclamation of flooded lands, but France and Germany have both spent a vast amount in this direction, and we give a selection showing the recent progress in the former country.

Irrigation has been practised by governments on a large scale in many countries. Outside of the United States undoubtedly the chief work has been the vast projects of the British Government in Egypt and British India, in the latter of which cases the work done, though already considerable, must be regarded as still at an early stage, in view of the immense possibilities of the future.

Almost, if not quite, as great are the possibilities of irrigation in the United States. We give our chief attention to the work being done here because it is more advanced and more varied than in other countries, and is proceeding at a more rapid rate at the present time. Already (to June 30, 1916) the United States Government has invested \$101,000,000 in 35 projects, and incidentally has created the opportunity of developing nearly 2,000,000 horse power—though only a part of this horse power is as yet in use. The figures as to the number of acres reclaimed and number of farms in operation, etc., follow in our selections. It may be added that a population of 341,000 is being supported by these new projects, nearly all of which are less than 10 years old. Two-thirds of this population is able to live in towns on account of the high productivity per acre and the closeness of the farms to one another. Nearly 500 schools have been established and over \$63,000,000 deposited in the banks.

THE UNITED STATES

[SOURCE: Report of the United States Secretary of the Interior, 1916, pp. 6, 7, 36-39.]

In 1915 the Reclamation Service—

1. Developed, stored, distributed and delivered irrigation water to 850,000 acres of arid land in 17 States, converting from desert to producing farms an area equal to the cultivated acreage of Delaware or Nevada and yielding a crop value exceeding that of New Hampshire or Utah.

2. Operated irrigation works including 40 reservoirs with a total capacity of 9,000,000 acre-feet, or 3,000,000,000,000 gallons, sufficient water to cover Massachusetts and Connecticut a foot deep; 10,000 miles of canals, flumes, tunnels, and other conduits, a length sufficient to circle the United States; 75,000 structures, including dams, head gates, weirs, checks, and other irrigation devices.

3. Took into its canal system 4,500,000 acre-feet of water and delivered 2,500,000 acre-feet to 20,000 farms.

4. Carried on construction work on 24 irrigation projects, bringing 10 projects or units thereof to completion and issuing public notices opening the lands to entry and water service. Added a quarter of a million acres, or 5,000 farms, to the area under Government works for which irrigation water is available.

5. Completed the highest dam in the world and another forming the largest irrigation reservoir; built 700 miles of canals, 80 miles of drains, 50 miles of pipe line, 66 miles of roads, 7,200 canal structures, 600 bridges, 650 culverts; excavated about 10,000,000 cubic yards of earth and rock; used 500,000 barrels of cement, and manufactured 60,000 barrels of sand cement.

6. Co-operated with other departments of the Government: State Department regarding treaties relating to international streams used for irrigation; Department of Justice regarding suits affecting interests of United States and water users in irrigation works and water rights; Department of Commerce in developing alkali-resistant concrete and other tests; Department of Agriculture in demonstration and experiment work on reclamation projects; Department of Labor in bettering labor conditions on irrigation construction work; and with various departments to standardize Government cement specifications.

Co-operated with other bureaus of the Interior Department: General Land Office in many details affecting the administration of the public domain; Geological Survey in stream-flow measure-

ment, and Indian Office in irrigation work on Indian reservations.

Co-operated with State governments in the investigation of irrigation possibilities and general stimulation of irrigation development.

Co-operated with numerous local organizations to similar purpose, providing needed water supplies for private projects.

Co-operated with 25,000 water users on Government projects in the delivery to them of the most vital requisite in their daily occupation of irrigation farming and in improving the efficiency and economy of administering the irrigation systems through enlargement of the responsibilities of the settlers themselves and improved organizations, such as irrigation districts. Distributed to the water users 150,000 copies of the Reclamation Record, a monthly publication containing information of value to the irrigators.

During the past year the operation of the reclamation laws has continued to advance their objects as shown by the increase in the area for which the service could supply water, the increase in the areas actually irrigated and cropped, the increase in the value of crops produced, and the increase in the actual number of settlers and of homes. The progressive increase in these elements is shown in the following table:

Results of Reclamation

Year.	Irrigable acreage.	Irrigated acreage.	Irrigated farms.	Cropped acreage.	Crop value.
1909	730,000	382,000	9,000		
1910	880,000	475,000	12,000	415,000	\$12,500,000
1911	1,015,000	560,000	14,000	470,000	13,000,000
1912	1,160,000	645,000	15,000	590,000	14,500,000
1913	1,200,000	700,000	16,000	650,000	16,000,000
1914	1,250,000	770,000	18,000	700,000	16,500,000
1915	1,500,000	857,000	20,000	800,000	19,000,000

Crops of 1915.—The figures for 1915 show no marked change in the character of crops grown or their relative areas. More than half the total cropped area is devoted to hay and forage crops, slightly less than one-third to grains, and less than five per cent each to fruit, vegetables, and sugar beets. There is evident a gradual increase in the proportionate area of bearing fruit.

Alfalfa continues to dominate the crop statistics from the irri-

gated areas. In 1915 it occupied nearly half the cropped acreage and yielded over one-third the total crop value. Its many virtues readily explain this popularity. Once established, or a "stand" secured, it is a hardy plant and continues almost indefinitely to furnish good annual yields without reseeding. It gives several yields or cuttings each year. It is a legume with the peculiar power of drawing from the atmosphere the nitrogen in which the soils of the arid region are often deficient, and leaves behind more than it found of this valuable plant requirement. It is the deepest of subsoilers, penetrating with its many roots to a remarkable depth for the other essential elements of plant growth and improving the physical condition of the soil. It furnishes a hay of superior quality for conditioning and fattening stock, so effective in fact that it is now being utilized medicinally for humans.

A summary of 18,624 irrigated farms shows the average farm contains 54 acres of irrigable land and 44 acres are actually watered, leaving 10 acres for fields not yet utilized, buildings, private roads, etc. On this average farm 20 acres are in alfalfa, 13 in grain, with small areas of other crops. The farmer crops a total of 41 acres. His total crop as harvested is worth a little less than \$1,000, but he has three or four work animals to feed and by feeding the rest of his crop its value can be greatly increased. For this purpose he has cows, sheep, and hogs, in all some 25 animals. These are worth about \$1,000; adding the price of his land and water-right payments, this average farmer is using a capital investment of \$6,000. His success depends largely on what he pays for the use of this capital. If he is indebted for a large share of it at a high interest rate, he is likely to fail; if his capital is clear or indebtedness and interest low, his chance is excellent.

[SOURCE: Report of United States Reclamation Service, 1915-1916, pp. 17-20.]

Excellent assistance in the purchase, care, and feeding of all classes of live stock has been given the project farmers by the agriculturists assigned to several of the projects, under the direction of Mr. F. D. Farrell, of the Department of Agriculture. That department, after considering conditions on the projects, decided that the greatest advantage would accrue to the farmers by the assignment to the projects of men educated and trained particularly along animal-husbandry lines, and this course has proved wise. Losses to the farmers by reason of live-stock diseases have been minimized by the presence on the projects of these trained men, and the advan-

tages of their help in the purchase of breeding stock will be continually apparent hereafter.

Increases in the live stock handled on the projects have created marketing facilities for much forage and bulk feeds heretofore unmarketable at a profit.

The act of October 5, 1914, authorized the Secretary of the Interior to withdraw from other disposition and reservation land for community centers for the use of residents on the reclamation projects of the Government, and this provision of the law has been utilized in many sections. The project women have been particularly active in building community houses and forming community clubs and other organizations which bind individuals in closer relations. More than 200 women's organizations have been reported, a large percentage of them being affiliated with State and National federations. That they are already an important factor in the upbuilding of the West is well recognized, and they are working side by side in effective co-operation with boards of trade, chambers of commerce, and other organizations for better farms, better health, better schools, better communities, and better homes.

FRANCE

[SOURCE: Publication of United States Geological Survey entitled, *The Public Utility of Water Powers*, by René Tavernier, Chief Engineer, Department of Public Works of the Republic of France, pp. 98-102.]

Drainage and Soil Improvement

Among the drainage works undertaken within the past 30 years may be cited the draining of the Fos marshes (Bouches-du-Rhône), and among the projects soon to be undertaken the draining of the pool of Arnel (Hérault).

Among the principal enterprises for soil improvement fully executed or terminated since 1870 must be mentioned the moors of Gascony (Gironde et Landes), covering an area of 800,000 hectares (3,088 square miles); the Sologne (Loiret, Loir-et-Cher, Cher) extending over 500,000 hectares (1,930 square miles); the Dombes (Ain), 112,700 hectares (435 square miles); and the Double (Dordogne), 50,000 hectares (193 square miles). Works for the improvement of the plain of Forez (Loire), which has an area of 60,000 hectares (232 square miles), are now in course of construction. This enterprise includes the building of an irrigation canal, which will enhance the value of the reclaimed lands.

The Government has contributed largely to defraying the cost

of all these enterprises. The work has remarkably ameliorated the conditions of human life in these regions and has at the same time greatly increased the territorial wealth of the country. Take, for example, the moors of Gascony; the average price of the land per hectare has risen from 65 to 270 francs (\$13 to \$54); the average length of life, formerly 34 years and 9 months, is now 39 years, a higher average than that for the whole country. The pines of Landes, which cover immense tracts of improved lands, have added to the wealth of the country by the commerce in timber, resin, etc., to which they give rise. The general well-being is increased and there has been a notable growth in the public revenues.

In Sologne the moors, which were formerly uncultivated, are to-day covered with woods over an area of more than 250,000 hectares (965 square miles). Since the beginning of the works the population of Sologne has increased 20 per cent, while that of neighboring regions has grown only 10 per cent. In the Dombes country, formerly the most unhealthy region in France, the work of improvement has resulted in diminishing the fever cases by five-sixths. Similar results have been obtained on the plain of Forez, where, thanks to irrigation, land values have increased enormously.

There is one enterprise now projected and soon to be begun, if Parliament grants the necessary funds, with which, so far as the results to be obtained are concerned, only the improvement of Landes can be compared—that is, the drainage of the east coast of Corsica. This is a vast project, which includes the filling up and drainage of insalubrious marshes and pools and the improvement of the mouths of rivers. This work is to be completed by the construction of a system of canals for the conveyance of good drinking water, so indispensable to the health of the communes interested. When the work is completed we may expect a transformation of a region now devastated by malaria extending over more than 100,000 hectares (386 square miles).

Cleansing and Straightening Watercourses

These operations, which are necessary to insure the free flow of waters and which have considerable influence on the salubrity of river lands, are particularly delicate and require the constant attention of the hydraulic service. The importance of the work accomplished is demonstrated by the length of the streams annually cleaned, which extend over more than 13,000 kilometers (8,080 miles) and drain an area of more than 420,000 hectares (1,622 square miles). Sometimes it is necessary to complete the work of

cleaning and weed cutting by straightening and deepening the channel. As an instance we may point to the work recently done on the Conie (Eure-et-Loir), which covered more than 150 kilometers (93 miles) of the river.

This work, by which lands of great value are preserved and brought under cultivation, serves also in certain cases to protect dwellings. The work is done by corporate associations, with important subsidies from the Government. The most important enterprises of this nature have been completed in regions exposed to the ravages of torrents, such as the Jura, the Pyrenees, and the Alps.

But it is not only against river waters that we must protect cultivated lands. The sea also commits depredations, and important dike work has been undertaken to restrain its incursions. In this connection the repair of the dikes encircling the salt marshes of Guerande may be cited. This great enterprise, which has cost not less than 300,000 francs (about \$56,000), will preserve to the salt industry an important area, which was menaced by the encroachments of the sea.

Irrigation and Submersion

The hydraulic service has directed its efforts principally to the development of irrigation of lands not bordering on rivers. Such lands can be watered only by the construction of irrigation canals. These are built either by corporate associations or by associations of concessionnaires. The Government subsidizes such enterprises, leaving, however, a large part of the expense to be borne by those interested.

Since 1870 eight large irrigation canals have been constructed, with a delivering capacity exceeding 1,000 liters per second (35 second-feet). Twelve more large canals were projected and are now completed or about to be completed.

In addition to canals for watering the land must be mentioned those for the submersion of vineyards, constructed in the Department of Aude between 1880 and 1890, after the invasion of phylloxera. These canals are designed to enable the vine grower to keep his vines under water in winter to a depth of 30 or 40 centimeters (0.98 to 1.31 feet) for a period of 40 to 60 days. The canals of Aude serve a vineyard area of 11,000 hectares (42.5 square miles), of which 7,225 hectares (27.9 square miles) have been submerged since the completion of the work. They were built by the Government at a cost of more than 5,000,000 francs

(\$1,000,000) and were first put under the charge of the corporate associations interested, but were finally transferred to them entirely on condition of the payment in annual installments of two-thirds of the cost price advanced by the treasury.

The irrigation canals proper are situated in the arid region of the southeast. Irrigation alone renders possible truck gardening and the culture of fruits and flowers, which are shipped as far as Paris. Flowers for perfumery are cultivated on a large scale in the Departments of Var and Alpes-Maritimes. The market for aromatic flowers in the city of Grasse owes its importance wholly to the proximity of the Siagne canal.

Finally, the service will study the question whether it will not be profitable to extend irrigation projects in certain regions by pumping water to fields not susceptible of irrigation by gravity canals. It is possible that, by selling the surplus power thus obtained, water can thereby be supplied for agricultural purposes at a price more commensurate with the returns from the land.

Increasing the Regularity of Stream Flow

In the Midi, where irrigation is especially well developed, the volume of the streams is frequently insufficient in the dry season to meet all the requirements of irrigation. Although the quantity of water allowed to each irrigator has been reduced to bare necessity, it frequently happens that the lack of water brings ruin to agriculture. This distressing condition is remedied by the construction of reservoirs in the more elevated parts of the valley in which considerable quantities of water are stored up in times of plenty for use when the dry season sets in. These works are important for another reason. By regulating the volume of the streams, they increase the available water power in the streams below.

Among the operations of this kind is included the regulation of the volume of the streams flowing from the plateau of Lannemezan (upper Pyrenees). This regulation is accomplished by means of a canal which draws water from the river Neste. As the Neste was not of sufficient volume to assure at all times a sufficient flow in the canal, the Government had to supplement its volume artificially. For this purpose the lakes of Oredon, Caillaouas, Aumar, and Cap de Long, situated in the Pyrenees, have been transformed into reservoirs. During the dry season the waters from these lakes are diverted into the Neste.

Municipal Water Supplies

As has been said above, under the law of March 31, 1903, a tax of one per cent is levied on the money put up in wagers under certain conditions, and from the sums thus collected subsidies are granted to communes who apply for them for the construction of aqueducts for drinking water. The applications for subsidies are submitted to the special commission mentioned above, which approves them after a thorough investigation of the project by the agents of the hydraulic service. This examination covers several entirely distinct subjects. First, the hydraulic service must ascertain under what conditions and with what restrictions the contemplated conveyance can be authorized, in order to determine whether it shall or shall not be subsidized. This is indispensable, as by law the rights and interests of all users of the waters from which the supply is to be derived must be safeguarded. Also, the engineers of the hydraulic service are required to verify every detail of the enterprise; to see whether the plans are technically correct and well adapted to accomplish the end in view; and, finally, to determine whether the work is planned as economically as possible.* After these data have been obtained in the field the bureau of hydraulics and agricultural improvements submits the projected enterprise to its technical advisers for another examination. If advisable, it takes the necessary steps to have the enterprise declared of public utility, and finally gives to the commission on subsidies a full and clear statement of all the facts.

The subsidies are paid to the communes in installments proportioned to the expense actually incurred, after it has been proved that the work has been properly done and that no modifications have been made in the plans whereby their value might be impaired.

After the experience of three years we may safely assert that the law of March 31, 1903, has resulted in a considerable increase in communal enterprises for the conveyance of drinking water, and that the effect on public health has been most gratifying.

* In addition to their duty as supervisors, the engineers of the service are at the command of the communes to prepare, on request as communal engineers, all plans for the installation of domestic water supply.

INDIA

[SOURCE: United States Geological Survey, Water-Supply Paper No. 87, by Herbert M. Wilson—pp. 31-36, 58, 60.]

Between 1877 and 1900 the gross outlay was \$285,000,000, the grand total expended on such work from 1867 to 1900 being \$337,850,000. In the year 1900-1901 the expenditures on account of irrigation aggregated \$11,500,000 and the revenue \$12,075,000, the profit earned on the capital outlay being 7.5 per cent.

Counting irrigated areas cropped twice, the total acres irrigated were 32,059,993; and counting areas of all kinds cropped more than once, the total area under cultivation was 229,362,381 acres.

In the province of Sind in the Indus Valley, including the southern Punjab, there is an enormous and thirsty waste of sandy desert where the annual precipitation is always below 10 inches, even falling as low as 3 or 4 inches. There nothing can be grown without the aid of irrigation, and the entire area under cultivation and the population supported thereby are entirely dependent on irrigation. The works in that region are chiefly inundation canals with a few perennial canals mostly taken from the Indus River. In the Sind alone over 3,000,000 acres are under cultivation, and yield an annual revenue of about \$3,700,000.

In Bombay and the Northwest Provinces nearly double the population is now sustained that was supported previous to the introduction of modern irrigation works. According to Col. Baird Smith, the whole of the region irrigated by the Eastern Jumna canal would have been devastated by the famine of 1837-38 without the aid of the irrigation which that canal afforded. With its aid the population was comfortably supported and the gross revenue derived from the use of the water was \$2,445,000, of which the Government received a yearly net income of \$250,000, and this shortly after the completion of the work. In the same year the united Eastern and Western Jumna canals were estimated to have saved property to the value of \$10,000,000, and as a result of this showing the British Government shortly afterwards began the construction of the great Ganges canal and other similar works.

As an indication of the increased revenue derived from the use of water and the capability of the soil to pay that increase, it appears that in the presidency of Madras the rate of assessment in the tank region is about \$2.30 per acre on irrigated land, as against 55 cents per acre on land not irrigated.

Of major productive works, the capital for which has been pro-

vided from borrowed money, there are 35 in the six principal provinces. The capital expended on these works to the year 1900 was about \$100,000,000, while the sanctioned estimates for the completed projects were \$103,572,000. These 35 major works are designed to irrigate, when fully completed and irrigation has been fully developed, something more than 10,356,000 acres. Of 6,000 miles of main and branch canals no less than 2,300 miles are navigable. The cost of making these canals navigable can not be readily ascertained, but should be eliminated in determining the true cost of each irrigable acre. The Mutha canal, in Bombay, which is the most expensive of any canal of its kind, derives a considerable income from the supply of water for domestic purposes to the city of Poona. It may be said that the works of this class average \$9.30 for each acre irrigable. Of the 10 largest of these major works, the most expensive, the Orissa system in Bengal, cost \$27 per acre, and the Ganges canal, which covers the largest area of all, and is at the same time the cheapest, cost a little under \$6.30 per acre.

In 1900 there were irrigated by major productive works alone 11,409,528 acres. The rate of working expenses per acre on all the classes of works varied between 40 cents and \$2.60. The gross area irrigated by all three classes of works was 18,611,106 acres, while the entire area under irrigation, including that watered by wells and that double cropped, was 33,096,031 acres. The average water rate charged was less than \$1.40 per acre. The average value of crops per acre varied from \$10 to \$35, and the percentage of rate charged on the value of the crop was between \$3.30 and \$8.25. Gaged by the standard of the percentage of rates charged, theoretically the gage of the severity of the charge on the cultivator, the Bombay rates, which are actually the highest, are shown to be the lowest, and this is really the fact because of the very high value of the sugar-cane crop so extensively cultivated in that province. The gross value of the crops irrigated in 1900 by all the four classes of irrigation works administered by the government reached the sum of \$155,000,000.

EGYPT

[SOURCE: Office of United States Agricultural Experiment Stations, Bulletin No. 130, by Clarence T. Johnston, pp. 5, 6, 56, 57, 82.]

By far the most important modern irrigation work in Egypt is the Assouan dam, which regulates the flow of the whole of

the lower Nile and thus affects the irrigation of 4,000,000 of the 5,000,000 acres under cultivation in that country. The dam was completed in 1898 at the cost of \$22,000,000, but it is estimated that the resulting increase in the agricultural production of Egypt would pay for this expenditure every two years. The total cost of irrigation per acre of land irrigated, when the smaller distributary canals are included, will be \$57. But the *net* profit per acre of the chief crops varies from \$50 to \$150 *annually*.

The revenues of the Egyptian Government from the areas devoted to dates run from \$10 to \$45 an acre, and the net profit to the cultivator approximates \$150 an acre. This little tract of agricultural land, no larger than the irrigable area of California, supports between 5,000,000 and 6,000,000 people, pays the expenses of a costly government, and meets the interest on a national debt half as large as our own from the returns on agriculture alone.

It is believed that the water stored in the Assouan reservoir will add annually to the wealth of the country a total of \$11,000,000. Land which can be perennially irrigated rents about \$5 per acre higher than that which depends upon inundation alone. As shown above, the taxes on perennially irrigated land are much higher than on land not so watered. It is expected that the semiannual payments on the reservoir will be met by the increased revenue from the lands deriving benefit from the stored water. In the words of Sir Alfred Milner, "The Egyptian Government is relieved from the difficulty of paying for the works until return is received from them; until, in other words, they pay for themselves."

CHAPTER VI

LAND DEVELOPMENT

GOVERNMENT ownership of land is so common under all forms of government and all economic conditions that it can by no means be taken as an example of collectivism. For instance, those new countries most ardently devoted to an individualistic form of government, like the United States and Canada, are often in possession of large tracts of uninhabited land through no fault of their own. The purpose of such governments is to turn this land into private property as soon as possible. And this probably applies to all the governments that control vast areas of new land to-day.

In a few cases, such as the Imperial domains of Russia, Prussia, and Austria, the land is leased instead of being sold outright in small parcels. This is a case of government ownership in the collectivist sense; but governmental operation is far more rare. It is chiefly to be found, in temporary and partial effect, in the process of securing settlers for farming colonies. In such instances while governments do not operate farms entirely, they perform a great many agricultural functions—on such a large scale and in such an efficient manner as to demonstrate the practicability of governmental agriculture where governments desire to enter into this field. It is for this reason that we have devoted a moderate amount of our space to examples of governmental success in this direction—and also to a project of permanent governmental exploitation. (See Chapter VII.)

Undoubtedly still more important examples of the success of government in the field of agriculture are to be found in the European war. (See Chapter on The Food Supply.) At the time of the rapid rise of the cost of living in 1911, a large number of European municipalities also went into various branches of the food producing business. (See Chapter on Municipal Socialism.)

[SOURCE: Report of the Commission on Land Colonization and Rural Credits, Nov. 29, 1916, State of California, pp. 5, 7, 62-74.]

Within the last five years, questions of land tenure and land settlement have assumed a hitherto unthought of importance in the United States. The causes for this are the disappearance of free, fertile public land; the rising prices of privately-owned farm lands; the increase in tenant farming and a clearer recognition of its dangers; and the increasing attractions of city life which threaten the social impairment of rural communities by causing young people to leave the farms.

Some of the most enlightened nations of the world have gone far toward solving the problems created by such undesirable conditions by the adoption of new attitudes on the part of the government towards land ownership and land settlement. In such countries the State has taken an active part in subdividing large estates and in creating conditions which will enable farm laborers and farmers of small capital to own their homes. They have adopted this policy because experience has shown that non-resident ownership and tenant farming are politically dangerous and socially undesirable; that ignorant and nomadic farm labor is bad; and that the balance between the growth of city and country can be maintained only through creating rural conditions which will make the farm as attractive as the office or factory for men and women of character and intelligence.

It is to the interest of the whole state that its fertile lands should be cultivated and that active colonization should be promoted. The State now buys a large part of its meat and many other farm products abroad. Increased production would lessen the cost of living and keep at home money now sent to other sections to pay for food products. Moreover, great properties, owned by non-residents, are being cultivated by tenants or by nomadic and unsatisfactory hired labor. These great properties ought to be subdivided and cultivated by residents. From statistics furnished by C. L. Seavey, tax commissioner, it appears that 310 landed proprietors own over 4,000,000 acres of land suited to intensive cultivation and capable of supporting a dense population. This would make 100,000 forty-acre farms. One firm owns nearly 1,000,000 acres; one railroad owns 500,000 acres. In Kern County four companies own over 1,000,000 acres, or more than half the land in private ownership.

The statements of the Canadian Commission about the effects of the New Zealand system on rural life indicate equally well the

effects of the systems of Ireland, Denmark, Germany, and practically all the other countries in which state aid in land settlement is in practice. The statements of the commission follow:

“With money available on terms suitable to the industry, the farmers have built better houses or remodeled their old ones; brought a large acreage of land under cultivation that would otherwise be lying idle; have bought and kept better live stock; have bought and used more labor-saving machinery on the farms and in the houses; have erected elevated tanks and windmills; have piped water to their dwellings and to their outbuildings; have irrigation for their vegetable and flower gardens around the houses; and have increased their dairy herds. They keep more sheep and pigs and have so largely increased the revenue from their farms that they are able to meet the payments on the mortgages and to adopt a higher standard of living, and a better one. Throughout the country a higher and better civilization is gradually being evolved; the young men and women who are growing up are happy and contented to remain at home on the farms, and find ample time and opportunity for recreation and entertainment of a kind more wholesome and elevating than can be obtained in the cities.”

[“A sum of more than \$38,000,000 has been spent in making advances to settlers for the purpose of reducing the burden of interest usually charged on such loans by private capitalists and companies.”—Lusk, *Social Welfare in New Zealand.*]

State-aided Land Settlement

Ireland.—In Ireland 9,000,000 acres of land have been purchased by the British Government since 1903. After the purchase this land was subdivided into small farms on which the necessary houses and other improvements were erected. These ready-made farms were then sold, mainly to former tenants, at an average price of about \$50 an acre, the buyer to have 68 years in which to pay for the farm and the improvements, with three and one-half per cent interest on deferred payments. The report of the Industrial Relations Commission speaks as follows of the transformation resulting in Ireland from the state aid policy:

“For many generations Ireland was one of the most distressed countries in the world. All of its evils were due primarily to absentee landlords and farm tenants. But within the last decade a wonderful change has taken place in the social and economic condition of the Irish peasant, brought about by the enactment by parliament of what has since become known as the Irish land bill.

This act created a royal commission, with power to appraise the large Irish land estates owned by absentee landlords, at their real and not at their speculative value, to buy them in the name of the government at the appraised value, plus 12 per cent bonus, to cut them up into small parcels, to sell them to worthy farm tenants, giving some 70 years time in which to make small annual payments on the amortization plan, the deferred payments bearing but three per cent interest. In addition to this, the government made personal loans to peasants sufficient to cover the cost of stock and farm implements, also payable in small annual installments bearing a minimum rate of interest. The government further furnished the various farm districts with farm advisers, trained graduates from agricultural colleges, who act as friend, adviser, and scientific farm instructor to the peasants. Within a decade the wretched and more or less lawbreaking farm tenant has been converted into an industrious, progressive, and law-abiding landed proprietor; in fact, he has become so law-abiding that many jails in the farming districts, formerly filled with agrarian criminals, have been converted into public schools."

England and Scotland.—Just prior to the outbreak of the present war, the government of Great Britain had agreed to provide a land settlement policy for Scotland similar to that now operating in Ireland. Since the war began a parliamentary commission has been studying the subject in England with a view to providing, by public purchase and subdivision, farm lands for returning soldiers, these lands to be sold to soldiers on long-time terms with amortized payments and with low rates of interest.

Already much has been done in England to provide farms for tenants under the Small Holdings Act passed in 1908. Under this act estates are being purchased by the county councils, subdivided into small farms, and sold or rented to poor people. These farms are first improved by the erection of houses and other farm conveniences and then sold at a slight increase on the purchase price.

Settlers are given from 30 to 50 years time with interest on deferred payments at four per cent.

The significant fact is the price at which the government buys this land. In England the average price has been \$160 an acre; in Wales \$105 an acre. For \$150 an acre highly improved farms are being bought privately within 30 miles of the great retail markets of London.

Denmark.—In 1899 the Danish Government, to prevent further and ruinous emigration, began buying and subdividing large

estates and selling them to those of its people who had the necessary evidences of character and farming experience and who were able to pay *one-tenth* the cost of the land and improvements. The government, according to the last statistics available, has bought this land at an average price of \$71.65 an acre. The settler is given from 50 to 75 years in which to repay this price, with an interest rate of from three to four per cent; and in some instances there is to be no payment of interest for the first five years.

In recent years there has been much private subdivision, carried on under public supervision. Associations formed for this purpose buy large farms and then subdivide and sell them to settlers at prices approved by the government, which guarantees loans made by land banks to assist buyers to complete their payments. The average purchase price of land so bought on the islands was \$102.04 and on the mainland \$61.15 an acre.

Germany.—Beginning in 1886, the German Government entered on a state system of colonization which to-day represents one of the greatest agrarian reforms of that empire. It was inaugurated in the face of bitter opposition from the large landholders. They saw their political prestige menaced by a movement that was to change a society having a landed aristocracy at one end of the scale and a poverty-stricken, discontented peasantry at the other into a society made up principally of a middle class.

Land settlement in Germany is now being carried on by two different authorities. The first is the *Home Colonization Commission* created to increase the number of German farmers in east Prussia and Poland. The other is a combination of state and local authorities which promotes and manages land subdivision and settlement in all parts of the empire. The local members of these associations usually include representatives of the local government and of the rural credit banks. One-half of the funds for these associations is contributed by the state and the other half by the local authorities. For the first of these organizations the government has provided \$214,000,000, the greater part since 1909. With it the *Home Colonization Commission* has bought and subdivided lands and financed settlers on more than a million acres in five provinces of the empire.

Colonization under a combination of local and state authorities is a recent development, the law concerning it having been passed in 1911 and amended in 1913. A great deal has been done, however, especially in providing homes for farm laborers.

At first the tendency was to buy land remote from markets and

not cultivated to the best advantage. But since 1909 the demand for farms and the benefits derived from them has led to the buying of highly-improved estates. The tendency now seems to be to continue this until tenant farming in Germany is practically abolished, and also until all the estates of any considerable size have been subdivided.

When the *Home Colonization Commission* purchases an estate it keeps it two years before offering it to settlers. That time is used to carry out the improvements which can best be made before settlement. These include macadamized roads, drainage works, the manuring and the seeding of farms, and in some cases systems of irrigation. The land is cultivated in order to bring it into a condition in which it will be profitable to the settler. The subdivisions include farms varying in size from 12 to 65 acres and homes for farm laborers varying in area from one and a half to five acres. If estates have large groups of buildings, these are made a sort of civic center where are found blacksmith shops, stores, schools, and churches.

Settlers are given the services of expert advisers. Seed for the first year is furnished and where it is desired houses are built. These houses cost from \$300 to \$1,000. The settler is expected to have money enough to pay for house, seed, and equipment, but if he lacks this and is satisfactory in other respects aid in securing these is supplied. The average expenditure for seed, tools, and improvements, aside from the house, is about \$500 for each farm.

At first these farms were leased to settlers. This was not a success. Then settlers were allowed to buy them outright, or to pay for them as soon as possible. This also was unsatisfactory, because many of the settlers were disposed to speculate and sell out whenever a profit could be secured. Under the present system the settler is not required to make any cash payment on the land, but has it for 50 years with an annual payment of three and one-half per cent interest on the total cost. He must also meet the requirements of the state regarding cultivation and keeping up improvements, which are closely looked after. At the end of this 50-year period the payments on the land begin. The average cost of land bought and subdivided by the *Home Colonization Commission* has been about \$95 an acre. The average cost under the local boards, as far as ascertained, has been about \$110 an acre.

Italy.—The commission has been unable to get the latest reports on the land settlement operations of the Italian Government or of the several associations, operating under government direc-

tion, which carry on this business on a nonprofit-seeking basis. However, such valuable results have been obtained from state loans for making farm improvements, and carrying out irrigation and drainage plans that such loans have now become a permanent state policy. The state loan is made for a period of 75 years with interest at two and one-half per cent.

Russia.—In no other country has systematic state colonization reached the magnitude that it has attained in recent years in Russia. Between 1906 and 1910 the Peasants' Land Bank, which has an annual government subsidy of \$2,575,000, bought, subdivided, and sold to settlers 4,041,789 acres for \$92,700,000, or about \$23 an acre. The maximum size of these farms is 57 acres. Loans are made up to 90 per cent of the value of the land with interest at four per cent and a payment period varying from 13 to 55 years. This is in addition to the immense colonization operations of the government in Siberia where, as stated in Herrick's work on rural credits, "*Hundreds upon hundreds of thousands of Russian farmers have acquired millions of acres, worth billions of dollars, by means of money and credit facilities supplied by the government.*" It is reported that Russia is now making preparations to inaugurate, at the close of the present war, the most liberal and comprehensive system of state aid in land settlement yet undertaken by any country.

New Zealand.—The reasons for colonization in New Zealand are not unlike those in California. A country of 66,000,000 acres, about two-thirds the area of California has a population of a little over 1,000,000, or about one-third that of this state. In order to bring about a more rapid development of the unoccupied land, New Zealand adopted a system of issuing bonds for long periods of years, selling these bonds in London, and lending the money to farmers for the purpose of buying land and making improvements on it. In the eight years from 1906 to 1914, the government loaned \$72,726,800. The loans are made at four and one-half per cent interest for terms of payment varying from 20 to 36 years. Up to 60 per cent of the value of the property may be borrowed if the settler can give first mortgage security, or 60 per cent of his equity in the property if it is a leasehold.

There are wide variations in land prices in New Zealand, due to differences in location and improvements. Generally speaking, however, land prices in New Zealand are high, relatively much higher than in Europe.

The Australian States.—The most fruitful field for study of land settlement operations is, however, the six Australian states.

Especially is this true with respect to California, as the southern half of the continent has climate, products, and market conditions very similar to ours. The resemblance goes farther. The two countries are peopled by the same race, and they have the same habits, the same social and political ideals, and very similar economic conditions.

In the two most highly developed states of Australia, Victoria and New South Wales, there is another resemblance. There, as in California, the early land policies were unwise and profligate. Land was given away without regard to the needs and the rights of future generations. Great landed estates were created until, as pastoral pursuits gave way to cultivation, and especially to intensive cultivation, there developed an agriculture in which non-resident ownership and tenant farming were the dominating features. This was not regarded as desirable. It led to the inauguration of the present system of closer settlement.

The plan of this system was to incorporate the following ideas:

1. Have the area of land large enough to give a living income for a settler and family.
2. Estimate in advance the capital needed to improve and equip that area, and fix the proportion to be supplied by the settler and terms of borrowing the remainder.
3. Provide organized direction in the improvement of farms in order that the settler may earn a living in the least time and with the least expense.

The systems now in operation in Victoria and New South Wales are alike in essential features, the only difference between them being the nature of the land title. In New South Wales the settler acquires only a perpetual lease, while in Victoria he acquires a freehold title. But in Victoria the title to the land does not pass to the settler for 12 years, and can then only be acquired or held by an actual resident. This prevents speculators from acquiring land.

Between 1901 and 1914 the six Australian states purchased and subdivided 3,056,957 acres, for which \$55,243,125 were paid, or about \$18 an acre. In all of the states provisions are made to assist settlers to build homes and effect improvements needed to bring the land fully and promptly under cultivation. In the five-year period from 1909 to 1914 these six states loaned to farmers to make improvements and buy equipment \$68,029,500. This has been done without any cost to the general taxpayer, as the interest paid by the farmers was greater than the interest paid by the state;

and the farmers have met both payments of principal and interest, so that there has been an accumulated profit of \$1,233,370.

Brazil.—In Brazil the federal government co-operates with the state governments, with the transportation companies, and with individuals in giving aid to settlers. The state government, with which the federal government has arrangements, will provide colonists with tools and seed. The farms, when near railroads, do not exceed 62 acres. If they are distant from transportation, they may be 125 acres in extent.

The government will, when requested, build good and sanitary houses, but immigrants who desire to erect houses at their own expense and to their own taste can do so. Improved farms will be sold either for cash or payments in installments. Where cash is paid a definite title is given immediately; where payments are amortized, title is given when payments have been completed. Those who purchase farms on the installment plan may pay off any part of the debt before the final date, and if this is done a rebate of 12 per cent is given on the installments paid in advance.

For the first six months after their arrival, or until they harvest and sell their first crop, colonists coming from other countries may when necessary obtain loans to purchase food for their families and for the first year they receive medical attendance and medicine free of charge. The land, the improvements, and such aid as is not given free of charge are all lumped together in the debt for the land. The amortized payments for the land begin not later than the end of the second year, and the period for completing payments is five years when the lands are near railroads, and eight years when distant from them.

In the state of São Paulo the price of land varies from \$.60 to \$4.50 an acre and the annual payments vary from \$30 to \$90. In 1914, the year after state aid began, there were 1,600 applications for homesteads from the city of San Francisco. Settlement has been interrupted by the war, but it is expected to be active when the war ceases.

Intelligent, reliable farm labor is a growing need of agriculture in practically every country. Men of superior qualifications are needed to look after blooded live stock, to care for orchards and vineyards, and to do the work which requires interest, knowledge, and skill on the part of the laborer. It is becoming increasingly difficult to keep men of this type on the farm because of the constantly increased wages and greater opportunities of the city.

Everywhere it is recognized that this is one of the most difficult

problems connected with agricultural progress. Under the best possible conditions there are serious drawbacks to farm labor which tend to drive good men away from it. There is difficulty in providing employment throughout the year. It is impossible to pay as high wages as are now paid artisans in the cities. When to this is added social ostracism or at least a position of social inferiority compared to city workers, it is inevitable that the best American workers will leave the farm.

On the other hand, it is feasible to create conditions which will make life as a farm worker more desirable and as profitable to those with families as is the life of the unskilled laborer or average artisan in cities. This has been demonstrated in Ireland, Denmark, Germany, and Australia. It has been accomplished in these and other countries by enabling the laborer to own his home. In Germany these homes include from one acre to five acres of land. Such an area, in the language of a government report, "permits of the cultivation of the wheat, potatoes, and vegetables for the household and of the rearing of a few pigs; for milk, goats are kept and sometimes even a cow. It has, besides, the great advantage that it may be cultivated by the wife and children and does not prevent the laborer from working elsewhere. A larger holding, on the contrary, might easily induce him to neglect his paid labor."

Germany.—Thousands of farm laborers' homes have been built by the Home Colonization Company, of Germany, a government body. They cost on an average about \$1,000 each. The laborer generally pays from 10 per cent to 20 per cent of the purchase price in cash. The rest is met by amortized payments. The cost of the land, according to the reports of 1912, has averaged \$135 an acre. Since 1913 a great many farm laborers' homes have also been provided by local colonization companies, which have government aid. Criticism is not directed against the extent of this activity but against the failure to move fast enough. Great difficulty is experienced in preventing the inflation of land prices. To prevent inflation the government has enacted a law authorizing the compulsory purchase of 175,000 acres of land for closer settlement by farmers and laborers. The war, however, has interrupted progress.

Australia.—In Australia, where natural conditions are like ours, there are great areas of unpeopled land. But the earlier nomadic and unreliable farm labor is happily disappearing in the areas which are being settled under the state system of colonization.

The first steps in this reform were made in the irrigated settlements. In these, two-acre homes for farm laborers are dotted all

over the areas. Frequently four homes are grouped at road crossings. On these two-acre allotments, the state builds, when required, cheap but comfortable three or four-room houses and sells the land and houses to farm workers who show evidences of industry, experience, and character, and who desire and expect to make most of their living working for wages. Only a nominal cash payment is required and at least twenty years' time with a low rate of interest is given in which to complete payments.

The laborer obtaining a home under this plan can keep a cow, some pigs, and poultry. He can grow his own vegetables and thus greatly reduce the cost of living. It gives to his wife and children a sense of security and independence. To them the state becomes a benefactor. They love it for what it has done for them.

No single feature of the Australian system of closer settlement has been more popular or useful than the two-acre farm laborers' homes in the irrigation areas. The laborers are contented. They are beautifying their homes and are meeting their payments. They provide reliable, casual help for neighboring farmers and farmers' wives. The children are a valuable aid in the rush of the fruit-picking season. Over 8,000 acres have been absorbed in farm laborers' allotments in the closer settlements of the state of Victoria, Australia; and the state is being asked to buy land to increase the number. The farmers who ask for this guarantee permanent employment.

In England, Ireland, Denmark, and Italy thousands of such homes have been provided for farm laborers. Their condition and their character have been immensely improved by the independence and the security which come with owning their homes and little patches of land.

[SOURCE: *New Statesman*, Supplement on State and Municipal Enterprise, May 8, 1915.]

Many cities and communes in Germany, Italy, Switzerland, and Scandinavia are owners of land—a few even in France and Great Britain—and municipal farming of the municipal estate is frequent enough. In Great Britain, France, and Germany the municipal sewage-farms amount, in the aggregate, to a very considerable acreage, and have annually large crops to sell. A considerable number of municipal horses and oxen, sheep and pigs are thus reared. But horse breeding is even more the business of the national governments, which, especially in France, Germany, Austria, Italy, and Russia, maintain large establishments, containing thou-

sands of stallions which stand in the service of the State. There are also, in Germany and Austria, government vineyards producing government wine, which sells on the market at high prices; public nursery gardens selling plants, and municipal dairy farms producing municipal milk, and in one case, at least, supplying a municipal cheese factory. After this, the enterprise of the Scottish government in branding herrings for the market, or that of the Australasian governments in collectively grading, branding, storing, packing, shipping, and selling the agricultural produce of their individual farmers, appears a small matter.

CHAPTER VII

AGRICULTURAL COLLECTIVISM

UNDOUBTEDLY the most important development of State Socialism in the field of agriculture has been the tendency of the State to take over functions related to but separable from agricultural operations. For example, the development of transportation especially adapted to the uses of agriculture through agricultural grain elevators, cold storage plants, cold storage cars, and also through the national subsidy of local roads previously left entirely to local taxation, may well be said to constitute a governmental participation in agricultural industry. The same is true of the support of local agricultural schools by national funds, the extension of the nation's credit to agriculturists, and the national development of agricultural science. But none of these activities would ordinarily be regarded as governmental participation in agriculture.

A somewhat more radical step is taken when co-operative associations secure various forms of governmental support (it being impracticable to extend this support to individual farmers). An illustration is the development of governmental creameries in Alberta and Western Canada. We quote from *The True American*:

A few years ago the farmers of Southern Alberta, Canada, became dissatisfied with the private creameries then in operation and asked the government to take charge of the business. The government is especially solicitous for the prosperity of farmers, and the public policy has no purpose that precedes their best interest. Therefore the request was taken up, and government creameries took the place of the old private concerns.

These creameries are equipped upon the most modern plans, and, being conducted with no thought of profit, but solely in the interests of the farmers, their operation has been of enormous benefit. They are called "co-operative," and really are just exactly that. A

chain of them has been established through the country sufficient and efficient to serve the whole farming community. They are subject to the control of their patrons, through boards of directors, and under government management.

Most of the patrons separate their milk at home by means of hand separators and take their cream to the government stations, say three or four times a week. There it is carefully tested, weighed, and credited up. At the end of each month each patron gets credit for the equivalent of his cream in butter and receives a cash advance equal to 10 cents a pound. Thirty or sixty days later a check for the balance is sent him from the department of agriculture direct—that is to say, the government actually takes his cream, makes his butter, and pays him the market rate in cash and a government check. This is neither paternalism nor Socialism. It is a farmers' government, doing business with and for the farmers. In other words, it is simply business, and good business at that, for all concerned. The average price paid at government creameries in 1908 was 25.43 cents.

Of course these creameries have to be maintained, and this is accomplished by making a charge of four cents a pound. One cent of this goes to a fund for the purchase of buildings and machinery, of which the farmers become part owners to the extent of their contributions.

All this would mean little if it did not secure the best market advantages for everybody concerned, but it does mean that and in a fuller sense than could be secured through any other process. The government has consolidated the market and conducts the sales, all in behalf of the producers. The butter is sold through government agencies, principally heretofore in British Columbia and the Yukon district, but of late in growing quantities to Japan. A large export trade in butter from Southern Alberta has sprung up in the Japanese market.

The governmental operation of elevators and cold storage plants may also be placed in the same category. The movement in this direction in the United States has been mentioned in the Introduction. An earlier and more remarkable movement was in the western provinces of Canada (Emil Davies, *Collectivist State in the Making*, pp. 68-69):

The movement in favor of the government owning and managing grain elevators has spread enormously throughout Canada. In

1910-11, the Manitoba government was operating 149 elevators, all but ten of which were purchased from private owners. During the year a loss of about \$84,000 was incurred on the operation of these elevators, and in 1912 the Manitoba government instituted a system which has worked admirably; it leased its elevators to a co-operative society, constituted of the farmers themselves, to which it lends money at a low rate of interest. During 1913 the Manitoba government made a profit of just \$330 on its elevators, so that a balance between receipts and expenditure was successfully attained. The system is spreading, and the Saskatchewan Co-operative Elevator Company, which is now one of the most important factors in the marketing of the grain output of Western Canada, is a good instance of the way in which the system works. The Saskatchewan government advances 85 per cent of the amount required to build elevators at 5 per cent interest, one of the provisions to such assistance being that there must exist one acre under cultivation for each dollar of the amount put into building a new elevator. The result has been extraordinarily successful. The company started operations in 1911, and in 1913 it handled 12,899,030 bushels, or nearly four times its record for the previous year. The Company has been assisted by the government to the extent of \$1,311,253. The assets stand at \$1,709,487; revenue for 1913 was \$600,923, and expenditure \$423,996. The company owns 192 grain elevators, and employs an office staff alone in Regina of 540. The 192 local branches comprise 13,156 co-operative shareholders. The Province of Alberta is working on the same lines, with the result that the major portion of the grain elevator business in Canada is coming under the control of the provincial governments, working through the farmers' co-operative societies, this being probably the ideal way of combining State control with management on the part of those directly interested.

THE GOVERNMENT IN BUSINESS IN WESTERN CANADA

[SOURCE: D. A. MacGibbon on "Grain Legislation in Western Canada," *Journal of Political Economy*, March, 1912.]

The grain growers declared the grading system unfair to grain slightly bleached, smutted, or frosted; maintained that the grades did not represent the value of the grain for milling purposes, and that selling by grade enabled the millers and elevators to fix prices on the basis of the lowest level of each grade. Nothing escaped their condemnation: it was an omnibus indictment which included the millers, the grain exchange, the railroads, the banks, and the

terminal elevators. And they summed up their case by demanding in Manitoba and Saskatchewan provincially owned initial elevators, and for the Federal government, federally owned terminals, and a sample market at Winnipeg, with the speculative element as far as possible eliminated.

In regard to the demand for provincially owned initial elevators the governments of Manitoba and Saskatchewan pursued different courses. The former government acceded to the demand; the latter, more astute, appointed a Commission to investigate. This Commission did so, and reported to the legislature recommending a co-operative scheme which has since been embodied in legislation. Thus in these two adjacent provinces there is at present in progress an experiment of some magnitude in handling grain. It is really too soon to make a thorough comparative study of the two systems—they have not been in operation long enough—but some considerations suggest themselves.

The Manitoba Grain Elevator Act received assent on March 16, 1910. The bill provides for the acquisition of elevators in Manitoba on a basis of their physical valuation and empowers their operation by a board of three commissioners appointed by the government. The whole aim of the bill is to afford all reasonable facilities in elevators for the receiving, storage, forwarding, and delivery of grain. This grain may come either from farmers who are shipping their grain to Winnipeg to sell through commission houses, or from wholesale dealers employing street buyers. In every case samples must be taken and these must be exhibited by the commissioners to prospective buyers. In no case shall the government acquire an elevator until a petition has been received by 60 per cent of the grain growers contributing to the elevator proposed to be purchased.

The government of Saskatchewan drafted a bill which was passed by the legislature. Its principles were also accepted, after stirring debates by the grain growers who were in annual convention when the act was being deliberated upon in the legislature. The act incorporated the Saskatchewan Co-operative Elevator Company, the names of the Grain Growers' executive committee being inserted as provisional directors. The company was given power "to construct, acquire, maintain, and operate grain elevators within Saskatchewan; to buy and sell grain and generally to do all things incidental to the production, storing, and marketing of grain." The amount of capital stock is to be fixed by the Governor in Council, and is divided into shares of \$50 each; is to

be sold only to agriculturists; no person to hold more than ten shares.

The books of the company are audited by the provincial auditor. If there is a surplus after operating charges and maintenance are paid, the shareholders are to receive dividends up to 6 per cent. The balance is to be divided into two equal parts, and half paid to the shareholders on the basis of the volume of business done with the company, or on some other method to be devised by the company. The other half of this residue is to be set aside as a reserve fund available to pay expenses in an unremunerative year of business.

One of the main features of the bill is the assistance the government guarantees to the company. The Lieutenant-Governor in Council is authorized to loan from time to time to the company for the purpose of aiding in the acquisition or construction of any local elevator a sum not to exceed 85 per cent of the estimated cost of the proposed elevator. The sums loaned are to be repaid in 20 annual equal payments.

These are the chief provisions of the Saskatchewan Co-operative Elevator Act. It will be clear that the aim has been to retain the advantages of the present competitive system while doing away with the farmers' grievances by putting the conducting of the grain business into the hands of the farmers themselves whenever they choose to take it up.

Two clauses of the act have received a great deal of attention and criticism. The clause stating the powers of the company at first confined it to "all things incidental to the storing and marketing of grain." In the last days of the debate an amendment interjected the word "production" into the clause so that it would read "all things incidental to the *production*, storing, and marketing of grain." The amendment passed with a large majority, though the Cabinet split upon the question and two members of the government voted against it. The inclusion of the word "production" confers wide powers on the company and enables it to trade in all sorts of farm machinery and binder-twine stock: in brief, in a very large measure to compete with all the trading interests in the province. Yet any one who comprehends the local situation in many parts of Saskatchewan will fully understand why power in this direction is sought. The reason for the demand is found in the peculiar conditions of the specialized grain farmer. He requires a very large supply of the largest and best farm machinery. This machinery is most expensive; for example, a threshing outfit

costs about \$5,000, and one is sufficient for a large district. In the newer districts scarcity of threshers has caused much loss and hardship, while in many districts a venture into the purchase of an outfit by one man has ultimately resulted in heavy losses to him.

These hard lessons of experience as regards machine companies have taught the western farmer that much risk and worry might be avoided if in some corporate way the farmers of a district could organize and purchase machinery on easier terms, and, in the case of threshing machines, for general use. It was to authorize functions of this sort that the word "production" was inserted into the bill. The gains of the local machine agent are not small. An agent's commission on a single threshing outfit is at least \$500, and that on other machinery is proportionately as great. The ideal exists, that if the Co-operative Elevator Company could place large orders for a great number of local units combined it could procure needed machinery at much lower prices than now rule. Saskatchewan would no longer be a paradise for the machine agent. The elevator company has it in its power now to do genuinely effective co-operative work of this sort. But it must be noted that the credit side of the business, if not carefully handled, will easily result in losses.

The other clause of the bill under criticism, which lays down that the government's financial assistance may amount to 85 per cent of the value of the elevator to be built, is not susceptible of so solid a defense. Its weakness lies not in the fact that the government is to render assistance to the co-operative elevators, nor in the guaranties the government exacts for the money lent, but rather in the way in which this money is to be obtained by the elevator company. The Lieutenant-Governor in Council—that is, the Cabinet—has discretionary power as to the terms and conditions of the sum, up to the 85 per cent limit, that shall be lent at any time to a local unit.

A more definite class of agricultural participation in agriculture arises where the central government enters on a large scale into certain specific agricultural businesses. Forestry, for example, may clearly be regarded as a branch of agriculture—and it has been undertaken on a large scale by nearly all the governments of the world, as we show in our Chapter on Forestry. Indeed, forestry is chiefly in governmental hands in most nations.

A remarkable example of the same kind is the nationalization

by the Japanese Government of the camphor business, constituting practically a world monopoly.

The Financial and Economic Annual of Japan, 1913, issued in August of that year by the Japanese Department of Finance.

“The Camphor Monopoly Law was first put in force in Formosa only; but the government issued in June, 1903, and carried into effect in October of the same year, the Crude Camphor and Camphor Oil Monopoly Law, to be operative both in Japan proper and Formosa, which provides for the manufacture of crude camphor and camphor oil shall be permitted only to those persons who have obtained the permission of the government therefor, and the article so manufactured shall be taken over by the government by paying suitable compensation therefor according to its quality. A large portion of the Japanese camphor is demanded in Europe and America, but its exportation chiefly consists of the Formosan product, as the product of Japan proper is mostly sold in the domestic market and there remains only a small part of it to be exported abroad.”

Davies points out that the British Government control of the opium industry in India approaches a world monopoly and puts the government in a position of being able to make large profits. The government grants licenses to a limited number of farmers to produce opium, and then proceeds to buy the whole product at prices named by itself.

But there can be no question that by far the most important and clear-cut State Socialistic developments in agriculture are the tentative experiments of many cities to operate farms or to go into other operations closely related to agriculture in order to reduce the cost of living to the consumer. This was the motive of the city of Rome and many other European cities which have built cold storage elevators, as well as entered into the business of slaughtering. An equally strong tendency exists for the municipal or state control of the milk supply. Moreover, since 1911 and 1912, numbers of cities all over Europe have taken still more radical steps in the direction of trading in and producing food supplies. (See Chapter on Municipal Socialism.)

Municipalities that have operated farms have usually done so as a part of their effort to control the food supply, and the war has led to numerous experiments in the same direction—

some of which promise to have lasting effects. Indeed, the 1916 regulations in Germany were so rigid as almost to amount to partial government operation, and the same was true of other countries. (See Chapter on Food Supply.)

In the same way, the food supply of armies in times of peace, and even of lesser governmental institutions, often leads towards government production. The forces that make for this result—even in times of peace—may be seen in a new project introduced in the State of New York. We quote from the *New York Evening Sun* (January 3, 1917):

Legislation designed to bring the 42 farms now operated in connection with State hospitals and the several State agricultural colleges at present managed by local trustees under the jurisdiction of the State Agricultural Department will be introduced early in the present session by Senator Henry M. Sage, chairman of the Senate Finance Committee. The object of this legislation is to increase the productiveness of the institutional farms to the point where they will be able entirely to supply the State hospitals with the necessaries of life. Centralization of control in the State Department of Agriculture, Senator Sage said to-day, will accomplish this.

The 42 institutional farms now maintained by the State under 42 separate jurisdictions comprise 23,738 acres, the net profits from the operation of which were \$352,456 last year. This figure is out of all keeping with the amount spent to supply these institutions with the necessaries. This foodstuffs item last year totalled \$2,138,502.

Senator Sage's plan involves the initiation of some scheme of intensive farming which will raise the productivity of these lands in order to lessen the heavy drain now made upon the State treasury for the support of the inmates.

It costs the State of New York \$279,762 to supply milk to the inmates of these institutions for a year. The item for beef at the present time is \$842,146. Butter alone entails an expenditure of \$400,000 annually; poultry, \$202,000; field crops, \$154,000; pork, \$103,000; potatoes, \$88,000.

"It would seem as if all of the milk, butter, pork products and potatoes, and certainly a large proportion of the poultry, garden products and field crops, could be produced on the farms," Senator Sage said to-day. "It is also possible that a large proportion of

the beef required for these institutions could be raised there. I believe that this result can be accomplished by the co-ordination of all of the farms and this co-ordination is possible only under one central authority. That authority unquestionably is the State Department of Agriculture.”

CHAPTER VIII

AGRICULTURAL SCIENCE

THE modern world has developed two widely different types of governmental aid to agricultural science. The United States stands almost alone with a direct, highly-centralized, and comparatively simple system—all co-ordinated under the Department of Agriculture. Though it is comparatively rare in America for State activities to be directly or indirectly controlled by Federal government, the Agricultural Experiment Stations of the States and the State Agricultural Colleges are both endowed and supported by the Adams and Hatch and Morrill Acts, and are very definitely, though only partly, under the control of the Federal government.

Only a few of the newer countries of South America, and some of the British colonies, have tentatively and recently taken up the American method. Nearly all the governments of Europe have pursued an almost opposite policy. There, unified and centralized aid to agricultural science is at a minimum. There is a considerable measure of governmental aid, though undoubtedly far less than in America. But this aid is given either (1) to more or less separated institutions of the central government, (2) to the local governments, (3) to co-operative societies, or (4) to agricultural boards of trade. As Germany furnishes more aid to agricultural science than any country except the United States, and as the expenditures of other governments are relatively small when compared with these two (space, moreover, being lacking for a larger survey), we shall limit ourselves to a brief review of the German methods and a more complete summary of the United States Department of Agriculture.

State aid to agriculture in Germany may be divided into three periods. The agriculture of eastern Prussia and several other sections of Germany, especially in Prussia, has long been chiefly in the hands of *large land owners*. For generations many

of these land owners, taking advantage of their superior resources, have followed and developed the most advanced forms of agriculture. Undoubtedly the greater part of the very remarkable progress of German agricultural science is due to the direct experiments and experience of these large land owners or "Junkers." At the same time, it is notorious that this class has a very close political control of these districts where its lands preponderate, exercises a dominant power over the government of Prussia, and a very great if not a dominating influence over the Empire. It has therefore followed inevitably that they have made a free use of the government to aid agriculture and agricultural science, especially those phases in which they were personally interested. But as it is doubtful whether such a development is to be characterized as a form of State Socialism or as a modern form of feudalism, it is not necessary to make a special study of this phase in the development of German agricultural science.

For more than a generation *co-operation* has greatly developed in German agriculture, and the co-operative associations, consisting of small or medium-sized farmers, have made very wide and successful applications of agricultural science in all directions, including the establishment of experiment stations and experiment farms. Similarly, the brewers, millers, and other industrial associations which utilize farm products have instituted large and costly scientific establishments.

Co-operation has no necessary connection with State Socialism, except in proportion as it is favored by government and comes in turn to depend upon governmental aid. Now the Prussian and German governments for many years have very actively promoted the development of agricultural co-operation, and so have directly and indirectly aided its efforts in the promotion and application of agricultural science. We read in the report to the British Board of Agriculture on "Agricultural Credit and Co-operation in Germany (by J. R. Cahill) :

Agricultural Co-operation and Public Aid in Germany

For nearly a generation the systematic furtherance of rural co-operation has been a matter of settled policy in the various German Federal States; and public aid has been liberally granted

for this purpose. Financial assistance has usually taken the form of small grants to cover the expenses of establishing credit societies, contributions to unions toward the cost of auditing, of propaganda, and of courses of instruction for persons holding office in rural societies, advances of capital at low rates to central banks, or endowments of capital, or grants toward establishment expenses of such banks, or both; occasionally it has taken the form of assisting central societies to secure advantageous terms at large banks. Direct financial assistance has been given to rural productive or trading societies of various kinds. The co-operative movement has been substantially promoted by the district governors, agricultural inspectors, rural teachers, and other public officials, while one of the primary aims of the semiofficial chambers of agriculture in Prussia, and of the similar bodies in other States, is the spread of co-operation among farmers.

The most signal acts of the Prussian government in this respect have been: In 1895 *the establishment of the State Central Co-operative Bank which has received up to date a total capital of £3,750,000*; in the period 1896-1906 *the construction and equipment of granaries at a total cost of £250,000*; and in 1902 a loan of about £80,000 to the Berlin Central Cattle-Selling Society at $3\frac{1}{2}$ per cent interest, subject to an annual sinking fund payment of 1 per cent. At the present time *annual grants are made by nearly all the provincial governments*; and the chambers of agriculture established in each province usually work in close association with the co-operative unions, give to the latter the constant or temporary services of their officials free of charge, or make money grants, or do both.

In Bavaria the State has, among other things, made a loan of £200,000 at 3 per cent to the Central Loan Bank to serve as working capital, and arranged for this bank a credit at the Royal Bank of up to £50,000 at 1 per cent below the official rate of that bank (but not at less than 3 per cent); it has advanced to the Bavarian Agricultural Bank, a co-operative society with limited liability, £50,000 without interest and £200,000 at 3 per cent, besides providing £3,000 toward its establishment expenses; and advances and grants on a considerable scale have been accorded to granary undertakings, breeding societies, and vine growers' societies. The co-operative granaries obtain support in an especial measure from the State. Since 1904 the Bavarian National Union has received annually £1,700 toward the cost of audit; and other grants are made for general co-operative purposes in Bavaria. It may be added that

the insurance societies for live stock also receive considerable State assistance.

In Saxony, Baden, Hesse, Wurttemberg, and Alsace-Lorraine substantial public aid is also accorded; in each of these cases, except in that of Hesse, central credit or central trading organizations, or both, obtain financial support from the State.

State assistance assumed important dimensions only subsequent to the enactment of the act of 1889. It usually took the form of small grants to cover the expenses of founding societies, contributions toward the cost of auditing by co-operative unions, and of propaganda, advances of capital to central banks at low rates, occasionally endowments of capital, of grants toward establishment expenses; in a few cases it took the form of assisting groups of societies to secure advantageous terms at banks; and throughout Germany public officials, especially the agricultural traveling inspectors and district governors, were urged to promote co-operation. The knowledge that the extension of agricultural co-operation was part of the general policy of the government stimulated its officials to take an active interest in it. This is more especially true of such influential officials as district governors who, in the exercise of their duties, are brought into contact with nearly every branch of public activity in the locality, and whose influence among the rural population is considerable, while the village school-teachers, who are also State employees, were also encouraged to give their services. From these considerations it will be readily understood that the State has been an important factor in the development of rural co-operation in Germany.

While direct financial help was given to co-operative credit in several States, such assistance to rural productive or trading societies has been more limited. It has been accorded, however, in cash or otherwise, by the Prussian government; for instance, to dairy societies, granaries, associations for cattle breeding and land improvement, cattle-selling societies, and central electrical stations; in Bavaria large sums have been given toward the building of granaries, the government custom for produce has been assured, and other assistance (e. g., favorable railway rates) accorded; similar help, but on a more restricted scale, has been given in Wurttemberg and Baden.

The general tendency has been apparent in recent years, in Prussia at all events, to reduce financial assistance to co-operative societies, or to give it with greater reserve, on the ground that the co-operative movement, having now passed out of its early diffi-

culties and grown strong, is able to draw upon its own resources. But, as will be observed in reading this chapter, the effective assistance rendered to rural co-operation by the State in Germany generally is still very substantial.

Prussia.—The Prussian State has taken a most active part in the last 16 years or more in the furtherance of co-operation, and, in particular, of rural co-operation. Its most signal act was the foundation in 1895 of the Central Co-operative State Bank. In the years 1896-1906 about £250,000 was voted by the Prussian Parliament for the establishment of granaries, which were let to co-operative societies; and in 1902 a loan of about £80,000 was granted by the State to the Berlin Central Cattle-Selling Society at $3\frac{1}{2}$ per cent interest, with an annual payment of 1 per cent for sinking-fund purposes. At the present time the central government does not make large grants to co-operative organizations, but suitable appropriations for co-operative purposes are assigned by the provincial governments and the semi-official chambers of agriculture. Of the grant (in 1909, £1,090) made to the Imperial Federation toward the cost of compilation of statistics and the maintenance of the Darmstadt School for Co-operative Officials, Prussia contributes more than half. The ministry of agriculture has, within the last few years, provided salaries for the appointment of two experts to promote cattle selling, one for the eastern and one for the western provinces. *Co-operative dairy societies in some cases receive grants for the furtherance of cattle breeding, and also in support of dairy schools conducted in connection with the dairies.* Assistance is often given to societies formed to examine and control the milk-giving capacity of cows, but such grants fall to these societies in common with others in the same business; they share in grants given in general for the improvement of agricultural (e. g., dairy) industry. *Horse-breeding societies also obtain help in numerous cases either by direct money grants by advances for their purchase, or by the provision of suitable animals. Grants are not infrequently made to special kinds of co-operative societies, such as forestry, drainage, dike, and general land improvement societies, but such societies are often co-operative in name only, like many horse and cattle-breeding societies, being constituted under this legal form in order to qualify for government grants not given to individuals.*

The majority of the rural co-operative unions receive grants from the provincial governments and in many cases also from the provincial chambers of agriculture. Up to the year 1895 advances were made by the provincial governments in several cases to the

central banks, but such credits have not been given since the creation of the Central Co-operative State Bank in Berlin. The exact application of the sums now paid to the unions is not usually specified, the grants being made to "meet the general cost of audit and supervision," or "for the furtherance of co-operation." Additional amounts are given in most provinces to enable the unions to hold courses of instruction for secretaries and for members of committees of management and of boards of supervision of societies; further, on application from a newly founded credit society, small amounts ranging from £2 10s. to £7 10s. are often given for the purpose of meeting initial expenses of establishment. In one or two provinces a fixed amount is allotted for propaganda and for meeting initial expenses of societies. It was stated to the writer that these small grants are made with less frequency than formerly, except in some of the eastern provinces. The local conditions are now more closely considered; if the particular union is well established and the district in which the new bank is founded not economically backward, such help has, of course, become less urgent. These grants are never made to trading societies.

Berlin, which is situated in this province, is the headquarters of two federations; that is, organizations whose sphere of action embraces the Empire, and of two so-called provincial unions. The Central Cattle-selling Society (which received the loan of £80,000 already mentioned) and some 500 credit societies with other miscellaneous societies are affiliated to one of these federations, entitled The Agrarian League; and its credit societies are eligible for grants toward expenses of establishment.

A third stage in the governmental aid to agricultural science was reached with the formation in 1894 of the Chambers of Agriculture in the Prussian provinces. The associations of farmers, brewers, etc., had furnished more than two-thirds of the funds for the scattered experiment stations before that time. Nor were these subsidies very greatly increased, but a far more radical step was taken when the newly formed Chambers were given *the power to tax*. This very radical departure is decidedly an experiment in the direction of "State Socialism"—of a certain type. It is true that the land owners or Junkers are still largely in control of these Chambers. Nevertheless, we have here what amounts to an industrial parliament (though the organization is far from democratic, and must remain far from

democratic as long as the Prussian provincial government remains in the hands of the large land owners). Mr. Cahill reports on this development as follows:

Agricultural Credit and Co-operation in Germany

The act of 1894 establishing chambers of agriculture in Prussian Provinces defines their functions as "the care of all matters pertaining to agriculture and forestry within their districts, and, to this end, the furtherance of all measures calculated to better the position of landowners, with especial regard to the more complete co-operative organization of farmers." They are thus not merely to act as advisory bodies, but are intrusted with the duty of representing agricultural interests in general, and are to initiate measures for the furtherance of such interests. Their duties are to foster the technical and economic progress of the agricultural area within their jurisdiction by the organization of agricultural education and co-operation; to take part in the management of the corn exchanges and markets within their area, and to observe and collect market prices; the conduct of experiment stations; the organization of measures for the improvement of horse, cattle, and poultry breeding, and fruit growing; to maintain exchanges for agricultural labor; and to adopt all other suitable measures. They are also designed to act as agencies for the distribution of State grants for agricultural purposes.

The creation of these chambers was due to the fact that the existing agricultural associations were not adequate to represent agricultural interests, whether political, economic, or technical, completely and with sufficient authority and prestige. Such associations as existed were voluntary, they often comprised members who had little to do with agriculture, and their funds were liable to be unstable and insufficient in amount. The State also felt the need of a fully representative organization in various parts of the Kingdom for purposes of advice on important agricultural matters, as well as for assisting in the execution of State policy as regards agriculture. Their establishment was discussed in connection with the active agricultural policy urged upon the Prussian government in the middle of the nineties, with a view to the relief of the then prevailing agricultural depression.

The Prussian chambers of agriculture were established in the years 1894-1899. Since 1900 most other States have followed the example of Prussia, among them being Oldenburg (in 1900), Hesse (1906), Baden (1907), and Saxe-Weimar (1909). The only im-

portant States which have not created chambers, namely, Bavaria, Saxony, and Wurttemberg, already possess semiofficial authoritative agricultural corporations. It is understood, however, that official chambers similarly empowered to levy rates on agriculturists are to be created in these States at an early date.

Every agriculturist assessed for land tax at or over a certain amount, which is fixed by the chamber of his Province or administrative district, is obliged to pay the rate levied for the support of that body. A different standard of taxable capacity is adopted in each Province, e. g., in East Prussia landholders with land assessed for the land tax at £4 10s., in Posen and Cassel at £6, in Westphalia at £3 15s., and in the Rhine Province at £7 10s. are liable for the rate. The rates levied by the chambers are collected without charge and simultaneously with the land tax by the ordinary revenue officials. The tax may be fixed at any proportion up to one-half per cent of the land-tax assessment; to levy a higher rate the assent of the minister for agriculture is required. In 1909 the levy was one-half per cent in seven areas, two-thirds per cent in two (Pomerania and Cassel), five-twelfths in one (Silesia), three-fourths in one (Rhine Province), seventeen-twentieths in one (Brandenburg), and seven-eighths in one (Wiesbaden). The four highest absolute sums thus raised were £14,515 in Brandenburg, £13,071 in Silesia, £12,678 in the Rhine Province, and £11,391 in Hanover. Grants for special agricultural purposes are also made to the chambers by the State; *in 1909 about £160,000 was thus allotted to the chambers.*

The activity of the chambers is very great. They are wont to maintain a staff of traveling technical experts, e. g., in cattle breeding, horse breeding, fruit growing, poultry farming, and in co-operation; they have established, partly or wholly at their own expense, experiment stations, forestry institutions, poultry-breeding institutions, dairy schools, *agricultural labor exchanges* and agricultural bookkeeping departments; *they supply stallions and bulls direct to farmers and on very favorable terms; they also sell breeding fowls at cost price; they maintain bureaus of information (as to market prices, customers, etc.) for the benefit of farmers, and besides having special central agencies for cattle selling, usually at the city where their headquarters are situated, they have united to form the central cattle-selling office and store cattle market in Berlin.* They focus, in fact, the whole organization of agriculture within their area, and promote the progress—both technical and economic—of agricultural interests generally which they officially represent.

This new development is important not only as containing the possible germ of an industrial parliament, but also as indicating the probable development of co-operative associations under State Socialism. When co-operative associations secure subsidies, it is likely they will have to respond to the needs and demands of the State. They then cease to be wholly voluntary co-operative associations and become, to some extent, industrial guilds under state control. Their policy will then depend on that of the State. In a feudal State they would be feudal guilds; in a democratic State they would be democratic guilds (though it is difficult to see how the real democracy can exist at all unless the land holdings are approximately equal—the very opposite of the existing condition in Prussia).

The following quotations show that all the public agricultural bodies in Germany are closely related to private organizations:

[SOURCE: From U. S. Special Commercial Agents Report on Commercial Organizations in Germany.]

German Council of Agriculture

The German Council of Agriculture, der Deutsche Landwirtschaftsrat, was founded in 1872 in Berlin. Its president is a prominent landowner and the secretary a professor of agriculture in the University of Berlin. All German Federal States are represented, Prussia furnishing 25, Bavaria 9, and all the other States from 1 to 9 delegates; it has 75 regular and 3 associate members. The object of the council is to represent the agricultural interests of the entire German Empire. With this aim in view it furnishes expert opinions on the economic problems of agriculture, and addresses petitions, suggestions, complaints, and proposals to the Imperial Chancellor and to Parliament.

The membership is composed of delegates sent to the council by the official agricultural organizations of the various States of the German confederation. If there are no such official organizations in individual States, nonofficial organizations adhering to the Council of Agriculture elect the delegates. The council maintains two publications, one entitled *Zeitschrift für Agrarpolitik* and the other *Archiv des Deutschen Landwirtschaftsrats*.

It has a permanent committee for considering urgent affairs, consisting of nine members; the president and two vice-presidents and the boards of directors are ex-officio members.

Royal Prussian Agricultural College

Similar to the German Council of Agriculture, but with authority extending only to the territory of the Kingdom of Prussia, is the Royal Prussian Agricultural College (Königlich-Preussisches Landes-Ökonomie-Kollegium). This was founded in 1842 and its statutes were revised in 1898. The German Council of Agriculture is not attached to any Imperial or State department; on the other hand, the Royal Prussian Agricultural College is practically a bureau of the Ministry of Agricultural Domains and Forestry. It is an advisory council to assist the ministry in all matters concerning the promotion of agriculture and forestry and serves as a central organization for all the chambers of agriculture in Prussia. It happens that both the Royal Prussian Agricultural College and the German Council of Agriculture have the same president. The former has, however, a special secretary who is a doctor of political economy. The membership of this institution consists of 34 delegates, 25 of whom are elected by the chambers of agriculture and 9 appointed by the Minister of Agriculture. The college has an income of 65,000 marks (\$15,471) derived partly from a State subsidy and partly subscribed by the chambers of agriculture. It publishes two periodicals, one being the *Archives of the College* and the other the *Bulletin of the Chambers of Agriculture*. Permanently connected with the college is the Central Association of the Prussian Chambers of Agriculture, a free association of the Prussian chambers of agriculture using the facilities of the college for the transaction of its business.

As far back as 1810 an agricultural association for Bavaria was founded at Munich. The governing body of this association was the general committee at Munich. After several reorganizations, the general committee was transformed in 1895 into the Bavarian Council of Agriculture, and the law conferred upon it the right to be regarded as the central representative organ of agricultural interests in Bavaria. The council has for its general secretary a professor at the University of Munich, and the assistant secretary is a trained agriculturist. The association is divided into 8 provincial and 235 district organizations, having about 12,000 members. It has an income of 270,000 marks (\$64,260), and each of the 8 provincial associations has an income of 50,000 to 150,000 marks (\$11,900 to \$35,700). The council organizes agricultural expositions in the various districts; it maintains a legal aid society and sales departments at Munich, Augsburg, and Nuremberg for

fresh meat. Allied with the council are the Federation of Farm Loan Societies and the Bavarian Agricultural Bank. The council also owns several experiment stations.

Saxony

The agricultural organizations of Saxony formed a federation in 1850, which was nonofficial and independent. In 1872 the official Council of Agriculture for the Kingdom of Saxony was founded. It has 28 regular members, consisting of the presidents of the 5 provincial agricultural associations, 13 members chosen by chambers of agriculture, 3 persons appointed by the Minister of Agriculture, 5 scientists, the president of the subcommittee on gardening, and the general secretary. There are also 7 additional members, representing veterinary science, cattle raising, hog raising, horse raising, fish culture, beekeeping, agricultural machinery, and fruit and wine culture. The income of the council is over 125,000 marks (\$29,750) and the expenditures about 70,000 marks (\$16,660). The council represents the interests of agriculture, forestry, and gardening, and is charged with developing and promoting all three branches. It acts as the connecting link between the administration and the agricultural interests. It may bring before the government the wishes and needs of agricultural communities, and it may organize, manage, and develop schools and institutions to promote the welfare of agriculturists. It is not essentially different in its activities from the Prussian chambers of agriculture.

The five subdivisions of the council of agriculture are located at Dresden, Leipzig, Chemnitz, Auerbach, and Bautzen. All of these subsidiary organizations maintain local schools, experimental stations, etc. They have an income of 20,000 to 50,000 marks (\$4,760 to \$11,590) each, and affiliated with them are associations of special character, such as beekeepers' associations and fishery owners' associations.

Württemberg

The Central Agricultural Bureau at Württemberg has 12 provincial and 64 district organizations, with over 75,000 members and an income of 1,000,000 marks (\$238,000). It is charged with representing the interests of agriculture and is subject to control by two ministers, the Minister of the Interior as regards all measures affecting agricultural interests in general, and the Minister of Public Worship and Instruction as regards agricultural schools. It is

an evolution of a bureau that was founded in 1817. It is peculiar in its position, being practically a bureau of the government and at the same time a free and independent federation of agricultural societies. In its first capacity it advises the government on all matters relating to agriculture, commerce in agricultural products, transportation, customs tariffs and insurance, improvement of agriculture, promotion of agricultural knowledge, agricultural expositions, etc. It also manages government funds for the improvement of agriculture, operates schools of agriculture and viticulture, and experimental stations. As a federation of free and independent organizations it aims to stimulate local organizations to the improvement of local agricultural conditions, to bring them together to discuss matters of common interest, to transmit the wishes and needs of the agricultural communities to the authorities, and otherwise to encourage and assist local associations.

Baden, Hesse, and Oldenburg

The Chamber of Agriculture for the Grand Duchy of Baden, at Karlsruhe, with 28 subdivisions and 42 members in the principal chamber, is subsidized by the government with a fund of 25,000 marks (\$5,950) per annum. No tax is levied on the agriculturists for the support of the chamber. It was founded in 1908.

The Chamber of Agriculture for Hesse, at Darmstadt, consists of 45 members, and the subsidiary organizations represented in the central chamber have about 80,000 members. It was founded in 1906.

The Chamber of Agriculture at Oldenburg was founded in 1900. It maintains a number of agricultural schools. About 90 central organizations with 10,000 members adhere to this chamber.

CHAPTER IX

THE UNITED STATES DEPARTMENT OF AGRICULTURE

EXPENDITURES OF UNITED STATES DEPARTMENT OF AGRICULTURE 1910-1917

	Meat Inspection	Acquisition of Lands	Eradication of Foot and Mouth Disease	Agricultural Extension	Roads	Total
1910	\$3,000,000					\$16,542,000
1911	3,000,000	\$2,000,000				20,070,000
1912	3,000,000	2,000,000				22,370,000
1913	3,000,000	2,000,000				22,666,000
1914	3,000,000	2,000,000				24,076,000
1915	3,000,000	2,000,000	\$2,500,000	\$ 480,000		28,530,000
1916	3,000,000			1,080,000		28,004,000
1917	3,000,000			1,580,000	\$6,000,000	36,128,000

“There is no other government in the world which has agricultural establishments at all comparable with those now provided by the people of the United States through their Federal and State governments. More helpful and constructive agencies are now in operation for the betterment of rural life than ever before in the history of the Nation. Even now no farmer in the world can compare with the American farmer in agricultural efficiency. His adaptability to new and changing conditions, to the use of improved machinery and processes, coupled with the great natural resources with which the Nation is endowed, make him far superior to any of his competitors. It is true that he does not produce more per acre than the farmers of some of the other nations. Production per acre, however, is not the American standard. The standard is the amount of production for each person engaged in agriculture, and by this test the American farmer appears to be from two to six times as efficient as most of his competitors.” [Democratic Text-Book, 1916.]

Publications.

[SOURCE: Democratic Text-Book, 1916, (prepared from official sources).]

It was realized that *if the average farmer could be induced to apply what the experts knew and what the best farmers practised a*

revolution could be brought about in the agriculture of the Nation. It was clearly a matter of urgency that through every proper channel at the earliest possible moment there be brought home to the 6,000,000 farm families of the Union the knowledge which the agricultural agencies of the Nation had acquired and were increasingly acquiring. Therefore, immediately the Department of Agriculture attacked this problem. It first dealt with the printed matter of the Department. It was clear that bulletins were not infrequently difficult to interpret, to understand, and to apply. It was necessary to adapt them to the classes of people they were intended to reach. The first step taken was to segregate the scientific bulletins for the scientists from the popular bulletins for the farmer; and no pains were spared to simplify the latter. The second step was to devise a central agency to facilitate the securing of information by all interested parties and agencies, including the daily and weekly newspapers, and in particular the agricultural journals. It was ascertained that such papers would gladly use material if it were furnished to them in readily available form.

To circulate its agricultural information directly among farmers and other citizens, the Department of Agriculture in the last three years has printed and distributed over 107,000,000 copies of publications dealing with the latest methods of crop production and animal husbandry, giving effective means of combating plant and animal diseases and pests, and reporting the results of its scientific experiments. During this period, 3,836 new publications have been issued. To make it possible to issue still more publications and to reach a larger number of farmers, Congress for the fiscal year 1916-17 granted an additional appropriation of \$100,000.

[SOURCE: Report of the Secretary, 1912, U. S. Department of Agriculture, pp. 114, 115.]

Employees and Appropriations

Compared with present proportions, most of the department bureaus of 1897 were small and confined to few lines of investigation and endeavor. The whole department had on its pay roll in that year 2,444 persons. The number has increased steadily until on July 1, 1912, 13,858 were on. . . . It has been a difficult matter to determine how many scientists and scientific experts are employed by the department . . . it is a matter of record that from 1902 to 1907 from 1,927 to 2,326 scientists and scientific experts, assistants, and agents were employed.

Along with the increase in the number of the department em-

ployees it is to be expected that the appropriations of money by Congress for the use of the department would greatly increase. For the fiscal year ending June 30, 1898, the appropriations amounted to \$3,272,902. . . . The appropriations by 1911 aggregated \$20,888,449.28, and for 1913 the total amount is \$24,743,044.81.

In wealth produced and in wealth conserved during these 16 years the department has returned to the Nation more than 10 times these appropriations.

[SOURCE: Report of the Secretary of Agriculture, 1916, pp. 14 to 32, inc.]

Increasing the Meat Output

To increase the meat production of the United States has been one of the principal aims . . . it is gratifying to note that the decline in beef production reached its lowest point in 1913, and that since that date there has been a material increase, while there has been a marked advance in the number of swine since the census year 1899. The number of sheep has continued to decline, but only to a slight extent. The number of animals slaughtered and the quantity of meat products prepared under government inspection during the past fiscal year are the largest in the history of the service; yet this heavier slaughtering has been accompanied by an increase in the remaining stock of animals.

In December, 1913, a committee of experts was appointed to make a thorough survey of the meat situation. As a result of this study, the department recently issued a series of illuminating reports. The activities have taken two principal directions—(1) checking and eliminating diseases and parasites, and (2) increasing and improving stock raising by extending the industry . . . and by pointing the way to better breeding and feeding.

Combating Stock Diseases

The eradication of the southern cattle tick is proceeding more rapidly than ever before and is opening up for beef and dairy production a large territory. During the past fiscal year 31,358 square miles were released from quarantine and, in addition, 9,493 square miles were released on September 15, 1916. Within the past three years the quarantine has been removed from 106,810 square miles, making a total of 294,014 since the work was begun in 1906. More than 40 per cent of the original tick-infested territory has been cleared, and therefore the direct losses, originally estimated at \$40,000,000 annually, are being greatly reduced.

The diseases known as sheep scabies and cattle scabies likewise are being eliminated rapidly from the Western States. During the fiscal year 1916, 43,243 square miles were released from quarantine for sheep scabies and 12,691 for cattle scabies. At present only 286,398 square miles remain under quarantine for sheep scabies and 3,817 for cattle scabies.

Hog cholera.—Hog cholera, always the cause of heavy losses throughout the country, is less prevalent this year than for many years. This is due, in marked degree, to the wise application of the protective serum devised by the department and to the demonstration work in certain selected counties. The beneficial results of the field demonstrations are shown by a comparison of statistics for the 14 experimental counties before the work was undertaken and after it had been in progress for a time. There was an increase in the number of hogs raised in these counties from 859,910 in 1912 to 1,334,644 in 1915, while during the same period there was a decrease in the number that died from 152,296 to 30,668.

Contagious abortion.—Contagious abortion in recent years has reached such proportions as seriously to threaten the cattle-raising industry. It strikes at the source by curtailing the production of calves. It has been studied by the department, and vigorous efforts are being made to advise stock breeders as to its nature and means of prevention and eradication. The last Congress, upon the recommendation of the department, made a special appropriation of \$50,000 for attacking the problem.

Foot-and-mouth disease.—I am glad to be able to report the complete suppression of foot-and-mouth disease during the year. The disease appeared near Niles, Mich., late in the summer of 1914 and reached 22 States and the District of Columbia. It extended entirely across the country, from Massachusetts on the east to Washington on the west, the region of greatest prevalence being from New York to Illinois.

After July 1, 1915, the disease occurred only in Illinois, Massachusetts, New York, Indiana, and Minnesota. Before the end of August it had been eradicated from the last three mentioned States. It recurred in Massachusetts in October, 1915, and was promptly suppressed. In Illinois the last herd of cattle affected by the natural spread of the disease was disposed of in February, 1916. The infection reappeared, however, early in May among some test animals on a previously infected farm. These animals had been placed there to determine, before the owner was allowed to restock his farm, whether the disinfection was effective. As the cleaning and

disinfection of these premises had been done under very unfavorable weather conditions, the outbreak was not entirely unexpected. The diseased animals were slaughtered promptly and the premises again disinfected. There has been no reoccurrence of the disease anywhere in the United States. The last quarantine restrictions were removed June 5, 1916. Supervision by veterinary inspectors has been continued in the lately infected areas as a precaution.

This outbreak was the most serious that has ever menaced the live-stock industry. It was overcome only after a hard struggle in which the authorities of the various States affected co-operated cordially with the Federal government. . . . Congress has made a special appropriation of \$1,250,000. It also has provided, upon the recommendation of the department, that breeding value, as well as meat or dairy value, may be taken into account in compensating owners for animals destroyed hereafter in the eradication work.

Tuberculosis of Farm Animals

Tuberculosis probably is the most common, destructive, and widely disseminated of the infectious diseases of domestic animals, especially of cattle and swine. Its seriousness is emphasized by the fact that it is transmitted to human beings. This may be prevented in reasonable measure by the pasteurization of milk and the inspection of meat. There remains, however, the problem of eliminating the disease from farm animals in order to prevent losses estimated at \$25,000,000 a year in the United States. This is the greatest problem confronting the live-stock industry of the country. Its very magnitude discourages the undertaking of any general plan of eradication.

Despite all that has been done in the past 10 or 15 years, there is no indication that tuberculosis of cattle and hogs is on the decline in the United States. It has been reduced or partially checked here and there, and even eradicated from some herds; but generally it is as prevalent as ever. The disease can be prevented and some definite system of eradication should be inaugurated. Three undertakings seem practicable at this time.

Eradication from pure-bred herds.—The first is the eradication from pure-bred herds of cattle. It is not necessary to resort to compulsion. The department should be placed in position more fully to assist individuals who wish to undertake the complete eradication of the disease from their herds. It could apply the tuberculin test and, in case infected animals are discovered, advise and supervise their proper disposal or management. The ruthless

slaughter of all tuberculin reactors is not necessary. Many of them may be safely retained under proper quarantine conditions and their offspring raised free from tuberculosis.

Eradication from hogs.—The second undertaking is the eradication of tuberculosis from hogs. The experts of the Bureau of Animal Industry believe that this would be relatively easy of accomplishment. Hogs do not convey the disease to one another to any appreciable extent. They contract it from cattle, chiefly in two ways—by being fed on nonpasteurized products from creameries and by following cattle of somewhat mature age in the feed lot and feeding upon the undigested grain.

Eradication from restricted areas.—The third undertaking is complete eradication in restricted areas. The plan would be to select certain communities in which, after a thorough educational campaign, the stock owners are willing to co-operate. This would require the slaughter of infected animals and necessitate reasonable indemnity. The latter feature undoubtedly would require large expenditures.

The results accomplished in the District of Columbia afford an example of what can be done where systematic local eradication is undertaken. By means of repeated tuberculin testing, accompanied by the slaughter of the reacting animals, tuberculosis among cattle in the District has been reduced in a few years from nearly 19 per cent to slightly over 1 per cent. The joining of areas freed of tuberculosis gradually should result in the elimination of the disease from groups of counties and from entire States.

Such an undertaking would be very similar to the plan of exterminating cattle ticks in the South. This work was begun systematically in 1906 in certain restricted areas on the border of the infested region. At first the opposition of the local people was almost unanimous. Gradually the people were convinced that the tick is an evil; that its eradication would be advantageous; and that the cost would be small in comparison with the benefits. The movement is now going forward very rapidly. Furthermore, this activity was begun almost exclusively at department expense. Last year the department spent approximately \$400,000, while local agencies, including State and county governments, expended double that amount.

Such a plan should succeed against tuberculosis. It is a large task. The department has recommended in the estimates for the next fiscal year that an appropriation of \$75,000 be made for the inauguration of the work.

Development of Stock Raising

Experiments by the department, in co-operation with the State experiment stations, have shown conclusively that the South is well adapted to economical beef and pork production. It is beginning to take its place with other sections as a stock-raising territory. Numerous breeding herds are being established. The leading beef-cattle breeders' associations are featuring the southern trade, and two of them are holding sales in co-operation with the department. Cattle from southern herds have won the highest honors in northern show rings, and steers from southern feed lots now command good prices. This work is not for the benefit of one section alone; the entire country will profit.

Destruction of forage by rodents.—The grazing value of the western stock ranges is much reduced by the depredations of prairie dogs and ground squirrels. More than 22,000,000 acres in 12 States are infested with prairie dogs. These rodents often completely destroy the forage plants over considerable areas and cause enormous damage to grain and other crops. Ground squirrels occur in large numbers in 18 States. While they are less destructive to forage plants than prairie dogs, they consume large quantities of forage and grain. The Bureau of Biological Survey has developed new methods of poisoning these pests at a cost of approximately five cents per acre. This is less than the grazing value of the land for a single year. The bureau practically has eradicated prairie dogs from more than 2,000,000 acres of public lands and ground squirrels from 500,000 acres.

Predatory animals.—The annual losses of live stock in the United States, mainly upon the public domain, from the depredations of such animals as wolves, coyotes, mountain lions, and bears exceeds \$12,000,000. Wolves and coyotes are subject to epidemics of rabies and, therefore, are peculiarly a menace to domestic animals and human beings. There was a serious outbreak of this disease among coyotes during the past year. It was prevalent in several States in the Northwest and was especially disturbing in Nevada.

Congress appropriated \$200,000 for the destruction of predatory wild animals during the past year. The sum of \$250,000 is available for this purpose during the fiscal year 1917. A force of hunters and trappers has been organized in the infested States, and 543 wolves, 19,170 coyotes, and many other predatory animals have been destroyed. As a single wolf has been known to kill more than \$3,000

worth of stock in one year, the effect on the stock-raising industry of the elimination of this number of destroyers is apparent.

The Sheep Industry

Normally the United States imports from about two-fifths to more than one-half of the wool required for domestic consumption. During the past three years importations have ranged from nearly 250 million to more than 500 million pounds each year, the average being over 300 million pounds. The total consumption of lamb and mutton during the past 10 years has increased appreciably. In 1907 more than 9½ million sheep and lambs were slaughtered at plants subject to Federal inspection. The number now averages about 13 million per annum.

In some sections of the United States there has been a steady decline in sheep production. This has been true also in every other settled country except Great Britain. The explanation undoubtedly is an economic one. In general, the primary purpose of sheep growers has been to produce wool. This can not be attained profitably on high-priced land. Naturally, therefore, with the increase in land values there is a rapid decline in the number of sheep. In Great Britain meat has been the principal product and wool the by-product.

Waste land made productive.—If American farmers will follow the British custom the industry can be put on a profitable and permanent basis. The greater number of sheep in Great Britain are raised in the hills and on land comparable to much of the "waste land" of American farms. The areas in this country, especially in the East and in parts of the South, now relatively little used, can profitably be devoted to sheep production if the farmers will secure the proper breed of sheep.

Sheep also can be made profitable on higher-priced land, as British experience shows. They compare favorably with other animals in economy of production. They require a minimum of expensive concentrated feeds. They exceed the other larger animals in the rate of maturity; lambs can be made ready for market at from four to six months. They make possible the economical and fuller use of labor. They are of assistance in keeping the farm free from weeds.

Extension of industry.—In the United States only one in seven farms of over 20 acres now supports sheep, with an average of one sheep of shearing age to three acres of land. The 300 million

pounds of wool now imported annually could be secured from 50 million sheep, and this number could be added to our stock if a fourth of the remaining farms sustained one sheep for each three acres.

In 1914 the Animal Husbandry Division of the Bureau of Animal Industry and the Bureau of Crop Estimates canvassed crop reporters in 36 States in reference to sheep on farms. The replies indicated that the number could be increased 150 per cent without displacing other animals. It is to our settled areas, particularly in the Central, Southern, and Eastern States, that we must look for an increase in the number of sheep.

The Dairy Industry

Dairy farming is increasing in almost every section of the country, largely because it is the most economical form of agriculture so far as soil fertility is concerned. A ton of butter removes from the soil less than a dollar's worth of fertilizing elements.

Cheese production.—In 1909 this country produced 1,622 million pounds of butter and 321 million pounds of cheese. In 1870 our cheese exports amounted to 57 million pounds. They steadily increased until 1881, when the total was 148 million pounds. After that date they decreased rapidly until in 1914 they had dropped to less than 2½ million pounds. On the other hand, our imports of cheese amounted to 2 1-3 million pounds in 1870 and advanced slowly. . . . From 1900 to 1914 the imports increased to 64 million pounds. Much of this cheese could and should be produced in the United States.

Most of the cheese in this country has been made in the territory around the Great Lakes, where climatic conditions are favorable to the handling of whole milk. All the valleys in the Rocky Mountain section and a large area on the Pacific coast offer splendid conditions for cheese production. So, also, does the mountain section of the South.

Co-operative associations.—Rigid selection, intelligent breeding, and skilful feeding are important factors in economical production. Cow-testing associations teach rigid selection and skilful feeding. Co-operative bull associations promote intelligent breeding. In co-operation with the various State agricultural colleges the department has greatly extended the work of these associations. For several years co-operative bull associations have been common in some parts of Europe. The first association of the kind in the United States was organized in Michigan in 1908. In this country

their growth has not been rapid, but as a rule they have been successful. They provide for the joint ownership, use, and exchange of high-class, pure-bred bulls. If skilfully managed, these associations should become potent factors in the upbuilding of a more profitable dairy industry.

A large part of the work of the cow-testing associations and co-operative bull associations has been done in the North and West. The dairy industry in the Rocky Mountain and Pacific Coast States recently has made great progress, owing in part to the importation of carefully selected dairy cows and registered bulls from the East and Middle West. Its development in the South has been very marked during the past year. A beginning was made in the work of cow-testing associations and co-operative bull associations. Five of the agricultural colleges have organized creameries to encourage dairying and to provide a market for the increased production of milk and cream. These creameries furnish excellent facilities for teaching students improved methods of manufacturing and handling dairy products.

Community development in dairying.—Community development in dairying was undertaken by the department in a typical small creamery community in northern Iowa in 1910. The object of the experiment was to determine the practicability of employing skilled instructors to assist such communities in bringing the dairy business to a higher level. The work, which proved to be financially successful, was continued for five years, and similar work now is being carried on, with even greater success, in the vicinity of Grove City, Pa.

The creamery extension work has increased the efficiency of a large number of creameries. The department also has given assistance in building and equipping creameries, rearranging the machinery, systematizing the methods of operation, eliminating losses, and improving the quality of the products.

Research work.—The activities indicated are almost entirely of an educational nature. The department also is conducting investigations relating to dairy problems on a scale which is unequalled anywhere else in the world. Much of this work, in its beginning, is of a highly technical nature, but results are being accumulated which are of great practical value in the field demonstration work. Extensive study of the types of bacteria in milk, their origin, and the channels through which they contaminate milk, has established a reasonable basis for dairy sanitation. Perhaps the most striking example of the application of the results of laboratory research to

practice is the development of methods of manufacture of some of the foreign cheeses which make up the bulk of our cheese imports.

Production of Food Crops

The production of food crops adequate to meet the consuming needs of the country and the export demand is a matter of large importance to the American people. One of the greatest agricultural needs is the stabilizing of production.

The extent to which the productiveness of such a crop as corn can be improved through continued selection is illustrated strikingly by the results of work done by department specialists. For 14 seasons the yields of 10-acre fields of corn, planted on a 3,000-acre farm in Ohio with seed selected from the department co-operative improvement plots on the farm, have been contrasted with the farm yields of the same variety of corn less rigidly selected and grown under identical cultural conditions. During the first seven-year period the fields planted with department seed yielded 13.3 bushels per acre more than the farm fields, while for the second seven years the increase averaged 21.8 bushels per acre.

In western Kansas, Oklahoma, and the Panhandle of Texas, corn is being displaced to a considerable extent by the grain sorghums because they more regularly produce profitable crops. Approximately 4 million acres are now devoted to these crops. Dwarf milo, a recent result of systematic breeding for low stature, has a higher grain-yielding power under adverse conditions than the tall variety. During the past four years it has become the leading variety grown in Oklahoma, Texas, and New Mexico. As the sorghum grains in large measure serve the same purposes as corn, the economic soundness to the Nation of their enlarged production is apparent.

In the Sacramento Valley of California, where this department has been investigating the possibility of rice culture, the acreage devoted to that crop has increased during the past five years from 1,400 to 67,000. The farm value of the current crop approximates \$3,500,000. The increased production of wheat, oats, and other small grains in the Southeastern and South Central States, which was specially stimulated by the cotton-market crisis of 1914, tends to stabilize the food supply. In several States the acreage planted to these grains was enlarged by from 50 to 100 per cent.

Adaptation studies of the hard red winter wheats, which formerly were restricted to a limited part of the Central Plains region, have shown that they can be grown throughout a much larger area.

During the past four years they have become established extensively in Montana and in the States of the Great Basin and the Pacific Northwest. In the States west of the Rocky Mountains they have largely replaced the soft wheats.

The area devoted to durum wheat has strikingly increased. This crop now is well established in western North Dakota, South Dakota, eastern Montana and Wyoming, and northeastern Colorado. As the durum varieties are more resistant to rust than other types and require less rainfall, their introduction by the department has proved to be of very great importance to the country. The production already has attained a magnitude of 40 million bushels in a single year.

Two new pure lines of Kherson oats have been developed in co-operation with the Iowa Agricultural Experiment Station and have been widely distributed in Iowa and adjoining corn-belt States. A large number of tests by farmers have shown a 10 per cent increase in yield over the varieties previously grown. Their adoption for Iowa probably would result in an increase in that State alone of from 12 to 15 million bushels.

A systematic study of the soy bean, with a view to determine the relative adaptability of varieties to regions, the best methods of culture, harvesting, and threshing, and the uses to which it can be put, has been under way for several years. This study has thrown much light on its economic possibilities. It not only produces forage for live stock, but oil for various uses can be obtained from the seed, and meal, flour, and other food products can be made from the resulting cake. Through the efforts of the department, cotton-oil mills crushed during the past season over 100,000 bushels of southern-grown soy beans with satisfactory results from the oil standpoint, while soy-bean flour, or meal, and other food products made from the resulting cake, are being marketed by several manufacturers.

As the soy bean can be produced under widely varying climatic and soil conditions, it seems certain in the future to occupy a larger and more important place in our agriculture and in our food supply.

California Citrus Industry

The citrus industry of California, although tracing its beginnings back to individual plantings by early settlers, owes its present magnitude and commercial importance in large measure to the introduction by this department many years ago of the Washington

navel orange from Brazil. The present production of this variety in that State is estimated at approximately 27,000 carloads in a normal year, or about two-thirds of the total orange shipments of the State. It has, in fact, become the most important citrus-fruit variety in the world.

Control of Plant Diseases

It is very clear that fuller knowledge of the distribution and the nature and methods of control of crop diseases is essential. It has been estimated that in years when cereal rusts are epidemic the losses from them alone amount at least to \$180,000,000. No effective remedies have yet been found for these diseases. It seems probable, however, that through the development of suitable resistant varieties their eventual control in large part can be affected.

Distinct headway has been made in the study of diseases of fruits and vegetables. Many of them have proved amenable to spray control, especially when combined with rational field practice to prevent infection.

Citrus Canker

Co-operative arrangements have been made with State officials of Florida, Texas, Louisiana, Mississippi, Alabama, Georgia, and South Carolina to insure the thorough inspection of nurseries and citrus groves for the purpose of promptly and completely eradicating citrus canker. This is an undertaking of great magnitude because of the extreme infectiousness of the disease and the wide area throughout which it has been disseminated. No final statement as to the outcome can be expected within a period of at least two years. The campaign, however, is progressing very satisfactorily in the commercially important orange and grapefruit regions of Florida. Supplemental protective measures, such as formalin treatments of infected soil and protective spraying of groves exposed to infection, are hastening the work of eradication materially. Even in the few places where citrus-canker outbreaks have occurred in commercial districts and in old trees, the disease can be eradicated promptly and effectively. Although thorough inspection of citrus plantings will be necessary, at least throughout the coming fiscal year, it is believed that Florida now is so nearly free of the disease as to render its eradication from that State practically certain.

Control of Insects

While all the State Experiment Stations support work in economic entomology, and while many other countries are developing services in this direction, the Department of Agriculture has by far the largest organization for the purpose of research. It is virtually the leader of the world in the warfare against injurious insects. It has in its files biological notes on thousands of species and is studying them from all points of view in its field laboratories. No less than 143 distinct projects are being investigated at the present time, involving possibly 500 of the species of insects most injurious to crops, domestic animals, stored foods, forest products, shade trees, and ornamental plants. It is safe to say that some form of remedial treatment has been found for every markedly injurious insect in the United States, but continued efforts are being made to find something more effective or cheaper or simpler.

Plant Quarantines

Important service is rendered to the farm and fruit interests of the country, under the Plant Quarantine Act, by preventing the introduction of new and dangerous insect pests and plant diseases. There are now in force nine foreign quarantines. The more important quarantines relate to the Mediterranean fruit fly, perhaps the worst fruit pest of the tropical and subtropical countries; the pink boll worm, an insect which threatens to become the most serious enemy known to cotton; the potato wart, a disease which not only destroys the tuber but infects the soil; and a white-pine blister rust and the citrus canker, two diseases which became established in the United States prior to the passage of the act.

[NOTE.—For a partial list of the divisions of the United States Department of Agriculture—showing the amazing extent and the extraordinary ramifications of its scientific work—see the four pages following. We believe a satisfactory conspectus of the Department has never before been brought into so small a space.]

UNITED STATES DEPARTMENT OF AGRICULTURE—CHIEF DIVISIONS

Bureaus

Chief Divisions

Animal Industry

- | | | |
|------------------|---|---|
| Animal Husbandry | { | Chief Subdivisions:
Breeding, Nutrition,
Sheep, Cattle, Hog,
Horses, Poultry |
| Biochemics | { | Chief Subdivisions: Disinfectants,
Virus, Serums, Toxins, Tuberculin,
Mallein, Hog Cholera |
| Pathological | { | Chief Subdivisions: Physio-
logical, Animal Diseases, Bio-
logical Products, Vaccine, Poul-
try Diseases |
| Dairy | { | Chief Subdivisions: Dairy Farming,
Dairy Engineering, Dairy Manufactur-
ing, Milk Investigations, Renovated
Butter |
| Zoological | { | Chief Subdivisions: Veterinary
Literature, Parasites and Para-
sitic Diseases |

Plant Industry

- Plant Pathology
- Forest Pathology
- Fruit Diseases
- Cotton and Truck Diseases
- Crop Physiology and Breeding
- Crop Acclimatization
- Soil Bacteriology
- Drugs and Poisonous Plants
- Agricultural Technology and Fiber Plant Work
- Cotton Standardization and Paper Plant Work
- Grain Standardization
- Biophysical Investigations
- Cereal Investigations
- Corn Investigations
- Tobacco Investigations
- Sugar Beet Investigations
- Seeds (Laboratory, New and Rare, Etc.)
- Foreign Plants and Seeds
- Alkali and Drought-Resistant Plants
- Dry Land Agriculture
- Irrigation Agriculture

Bureaus *Chief Divisions*

Plant Industry (*Cont.*)

Reclamation Projects (Demonstrations on)
Economic and Systematic Botany
Horticulture and Pomology
Forage Crop Investigations
Co-operative Demonstration Work
Co-operative Demonstration Work in Cotton Belt

Chemistry

Sirup Investigations
Denatured Alcohol
Products of Wood Distillation
Paper and Leather Making Materials
Commercial Feeding Stuffs
Use of By-Products
Insecticide Investigations
Drug Investigations

Soils

Soil Chemistry { Chief Subdivisions:
Composition of Soils
Absorption by Soils
Concentration of Soil
Hydrolysis—Solutions
Decay

Soil Physics { Chief Subdivisions:
Mechanical Composition
Texture
Movements of Moisture
Aeration
Heat
Moisture Content and Condition

Fertilizer Resources { Chief Subdivisions:
Potash
Nitrogen
Phosphorus
Miscellaneous
Methods of Preparation

Soil Survey { Chief Subdivisions:
Mapping
Relation of Soils to Crops

Entomology

Bee Culture
Cereal and Forage Insects

<i>Bureaus</i>	<i>Chief Divisions</i>
Entomology (<i>Cont.</i>)	Deciduous Fruit Insects Moths Forest Insects Truck Crop and Storage Insects Southern Field Insects Miscellaneous Insects
Biological Survey	Food Habits Noxious Mammals Fur Farming Mortality of Water Fowl Crawfish on Cotton Lands Importations Bird and Game Reservations Game and Bird Laws
Office of Experiment Stations	Superintendence of State Experiment Station Relation with Agricultural Schools Experiment Stations in Alaska, Hawaii, Porto Rico, etc. Home Economics Investigations Drainage Investigations Irrigation Investigations
Horticultural Board	Pathological Inspection Entomological Inspection Foreign and Domestic Quarantines
Insecticide and Fungicide Board	
Food and Drug Control	Chemical and Biological Research Carbohydrates Citrus By-Products Food Investigation Fruit and Vegetable Utilization Leather and Paper Mycological Organic Investigation Pharmacology Plant Chemicals

Bureaus
Forest Service

Chief Divisions

Products (Industrial and Research Investigation)
Grazing.
Water-Power.
Silviculture.

Weather Bureau

Aerological Investigations.
Solar Radiation.
Climatology (Weather Records, Crop, Fruit, and
Marine Services).
Meteorological and River Investigation.
Forecast Service.
Seismological Investigation.
River and Flood Service.

Crop Estimates

Markets and
Rural Organi-
zation

Market Surveys, Methods, and Costs
Marketing Live Stock and Meat
Marketing Dairy Products
Co-operative Purchasing and Marketing
Rural Organization
Marketing by Parcel Post and Express
City Marketing and Distribution
Cotton (Handling, Marketing, Standardization,
etc.
Market Grades and Standards
Transportation and Storage
Marketing Business Practice

Public Roads
and Rural En-
gineering

Mechanical Engineering
Chemistry
Construction
Farm Irrigation
Farm Drainage
Maintenance
National Park and Forest Roads
Administration
Road Economics

CHAPTER X

LEADING BUREAUS OF THE AGRICULTURAL DEPARTMENT

1. THE DEPARTMENT OF AGRICULTURE AND THE CONSUMER

[SOURCE: Report of the Secretary of Agriculture, 1912, pp. 203 to 207, inc.]

Food Standards

IN the appropriation bill for 1903 Congress authorized the Secretary of Agriculture "in collaboration with the Association of Official Agricultural Chemists, and such other experts as he may deem necessary, to establish standards of purity for food products and to determine what are regarded as adulterations therein." In accordance with this authority, I appointed as special agents members of the food standards committee of the Association of Official Agricultural Chemists, and the work of establishing standards was taken up. Later this authority was repealed.

Enforcement of the Food and Drugs Act

The food and drugs act became effective on January 1, 1907, and the actual work in connection with the enforcement of the law began on that date. The first step was to organize a force to handle the various phases of the work. The organization includes: (1) Inspectors who procure samples for analysis and information regarding the manufacture and sale of food and drugs; (2) chemists who analyze samples and make scientific investigations of problems relating to the composition and adulteration of food and drugs; (3) the Board of Food and Drug Inspection, whose duties are to consider all questions arising in the enforcement of the food and drugs act upon which the decision of the Secretary of Agriculture is necessary, to consider correspondence involving interpretations of the law and questions arising under the law, and to conduct hearings based upon alleged violations of the food and drugs act.

The enforcement of the law proceeds along two lines: First, products imported into the United States from foreign countries;

and, second, products manufactured or sold in the District of Columbia or the Territories, introduced into interstate commerce, or exported from the United States.

In the case of imported foods and drugs no prosecutions are made. The effort of the department is confined to preventing the importation of adulterated or misbranded goods and causing their reshipment beyond the jurisdiction of the United States. This work is done through branch laboratories which are located at the leading ports of entry, where inspection is made of all food and drug products that enter the United States.

The inspectors visit all sections of the country. In the case of goods shipped into interstate commerce, or manufactured, or sold within the District of Columbia, or the Territories, the duties of the inspectors are as follows: (1) To investigate the wholesale and retail market and obtain samples of foods and drugs shipped in interstate commerce. (2) To inspect manufacturing establishments and secure information in regard to the nature of the foods shipped. (3) To investigate the manufacture and use of substances which are or may be employed for the adulteration of foods and drugs and methods of preparation which may lead to the damage or deterioration of foods and drugs, or to the use of improper materials in their manufacture. (4) To inspect foods and drugs imported at ports where branch laboratories have not been established. In addition, special investigations are frequently made by inspectors concerning important questions of sanitation and processes of manufacture.

Samples are shipped to the laboratories at Washington or to one of the 22 branch laboratories which are located at the principal ports of entry and the leading commercial centers.

When goods are found that are in violation of the law, the dealer or shipper is given an opportunity to appear before the Secretary of Agriculture, the Board of Food and Drug Inspection, or such official as may be designated, and present evidence in reference to the question at issue. If after the hearing it appears that the law has been violated, the board makes the appropriate recommendation to the Secretary of Agriculture, who certifies the fact to the proper United States attorney through the Attorney General, together with the necessary information regarding the case. It is then the duty of the district attorney to prosecute the case in the United States district courts.

The law also provides that adulterated or misbranded food or drugs sold or offered for sale in the District of Columbia or the

Territories, imported, delivered for export, or introduced into interstate commerce may be seized and disposed of by destruction or sale, as the court may direct.

Investigations Under the Food and Drugs Act

In addition to the chemical analysis of samples taken in the enforcement of the food and drugs act, a great deal of work has been necessary in the way of investigating manufacturing processes and trade practices in many classes of food and drug products. A considerable portion of the time of the analysts of the bureau has been devoted to research work along these lines. In the scope of this report it is only possible to refer in a general way to a few of the important studies. The investigations have two general objects in view: (1) To secure data on which to base action under the food and drugs act. (2) To show manufacturers and dealers how they can prepare, pack, and ship their products in such manner as to increase their quality and purity and bring them up to a standard that will be in harmony with the law.

Among the important scientific investigations which have resulted in direct action under the food and drugs act may be mentioned that of the shellfish industry. In collaboration with the Oyster Packers' and Growers' Association, a number of experimental shipments were made on a commercial scale, oysters being taken from several localities of the United States and shipped by the different methods in ordinary practice. Chemical and bacteriological examinations were made of the oysters before and after shipping. Extended investigations have also been made of the pollution of oyster beds from sewage.

The effect of cold storage on various food products has been subjected to extended study.

Constructive Scientific Food Work

It has been found that by far the larger number of food manufacturers and dealers desire to comply fully with the law and to handle only pure and standard products. Many of them, however, owing to lack of technical knowledge or suitable equipment or adverse local conditions, have experienced difficulty in reaching the high standard necessary to fully meet the requirements of the law. The pure-food board has undertaken, in a number of lines where the difficulties seemed greatest, to work out methods by which the product could be properly controlled and to demonstrate to the

manufacturers how they can put on the market goods that are of the required standard. Trained experts have gone into the factories and studied the problems involved in the manufacture, the packing, the shipping, and the marketing of the products. The industries in which this work has been done have co-operated to the fullest extent with the bureau and have eagerly adopted improved methods that have been pointed out to them.

Constructive work naturally follows the police work under the law. It has been possible only to make a good beginning with our limited appropriation.

Along this line an investigation of methods for preparing and shipping poultry and eggs in order to prevent deterioration is in progress. The industries concerned are offering the most hearty co-operation. The co-operators include not only associations of poultry dressers and merchants, but also railways, refrigerator transportation companies, and cold-storage warehousemen.

Another important work is being conducted in co-operation with the canning industry. A study has been made of the material to use in the manufacture of the can, and the degree of temperature and length of time that should be given in processing. An experimental factory has been erected and valuable data have been secured.

Experts have been sent to factories to show how different food products could be put up and kept indefinitely without the use of any chemical preservatives.

Results of the Food and Drugs Act

There has been a marked improvement in the food and drug supply of the Nation as a result of the enactment and enforcement of the pure food and drugs law that has been of great benefit to the industries involved, as well as to the consuming public. No longer do the honest manufacturer and dealer have to compete on uneven terms with the misbranded and cheapened product of the dishonest competitor. The law prevents misbranding on the one hand and adulteration on the other. The product of low grade must be sold for what it is, and can not pass under the colors of a higher grade to the deception of the buyer and unfairness to the competitor.

As an illustration of the benefits derived from proper branding may be mentioned the use of medicines that contain cocaine, morphin, alcohol, and other habit-forming drugs.

The better element in all the industries affected have co-operated with the department in bringing about a strict enforcement of the law, and the bureau is now making preparations to still further aid the industry in solving the technical problems involved in the improvement of the products.

[SOURCE: Report of the Secretary of Agriculture, 1916.]

Instead of attempting to deal with food products indiscriminately, the Bureau of Chemistry during the past three years has given special attention to articles in common use, such as eggs, milk, beans, shellfish, citrus fruits, tomato products, canned foods, and cottonseed meal and other feed for animals. As a result there has been a marked improvement in the quality of these products entering interstate commerce.

During the past three years the bureau has collected and analyzed at least 22,000 samples of domestic foods and drugs. It has afforded formal hearings to more than 9,000 manufacturers and shippers, and has sent to the Department of Justice, through the solicitor, about 2,250 cases. Approximately 3,000 cases have been finally disposed of by the courts, the great majority having been uncontested and practically all those contested having been decided in favor of the government.

Experience in connection with the administration of the Food and Drugs Act has strikingly emphasized the importance of enforceable standards for foods and drugs. Without them it is impossible to carry out completely the purposes of the act.

The adoption of legally enforceable standards will benefit both the consumer and the honest manufacturer. They will give consumers exact information as to the quality of food and drug products and will enable manufacturers to produce articles which will meet the requirements of the act, putting competition on a fairer basis. They will be of great assistance to Federal and State officials in the enforcement of food and drug laws and will tend to promote uniformity among the various States.

[SOURCE: Report of the Secretary of Agriculture, 1912, pp. 221 and 222.]

Nutrition Investigations

Sixteen years ago the nutrition investigations of the Department had just begun the period of development which since that time has been continuous. The purpose is to study the use as food of products of farm, ranch, and garden, and to bring the results

obtained to the attention of housekeepers, and thus help them in making the best, most rational, and most economical use of available resources.

Digestibility

The relative digestibility of bread made from different sorts of flour has been studied exhaustively, the conclusion reached being that coarse flours are somewhat less thoroughly assimilated than fine grades, but as a whole all are well digested and are very valuable foods. Similar studies have been made of the relative digestibility and nutritive value of meat of different kinds and cuts. Whatever the cut, mutton, beef, and other meats were found to be very thoroughly assimilated and valuable sources of protein and energy. Cheese has been studied exhaustively, and, judged by its thoroughness of digestion and other nutritive qualities, it is to be regarded as a staple food suitable for use in quantity rather than as an article for occasional use. Studies of the digestibility and nutritive value of cereal breakfast foods and other cereal foods, of nuts, and vegetables have also been carried on.

Cooking Processes

Much time has been given to the effects of various cooking processes on nutritive value and digestibility and to the relative value of different methods of preparing food when judged by quality, palatability, and the labor involved. The results show clearly that laboratory methods can be as profitably used in the solution of such questions as in milling, paper making, dyeing. . . .

Dietary Studies

Dietary studies have been carried on in homes and in public institutions, which have furnished data of great value regarding the living conditions of the American people and have helped in the formulation of dietary standards. The studies have also furnished information of use in the selection and preparation of foods as well as in providing quantities sufficient for adequate nourishment without undue waste.

Studies planned, or already in progress, have to do with the food value of mutton, the relative nutritive value and culinary qualities of different animal and vegetable fats, the use of dried fruits in the diet, the relative ease of digestion of different foods, and other similar work. In carrying out these projects the respiration calorimeter will be used.

[SOURCE: Annual Reports of Department of Agriculture, 1915, pp. 17-18.]

Home Economics Investigations

The work of the year in this division of the office was broader in scope than heretofore, since it included studies of clothing, household equipment, and household labor, as well as food and nutrition.

As a result of studies of spots and stains and their removal from clothing and household textiles, methods were found which will greatly aid the housekeeper. Similar studies regarding the cleaning and care of other household equipment are in progress. The studies of household labor undertaken with the respiration calorimeter proved in general that the choice of equipment is an important matter, making it clear that poor equipment means a loss of labor and furnishing data to show how great the loss is. Of the types of labor so far studied (dishwashing and sewing), the former makes decidedly greater demands on the worker's strength than the latter.

2. THE WEATHER BUREAU

[SOURCE: *The Weather Bureau*, Prepared by Henry E. Williams, Meteorologist, U. S. Department of Agriculture, 1915, pp. 9-19, 33-57.]

Reports on climatic conditions were demanded for the farmer, and observations and warnings for the public and for railroad and water carriers. Hence, it soon became necessary to enlarge the scope of the service so as to include agriculture and commerce as well as navigation and to extend the sphere of the meteorologist to cover the study not only of the dynamics and motions of the atmosphere, but of climatology (the prevailing temperature and rainfall), together with their effects upon human life.

Observations and Forecasts

To the general public the Weather Bureau is probably best known through the medium of its daily forecasts and weather maps.

A careful comparison of the forecasts with the weather for the periods covered shows an approximate verification of 90 per cent.

Weather services similar to that of the United States are maintained by the Canadian and Mexican Governments, and by a system of interchange daily reports are received. Daily observations are also received from the Azores, Iceland,* the Faeroe Islands,* Great Britain,* Germany,* France,* Portugal, European and Asiatic Russia,*

* Suspended during the European War.

China, Japan, the Philippines, Hawaii, and Alaska so that the field represented by the daily reports extends over practically the entire Northern Hemisphere.

*Collection and Distribution of Weather information by
Radio Service*

The recent development in the art of radio-telegraphy has made possible the transmission of meteorological observations made by ships at sea to shore stations, thence by land lines to a central meteorological service.

The Weather Bureau has organized a system of meteorological observations on vessels navigating the coastal waters of the Middle and South Atlantic States, the Gulf of Mexico, and the Caribbean Sea, the primary object being to gain information of subtropical storms. Observations are made on upward of 50 vessels and transmitted by radio service to shore stations, thence to the central office of the Weather Bureau, where they are charted on the twice-daily synoptic charts and used in making forecasts and warnings. A similar service is also maintained on the Pacific coast. Distribution of weather information, forecasts, and warnings, is made daily through the co-operation of the radio service of the United States Navy.

Mountain Snowfall Measurements

Several hundred stations are maintained in the elevated regions of Washington, Oregon, California, Idaho, Utah, Montana, Wyoming, Colorado, South Dakota, New Mexico, and Arizona for the purpose of obtaining precise measurements of the depth and water content of the snow which falls in the elevated portions of those States. Such measurements are useful in determining approximately the amount of water available for irrigating purposes on the adjacent lowlands.

Climatological Service

Although the 200 regular observing stations, each representing about 15,000 square miles, furnish sufficient data upon which to base the various forecasts, observations at many intermediate points are necessary. This need has given rise to the establishment of the Climatological Service, which is divided into 44 local sections, each section, as a rule, covering a single State, and having for its center a regular observing station. These centers each month collect tem-

perature and precipitation observations from more than 4,500 cooperative and other stations, and publish each a monthly and an annual summary. During the crop-growing season (April to September, inclusive), each section center also receives weekly reports of weather and crop conditions from numerous correspondents. During the same season the central office at Washington issues a National Weather and Crop Bulletin containing a general summary of weather and crop conditions as well as individual summaries for the various States. It also contains a series of charts and diagrams showing graphically the actual and normal conditions of precipitation and temperature for the current week and for the preceding weeks of the season in the principal crop-growing areas.

Forecasts and Warnings

The extent to which the work of the Weather Bureau, in the collection and publication of data and the issue of weather forecasts and warnings, affects the daily life of the people and becomes a factor in their various vocations and business enterprises, already very great, is increasing yearly.

Of the warnings those of storms and hurricanes are the most valuable. Storm warnings are displayed at more than 300 points along the Atlantic, Pacific, and Gulf coasts and the shores of the Great Lakes, including every port and harbor of any considerable importance; and so nearly perfect has this service become that scarcely a storm of marked danger to maritime interests has occurred for years for which ample warnings have not been issued from 12 to 24 hours in advance. The reports from the West Indies are especially valuable, as they enable the bureau to forecast with great accuracy the approach of those destructive hurricanes which, from July to October, are liable to sweep the Gulf and Atlantic coasts. The sailings of the immense number of vessels engaged in our ocean and lake traffic are largely determined by these warnings, and those displayed for a single hurricane are known to have detained in port on our Atlantic coast vessels valued with their cargoes at over \$30,000,000.

The warnings of those sudden and destructive temperature changes known as cold waves are probably next in importance. These warnings, issued from 24 to 36 hours in advance, are disseminated throughout the threatened regions by means of flags displayed at regular Weather Bureau and subdisplay stations, by telegraph, telephone, and mail service to all places receiving the

daily forecasts, and to a large number of special addresses. The warnings issued for a single cold wave of exceptional severity and extent resulted in saving over \$3,500,000 through the protection of property from injury or destruction.

The warnings of frosts and freezing weather are also of immense value, particularly to the fruit, sugar, tobacco, cranberry, and market gardening interests. The early truck raising industry, so extensively carried on in the regions bordering on the Gulf and south Atlantic coasts and in Florida, and which has increased so greatly in recent years, is largely dependent for its success on the co-operation of the Weather Bureau in this particular, and the growers of oranges and other fruits in Florida and California have received great benefit. The value of the orange bloom, vegetables, and strawberries protected and saved on a single night in a limited district in Florida, through the instrumentality of warnings of freezing weather sent out by the bureau, was reported at over \$100,000.

In the citrus fruit district of California it is reported that fruit to the value of \$14,000,000 was saved by taking advantage of warnings issued by the bureau during one cold wave.

The deciduous fruit districts of Washington, Oregon, Idaho, Utah, Colorado, and throughout the East, rely upon the warnings of the bureau to guide them in smudging and heating their orchards for the prevention of frost in time of danger.

River and Flood Service

Human life and large property interests along the rivers of the United States are safeguarded by flood warnings.

The river and flood service is organized with its principal headquarters at Washington, D. C., and subsidiary district centers at advantageous points on the respective rivers along which a service is maintained. About 60 district centers are maintained outside of Washington, D. C.

Measurements of precipitation on the headwaters of the stream and observations of the height of water on the gauge at upstream points are collected by telegraph or telephone, and serve as the basis for warnings of floods in the lower reaches of the stream. A second useful purpose is served on navigable streams, viz., that of giving notice of boating stages during the low-water season.

Special Benefits Derived From Reports and Warnings

While the value of the bureau's reports and warnings to many interests is so obvious as scarcely to need more than the brief mention already given, there are numerous special applications of the information to individual pursuits and industries that might not have been suspected.

Many crops, such as beans and grapes, are saved by being picked in advance of the freeze, while tobacco and unmaturing corn are cut at once upon advance notice. The raisin crop while drying is extremely susceptible to injury from rain, and the warnings enable the producers to protect the fruit by stacking and covering the trays. The accuracy of the rain forecasts for this region and the system for their distribution have been so complete that practically no loss from this cause has occurred for years.

The rain forecasts are used by contractors in their roofing work. Photographic firms working on a large scale find them helpful in planning for panoramic views. Warnings of heavy snows are very valuable to railroads by enabling them to organize their snow-fighting equipment and to reduce the tonnage of their freight and passenger trains. They are also necessary on the great western ranches and plains, where the stock is hurried from the ranges to shelter. At lake ports vessels load hurriedly if they can get off two to five hours in advance of offshore winds; if snow is also expected, a start of seven to eighteen hours is necessary.

Along the river streets of many cities the basements of warehouses are submerged at high water; accurate river forecasts enable the business men to postpone moving their goods to the upper floor until the last moment, and often prevent the needless expense of such a transfer.

Dock building, pile driving, dredging, and repairing are largely done during low-water stages, previous notice of which enables engineers to arrange for such operations.

Among the miscellaneous uses of the various classes of forecasts are their application to the manufacture of certain articles where slight changes in temperature, moisture, and other weather elements have been found to affect the quality of the product. This is true of certain stages in the manufacture of bluing, varnish, oils, cement, lime, bricks, paper, photographic supplies, chocolate candies, and some acids. They also serve usefully the plans of public amusement companies, excursion enterprises, awning companies, and those engaged in outdoor painting.

Data regarding rainfall and snowfall are extremely useful in planning irrigation enterprises and selecting reservoir sites, and are studied in connection with the construction of waterworks, bridges, culverts, and sewers. River data are utilized by filtration plants in guiding their methods of chemically purifying the water used for drinking purposes, as the conditions of the raw-water supply as regards bacteria content and turbidity are greatly affected by the height of the river and the amount of rainfall. They are also necessary in studies of stream flow, dredging operations, the location of wharves, the construction of dams, and in practically every phase of bridge building, levee work, and general river improvement. Weather maps are used by business men generally, by aero clubs in studies for flights, and by school teachers in class instruction.

3. AGRICULTURAL EXTENSION

[SOURCE: Semi-Official Statement in Democratic Text-Book, 1916.]

The Cooperative-Agricultural Extension Act, which became a law May 8, 1914, is one of the most significant educational measures ever adopted by any government. It recognizes a new class of pupils, a class composed of men and women, working at their daily tasks on the farm. The Government takes the adult farmer and farm woman, as well as the farm boy and girl, as its pupils. It provides for the expenditure of over \$8,000,000 annually, partly by the States. It incorporates the most efficient method of conveying information to the farmer and, through the healthful process of co-operation between the State and the Nation, places the brains of these two agencies at his disposal, insures efficiency, and eliminates waste and friction. The value of scientific investigation and research is fully recognized, but the great task confronting us now for the betterment of agriculture is to bring to the average farmer what the experts and the best farmers know and to induce him to apply it. If this could be done completely, it would revolutionize agriculture, and to bring this information to the individual farmer is the object of the Smith-Lever Act. It aims to reach the farmer by personal contact and, above all, to bring assistance to the farm woman, who has been too long neglected as a factor in the agricultural life of the Nation.

*\$41,000,000 for Demonstrations in Agriculture and
Home Economics*

The Act makes available to the States for the nine fiscal years after its passage the aggregate sum of \$23,120,000 of Federal funds

to be expended for instruction and practical demonstrations in agriculture and home economics. The States from their own resources must appropriate for like purposes a total of \$18,800,000, making a grand total of \$41,920,000 to be expended up to the end of the fiscal year 1923. Thereafter, the Federal Government is to continue to appropriate \$4,580,000 annually and the States must appropriate \$4,100,000 annually, making a total expenditure for this new form of agricultural promotion of \$8,680,000.

These sums by no means represent the full appropriation of the Federal Government to the county-agents' demonstration work. In addition, Congress has appropriated directly to the Department of Agriculture for this purpose over \$1,000,000 a year. This sum does not include \$20,000 for aiding farmers' institutes and agricultural schools and over \$20,000 to be used by the Department in home economic investigations.

Purposes of the Act

The purposes to which Federal funds are to be applied are defined by the Act as follows:

That co-operative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agricultural and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications, and otherwise; and this work shall be carried on in such manner as may be mutually agreed upon by the Secretary of Agriculture and the State agricultural college or colleges receiving the benefits of this Act.

None of this money may be applied to the purchase, erection, and repair of any building, or the purchase and rental of land, or any college course teaching or lectures in colleges, promoting agricultural trains, etc. Not more than 5 per cent of each annual appropriation may be used in printing or the distribution of publications; so that at least 95 per cent must be expended in direct extension activities.

[SOURCE: Report of the Secretary of Agriculture, 1916, pp. 41-46.]

The general lines of the extension system for the whole country have been well marked out. They embrace (1) the county agricultural agents, (2) the boys' and girls' clubs, (3) the movable schools, and (4) the supporting work of the college and department specialists.

The county agent.—The experience of the last 12 years has demonstrated fully the value of the county agent as a means of bringing to the people on their farms and in their homes the results of practical experience and scientific research. There is general agreement that nothing is more important than the establishment in each county of permanent headquarters, in charge of a competent agent, who shall serve as the joint representative of the local community, the agricultural college, and the department. Through this arrangement the needs of the several communities can best be determined and the help of the State and the Nation most speedily and effectively rendered. A large part of the extension funds derived from all sources, Federal, State, and local, have been devoted to the maintenance and development of the county-agent system. There are now more than 1,000 counties which have men as agents, of whom 680 are in 15 Southern States, where there are also 355 women employed. On the whole, these agents have been very successful in securing the support and confidence of the people; and the tangible results of their work are encouraging. The personality of an agent is a large factor in determining his success. Understanding of the real problems of the region, sympathy with the people, ability to meet them on their own ground and to convey practical instruction in a convincing way, studious inclinations and habits, and business ability of a high order are essential.

County organizations.—As the agent can not deal altogether with individual farmers, the problem of the organization of groups of farm people through which he may work is assuming great importance. Two general types exist. County associations, often called farm bureaus, have been formed. These are expected to take the initiative in securing local financial support for the agent, to join in his selection and appointment, and to stand behind him in his efforts to advance agricultural interests.

Work of county agents.—The work of the county agents is highly varied. In the 15 Southern States during the year direct demonstrations were made on 105,000 farms and instruction was given to 60,000 boys and 50,000 girls. Approximately 500,000 visits were made. The demonstrations covered practically every phase of southern agriculture. Nearly 3,000 silos were built under the direct instruction of the agents and 13,000 pure-bred animals were purchased for breeding purposes. Under the direction of specialists, the agents assisted in hog-cholera control by organizing farmers and instructing them as to the administration of serum. In demonstrating the method, they inoculated 118,000 hogs. They also as-

sisted in organizing communities for the prevention of other animal diseases and vaccinated 26,000 head of stock to show how such maladies as blackleg and anthrax might be combated. They aided department employees in tick eradication and were instrumental in securing the construction of 2,000 dipping vats. Many creameries and cream routes were established, and instruction was given in the feeding of dairy cattle and the marketing of milk.

More than 75,000 hillsides were terraced to prevent erosion. On thousands of farms the stumps were removed to permit better cultivation. Approximately 65,000 acres were drained. Nearly 3,000 demonstration home gardens were planted, and farmers were induced to purchase 132,000 improved implements. About 500 communities were organized and engaged co-operatively in some special work, such as breeding of live stock, purchasing and selling, handling of seed, and marketing of crops, and the improvement of farm practices. Many of these not only handled financial matters, but also interested themselves in the social, educational, and rural betterment of the neighborhood.

The women county agents inaugurated work for women. Home conveniences, eradication of flies and mosquitoes, proper preparation of food, care of poultry, and marketing of eggs received attention. Approximately 50,000 homes were visited and given helpful suggestions, while 6,000 farm women made special demonstrations in home improvement.

In the Northern and Western States, where the work is comparatively new, the number of agents increased during the year from 219 to 350. These agents were instrumental in forming 875 local organizations, including farmers' clubs and associations for improvement of crop production, breeding of live stock, cow testing, and purchasing and marketing. They conducted 35,000 demonstrations with crops and live stock. They visited 76,000 farms, addressed meetings attended by 1,200,000 people, and assisted in developing agricultural instruction in 4,600 schools. About 72,000 farmers and their families attended short courses or movable schools. On the advice of agents 600,000 acres of tested corn, 280,000 acres of oats, 17,000 acres of potatoes, and 85,000 acres of alfalfa were planted. Approximately 2,000 registered sires were secured for farmers; 300,000 hogs were vaccinated for cholera; 2,000 farmers were instructed in the mixing of fertilizers, and 11,500 conducted demonstrations in the use of lime; more than 2,000 were assisted in keeping farm accounts, and, through exchanges organized by the agents, 2,300 were supplied with labor.

Boys' and girls' clubs.—Another important activity developed by the department and the agricultural colleges prior to the passage of the extension act and continued under the new machinery is the boys' and girls' club work. In the Southern States this undertaking is associated with the county-agent system; in the other States it is conducted independently. Through it the extension agencies are brought into close touch with the State and local school officers and teachers, who co-operate in the formation and management of the clubs.

In the Southern States 110,000 boys and girls were enrolled during the year. Among their activities the following are of special interest: Of the 60,000 boys, many were interested in growing winter legumes for soil improvement. Four-crop clubs were formed in some of the States, with rotation on three acres of ground, to show the financial advantage of improving soil fertility. Many of the boys were organized into clubs to raise pigs and poultry. Fifty thousand girls were enrolled in the canning clubs. They were taught to make home gardens and to preserve for home use the garden products as well as the waste fruits and vegetables of the entire farm.

In the Northern and Western States the enrollment of boys and girls was more than 150,000. The leading club projects were the growing of corn and potatoes and garden and canning work. Through these clubs, work in crop rotation, soil building, and the proper distribution of labor and enterprises throughout the year was undertaken by the boys and girls. Many members are working out three and four-year rotations of crops and are spending their net profits in the purchase of pure-bred stock, hogs, poultry, sheep, and labor-saving machinery for both farm and kitchen. Numbers of them are buying land, thus early acquiring the habit of thrift and the sense of the dignity of land ownership. At 938 public demonstrations in the home canning of fruits and vegetables 118,000 persons were in attendance, including more than 50,000 women and 10,000 men. Of the 1,557 club members who attended the mid-winter short courses at the colleges of agriculture, 968 had their expenses paid by the local people, institutions, or organizations as a recognition of their achievements.

[SOURCE: Report of Director of States Relations Service, 1915, pp. 26-29.]

Work in Relation to Farm Business

One of the most important projects undertaken by the county agents during the past year was that relating to farm-management

demonstrations or assistance given to the farmer in determining the factors that make for success or failure in his farm enterprises. This project was developed in co-operation with the State farm management demonstration work. Four thousand four hundred and seventy-five farm analysis records were taken by county agents. Four thousand six hundred and nineteen farmers were induced to keep farm accounts, either partial or complete. Another important phase of the work was the promotion of the organization of local farmers' exchanges to facilitate the interchange of products between farmers. The total value of business done through these exchanges amounted to \$341,110. In addition to this the exchanges performed a valuable service in the renting of farms, securing of labor, etc. One hundred and ninety-three farms were rented through these exchanges and 2,935 farmers supplied with farm labor. In many counties the problem of marketing farm products is a most acute one. The agents encouraged and gave assistance in the organization of co-operative marketing and purchasing associations. One hundred and sixty-four such associations were organized by agents during the past year. These organizations did a business of the amount of \$3,575,373, effecting an approximate saving of \$377,975. The most important marketing associations have been in connection with the shipping of live stock. Two such associations, one in Michigan and one in Minnesota, each marketed through its associations in excess of \$500,000 worth of live stock.

Farm Management Demonstrations

This work, initiated in 1914 for the purpose of teaching the farmer better organization, administration, and business methods, continued under the leadership of L. H. Goddard and has grown steadily in favor with farmers, county agents, and extension directors. The work emphasizes the need in each community of—

(1) A farm business large enough to make possible a fair labor income.

(2) Crop yields as good or better than the average of the community.

(3) Stock which gives returns equal or better than the average of the community.

(4) A farm so organized that it will permit of the maximum use during the year of the work, stock, equipment, and labor on the farm.

These matters are brought home to the farmers through the

analyses of the business of groups of farms of about 70 in each group, in which each farmer is shown how to analyze his business with reference to the important factors affecting his labor income and then given opportunity to compare each of these factors on his own farm with the same factors on other like farms in the community as well as with the averages of all farms in the community.

Farm management demonstration work was taken up by five States in co-operation with the Federal Government in September, 1914, the training of men for the duties of State farm management demonstrator beginning the preceding July. At the close of the fiscal year ending June 30, 1916, work was under way in 26 of the 33 Northern and Western States. In 181 areas, 17,985 farm records had been taken, 1,104 meetings held, and 11,481 records returned to the farmers for their consideration. Two thousand and ninety-three farmers are avowedly arranging for readjustments in their farm business as a result of this work and many others will doubtless make such changes. Six thousand two hundred and forty-seven farmers are studying their business more carefully through daily records of receipts and expenses and 3,401 of them have been reached in follow-up work.

4. STATE EXPERIMENT STATIONS

[SOURCE: Annual Report of the Office of Experiment Stations, U. S. Department of Agriculture, 1912, pp. 43, 46, 47, 235, 236.]

The beginning of a national system of agricultural experiment stations in the United States dates from 1887, when a bill introduced by Hon. William H. Hatch, of Missouri, was passed by Congress and became effective. The year 1912, therefore, marked the completion of a quarter century of operation under this act. The anniversary was celebrated, in connection with the fiftieth anniversary of the establishment of agricultural colleges and of the Federal Department of Agriculture, at the annual convention of the Association of American Agricultural Colleges and Experiment Stations at Atlanta in November, 1912.

The [past] year was one of marked prosperity and progress at the experiment stations. There was a notable improvement in the general character of the work conducted and in the organization of the departments and adjustment of duties so as to permit larger freedom for uninterrupted investigation by the men who are primarily station employees.

There were many improvements in facilities for the station work in the shape of specially designed buildings, laboratory equip-

ment, and apparatus. As examples may be mentioned special facilities for slaughtering animals and the handling of the carcasses preparatory to analysis in the new building for agricultural chemistry at the Missouri university and station, improved facilities for the milling of grains and the testing of flour in the new agricultural building in Kansas, and the construction of an extensive and elaborate outdoor laboratory at the Colorado college and station for the study of problems in hydraulics as related to irrigation. Such facilities have grown out of the experience and the necessities of the station work, and in many cases are an important original contribution to the methods of investigation.

A considerable number of the stations are simplifying the mailing of their bulletins and classifying their mailing lists to avoid waste in distributing their publications. The mailing lists have quite generally been put on stencils, where they are large, and mailing machines are employed to economize labor. Where the mailing lists are classified, the subjects in which the individuals are interested are ascertained by correspondence—whether horticulture, or animal feeding, or dairying, or forestry, etc., and such persons are not sent bulletins in lines in which they have no interest. Such a classification by subjects has been recommended by the committee on station organization and policy of the Association of American Agricultural Colleges and Experiment Stations.

Greater provision has recently been made for the stations to conduct work in different regions of the States, away from the headquarters, wherever the problem may lead. The general principle followed in such cases is that the station must have absolute control of the land and crops, and to this end the land is leased or purchased. The location of branch stations on a geographical basis is very generally condemned, as not being necessary and rarely meeting the special requirements of the station. The station should follow the problem where it leads, and locate its branch station at a point which will be most advantageous for its study. The attempt to make these branch or substations anything more than special stations for the study of particular problems which led to their establishment is generally discouraged. Duplication of equipment and the incurring of heavy maintenance charges are to be avoided as far as possible; and the substations, whether temporary or permanent, should be field laboratories or extensions of the facilities of the central station. The work done there should be planned by the experts at the central station and thoroughly directed and controlled by them.

The quarter century which has passed has been a remarkable period of development. More progress has been made in an intelligent understanding of the great industry of agriculture and in the improvement of its methods than in the centuries that have gone before. Out of the passage of the Hatch Act has grown the most comprehensive and efficient system of experiment stations to be found in any country—one which has been close to the problems of the people, has revolutionized practice in many important respects and provided notable improvements in others, and has laid a broad foundation for a science of agriculture.

In a few short years there has been a remarkable change in the popular attitude toward scientific investigation. Instead of being something for the pursuit and understanding of the few it is seen to be intensely human, and science in the service of mankind has become a watchword of progress. Some of its most striking and widely heralded illustrations have come through agriculture, and have probably done more than investigations in any other field to popularize science.

Nowhere has the change been more striking than in the Western States. To the pioneer farmer the new experiment station was an object of scant interest, if not of ridicule and contempt. With the primitive and crude methods there followed, it was difficult to see that such an institution was needed or could be of any service to the ranchers or stockmen. But the pioneer conditions soon changed with the settling of the country, the following of more intensive methods, the necessity for economizing the water supplies, and the introduction and culture of crops not native to the section. With his characteristic enthusiasm and progressiveness the western farmer has quickly learned to use his experiment station and has been ready to embrace its teachings, because, fortunately, he was not bound down by tradition and had an open and receptive mind. To-day the new settler looks to the experiment station for guidance, for he soon learns that his experience in other sections is not a safe guide, and the old settler drives a hundred miles across the plains to the experiment station to learn the cause of his failure to make alfalfa grow, or leaves his home for a week's short course. The transformation has indeed been a great one.

No one familiar with the conditions will doubt that the establishment of a national system of experiment stations has proved one of the most important and far-reaching steps which this country has ever taken for the advancement of an industry. The breadth of agriculture as we now understand it, and its manifold relations to

commerce and industry and to the affairs of man, magnifies the significance of this step.

[SOURCE: Yearbook of the Department of Agriculture, Report of the Secretary, 1912, pp. 212-213.]

The total income of the stations maintained under the acts of 1887 and 1906 during 1912 was \$4,068,240.09, of which \$1,440,000 (Hatch fund, \$720,000; Adams fund, \$720,000) was received from the National government, the remainder \$2,628,240.09 coming from the following sources: State governments, individuals and communities, fees for analyses of fertilizers, sales of farm products, miscellaneous.

In 1897 the stations employed 628 persons in the work of administration and research, while in 1911, the last year for which statistics are available, the stations employed 1,567 persons in their administrative, research, and other lines of work. Likewise in 1897 the stations had a total income of \$1,129,833, of which \$720,000 represented the Hatch Act, while in 1911 their total income was \$3,662,425, of which \$1,440,000 was received from the United States under the Hatch and Adams Acts. In other words, the employees and income of the stations more than doubled during the period named.

The Adams Act, passed in 1906, doubled the Federal appropriations to the State experiment stations and greatly increased the duties of the office in relation to the use of these funds for research work. The legality of the expenditures is so largely dependent upon the character of the investigation that the supervision of the funds becomes in a large measure a supervision of the investigations and experiments as far as their character, original features, and continuity are concerned. The Adams fund projects of the experiment station represent a vast amount of original investigation, and there probably has never been an attempt to supervise research work conducted on such an extensive scale.

[SOURCE: Report of Office of Experiment Stations, U. S. Department of Agriculture, 1912, pp. 283-284.]

The act creating the office of specialist in agricultural education in the Office of Experiment Stations prescribes quite definitely the duties to be undertaken as well as the amount of money that shall be available. It is made the duty to "investigate and report upon the organization and progress of agricultural schools in the several States and Territories, and upon similar organizations in foreign countries, with special suggestions of plans and methods

for making such organizations more effective for the dissemination of the results of the work of the Department of Agriculture and the experiment stations, and of improved methods of agricultural practice."

In carrying out these provisions the agricultural education service has maintained advisory relations with all phases of the movement for education in agriculture.

The editorial work of the department of agricultural education in the Experiment Station Record involved the reviewing of 2,300 foreign publications and about 1,500 American publications. The regular publications relating to the statistics and organization of the agricultural colleges and experiment stations, lists of educational publications and institutions, and the annual review of progress in agricultural education were issued.

[SOURCE: Report of Director of States Relations Service, 1916, p. 9.]

In accordance with the general plan in operation for several years, Volumes XXXIII and XXXIV of Experiment Station Record, each consisting of nine numbers and the usual author and subject indexes, were prepared during the year. These volumes contained about 7,400 abstracts of the world's scientific literature pertaining to agriculture, together with monthly editorials discussing important phases of the development of agricultural investigation and science, and brief notes on the progress of institutions for agricultural education and research in this country and abroad.

5. MARKETING

[SOURCE: Semi-Official Statement in Democratic Party Textbook, 1916.]

Beginning with a modest sum, the appropriations for this Office, including those for enforcing new laws designed to promote better marketing, have increased to \$1,200,000. Quickly an effective organization was developed and has been engaged in making market surveys, studying methods and costs, transportation and storage problems, city marketing and distribution, the establishment and promulgation of market grades and standards, and co-operation in production, marketing, and finance. Since the problems of those engaged in producing and marketing perishables were especially urgent, plans were formulated to assist these producers through a market news service. Congress has made available for this undertaking the sum of \$137,000. Effective assistance has been given

to groups of producers in many areas. A similar service for live stock will be inaugurated during the year, an appropriation of \$65,000 having been made available for the purpose.

The United States Warehouse Act provides for licensed warehouses and licensed weighers and graders for cotton, corn, wool, tobacco, and flaxseed, stored for interstate or foreign shipment. It establishes a form of warehouse receipt which can be issued only by licensed, bonded warehouses, and so makes these receipts reliable proof of the condition, quality, quantity, and ownership of the products stored that they will be easily and widely negotiable as delivery orders or as collateral for loans. The act is permissive in character and no warehouseman is required to obtain a license. No one not so licensed, however, can use the prescribed form of receipt or set up a claim of being licensed or bonded under the act.

The benefits which will result from this act were thus described by the Secretary of Agriculture in his annual report for 1915:

“It would promote the better storing of farm products, increase the desirability of receipts as collateral for loans, and therefore would be of definite assistance in financing crops. It would also promote the standardizing of storage, of warehouse receipts, and of marketing processes.”

Without standards there is no incentive for the grower to improve the quality of his crops, while on the part of the consumer purchasing becomes a speculation rather than a matter of sound business.

The Secretary of Agriculture in his annual report for 1915 summed up the benefits to be expected from the enactment of this legislation [the Grain Standards Act] in the following words:

“Grades for grain, if generally adopted and uniformly applied throughout the country, will simplify the relations between producers, dealers, and consumers. Under these grades, fairly used, the grower or shipper of a superior quality of grain will be in a position to demand from the buyer the fair value to which the quality of his product entitles him. The beneficial influence upon agriculture of a uniform system of grading staple crop products will be very great through the financial incentive afforded the farmer to improve the quality of his product by careful selection of varieties, skilful culture, and adequate and effective methods of harvesting, handling, and protecting it while in his hands.”

[SOURCE: Report of the Secretary of Agriculture, Bureau of Markets, 1916, pp. 7-11.]

The work of the Office has developed very rapidly, and some notable results have been secured. Definite assistance has been rendered to the fruit interests of the States of Oregon, Washington, Idaho, and Montana. An organization composed of co-operative associations, corporations operating for the producers, and individual growers was formed during the past year. The purpose is to secure broader distribution through the establishment of uniform grades and marketing methods. Through it the fruit industry of the Northwestern States should be placed upon a more efficient business basis. It comprises 65 per cent of the northwestern fruit industry, representing an investment of \$150,000,000, and supporting approximately 20,000 growers. This is probably the most important single activity in forming co-operative organizations that has yet been undertaken by the department.

Well-tested systems of accounts and records for primary grain elevators, for live-stock shipping associations, and for co-operative stores have been issued. Systems for country creameries and cotton warehouses have been devised and are being tested under commercial conditions. Systems perfected by the department for farmers' co-operative elevators and for fruit and produce associations already are in extensive use. A plan for adapting farmers' grain-elevator companies to the patronage dividend basis has been worked out and published.

The issuance of monthly cold-storage reports on apples has been continued, and the work has been extended to include butter, eggs, and cheese. These reports show the cold-storage holdings throughout the country, and include a comparison of the holdings of the current year with those of the previous year. In co-operation with carriers, extensive investigations of the economic waste of foodstuffs in transit have been conducted. The object of these investigations is to secure better co-operation between shippers and carriers and greater efficiency in methods of handling, with a view to eliminate, or at least greatly to reduce, the present waste.

A systematic survey of centralized live-stock markets, begun during 1915, has been extended to cover practically all the large stockyard centers. Arrangements have been made with 58 stockyard companies to secure monthly reports of live-stock receipts and shipments. A uniform system of market records has been adopted, at the instance of the department, by a number of the yards. Twenty-six companies are reporting stocker and feeder shipments

separately, in accordance with a form prepared by the Office of Markets and Rural Organization.

An investigation of the organization and conduct of co-operative live-stock shipping associations, begun during 1915, has been completed and the results published. The directory of these associations now includes 485 organizations, aside from 440 other agricultural associations which ship live stock as a branch of their business. The farmers' co-operative packing-house movement was studied and a press bulletin on the subject was issued.

Methods and costs of marketing live stock and meats in the United States were investigated. Extensive schedules were sent to 10,500 correspondents of the Bureau of Crop Estimates. A summary and discussion of the returns, together with data on economic factors affecting the cost of marketing and distribution, has been published. A preliminary investigation of the sources, accuracy, and use of market reports on live stock and meats has been made. The results of this study also have been published and have been utilized in the development of plans for the organization of a demonstration market news service for live stock similar to that now conducted for perishable crops. An appropriation of \$65,000 has been made available for the purpose. Other subjects which received attention are public abattoirs, transportation of live stock, organization and methods of the wholesale meat-packing industry, and local marketing of live stock and meats.

Surveys have been made of the marketing facilities for agricultural products in nine cities and advice has been given regarding the location, establishment, and management of municipal retail and wholesale public markets. Detailed studies also have been made of local conditions in other cities. The department now is prepared to furnish a model design for a public retail market, with the cost, fully equipped, estimated on the basis of square feet. Designs of model steel sheds for use on open farmers' markets also are available.

Investigations concerning methods of handling and grading perishable products and the practicability of the standardization of the products and their containers have progressed rapidly. Tentative grades for sweet potatoes of Arkansas and Bermuda onions of Texas have been worked out and adopted by the local growers' associations. Several standardization laws, Federal and State, have been enacted during the year. The most significant Federal legislation in this field is the United States Grain Standards Act. Congress also has established the two, four, and 12-quart sizes, with certain

dimensions, as standards for Climax baskets for grades and other fruits and vegetables, as well as the dry-measure one-half pint, pint, quart, or multiples of the quart as standards of capacity for baskets or other containers for small fruits, berries, and vegetables.

Preliminary plans have been formulated for the investigation of foreign markets for American farm products and for assistance in the development of the export trade under normal conditions. A representative of the department recently conducted investigations in Europe along this line. The work, in so far as possible, will be done in close co-operation with the Departments of State and Commerce.

The value to producers of fruits and vegetables of the experimental market news service inaugurated in 1915 resulted in insistent demands for the extension of the work. During the past year telegraphic reports have been received from 33 important metropolitan markets and from officials of all railroads serving producing territory. The information thus secured has been furnished to growers, shippers, and distributors through 35 temporary offices in producing territories and 11 permanent offices in large cities. Statements from growers and shippers of tomatoes, strawberries, peaches, cantaloupes, watermelons, onions, grapes, apples, and potatoes indicate that the actual monetary saving due to a wider knowledge of market conditions has exceeded the cost of the service many fold.

The education of producers in the proper marketing of farm products, the avoidance of unnecessary losses due to diversions in transit, and the encouragement given to growers who desire to reach new consuming centers are some of the benefits resulting from this attempt to develop for the farmer a reliable business basis.

6. THE PLANT INDUSTRY

[SOURCE: Report of the Secretary, 1912, Yearbook of the Department of Agriculture, pp. 117-140.]

New Crops and New Industries

Since 1898, when the plant-introduction work was inaugurated, the department has actively pursued this field of study. At the present time the department has six important field propagating stations, has brought in something over 34,000 plant varieties and species from every quarter of the globe, and has sent out the progeny from these introductions by the hundreds of thousands to experiment stations and private experimenters and plant breeders through-

out the entire United States and its tropical possessions. It has kept a historical record of all these introductions and distributions and accumulated a most extensive collection of data bearing on new economic plants.

This is the first systematic attempt by any government to supply its bona fide plant experimenters on an extensive scale with the material out of which new plant industries can be built.

The department has originated the profession of agricultural exploration and has sent out as agricultural explorers 25 trained men whose search has taken them through many of the cultivated regions of the world and has already been the means of bringing to the notice of the American farmer many of the farm customs and practices of the centuries-old farm civilizations of other countries. [Our italics.]

Aiding Rice Farmers

One of the earliest explorations undertaken in this field was for the purpose of aiding the rice growers of the Southern States. During the year 1898 and again in 1901 an explorer was sent to Japan, China, and India for the purpose of securing short-kernel types of rice better adapted to the conditions of southern Louisiana and Texas and more suited to the needs of the market, especially as regards milling qualities.

The great growth of the rice industry is a matter of history. Lands which 15 years ago were selling at the nominal price of two or three dollars per acre have come to have values of \$30 to \$50 an acre. The total output of rice in this time has increased from 96,886,400 pounds in 1896 to 637,055,556 pounds in 1911. Not all of this advance has been due to the department's introduction work, but the industry received an impetus at that time that has gone far toward making it what it represents to-day.

Grains and Other Crops for Semiarid Lands

About the time an interest in rice was being developed another explorer was sent to Russia for the purpose of securing help in the matter of grains adapted to our northwestern and semiarid regions. A large extent of territory in this section was yielding no valuable crop returns. As a result of this first exploration work in 1898, followed by a second trip in 1900, large quantities of drought-resistant durum wheat and other varieties of wheats, oats, and special cereals were brought in. The results of this work are found

in the rapid extension of the durum wheat throughout the north-west territory and the distribution and extension of the Swedish select oats throughout several of the Northwestern States.

The whole alfalfa question in the United States has been put on a new basis by the introduction of the Turkestan, Siberian, Arabian, and Peruvian alfalfas and the development of the hardy hybrid strains which grow in the Southwest throughout the winter. The introduced Swedish barleys have created a new situation in the barley-growing industry of Montana, Idaho, and California.

New Fruits and Other Crops Introduced

The seedless grapes of Italy and Greece have begun to have their effect on the table-grape and raisin industries of the Pacific coast. The Bohemian horse-radish has supplanted the old variety in New Jersey as a better yielder and a better flavored sort.

The dasheen, a root crop for the South, has proved its possibilities as a food producer and will probably rival the potato in the South for lands too moist for this staple crop.

The Chinese wood-oil tree, from the nuts of which the best varnish oil in the trade is produced, has fruited successfully in the Gulf States and promises a new crop for cheap lands which can be harvested during the slack-labor season.

The Guatemalan and Mexican avocados and selected seedlings of West Indian and Florida origin are creating a new fruit situation in California and Florida.

The Smyrna fig industry of the Pacific coast is now established, and the introduction by the department of the insect-carrying capri-fig has become a matter of history. Over 1,000 tons of this choice fig were produced last year.

The pistache nut of the Orient, together with its relatives from China and the Mediterranean region, have been introduced and proved valuable for Pacific coast conditions.

The introduced Chinese jujube has proved adapted to Texas and other portions of the Southwest, and a new dry-land fruit tree, comparable in a measure to the prune, has been added to our horticulture for semiarid regions.

The Chinese persimmon varieties have proved quite as well adapted to conditions in America as the Japanese varieties and are showing certain advantages over them. They have added a distinct new type of fruit to our fruit culture.

The cork-oak acorns, which were early introduced, have grown

into large trees and have demonstrated the possibility of growing American cork.

Explorations Under Way

During the past year an agricultural explorer was sent through the steppe regions of western Siberia, south of Omsk, to make a detailed study of the behavior of the yellow-flowered, hardy alfalfa on the cattle ranches there, and he made contracts with the peasants for all the possible seed for special experimental tests of this plant in the Northwest. He imported the Siberian bush cherry, which he believes will become important for the extreme northern tier of States, and the Siberian larch, which is the fastest-growing conifer of that region, together with several hundred dry-land grains, forage crops, and fruit-tree varieties.

As a result of a survey of the East Indian cattle-raising country, which the forage-crop expert of the department was sent to make, some promising Indian forage grasses were secured, which may prove valuable for the Southern States. An investigation of the Egyptian date region resulted in the introduction of new varieties of date palms for the experimental plantings in the Salton Basin.

A special effort has been made to secure plants from the dry and cold regions of central Asia, including the little-known Chinese Turkestan. This exploration work has been continued actively the past year. As a result of the establishment of a new plant station in North Dakota, at Mandan, it has been found necessary to look further for crops that may be brought in, established, and tested at the station, with a view to using them for breeding purposes and distribution throughout the entire Northwest to help the farmers of that region.

Numerous types of dry-land poplars and other trees suitable for wood, windbreaks, etc., have been located. Valuable shipping varieties of table grapes, hardy wild apples and apricots, and a number of wild forage legumes from the Siberian steppes have been located and are now being secured in quantities for distribution and testing in the years to come.

Special Work on Forage Crops

A great many valuable introductions have been made through correspondence and in ways other than through explorers. This is the case with forage crops for nearly all parts of the country. Sudan grass, a wild form of sorghum, although introduced only four years ago, is now greatly in demand in the southern portion

of the Great Plains region on account of its ability to produce an abundance of good forage under conditions of low rainfall.

In Florida and the immediate Gulf coast region a good hay grass has long been a desideratum. Rhodes grass, secured from Africa, promises practically to solve the hay question for that portion of the South.

Renewed interest has been awakened in the soy bean by the establishment in general use of new varieties secured from China and Japan. These varieties have proved far superior to those originally grown. Likewise, new and improved varieties of cowpeas have been introduced and developed, thereby extending materially the usefulness of this very important crop. The origination of improved varieties of timothy by selection and breeding has opened up great possibilities along the line of improving the most important grass-hay crop for the United States.

Much attention has been given to the extension of alfalfa, and our efforts have met with marked success. At the present time this valuable forage crop is becoming a staple in many sections of the Eastern States and promises to increase rapidly in importance during the next few years.

During the past year marked advance has been made in the work with the hardy and drought-resistant alfalfas introduced from Europe and Asia. The crossing of the yellow-flowered form with the common species has resulted in some very promising hybrids adapted to use both as hay and for grazing in the Great Plains region. The value of the new alfalfa for hybridizing can scarcely be overestimated.

The increasing difficulty of obtaining and maintaining profitable stands of red clover has long been a matter of serious concern in many parts of the clover belt. Investigations started last season are already indicating the solution of this problem. Efforts to develop methods of handling the clover-seed crop in order to make it more certain are meeting with success.

Rhodes grass and Sudan grass have this season even surpassed expectations. Extensive seedings of both of these grasses have been made, so that there is now abundant evidence of their value under field conditions.

Work with the sorghums and other drought-resistant forage crops has continued to give results of great importance to the dry land of the West.

Tobacco

A great deal of hay has been imported into these tobacco districts each year, while practical demonstrations have shown that the growing of grasses for hay is just what is most needed on these soils to obtain the best results with tobacco. Our experiments and demonstrations have shown beyond doubt that the yield and value of the tobacco crop in these sections can easily be doubled by combining well-planned systems of rotation with the use of the proper quantities and forms of commercial fertilizers. It has also been shown that the growing of winter cover crops is highly beneficial to tobacco.

Mapping of Fruit Districts

It was understood that certain kinds of fruit would succeed in one place and would not succeed in another. No very definite and specific information was at hand as to the factors governing successful fruit production in different parts of the United States.

Work along these lines has proceeded now for 10 years, with the result that some of the more important fruit regions of the Eastern States and the western central portion of the United States have been indicated. Last year this work was extended into Oklahoma, Kansas, Nebraska, northern Texas, and portions of New Mexico and Colorado.

Fruit Marketing, Transportation, and Storage

In a number of sections of the country the handling, transportation, and storage of fruits have been practically revolutionized. This is especially the case in southern California, where the conditions affecting the fruit industry, including the co-operative marketing organizations among the fruit growers, afford an unusually favorable opportunity to work out through experiments in orchards and packing houses the fundamental principle involved in fruit handling and storage.

The beneficial results of this work are already apparent in many fruit-growing sections of the country where, with some modification, the principles discovered in California have been applied in the commercial handling of fruits, including the orange and pomelo shipping in Florida and the peach, pear, grape, and berry shipping of both the Eastern and Pacific Coast States.

A special effort has been put forth in encouraging the production of grapes in the Southern States, especially those of the Mus-

cadine types. Nut culture has also received special attention in connection with the progress of the general fruit work. Studies have been made of the principal species of nut trees grown in the States east of the Rocky Mountains with a view to determining the adaptability of the varieties. Further studies have been made of the details of orchard operations with a view to advising and assisting those who are desirous of engaging in this industry.

Seed Distribution

It is gratifying to review the progress made in the securing and distribution of seeds by the department. By a combination of clear-cut business principles and scientific knowledge the work has developed smoothly along satisfactory lines. Within the last decade, ever since the work has been handled exclusively by the Bureau of Plant Industry, more than 7,000 tons of seed have been secured, tested in the laboratory and in the field, assembled, and distributed.

Early in the work it was determined to conduct it in such a way that all the seed secured and sent out should be of high quality. It was determined furthermore to eliminate costly practices of hand work and to introduce, wherever practicable, modern mechanical appliances for facilitating operations.

Notwithstanding the fact that the quantity of seeds secured and distributed has nearly doubled in the past 10 years, the actual cost of handling the distribution is now less than it was 10 years ago. The funds saved by good business management have gone toward improving the quality and quantity of the seed and have enabled the department to take up a number of special lines which have resulted in much good.

Special features of seed distribution have been maintained, such as securing and distributing types of cotton better adapted to certain conditions in the South. Many of these types have been developed through breeding and selection. The extensive propagation of new types of citrus fruits adapted to home use has also been followed. Large numbers of citranges developed by the plant breeders of the department have been propagated and sent out under congressional distribution. Large quantities of special forage-crop seeds have been distributed in all parts of the country.

There is just now being put into effect a plan for the distribution of special seeds adapted to dry-farming conditions. The future success of dry farming in the semiarid districts will depend in large measure on the adaptation of suitable crops for these districts. An appropriation was made for this purpose at the last session of Con-

gress, and special types of sorghums, wheats, oats, barleys, grasses, and legumes of various kinds will be distributed the coming year throughout the entire semiarid region.

In connection with the congressional vegetable and flower seeds there has been a steady improvement in the quality distributed, and that this has been appreciated is shown by the increased demand for them. That part of the congressional seed distribution covering vegetables and flowers for 1912-13 will require about 600 tons of material. These seeds will all be assembled, packeted, and distributed by the 1st of April, 1913. In round numbers, about 61,000,000 packets will be put up and mailed. In addition, there will be special sets of cotton seed and special sets of seed adapted to dry farming, as already indicated.

Grain Grading and Grain Standardization

During the year approximately 25,000 samples of grain have been tested and analyzed. Tests for acidity, which denotes soundness, were made of over 5,000 samples of corn. Stock-feeding tests are now being conducted in co-operation with the Bureau of Animal Industry, to determine whether or not corn of high acid content is detrimental to stock as food.

Definite progress has been made in determining the changes which take place in grain while in storage and in railroad and ocean transportation, special attention having been given to causes and degree of deterioration and actual shrinkage as influenced by moisture content, soundness, and climatic conditions. It has been determined that excessive moisture is the most dangerous factor in handling commercial grain and that the artificial drying of corn increases its keeping qualities. Milling and baking investigations and grain-dockage investigations have been prosecuted vigorously.

Development of the Beet-Sugar Industry

The beet-sugar industry has practically grown up during the period covered by this report. There are now in operation 66 factories in 17 States, which required and used for the past season 5,062,333 tons of beets from 473,877 acres. It is estimated that the output of sugar from these factories the present year will be close to 700,000 tons, the largest yield in the history of the industry in this country.

The production of American sugar-beet seed has been an aim of the department for years. It has been demonstrated that seed of

good quality can be produced here, American strains have been bred, and the commercial production of beet seed is now in sight. In connection with this work field laboratories have been established with analytical and other facilities and experiments with cultural methods have been carried on, particularly in the irrigated districts of the West.

Problems in Plant Pathology

The cause of the crown-gall of plants has been determined, and it has been discovered that this disease resembles animal cancer in its manner of growth, and is due to bacteria lodged inside certain of the proliferating cells.

It has been proved that infection of Stewart's bacterial disease of sweet corn is produced by means of seed corn; that the black rot of crucifers, the brown rot of potatoes, the wilt of cucurbits, and other bacterial diseases are distributed by insects and slugs; that tobacco wilt is spread by nematodes; that bacterial infection can take place through stomata in the absence of wounds, as in the case of the black spot of plum, a disease of sweet corn and broom corn, and other plant diseases; that acid canes are resistant to the bacterial disease of sugar cane; that many bacteria, including *Bacillus typhosus*, are readily destroyed by freezing; that the Granville tobacco wilt is identical with the bacterial brown rot of potato, egg-plant, and tomato, and hence these plants should not be used in rotation.

The cause and remedy of the olive tubercle disease, coconut bud rot, bacterial mulberry blight, and a new knot disease of citrus trees have been discovered.

It has been shown that the cause of a large part of potato rot is due to *Bacillus phytophthorus*, and that the rot is arrested in tubers stored below 8° C.

Diseases of Fruits

The effective control of pear blight, one of the most serious diseases affecting pomaceous fruits, has been accomplished through eradication methods and has resulted in the saving of millions of dollars to pear orchardists on the Pacific coast and in other parts of the country.

Apple bitter-rot, a disease which has been responsible for immense losses to apple growers, has been shown to be easily and completely controlled by proper spraying with Bordeaux mixture.

A number of other apple diseases, such as scab, leaf-spot, pow-

dery mildew, and blotch, have also been successfully controlled by spraying. Partial control of apple cedar-rust has been accomplished by cutting down the cedars and by spraying.

Diseases of Cotton, Truck Crops and Sugar Beets

The cause of a group of destructive wilt diseases of cotton, cow-pea, watermelon, tomato, and other plants in the Southern States has been found to be root and stem infecting fungi (*Fusarium* spp.) and a practicable method of control developed through selection and the breeding of disease-resistant varieties.

Advances have been made in our knowledge of the cause and control of a number of potato diseases, the most serious of which is potato wilt, causing premature ripening followed by dry-rot in storage. Methods of treatment for blackleg and early and late blight have also been determined, and the cause ascertained of leaf-roll, a destructive disease of potatoes in the West.

The asparagus-rust problem has been solved by breeding resistant varieties. Truck growers have been shown, by spraying demonstrations, how to control the destructive blights of cucumbers, cantaloupes, celery, and other crops, and how to manage their soils to escape malnutrition troubles and at the same time to produce more crops with less fertilizer. A general investigation has been made of dry-rot, stem-rot, and other diseases of sweet potatoes, and remedial measures have been recommended. Tobacco root-rot, tomato wilt and rot, a number of ginseng diseases, and the whole group of nematode diseases have been studied critically and control measures introduced.

Leaf-spot and curly-top, two important diseases of sugar beets, have been thoroughly investigated, and better methods for combating them have been pointed out. Similar work has been done in connection with the damping-off and root-rot of sugar beets.

Soil-Bacteriology and Plant-Nutrition Investigations

Satisfactory methods for isolating and distributing nitrogen-fixing bacteria for improving leguminous crops by inoculating the seed or the soil were discovered. Tests in co-operation with thousands of farmers throughout the United States have shown that such crops as clover, alfalfa, vetch, peas, and beans are often doubled or trebled in value by pure-culture inoculation. During the past five years the efficiency of the cultures distributed to farmers has been approximately 75 per cent.

The copper-sulphate method for destroying objectionable algæ

in city water supplies without lowering the safety of the supply has been discovered and practically demonstrated. This method has become standard practice in sanitary engineering and is recommended by the leading sanitary experts. It was found that copper sulphate could be used in water supplies as an agent for killing dangerous germs, such as those causing cholera and typhoid. Simple directions for improving farm water supplies have also been formulated.

Extensive bacteriological studies to explain the variation in soil fertility have been undertaken, and during the past year the classical ideas regarding the decomposition of cellulose, which is considered a fundamental substance in humus formation, have been found to be erroneous. Many new and important species of soil bacteria that dissolve cellulose are under investigation, which are expected to make possible more suitable farm practices for maintaining soil humus.

Work on Drug Plants

It has been shown that many valuable drug and related crops can be successfully grown in favorable regions throughout the country. The culture of golden-seal and paprika peppers has been successfully established. Camphor culture has been introduced in Florida, with results sufficiently promising to attract private capital on an extensive scale.

The culture of American tea has been introduced in a demonstration experiment now yielding an annual crop of 14,000 to 16,000 pounds of high-grade tea, all of which finds a ready market in competition with imported teas.

Hop investigations have been productive of valuable results in demonstrating the causes of failure to produce the best returns in yield and quality, and have also led to the recommendation of rational criteria for judging hops on the basis of their properties and constituents rather than their geographic origin, with the hope of removing certain forms of discrimination now made against American hops in the trade. Improved foreign varieties are being introduced and progress made in the improvement of the yield and quality of American hops.

Studies of oil and perfumery plants have included the planting of 40 varieties of roses of imported types yielding the valuable rose oil of commerce and the development of good commercial values from raisin-seed waste and other oil-yielding residues, as well as from a number of neglected plants. In this connection a new tur-

pentine substitute and a new linseed-oil substitute have been demonstrated.

Poisonous-Plant Studies

Loco weeds, larkspur, wild lupine, death camas, and other poisonous plants have been responsible for enormous losses of stock in the grazing regions of the West. These losses have been greatly reduced through botanical surveys, and field and laboratory tests of suspected plants, so that it has been possible to point out the harmful plants, to recommend methods of avoiding poisonous-plant areas at the most dangerous period of growth, and to devise and indicate methods of treatment, antidoting, etc.

7. SOIL

[SOURCE: Report of the Secretary of Agriculture, 1912, pp. 150-154.]

For 60 years the scientists of the world had wrestled with Liebig's mineral theory of plant food without progressing much beyond the limits of his classical work. No practical or efficient basis of classification of soils had been worked out, the adaptation of crops to soils was not appreciated, there was no rational theory of fertilization, no specific knowledge of how fertilizers act upon the soil or plant, and no efficient methods of determining the manurial requirements of a soil.

Moreover, our people have always been an adventurous people; the country sparsely settled and new in experience and tradition. Methods of culture and crop rotation adapted to the different soils were little understood or considered of minor importance. The impression was general that the soils of the country were wearing out with ever-decreasing productivity, and alarm was felt for the future of our increasing population and the possibility of the ultimate exhaustion of our soils and of the natural deposits of fertilizer materials, which it was claimed were essential for the maintenance of the proper mineral composition of agricultural lands.

The Soil an Indestructible Asset

As a result of the profound investigation in the Bureau of Soils of reported cases of soil exhaustion, it appears that all such cases are due principally to mismanagement of tillage operations, to the lack of proper adaptation of soils and crops, to the unwise rotation of crops, and to the misuse of fertilizers and manures, making it a personal failure rather than a natural and fundamental deteriora-

tion of the soil. It can be said, therefore, that the soil is the one indestructible asset of the Nation, which can be vastly improved by better and intensive methods or which can be temporarily impaired by wrong usage.

This conclusion was reached through a mineralogical study of soils and rocks, the study of the solubility of soil minerals and of the composition of the soil solution, the study of the profound changes taking place in the soil constantly through the mixing of soil grains by erosion, winds, and internal movements, and in the soil constituents through the action of percolating and capillary waters, the study of the increasing yield of farm crops during the 40 years for which records have been kept in this country, a study of the much larger increases in yields on the older soils of Europe during the past 300 years, and by a comparison of the chemical composition of the relatively new soils of this country and the relatively older agricultural soils of Europe.

Soil Surveys

Admitting that the productivity of our many important soils depends in the long run upon the knowledge and skill of our people in handling each type according to its specific needs, the importance and significance of the bureau's work in the classification and mapping of soils can be more fully appreciated.

During the last 12 years soil surveys have been made of 622,595 square miles, or an area practically as large as the combined areas of Germany, France, Great Britain, Ireland, and Italy. In this work the soils are classified according to their origin and constitution, and the reports discuss their characteristics, their principal tillage requirements, and their crop adaptations. Omitting the sparsely settled Rocky Mountain region, the Northwest Intermountain region, the arid Southwest, and the Great Basin, the survey has covered 29.2 per cent of the land surface of the United States, giving a complete classification of the soils, showing their area and distribution within the limits of the surveys, and indicating in a general way the localities outside of the areas surveyed where the different soil types may be expected to be found.

Adaptation of Soils

During the progress of this work and through supplemental investigations, the special adaptation of many of these types of soils to crops has been worked out, and we have definitely established the cause of many failures in farming to be the attempt to produce

crops on soils to which they are not adapted and upon which a high degree of commercial success can not be expected.

Conversely, we have a knowledge of soils that are peculiarly adapted to certain crops and others which should be used for certain crops when increasing density of population and market and transportation facilities justify their most intensive use.

Examples of such knowledge acquired through the soil survey might be multiplied indefinitely. As a result of the soil survey of the Connecticut Valley in 1899, possibilities of introducing the Sumatra type of tobacco wrapper leaf were pointed out on certain soils of that locality, and since then an industry has been established where a very fine-textured leaf is produced, under the most intensive cultivation, which sells for as much as \$2 a pound, as against 20 to 30 cents a pound for the leaf previously grown, and the industry has now become one of considerable magnitude and importance.

In the soil of the Nacogdoches area, Texas, the similarity of certain soils there with the soils of the Vuelta Abajo district of Cuba was noticed, and as a result of field experiments put out by the bureau it was found that the Cuban tobacco seed produced on certain types of soils the fine aroma of the leaf grown in Cuba.

Maladaptation

The soil survey has shown that not over 5 per cent of the soils adapted to winter and spring vegetables are now being devoted to these valuable crops, the remaining 95 per cent being little used, as they have little value for general farm crops and are not needed at present for the crops for which they are adapted.

In the development of this industry in the future there will be no excuse for the mistakes that have been made in the past, as the relation of every type of truck soil to the variety of truck crop to which it is best adapted is now well understood, and the location of these soil types is known.

Similarly, the vast opportunities for the safe development of fruit and of dairy industries so far as they are dependent upon the soil and climatic conditions and cultural treatment are now assured, if one but takes advantage of the work that has been done by the Department of Agriculture.

The much-dreaded injury from alkali in the soils of the dry regions of the West no longer need exist, as the Bureau of Soils has located and accurately mapped the alkali soils, so far as they have been encountered in the survey, has studied the type of alkali in

each district, and has shown that it can be controlled and eliminated from serious consideration by practicable methods of soil management.

Through laboratory research it has been found that not only do soil types differ in their relation to crops but that they differ also in the effect left by these crops which influences succeeding crops, and that for the highest development of the soil crops must succeed crops in a certain general order, which order of rotation is dependent upon the nature of the soil as well as upon climatic conditions and cultural treatment.

Commercial Fertilizers

The subject of the use of commercial fertilizers, which has developed to so large proportions in the last 50 years, has also been investigated by the bureau, and it has been found that they have very important functions in addition to their value as mineral plant foods.

The soil is not static, as was formerly supposed, but is dynamic, with many functions continually at work producing changes and always mutually affecting one another, and these changes can also be profoundly influenced by the substances ordinarily used as soil amendments.

It has further been shown that the United States has within its borders ample supplies of the raw materials which experience has proved to be most useful as fertilizers to supply the Nation's needs for an indefinite period into the future.

There is in this country enough high-grade phosphate rock to supply three times the present demands for 12 centuries or more.

[SOURCE: Report of the Secretary of Agriculture, 1916, pp. 33 to 35, inc.]

Potash from Kelp

In 1911 the Bureau of Soils was authorized by the Congress to make a survey of the Nation's resources in fertilizer materials, particularly in potash, for which this country was entirely dependent upon the German mines. As a result of this reconnoissance, it became evident that the largest and most immediately available source of potash in this country was the giant kelps of the Pacific coast. This conclusion was reached after detailed surveys had been made of the kelp groves of southern California, the Puget Sound region, and Alaska. The attention of the public was called to this source in the hope that private capital would undertake its development.

Germany in 1915 prohibited the exportation of all potash salts.

This action greatly stimulated the attempts of American manufacturers to produce potash and resulted in the erection of eight large plants in southern California for the extraction of this material from kelp. These establishments were constructed at a cost ranging from \$50,000 to \$2,000,000 and are centered around two cities, Long Beach and San Diego, five at the former and three at the latter place. They are operating harvesting equipment having an aggregate daily capacity of 2,500 tons of raw kelp. On September 1, 1916, about 125,000 tons of raw kelp had been harvested and treated, yielding approximately 10 per cent of dry kelp.

Notwithstanding this comparatively rapid development in the kelp industry, the problem of extracting potash from kelp commercially has not been completely solved. It is essential that methods be devised for producing the numerous by-products which can be obtained from kelp. The plants now in operation, for the most part, are engaged only in the extraction of potash. Owing to the present abnormal prices for this material, they are devoting relatively little attention to the elaboration of processes for the recovery of by-products. If this situation continues, they probably will not be able to produce potash at a profit when conditions become normal. In the circumstances, it seems desirable for the department to demonstrate the commercial feasibility of producing potash and by-products from kelp with a view to put the industry on a sound economic basis. The Congress, upon the recommendation of the department, has made available \$175,000 for the purpose. Plans have been formulated for erecting and operating, at some advantageous point on the coast of southern California, a plant with a daily capacity of not less than 200 tons of raw kelp, in order that the necessary experiments may be conducted.

It is hoped that these experiments will result in the establishment of a potash industry which will prove profitable and permanent and render this country independent of foreign sources in normal times. In any event, information will be obtained which should be very valuable if the present abnormal conditions persist or recur.

8. INSECTS

[SOURCE: *Weekly News Letter* of the U. S. Department of Agriculture, April 7, 1915.]

More than 150 skilled investigators of insects are employed in this branch of the department actively engaged in studying the habits of harmful pests, examining and trying out possible reme-

dies, and in passing on this information to the individuals most in need of it.

Not only does the Bureau of Entomology give information regarding the extermination of well-known insect foes, but it can usually identify pests unknown to the sender and recommend a remedy. In this case specimens must be sent by the person desiring the information. The best way to send most insects is in a living condition with a supply of food in a strong wooden box, although they may be sent in alcohol in a mailing tube. By preference the experiment station or agricultural college nearest the farmer's locality should be applied to first, as more particular and intimate knowledge may be obtained regarding the present activities of the undesirable insect. The bureau at Washington, however, also answers such inquiries, its particular sphere being to deal with such pests as are doing injury over larger areas than represented by a single State.

Harmful insects are not the only ones about which information may be had by writing to the department's Bureau of Entomology or the various experiment stations in the States. If some strange-looking creature arouses the farmer's curiosity, he may write to headquarters and learn as much as is known about it. No return postage need be inclosed.

A general idea of the scope of the department's bureau may be gained from this list of its offices dealing with insects attacking special crops:

Apple-Insect Investigations.—Many preparations are being tested as remedies for such insects as the codling moth which attacks apple trees. How effective control of apple plant lice may be obtained by the timely use of nicotine sprays will be explained to any applicant for this information.

Peach-Insect Investigations.—The peach borer is being thoroughly studied and many washes and practices that were once thought valuable for its control have been discovered to be worthless. A successful treatment has already been developed for pear thrips, the details of which may be had by any one interested.

Grape-Insect Investigations.—Experiments in renovating old vineyards infested with certain crop pests have resulted in much benefit to the owners.

Nut-Insect Investigations.—Many pecan-growing regions in the South are profiting from the application of sprays applied with high-power sprayers, as recommended by the bureau.

Orchard Insecticides and Spraying Machinery.—The relative merits of most types of commercial insecticides have been determined

and new preparations as they are put on the market are tested as soon as practicable. Spraying apparatus is subjected to similar scrutiny, it being the desire of the office to determine the most economical type for each particular problem.

Cranberry-Insect Investigations.—The method of flooding hogs now in vogue is being investigated to determine its value and to improve the method if possible. Additional remedies are being worked out as well.

Orchard-Insect Survey.—Information is being gathered on a large number of orchard insect pests at present of minor importance in the United States and should these pests at any time become dangerous the information will be immediately available.

Cereal-Insect Investigations.—Such dangerous creatures as the Hessian fly, the corn-leaf aphid, cutworms, rootworms, wireworms, army worms, and the white grub are having their fields of action greatly limited by the activities of this office.

Forage-Insect Investigations.—Pests infesting alfalfa, clover, soy beans, cowpeas, etc., are of interest to this office.

Other offices deal with insects that injure cotton, tobacco, rice, and sugar cane. Still others look into remedies for pests that damage forests or forest products. The Mediterranean fruit fly has offered such a dangerous menace to the United States because of the fruit yearly imported from Mediterranean countries that one office devotes its energies to controlling this undesirable importation and to take any quarantine action that may be necessary. The great number of tropical and subtropical fruits growing in our Southern States has made it necessary for another office to deal with their particular enemies. Thus, in Florida the "white fly" is being combated, while in California methods of gassing citrus groves to drive out "scale" insects are being developed, and in Arizona and Texas date-palm pests are studied. The work in each case is done in co-operation with the interested States.

There also are specialists detailed to help the grower of such truck crops as potatoes, onions, spinach, tomatoes, melons, cucumbers, beans, peas, and lettuce. Sugar-beet pests receive special attention. Even the busy pests that seek out agricultural products after they are stored are fought by other specialists, who make up a special office devoted to this purpose. New methods of sterilizing such products are being devised as well as for making insect-proof cartons and containers for cereals and dried fruits.

Finally there are three very important branches of the department's Bureau of Entomology:

- (1) Bee-culture investigations.

(2) Investigations of insects affecting the health of man and of animals.

(3) Investigations of the devastating gipsy moth.

The first of these endeavors to improve and encourage the production of honey and wax as commercial products; the second bends its energies toward the eradication of the spotted fever tick in Montana, the malarial mosquito in Louisiana and elsewhere, the universal typhoid fly (better known by the euphonious title of house fly), as well as the tick, stable fly, and other creatures which reduce the efficiency of live stock; the third endeavors to prevent the spread of the New England moth pest by quarantine, inspection, and treatment of infested areas.

[SOURCE: Yearbook of the U. S. Department of Agriculture, 1912, pp. 144-149.]

Extraordinary Growth of Service

Sixteen years ago the entomological service of the department was ranked as a division, and it had on its rolls 21 employees; the statutory roll amounted to \$9,500 per annum, and the lump fund to be spent for investigations was \$20,000.

At the present time the service ranks as a bureau and carries more than 500 employees upon its rolls. The amount paid for statutory salaries is \$58,750 per annum, and the total annual appropriation is \$672,340.

Importations of Injurious Insects

Just 16 years ago the bureau began to study with extreme care the question of the accidental introduction, by means of commerce, of injurious insects from other countries. It was realized that about one-half of the injurious species of first-class importance had been so introduced, and in consequence not only was begun the study of other species likely to be imported, but a quarantine and inspection bill was drafted and put before Congress from time to time from 1897 down to the Congress of the winter of 1911-12. Passage of an act of this character was warmly urged by the department during all those years, and the passage of such a law by the last Congress is a measure which will undoubtedly prove of great benefit to the country.

San Jose Scale

During the early part of this 16-year period the San Jose scale, which had recently made its appearance in the East and threatened

the destruction of eastern orchards, was carefully investigated by the bureau, and its final report on the life history of this destructive scale has remained as a standard. Later the country of origin was discovered by an employee of the bureau, Mr. Marlatt, and from that country (China) he sent over a predatory enemy of the scale, which was reared in confinement at Washington and subsequently liberated in orchards in different parts of the country.

It is true that the success of the lime-sulphur wash as a winter treatment for this scale has obviated the necessity for a competent natural enemy to a large extent, but it is believed that this enemy is still living in parts of the South.

Fig Wasp

Following the sending to California from Algeria by Mr. Swingle, of the Bureau of Plant Industry, of the fig wasp (*Blastophaga grossorum*), this insect, upon whose relations with the flowers of the Smyrna fig the production of the Smyrna fig crop is dependent, was established in California under the management of an agent of the Bureau of Entomology, and this establishment is responsible for the present Smyrna fig culture in that State and of its future culture in other States.

Gipsy Moth and Brown-Tail Moth

The gipsy moth and the brown-tail moth, two insects accidentally introduced into New England, became so abundant and destructive in 1905 as to call not only for large State appropriations but for governmental aid. Realizing the hopelessness of exterminative work after these pests had gained a firm foothold over 4,000 square miles of territory, Congress appropriated to the department a sum of money to be used in the effort to prevent the spread of both gipsy moth and brown-tail moth.

During the years in which this appropriation has been made, the bureau and the different States acting in co-operation have succeeded in preventing any extensive spread and in making the conditions of the towns and villages within the infested territory perfectly livable, whereas previously both species had been enormously destructive and very annoying.

During that period further extensive importations of the parasites and natural enemies of the gipsy moth have been made from Europe and from Japan, and of the brown-tail moth from different parts of Europe. Very many species have been imported in great

quantities, and a number of them have been established in New England territory. The effect of their work is being more strongly seen each year, and it is hoped that they will shortly become so numerous as to be important factors in holding the destructive insects in check.

Recent discoveries have been made which promise, by observing certain principles in forest management, to result in the preservation of good stands of timber in the New England forests in spite of the continued presence of these tree pests.

Other Noxious Insects

The introduction of the parasites and natural enemies of the gipsy moth and brown-tail moth is not the only work of this kind done by the bureau. An important enemy of the black scale of the orange and olive has been introduced, an egg parasite of the elm-leaf beetle as well, and at present the bureau is engaged in importing the European parasites of the alfalfa weevil. Similar shipments of American parasites to foreign governments have also been made, and the most striking success has been achieved in the sending of a minute parasite of the mulberry scale from the United States to Italy, where it is reported to have been of the greatest benefit in the destruction of the scales, which bred so numerous in the mulberry plantations as to threaten the entire destruction of this tree upon which is based the great silk-growing industry of that country.

A few years ago a thrips appeared upon pear trees and other deciduous fruit trees in central California, completely blasting the crops and spreading rapidly, threatening the destruction of practically all deciduous fruits on the Pacific coast. After two years' investigation of the method of life of this pest, the bureau discovered perfectly competent remedies, by the use of which orchardists are once more growing their normal crops.

Three years ago a weevil destructive to the alfalfa was discovered in the vicinity of Salt Lake City. It has spread rather rapidly to the north and to the east, and appeared to threaten great danger to this vitally important crop of the irrigated regions of the West. The bureau's experts have been studying it since the beginning, have been engaged in importing its natural enemies from Europe (it is a European insect), and have now discovered a method by which the pest can be handled after the first crop of alfalfa has been harvested. It is hoped that in time some other means will be discovered whereby the important first crop can be saved.

Insects as Carriers of Diseases

Throughout the entire 16 years the important subject of the carriage of diseases of man and animals by insects has been investigated. The mosquitoes that carry malaria and yellow fever have been carefully studied, and publications have been issued warning people and giving remedies.

In the same way the relation of the common house fly to the carriage of typhoid fever and other intestinal diseases has been studied, and in the same way publications of warning have been issued, and these have given remedies.

The tick which carries the Rocky Mountain spotted fever has also been studied, and an investigation has been completed which points out a way to control this dangerous creature.

The ticks that carry the Texas fever of cattle have also been made the subject of intensive study, and many facts have been ascertained which are of service to the Bureau of Animal Industry in its large-scale work in pushing the quarantine line against southern cattle farther and farther to the south.

Insects Injurious to Trees

Facts determined within the past 10 years indicate quite conclusively that 7 species of bark beetles of the genus *Dendroctonus*, injurious to coniferous trees, have killed more merchantable pine, spruce, and Douglas fir timber in this country than has been killed in the same period by forest fires. Investigations by the bureau have resulted in the gaining of a very complete knowledge of these injurious species and in ascertaining methods of control. The success of these methods of control has been demonstrated many times. Extensive depredations in Colorado, South Dakota, Montana, Oregon, and California by one of these beetles have been successfully controlled in localities where co-operative demonstration work has been carried on at a cost conforming to profitable business methods.

In 1910 and 1911 an outbreak of the southern pine beetle, which 20 years before had devastated the pine forests of West Virginia and Virginia, threatened a like fate to the pine timber of the South Atlantic and Gulf States, but practical demonstrations by representatives of the bureau and the adoption by the owners of the timber of the methods recommended resulted in the cutting of millions of cords of wood from the infested trees, which was burned for fuel, thus destroying the broods of the beetles in the bark. This has contributed to the almost complete control of the beetle.

9. CONTROL OF WILD ANIMALS

[SOURCE: Report of the Secretary of Agriculture, 1912, pp. 173, 174, 175 and 176.]

Biological Survey

For the fiscal year ending June 30, 1912, the total number of mammals imported from abroad was 5,457, and the total number of birds 457,077. In other words, we are now importing foreign birds (chiefly cage birds) at an average rate of more than 1,000 a day, and a systematic record is kept of all such importations at each of the entry ports of the United States and in Hawaii.

No other country has undertaken so comprehensive a system to prevent the introduction of species which may become injurious to agriculture. Congress, recognizing the increased field of operations of the office, raised the division to the rank of a bureau on July 1, 1905.

Distribution and Habits of Native Mammals and Birds

The basis of most of the work is scientific investigation, and in this field the most notable accomplishments have been the systematic collection and publication of data regarding the distribution and habits of native mammals and birds, and the preparation of maps showing the natural life zones of the country. Each of these zones is especially adapted to the growth of special crops and marks the limits within which certain varieties of fruits and cereals produce the greatest yield or beyond which they are not likely to be commercially successful.

Maps showing the ranges of individual species have also been published, and have proved useful in co-operative work with the Public Health Service in outlining the range of mammals which carry the tick responsible for the deadly spotted fever in the Bitter Root Valley, Mont., and the area occupied by the ground squirrels in California which transmit bubonic plague.

Maps have also been prepared showing the distribution of other species of ground squirrels, of pocket gophers, prairie dogs, wolves, and coyotes, all of which are extremely destructive to stock and agricultural interests in the West. The survey has mapped the ranges, determined the abundance, and studied the habits of many of the North American mammals and birds, and the knowledge thus gained makes it possible to cope with most of the economic problems in which native species are involved.

Food Habits of Birds

Careful studies have been made of the food habits of birds considered injurious and of many species that are known to be beneficial. More than 50 species of birds have been found to destroy the cotton boll weevil and 31 have been found to feed on the alfalfa weevil which has recently become so destructive in Utah. Special studies have been made of the food of birds in the fruit-growing districts in California and of special generally distributed groups, such as the flycatchers, grosbeaks, shore birds, and waterfowl. A summary of some of these studies, entitled "Common Birds in Relation to Agriculture," has proved one of the most popular bulletins ever issued by the department, more than half a million copies having been distributed in recent years.

Species Injurious to Agriculture

Much attention has been devoted to species injurious to agriculture, and methods have been devised for destroying English sparrows, wolves, coyotes, moles, rats, ground squirrels, and prairie dogs. When it is considered that 32 prairie dogs will eat as much forage as one sheep and 250 prairie dogs as much as one cow, it can readily be seen how important is the destruction of these animals on grazing lands in the West. Even the crawfish, which are destructive in cotton fields in certain sections in Mississippi, have received attention, and methods of destroying them with bisulphide of carbon have been devised. This work has by no means been confined to experiments on a small scale. In co-operation with the Forest Service, the prairie dogs on considerable areas in the National Forests of Colorado have been poisoned, and the mice, chipmunks, and other rodents have been destroyed on seed plots and extensive tracts where the work of reforestation has been undertaken on the forests in the West.

Game Protection

Through co-operation with game commissions and associations of the various States and through its publications the department has been able to advance the cause of game protection materially, and in some instances to mold public opinion on certain matters of general interest. The last decade has witnessed a wonderful advance in game protection in the United States, and in this movement the Biological Survey has taken a prominent part. Native species have been almost entirely eliminated from the cage-bird traffic and have been largely eliminated from the plumage sold in

this country for millinery purposes. Restrictions on export and sale have greatly reduced the enormous shipments of game to market which were so common a few years ago.

10. AGRICULTURAL CHEMISTRY

[SOURCE: Report of the Secretary of Agriculture, 1912, pp. 196 to 202, inc.]

This division now includes nearly every phase of the application of chemistry to agriculture, to the food and drug industries, and to other manufacturing industries which utilize the products of the farm as raw material.

On July 1, 1897, the total appropriation for the Division of Chemistry was \$29,500, now it is approximately \$1,000,000. Then the total number of employees was 20, now over 500. Then the division occupied a small building, originally a residence, not well suited for laboratory purposes, consisting of nine rooms; now the bureau occupies a commodious, fireproof building, with 6 stories and basement, of approximately 100 rooms, constructed especially for laboratory work. In addition there are 25 branch laboratories in cities throughout the country in government buildings or in suitable rented quarters. All the laboratories both in and out of Washington are equipped with a complete line of scientific apparatus well adapted for the work to be done. In 1901 the Division of Chemistry was organized into a Bureau of Chemistry.

Sirup Investigations

In 1903 a study was begun of the methods of making a better table sirup from the ordinary sugar-producing plants, such as the maple tree, sorghum, and sugar cane. The work was directed toward ascertaining methods whereby the product could be made purer, better, of a more pleasing appearance, with less tendency to crystallization, and have a greater resistance to fermentative processes.

The manufacturing problems were taken up at Waycross, Ga., where a model sirup factory was erected, a special appropriation by Congress having been made for that purpose. Four important problems were solved:

(1) By arranging two mills tandem, each mill consisting of three rolls, the amount of juice extracted from the cane was practically doubled over the quantity usually extracted by the old-fashioned two-roll mill generally used throughout the cane-producing sections of the country. This is of the utmost importance to economical agriculture, since it is evidently most wasteful for the

farmer to produce by scientific methods and hard labor a larger crop, half of which is wasted in the process of manufacture.

(2) In addition to the great saving by extracting practically all the juice from the cane, other economies in the process of manufacture were worked out. One of the principal problems solved was that of utilizing the bagasse—that is, the residue of the cane as it leaves the mill—for fuel. The results of the work show that the bagasse can furnish a large part and in some instances all of the fuel necessary not only to drive the mill and press the cane, but also to evaporate the juices to the condition of sirup.

Insecticide Investigations

The chemical examination of insecticides and fungicides has been a potent factor in improving the purity of products now sold on the market. Some idea of the value of such work to the farmer is gained by consideration of the loss occasioned by the ravages of plant diseases and insects. Experts have estimated that there is a loss of 20 per cent from these two sources, which, when applied to the farm crops of 1911 valued at \$5,367,000,000, would indicate a loss of about \$1,000,000,000. Probably one-third of this enormous sum could be saved by the proper application of insecticides and fungicides of the requisite strength and purity. Any inferiority in the quality of these materials means the additional loss of the labor in applying them.

The early studies of this subject showed that many of the insecticides on the market were of practically no value whatever, owing to the fact that they contained little or no active ingredients. Other insecticides which contained some active ingredients were adulterated by the addition of inert substances for the purpose of increasing the bulk to such an extent that they were of no value whatever.

As a result of the data secured by these investigations an insecticide and fungicide law was passed and approved April 26, 1910, which has greatly improved the conditions. Now it is a violation of law to ship in interstate commerce for sale any insecticide or fungicide which is adulterated or misbranded in any particular. A farmer in buying a supply to protect his crops can be reasonably sure he is getting exactly what he asks for and what he pays for.

Commercial Feeding Stuffs.

An exhaustive study of the various feeding stuffs on the market was completed in 1908, and the results published in Bulletin 108.

This study furnished valuable data for the information of purchasers of feeding stuffs and for further studies of the nutritive value of the various materials used for stock foods. It also furnished information that has been of great value in the enforcement of the provisions of the Food and Drugs Act of June 30, 1906, which apply to these products. A study of the feeding value of various cereals was made and the results published in Bulletin 120. The chemical data secured from this investigation have been of value in agricultural studies of the best methods for increasing the nutritive value of various grains.

Farm Products and Wastes in Manufacturing Industries

From an economical standpoint the investigations of the Bureau of Chemistry relating to the utilization of farm products for paper making, tanning, denatured alcohol manufacture, turpentine and rosin industries, and the destructive distillation of wood products are of the utmost practical importance not only to the farmer, but also to the manufacturer and to the consuming public.

Paper and Leather Making Materials

In no industrial enterprise is there greater opportunity for conservation than in those agricultural-chemical industries, tanning and paper making. Not only are large quantities of raw materials totally unused, but those which are consumed are not so fashioned that articles of the highest utility are produced. National reserves are being sacrificed in the wasteful production of inferior products. American paper is beautiful in appearance, and American shoes are tastefully made, but too frequently both lack durability and utility.

These investigations have pointed out the ways in which better leather and paper may be made at less expense. It has been shown that certain operations of tanning—notably bleaching, adding foreign material, and scraping off the surface of the leather—are not only useless, so far as the quality of the leather is concerned, but are positively harmful to it, and make it cost more. It is important that these facts should be more generally known, in order that the squandering of the national reserves may be curtailed and the people protected from inferior products.

Investigations in progress have shown that it is practicable to reduce the weight or bulk of paper used in this country from 10 to 25 per cent. It has been demonstrated that lighter and thinner papers can be made that are in every way superior to those now generally used. The annual cost of paper can be reduced from

\$2,000,000 to \$3,000,000, and the equivalent in raw materials and labor conserved.

The leather and paper laboratory is in a position to propose specifications for paper for various purposes, and to show how the cost of paper may be reduced and the quality improved. In several instances the saving on mailing charges alone has paid the extra cost of higher grade papers suggested by the leather and paper laboratory.

Products Obtained by the Destructive Distillation of Wood

Extensive investigations have been made by the Bureau of Chemistry looking toward the recovery by distillation of turpentine from dead trees, sawdust, stumps, and other refuse of the lumber industry. Owing to the constantly widening field for the use of turpentine and the gradual reduction of the supply of gum spirits of turpentine the price has steadily increased. As a result the adulteration of turpentine has been all too common. The results of the investigations have been published in Circular 36 and in Bulletins 135 and 144.

It has been demonstrated that by utilizing the stumps, dead trees, sawdust, and other waste material of the lumber industry not only all the turpentine used in this country can be profitably produced, but that all the tar pitch, rosin spirits, rosin oils, methyl alcohol, acetate of lime, and acetone can be extracted from the same waste products. In addition there could be material left for making large quantities of ethyl alcohol, paper, oxalic acid, and other chemicals. The commercial importance of these facts together with processes of manufacture are fully set forth in Bulletin 144.

Denatured Alcohol

In 1906 Congress passed a law providing that domestic alcohol may be withdrawn from bond without the payment of an internal-revenue tax, for use in the arts and industries and for fuel, light, and power, on condition that it shall have been denatured by the admixture of some material which unfits it for use medicinally or as a beverage. In 1908 the Bureau of Chemistry began an investigation for the purpose of demonstrating the manufacture of denatured alcohol on a scale suitable for utilization by the farmer or associations of farmers. A model distillery was erected and operated. Various waste farm products were used in an experimental way to determine the manufacturing process to be used in each and to find out what wastes could be profitably used. A number of

State experiment stations sent men to be instructed in the operation of the plant and in the processes of distillation, in order that they would be in a position to assist the farmers in their respective States to equip and operate distilling plants. Valuable data as to the yield of alcohol from various farm products were secured. The results of this extensive investigation have been published and will be useful in the development of the industry.

Drug Investigation

On March 1, 1903, a drug laboratory was established in the Bureau of Chemistry for the purpose of studying chemicals and drugs. Valuable results have been secured. Extensive investigations of chemical reagents have been made with the view of securing more reliable chemicals for analytical work. Data have been collected for use in establishing standards.

The work done by the drug laboratory for the Post Office Department has been of special interest. Examinations have been made of a large number of remedies and fake cures of various kinds at the request of that department to assist in the enforcement of the law to prevent the use of the mails for fraudulent purposes. As a result of this work many worthless fakes have been denied the use of the mails.

[NOTE.—For the work of the Bureaus of Animal Industry and Meat Inspection, see preceding chapter.]

CHAPTER XI

FORESTRY

THE forests of the world may be divided into three parts. In most of the countries of Continental Europe the larger part of the forests have been long controlled by government, so that there is scarcely a question of public versus private ownership in these countries. In another group of countries such as China, Italy, and Spain the forests have been so largely destroyed or damaged that the situation is almost hopeless. The tendency in Spain and Italy is for the government to step in now and do what it can. But the possibilities of forest work in the near future are narrowly limited by the paucity of the forest resources of these countries.

In a third class are those comparatively new countries like the United States, Canada, and Australia, where a vast amount of lumbering is going on, but it is not too late to save a large part of the forests by governmental action. It is in these countries that the discussion of private versus public ownership is acute.

Finally, a fourth group may be made of the more distant parts of Asia, Africa, and South America, where very small inroads have been made into the forests and where the question of private versus public ownership has not yet become an acute issue. Possibly even parts of European Russia may be considered in this class, as the government has not yet been seriously tempted to sell its possessions into private hands—and might conceivably do so at some later date.

It is probably safe to say that the larger part of the forests in modern civilized communities are already under governmental control, and it is certain that the governmental area is increasing in most countries—though not at the present moment in the United States.

Our selections are chosen in view of the above facts. A brief discussion is given to countries where the question has been practically settled or where it has not yet become an issue. The larger part of our space is given to the United States, where the question is most acute and where the lumbering industry has developed on a larger scale than elsewhere.

GOVERNMENTS AND FORESTRY

[SOURCE: "What Forestry Has Done," U. S. Forest Service Circular 140.]

What forestry has done in other countries shows, first of all, that forestry pays, and that it pays best where the most money is expended in applying it. Both these points are very clearly brought out in the following table:

Expenditures and revenues of national forests, showing higher productivity under larger expenditures (1907)

Country.	Total net revenue from Government forests.	Expenditure per acre.	Net revenue per acre.
Württemberg	\$3,098,428	\$2.05	\$6.60
Saxony	2,299,000	3.00	5.30
Baden	829,162	3.58	4.42
Hesse	744,209	1.25	4.29
Switzerland	237,663	1.32	2.55
Prussia	17,054,144	1.58	2.50
Bavaria	5,128,348	1.99	2.22
France	4,737,250	.95	1.75
Italy .....	.....	.....	.33
Hungary .....	.....	.34	.32
Austria	5,313,000	.56	.21
Roumania	482,600	.....	.18
Spain .....	.....	.....	.17
Sweden	1,677,672	.02	.09
Russia	21,500,000	.01	.032
United States	{ 1905-6 * 12,000	.007	*.0001
	{ 1906-7 128,659	.0093	.00086

* Deficit.

FORESTRY ABROAD

[SOURCE: As above, pp. 7-28.]

Germany

The German Empire has nearly 35,000,000 acres of forest, of which 31.9 per cent belongs to the State, 1.8 per cent to the Crown, 16.1 per cent to communities, 46.5 per cent to private persons, 1.6 per cent to corporations, and the remainder to institutions and associations.

German forestry is remarkable in three ways. It has always led in scientific thoroughness, and now it is working out results with an exactness almost equal to that of the laboratory; it has applied this scientific knowledge with the greatest technical success; and it has solved the problem of securing through a long series of years an increasing forest output and increasing profits at the same time.

Like other advanced European countries, Germany felt the pinch of wood shortage a hundred and fifty years ago, and though this shortage was relieved by the coming of the railroads, which opened up new forests, and by the use of coal, which substituted a new fuel for wood, the warning was heeded, and systematic State forestry was begun. After all, the scare was not a false one, for even to-day Germany is not independent as regards wood, since she has to import one-sixth of all she uses.

In addition to the wood-supply question, Germany was forced to undertake forestry by the need of protecting agriculture and stream flow. The troubles which France was having with her mountain torrents opened the eyes of the Germans to the dangers from floods in their own land. As a result the maintenance of protective forests was provided for by Bavaria in 1852, by Prussia in 1875, and by Württemberg in 1879.

The method of management adopted calls for a sustained yield—that is, no more wood is cut than the forest produces. Under this management the growth of the forest, and consequently the amount cut, has risen sharply. In 1830 the yield was 20 cubic feet per acre; in 1865, 24 cubic feet; in 1890, 52 cubic feet, and 1904, 65 cubic feet. In other words, Prussian forest management has multiplied the rate of production threefold in seventy-five years. And the quality of the product has improved with the quantity. Between 1830 and 1904 the percentage of saw timber rose from 19 per cent to 54 per cent.

The financial returns in Prussia make an even better showing. Net returns per acre in 1850 were 28 cents. In 1865 they were 72

cents; in 1900, \$1.58; and in 1904, \$2.50. They are now nearly 10 times what they were 60 years ago.

France

Of the 23,500,000 acres of French forests the State owns 2,707,000, and the Department and communes 3,472,000. Since 1827, when the forest code was passed, the State and communal forests have been under management. The State forests yield a clear profit of \$4,737,250 a year, or \$1.75 per acre; \$0.95 is spent for the management of each acre every year.

The great achievement of France in forestry has been the establishment of protective forests where much destruction had been caused by floods and winds. From various causes large areas were cleared of forests toward the close of the eighteenth century, and only when it was too late was it realized that these lands were not fit for agriculture and should have been left in forest. To repair the mistake, a movement to reforest began in the nineteenth century. It was an exceedingly expensive mistake. Down to the present time, encouraged by wise laws, the State, the communes, and private landowners have restored to forest over 2,500,000 acres, and so saved them from ruin. In addition, the resulting forests return an excellent revenue.

Two-thirds of the torrents of Europe are in France. In the Alps, the Cevennes, and the Pyrenees mountains there are 1,462 brooks and mountain streams which are considered dangerous. Nearly a million acres of mountain slopes are exposed to erosion by these streams, to say nothing of the flat land below.

As far back as the sixteenth century there were local restrictions against clearing mountain sides, enforced by fines, confiscation, and corporal punishment. In the main these prevented ruinous stripping of hillsides, but with the French Revolution these restrictions were swept aside and the mountains were cleared at such a rate that disastrous effects were felt within ten years. By 1803 the people had become aroused to the folly of this cutting. Where useful brooks had been there now rushed torrents which flooded the fertile fields and covered them with sterile soil washed down from the mountains. The clearing continued unchecked until some 800,000 acres of farm land had been ruined or seriously injured, and the population of eighteen Departments had been reduced to poverty and forced to emigrate. By 1860 the State took up the problem, but in such a way that the burden of expense for reforestation was thrown upon the mountaineers, who, moreover, were deprived of much pasturage.

Complaints naturally arose. An attempt was made to check torrents by sodding instead of by forest planting. This, however, proved a failure, and recourse was again had to planting, by the law of 1882, which provides that the State shall bear the costs. Since then the excellent results of planting have completely changed public sentiment. The mountaineers are most eager to have the work go on and are ready to offer their land for nothing to the forest department. In addition to lands secured by gift, the State acquires 25,000 or 30,000 acres a year. Over 500,000 acres have been acquired and more than one-half of this area has been planted. Already 163 of the torrents have been entirely controlled and 654 are beginning to show the controlling effects of the forest on their watersheds. Thirty-one of the torrents now entirely controlled were considered hopelessly bad half a century ago.

It is expected that \$50,000,000 will have been spent before the work of reforestation for protection is complete.

The sand dunes on the coast of France, mainly in Gascony, which the winds drove farther and farther inland, wasting the vineyards, have now largely been fixed in place by forest plantations which were begun in 1793. Of the 350,000 acres of sand dunes 275,000 have been planted in forest, and the dunes, instead of being a constant menace to the neighboring farmers, now are growing crops of pine which produce valuable wood and resin. In all, about \$2,000,000 was spent in the work and an additional \$700,000 was laid out in bringing the forests under administration. Now, though about one-half of the lands have been acquired by private persons and the State retains only about 125,000 acres, the State has received \$120,000 above all expenses, and possesses a property worth \$10,000,000, acquired virtually for nothing.

Some 2,000,000 acres of shifting sands and marshes toward the interior of the country, a triangular territory known as the Landes, has been changed from a formerly worthless condition into a profitable forest valued at \$100,000,000. Reforestation was begun about the middle of the last century. This work was done principally by the communes, aided and imitated by private owners, and encouraged by the State. The resulting forest produces both pine timber and resin, upon the yield of which the present valuation is based.

Sweden

Sweden has nearly 50,000,000 acres of forest, covering nearly 50 per cent of the total land area. Since the English import duties were abolished in 1866 the wood exports from Sweden have steadily

increased, till now Sweden stands next to Russia, the world leader, in wood exports, with \$54,000,000 worth a year, representing nearly 4,500,000 tons.

The State owns about 13,500,000 acres, or 33.2 per cent, and controls 4,000,000 acres more. The State lands are, in the main, of lesser commercial value, and this fact, together with the existence of logging rights granted in the past, keeps the net income for the present down to 12 cents an acre. Nevertheless, since 1880 the net revenue from the State forests has risen from \$300,000 to nearly \$2,000,000 a year.

In the past thirty-five years the State has increased its forest holdings by 45 per cent through the purchase and reforestation of wastes and sand dunes and by the settlement of disputed titles. The purchases amount to over 600,000 acres, for which an average price of \$5.30 an acre was paid.

Russia

Russia's forests are of vast extent. More than 575,000,000 acres, or 39 per cent, of European Russia is forest, and the Siberian forests of Asiatic Russia contain about 350,000,000 acres. In the more wooded provinces of European Russia the Government owns about 89 per cent of the forest land. It owns 65.7 per cent of the total forest area. In general, the untouched forest resources of Russia comprise two-thirds of the whole forest area of Europe. Over \$30,000,000 worth of wood is exported.

From the 660,000,000 acres of State forests which are now being worked the net income is now nearly \$21,500,000, or 3 1-5 cents per acre.

Russia began to apply forestry before the time of want had arrived, though forest havoc had been wrought. She was not forced into it for self-protection, as were, for instance, Germany and France. The lessons mastered by such other countries were regarded by the Russian government as convincing enough without being actually experienced.

Attention was first turned to the protection of Russian forests about two hundred and fifty years ago, when Czars Michael and Alexis undertook to settle property rights and make provision against fire and theft. By the beginning of the eighteenth century more careful use of the forests, especially of those yielding ship timbers, was insisted upon by Peter the Great.

Finland

Finland has 50,000,000 acres, or 63 per cent of the whole land area, in forest. It exports each year 170,000,000 cubic feet of wood, valued at \$20,000,000, principally to England, France, Germany, and Holland.

Most of the forest—that is, between 35,000,000 and 45,000,000 acres—is State property. Since 1869 the State forests have been conservatively lumbered, but until the private forests are depleted it will not pay to make the management as thoroughgoing as it ought to be.

India

The forests of India in the territory under British control cover nearly 180,000,000 acres, or 24 per cent of British territory. Of this a little over 149,000,000 acres are State lands, principally under forest. The value of forest products annually exported is over \$144,000,000. The annual net revenue from the State forests has risen in forty years from \$240,000 to \$3,300,000.

Forest fires were always exceedingly destructive in India, but since 1860 protective measures have been so improved that an area of 3,500,000 acres, or 36 per cent of the area of reserved State forests, is now effectively protected against fire. The protected area is to be steadily increased.

Working plans for 3,000,000 acres are being carried out, and plans for a million acres more are being prepared.

Japan

Japan has nearly 58,000,000 acres, or 59 per cent of its total area, under forests. The State owns nearly 33,000,000 acres (56.8 per cent); the Crown nearly 5,250,000 (9.1 per cent); municipalities over 4,250,000 (7.5 per cent); shrines and temples nearly 500,000 (0.7 per cent), and private owners nearly 15,000,000 (25.9 per cent). Although more timber is imported than is exported, Japan exports nearly \$1,250,000 worth of wood and \$4,250,000 worth of matches. The net revenue from the State forests has risen 16 per cent in the past twenty years, and is now \$8,000,000 a year.

Under the old feudal system of Japan the forests were for centuries reserved and cared for, and a continuous policy was assured. In fact, Japanese forests have been managed longer than any of those of Europe. They were controlled before the birth of

Christ, and during the early Christian centuries forest planting on watersheds to prevent floods was enforced by frequent edicts, and the felling of trees was supervised by officers of the provinces. As a result, Japan alone among the nations began modern industrial progress with its forests not only unimpaired but improved after centuries of use.

When, in 1868, the feudal government of the Shoguns passed away and the Mikado was restored to power, the old restrictions were removed and the forest was over-used wherever it was within easy reach of the market. Ten years later public-spirited men demanded the reservation and administration of national forests. By 1882 a first draft of forest laws was prepared by officers who had been trained as foresters in Germany, and, after preliminary legislation, the general forest law of 1897 resulted. Under this law the State and Crown forests are administered and the cutting of private, municipal, and religious forests regulated.

Canada

About one-third of the Dominion of Canada, 1,249,000 square miles, or nearly 800,000,000 acres, is classed as woodland, though the area stocked with commercial timber probably does not exceed 260,000,000 acres. The net exports of wood are over 2,000,000 tons a year—more than double those of the United States.

In the Dominion and the Provinces, together, 203,500,000 acres have been made "forest reserves." The proportion of land in these reserves which at present bears merchantable timber is, however, in many cases small. Thus, while the reserves of British Columbia, recently created, nominally cover 100,000,000 acres, it is believed that not more than one-tenth of this area has a growth of commercial timber.

THE LUMBER INDUSTRY IN THE UNITED STATES

[SOURCE: U. S. Forestry publication, "Public and Economic Aspects of Lumber Industry," p. 8.]

Lumbering still holds its place as one of the basic industries of the United States. Its logging and milling branches rank first among the manufactures in the employment of labor. Their 736,000 employees include 10½ per cent of the wage earners in all manufacturing industries. They are exceeded only by the farms, the railroads, and the mining industries as a source of employment for labor. They rank third among manufactures in the value of their annual product, \$1,156,000,000 in 1909, dropping behind the meat

packing and metal industries only in this respect.* The retail lumber establishments in the United States, estimated at 42,000 in 1914, add 126,000 employees to the total pay roll of the industry. Their sales of lumber aggregate 27 billion feet a year, and their annual sales of all merchandise reach a total of \$1,432,000,000. The manufacturing and retail branches of the industry have a combined investment of perhaps \$2,381,000,000.†

THE FORESTS OF THE UNITED STATES

[Special Article Prepared by U. S. Forestry Service, 1916.]

Our forests now cover 550,000,000 acres, or about one-fourth of the United States. Forests publicly owned contain one-fifth of all timber standing. Forests privately owned contain at least four-fifths of the standing timber. The timber privately owned is not only four times that publicly owned, but it is generally more valuable.

The original forests of the United States contained timber in quantity and variety far beyond that upon any other area of similar size in the world. They covered 850,000,000 acres, with a stand of not less than 5,200,000,000,000 feet of merchantable timber, according to present standards of use. There were five great forest regions—the northern, the southern, the central, the Rocky Mountain, and the Pacific.

The present rate of cutting for all purposes undoubtedly exceeds the annual growth of the forests. The great pineries of the Lake States are nearing exhaustion and heavy inroads have been made upon the supply of valuable timber throughout all parts of the country.

The heavy demands for timber have been rapidly pushing the great centers of the lumber industry toward the South and West. In consequence, the State of Washington now leads in lumber production, followed closely by Louisiana, then Mississippi, North Carolina, and Oregon. Among the softwoods, in 1915, the production of yellow pine lumber amounted to about fourteen and three-quarter billion feet; the Douglas fir of the Northwest held second place,

* Data from the Thirteenth Census. The last figures include the product of all logging camps, sawmills, box factories, and planing mills operated as separate establishments. The value of part of the product thus appears more than once, in its different forms.

† The retail figures are based upon a study of lumber distribution by the Forest Service in 11 of the Central States, in 1914, whose results have been extended to cover the whole United States in proportion to population.

with more than four and one-half billion feet, while white pine with two and three-quarter million feet ranked third. Of the hardwoods, oak came first, with approximately three billion feet, followed in the order named by cypress, maple, red gum, chestnut, yellow poplar, birch, and beech.

We take from our forests yearly, including waste in logging and in manufacture, more than 22,000,000,000 cubic feet of wood, valued at \$1,375,000,000.

About four and one-third million cords of wood are used in the manufacture of paper, of which about one million cords are imported, practically all from Canada. The demand for wood pulp is making a severe drain on the spruce forests, which furnish the principal supply, though a number of other woods, such as aspen, hemlock, pine, and balsam, are now being used in considerable quantities. Tests by the Forest Service of the U. S. Department of Agriculture have shown that pulp suitable for use in the manufacture of news and wrapping paper can be made from some ten species of native woods, including Sitka spruce, western hemlock, Engelmann spruce, red fir, white fir, and lodgepole pine.

The demand for highly durable woods for railroad ties threatened to create a serious problem in many parts of the country where the supplies of white oak, chestnut, cedar, and cypress are growing less. In place of these, more plentiful woods, such as southern pine, Douglas fir, tamarack, and hemlock, are coming into use, largely in consequence of the introduction of treatment by preservatives which retard decay.

UNITED STATES GOVERNMENT FOREST WORK

[SOURCE: Publication of this title by U. S. Forestry Service.]

Until about 20 years ago the forests on the public domain—the timber of the Rocky Mountains from Montana to New Mexico and of the Pacific coast ranges from northern Washington to southern California—seemed in a fair way to be destroyed eventually by fire and reckless cutting. Nothing whatever was being done to protect them, or even to pass by means of one or another of the land laws into the hands of private owners whose interest in most cases impelled them to take from the land what they could get easily, and move on.

Had this destruction gone on unchecked, there would in the end have been little timber left in the West, either to burn or to cut, and

the development of the country, which calls for timber not only at certain times but all the time, would have been retarded or stopped altogether.

More than this, the destruction of the forest cover on the watersheds supplying hundreds of streams which rise in the western mountains would have had its certain effect on streamflow—low water or no water at all during the long dry periods, and destructive floods after heavy rains. This, of course, would have meant disaster to the systems of irrigation by which thousands of farmers raise their crops. It would also have very seriously hampered, and in many cases prevented, electric power development.

So in 1891 Congress authorized the President to set aside Forest Reserves, as National Forests were then called, in order to protect the remaining timber on the public domain from destruction and to insure a regular flow of water in the streams. The first one—the “Yellowstone Park Timberland Reserve”—was created by President Harrison that same year, and later Presidents have created others, until at present the total net area is approximately 162,000,000 acres. Within the Forest boundaries are also some 21,000,000 acres in private ownership, consisting of lands granted or taken up for one purpose or another before the Forests were created or of homestead entries made since.

Government administration of the Reserves soon made apparent the necessity for scientific forestry, to make their use general. It was the duty of the Secretary of the Interior to prescribe regulations which would insure the fulfilment of the objects aimed at in creating the Reserves. Timber cutting must not destroy the Forests, but must provide for the growing of a new timber crop. Grazing had grossly abused the range; it was necessary to devise methods for increasing the forage crop. Both timber use and grazing use must be so managed that water supplies would be maintained and bettered. All the resources of the Forests needed to be given careful consideration and plans devised for their best development. Without such plans, little of the value of the Forests to the public could be secured. Technical problems were involved which the officials of the Interior Department felt to be outside their province. They therefore at first requested the aid of the experts of the Department of Agriculture as advisers, and soon recommended the transfer of administration of the Reserves to the latter Department.

This transfer took place in 1905. In 1907 the name “Forest Reserves” was changed to “National Forests,” to indicate that their resources were not locked up as “reserves” for a distant future.

In administering the National Forests the first aim of the Forest Service has been to protect their resources so that they will always be there to use, and at the same time to see to it that the greatest number of people have an equal chance to use them.

Though the National Forests represent the greatest single activity of the government in forestry, government forest work had its real beginning as far back as 1876, with the appointment by the Department of Agriculture of a special agent to study general forest conditions in the United States. In 1881 a Division of Forestry was created in the Department; but for a long time it received an annual appropriation of less than \$30,000, and so could be little more than a bureau of information and advice. From this small beginning, as its field of work expanded, the Division grew (1901) into the Bureau of Forestry, and finally (1905) into the Forest Service, with an appropriation for the fiscal year 1915 of \$6,007,461.24, of which about \$4,750,000 was spent for the administration and protection of the Forests.

To-day the forest work of the government is mainly centered in the Forest Service, which, in addition to administering and protecting the National Forests, studies a great number of general forest problems and diffuses information regarding forestry.

The government does other forest work, however, besides that of the Forest Service. The Office of Forest Pathology of the Bureau of Plant Industry studies the diseases of trees, and the branch of Insect Investigation in the Bureau of Entomology seeks means for controlling their insect enemies. The Department of the Interior, through its Office of Indian Affairs, administers the forests on Indian Reservations, totaling some 15,000,000 acres, and has direct charge of the timber in the National Parks.

Thus in the space of less than 25 years the forests on the public domain have passed from a condition in which the timber was always in imminent danger of being destroyed to one in which it is everywhere being protected; from a state in which, as a result of repeated fires and wasteful lumbering, the annual growth was steadily decreasing, to one in which scientific management insures a steady increase in annual growth and a good supply of timber for the people for an indefinite period.

[SOURCE: Special article above cited.]

The National Forests were set aside as follows: By President Harrison, 13,416,710 acres [1889-1893]; by President Cleveland [1893-1897], 25,686,320 acres; by President McKinley, 7,050,089

acres [1897-1902]; by President Roosevelt [1902-1909], 148,346,924 acres. Since early in 1909 a careful readjustment of the boundaries has been going on. In consequence President Taft [1909-1913] added to the National Forests 4,333,847 acres and eliminated from them 11,680,578 acres, while to June 30 (inclusive), 1916, President Wilson [1913-1916] has added 562,279 acres and eliminated 11,615,124 acres. Acts of Congress prohibit any additions by the President to the National Forest area in Washington, Oregon, California, Idaho, Montana, Wyoming, and Colorado.

The expenditures upon the National Forests for protection, administration, and improvement at present exceed the revenues from the Forests by about 2½ to 3 million dollars a year, depending partly on the severity of the fire season and partly on the activity of the general lumber market, and excluding the recent appropriation of \$10,000,000 by Congress for roads and trails. The normal gross cost of administration and protection is approximately \$4,750,000, while from \$300,000 to \$600,000 yearly is invested in the construction of roads, trails, buildings, and other permanent improvements. The cost of administration includes the cost of handling much free-use business, while the cost of protection is chiefly the cost of protecting water-supplies and future timber-supplies.

*Comparison of receipts from the several sources for the fiscal years
1916 and 1915*

Fiscal Year	Timber	Grazing
1916	\$1,412,592.51	\$1,210,214.59
1915	1,175,133.95	1,130,495.00
	Special Uses, Etc.	All Sources
1916	\$200,733.61	\$2,823,540.71
1915	175,840.40	2,481,469.35

Under the law 25 per cent of the receipts is paid to the States in which the National Forests are located, to be expended for roads and schools. The amount to be paid to the States in this way from the receipts in 1916 is \$695,541.40.

Congress has also provided that 10 per cent of the receipts shall be set aside as an appropriation to be used under the direction of the Secretary of Agriculture for road and trail building in National Forests in co-operation with State authorities or otherwise. The amount thus appropriated on account of fiscal year 1916 receipts is \$278,216.56. This added to the amount carried over from

the 1915 receipts fund, \$151,089.21, and the amount appropriated for improvements, in the regular agricultural bill, \$400,000, makes \$829,305.77 available for the construction of roads, trails, cabins, bridges, telephone lines, etc., on the National Forests for the fiscal year 1917.

In addition to the foregoing the Federal Aid Road Act passed by Congress in 1916 appropriated ten million dollars for the construction and maintenance of roads and trails within or partly within National Forests. This money becomes available at the rate of a million dollars a year for the next ten years. In general, the States and Counties are required to furnish co-operation in an amount at least equal to 50 per cent of the estimated cost of the surveys and construction of projects approved by the Secretary of Agriculture. The apportionments among the States is based on the area of National Forest lands in each State and the estimated value of the timber and the forage resources which the Forests contain. The total amount from all sources available for roads, trails, and other improvements on the National Forests, during the fiscal year 1917, is \$1,829,305.77.

The total regular appropriation for the entire Forest Service for salaries, general expenses, and improvements, for the fiscal year 1917, is \$5,574,735, as against \$5,553,256 for 1916.

On July 1, 1916, the force employed by the Forest Service numbered 3,682. Of these, 3,008 were employed upon the National Forests, and 674 were engaged in administrative, scientific, and clerical work at the Washington and district headquarters. Of the employees on the National Forests the force engaged principally in protective work numbered 2,078 men, as follows: Forest rangers, 406; assistant forest rangers, 769; forest guards, 903. The protective force was therefore about one man for every 75,000 acres, or 117 square miles. Prussia has one man for every 1,700 acres, and Baden one for every 750.

The Branch of Silviculture directs the management of the National Forests as regards both the cutting of mature timber and the work of forest planting; co-operates with States in developing forest policies adapted to their requirements; and co-operates with private forest owners who desire to practice forestry on their lands.

The chief problems encountered in the management of the National Forests, after fire protection, are to secure the removal of mature timber without cutting more than the forest is actually producing, and to replace this timber as it is sold and cut by young growth of valuable species. Detailed plans are prepared for each

Forest on the basis of careful estimates of the present stand and its rate of growth, which specify the amount of timber that can be cut safely each year without impairing the permanent supply. This timber is advertised for sale as wanted at prices which secure to the government its full market value and at the same time allow a fair profit to the operator.

The replacement of old stands by new growth is accomplished by regulating the cutting, through the insertion of special provisions in timber sales contracts, in such a way as to insure natural reproduction. On completely denuded areas, however, artificial reforestation by planting or sowing is generally necessary for the establishment of a new growth of trees. The object of such work is usually to produce commercial timber, although in a number of cases the reforesting of denuded watersheds is undertaken primarily to control and regulate the flow of streams directly supplying cities and towns. During the year ending June 30, 1916, over 10,000 acres in National Forests were planted or sown to trees, chiefly Douglas fir, western yellow pine, western white pine, white pine, and lodgepole pine. There are 21 government nurseries which supply the National Forests. These have a present stock of about 37,000,000 plants and are capable of supplying 15,000,000 a year.

At the request of the States the Forest Service makes examinations of their forest conditions, and conducts other studies needed to frame forest legislation and formulate a State forest policy adapted to the special requirements of each State. The cost of such work is shared by the State and the Service. The Service co-operates with private owners, especially small owners, in States which have no State forester, by furnishing advice, with or without field examinations, concerning the best methods for managing and protecting their holdings. The cost of such examinations is borne by the owner.

The Branch of Grazing supervises the grazing of live stock upon the National Forests, the principal lines of work being the allotment of grazing privileges; the issuance of grazing permits; the division of the ranges between different classes of stock or their owners, and the regulation of the stock grazed under permit upon the ranges; and the development of the forage-producing capacity of the National Forests by the restoration of depleted areas through systematic control of the stock grazed upon them or by artificial means, through the eradication of noxious range-destroying rodents and through the institution of new methods of range control. By co-operation with federal and state authorities in the enforcement

of quarantine regulations the National Forests have been practically freed from infection or contagious diseases fatal to livestock, and by an active campaign against predaceous animals destructive to livestock the annual loss from this source within the National Forests has been reduced by several hundred thousand dollars.

The number of stock grazed during the past season (1916) under permit was 1,860,635 head of cattle, horses, and swine, and 7,886,473 head of sheep and goats. The annual productive value of this number of stock is more than \$30,000,000. The number of persons holding permits to graze livestock during the past year was 33,328. About 16 per cent of all the sheep in the United States are grazed in the National Forests.

The Branch of Research supervises the investigative work of the Service. This includes studies of the principal tree species, of the best methods of forest planting, and of State forest conditions; and investigations of the lumber and wood-using industries and lumber prices. It also has supervision over the Forest Products Laboratory maintained at Madison, Wis., in co-operation with the University of Wisconsin, where experiments are made to determine the physical properties of woods, to ascertain cheap and effective methods to prevent decay, to test the adaptability of untried woods for specific uses, to develop practical uses for sawmill, woods, and factory waste, and to discover processes to obtain valuable chemical by-products from the waste which can not otherwise be utilized. Experiments in the manufacture of pulpwood from woods heretofore little used are also carried on.

SCIENTIFIC RESEARCH OF UNITED STATES FORESTRY SERVICE

[SOURCE: Annual Report of Department of Agriculture, 1916, pp. 26 to 35, inc.]

Investigative work on the National Forests followed in the main the same lines as in previous years, with possibly a slight decrease in reforestation experiments and greater emphasis upon fire protection and general economic studies.

The most efficient protection of the National Forests from fire calls for an accurate and scientific knowledge of all the factors that enter into the problem. A comprehensive study was undertaken to secure the basis for a more scientific method of distributing National Forest fire-protection funds. The aim is to find the degree of intensiveness in fire protection warranted by timber, forage, and watershed values, as modified by their susceptibility to damage by

fire. The study covered also other phases of fire protection, such as the prediction of dangerous conditions and the best means of fire prevention, detection, and control.

Many of the National Forests include watersheds which supply large irrigation projects with water. Closely bound up with the protection of such watersheds is the erosion problem. Many streams carry such enormous quantities of silt that the storage capacity of reservoirs is impaired seriously within a relatively short time, while an expense is involved in keeping the diversion works free from an excess of this material. Closely connected with excessive erosion is rapid run-off. A study to determine in what way the administration of the National Forests can keep the destructive processes of erosion on these watersheds at a minimum showed the balance between stability and rapid erosion of slopes often to be so delicate that slight abuse may result in complete loss of the fertile top soil and permanent changes in the character of the vegetation. Preventive measures, such as the regulation of grazing, conservative cutting of timber, and prevention of cultivation of nonagricultural soils, were shown to be much more effective and less costly than remedial measures.

In the more strictly technical studies dealing with the reforestation problems on the National Forests and elsewhere, further progress has been made. The study of artificial methods of extracting the seed of lodgepole pine from its cones has been completed, and valuable data obtained on the effect of different temperatures on the opening of the cones and on the quality of the seed. Probably the most important single point established is that lodgepole pine seed is usually not affected by drying temperatures up to 150° F., and may, in fact, germinate better after such treatment than seed obtained by air-drying, provided the kiln is properly constructed to insure free ventilation.

The study to find a relation between germination of seed in the greenhouse and in the field has been practically brought to completion. The analysis of hundreds of greenhouse tests seems to show that in the greenhouse the rate and vigor of germination is affected mainly by the quality of the seed and not by its source, while in the field just the opposite is true.

Tests to show the effect of the source of seed on form and growth of trees indicate very clearly that with all species the seed grown in the locality where the trees are planted give, as a rule, better results than seed imported from another region.

Important advance was made in the studies of nursery practice.

Experiments are establishing the optimum spacing for the development of the best and cheapest planting stock. Experiments in grading seedlings at the time of transplanting brought out the need of a radical revision of our grading standards. Present standards do not eliminate the seedlings most likely to succumb in the transplant beds.

Experiments were made to determine the amount of seed to sow in nursery beds and the depth to which the seed of sugar pine, western yellow pine, Jeffrey pine, Douglas fir, white fir, incense cedar, and bigtree could be most advantageously covered.

A great many of the experiments concerned with the best methods and seasons for reforestation work were brought to conclusion. All confirm the conclusion previously reported that, in general, planting is much safer than direct seeding and usually less expensive. In the semiarid Southwest planting can now be carried on with reasonable assurance of success.

Another important phase of the reproduction study is that of protection from grazing. Very definite results were secured as to the extent and conditions under which grazing proves detrimental to the natural reproduction, and specific remedial measures were evolved. With the development of watering places and the construction of fences, making possible the shifting of stock at will, the system of range management can be further improved so as to co-ordinate more effectively the best interests of both silviculture and grazing.

The work of collecting and identifying plants which make up the forage crop on National Forest ranges and the collection of field notes on the distribution, forage value, and life history of these plants was continued.

A comprehensive study of the lumber industry was begun by the Forest Service early in 1914. The Bureau of Corporations and the Bureau of Foreign and Domestic Commerce joined in this survey, which aimed to analyze in a constructive way the conditions in the leading forest using industry in the United States, and to show their bearing both upon the health and stability of the industry and upon the conservation of the timber resources of the Nation.

The investigations conducted by the Forest Service have extended over the regions of the South and West, where the bulk of the remaining forests are located and lumber manufacture is now most active, and 11 of the Central States where the distribution of lumber is probably most highly developed and its varying phases and tendencies are to be seen most clearly. Other studies have dealt

with the technical sides of utilization and marketing and the replacement of lumber by other structural materials.

The Forest Service has co-operated with the Bureau of Foreign and Domestic Commerce meanwhile in studies of the opportunities for marketing American lumber abroad, and with the Federal Trade Commission in a series of hearings for the presentation of data by the lumbermen themselves regarding the condition of their industry. The Service has been in close touch with the Federal Trade Commission in the development of the entire inquiry and in the consideration of its conclusions, with a view to making the study of as much value as possible to the commission in relation to business methods and forms of organization in this industry.

The results of this broad survey, which is practically completed, will be embodied in 10 bulletins dealing with such subjects as timber ownership and lumber production by important regions, the cost and methods of distributing lumber, the most effective use of material now wasted in manufacture or converted into products of little value, and the character of the public timber holdings, together with the methods of administering them and the economic service which they should render.

The investigation has brought out strikingly the bad effect of the wholesale turning over of public timber lands into private ownership under the laws applicable to the public domain before the National Forests were created. The conditions resulting from private ownership, with its inevitable speculation and high capitalization of private timber lands, and from the demands of private capital have turned one of the great natural economic assets of the country into an industrial burden. Its weight is now being felt in frequent overproduction of lumber, which demoralizes the industry and leads to wasteful use of the very resource acquired from the public. These conditions have been accentuated by the narrowing market for lumber in relation to other structural materials, which has come about through changes in the standards and requirements of the country.

Although difficult by reason of the upset conditions in the lumber industry, the need for conserving the forests of this country is just as manifest as ever. The public itself is concerned most vitally in the long run.

The future of the pine lands of the South Atlantic and Gulf States received particular attention. A general survey of the field preliminary to a more detailed study brought to notice the rapid growth of slash pine, the early age at which it can be tapped, and

the vigor with which it takes possession of the ground formerly occupied by long-leaf pine. The unusual characteristics of the tree, together with the fact that it can be grown naturally over large areas of the cut-over pine lands, indicates the probability that it will be an important factor in the southern forests of the future. Its chief drawback, as compared with the long-leaf pine, is its greater susceptibility to fire in the early stages of its life.

Utilization of National Forest timber.—In forest products investigations bearing upon the utilization of National Forest timber a number of mill-scale and depreciation studies were made. Studies of market conditions, covering chiefly the amount of timber used, the extent to which National Forest material is supplying the demands, and the reasons, if any, which are withholding National Forest timber from local markets, were continued in nearly all of the districts. Investigations are under way to ascertain the cause for brown stain in sugar, western yellow, and western white pine lumber, and to develop preventatives. Several National Forest species were found to be suitable for kraft paper of an excellent grade. Engelmann spruce was found suitable for sulphite pulp. A report was prepared, as the result of an extensive field study, on the possibilities of pulp and paper production in Alaska. Approximately 5,000 mechanical tests were made of National Forest species, and other tests were initiated to determine the possibility of utilizing the products secured through distillation of National Forest species in the flotation process of mineral reduction.

Forest Products Laboratory.—The growing value of the Forest Products Laboratory as a source for information and advice to the various wood-using industries and the general public was indicated by the receipt of approximately 18,000 inquiries for data on the properties and uses of American woods and by visits to the laboratory of approximately 4,000 persons, including representatives from eight foreign countries. Co-operative relations were maintained with a considerable number of individuals, companies, associations, States, and other Federal departments in various investigations and tests.

Investigations by the Forest Service of particular importance in the news-print situation were continued. Tests on 22 species to improve methods and to determine the suitability of various species for the ground-wood process, which supplies in part the material for news-print, have been reported previously. Engelmann spruce, found in large quantities on the National Forests, has been shown to be suitable for manufacture under the sulphite process, which

supplies the other pulp constituent of news-print, and efforts are now under way to determine the feasibility of chipping and drying this wood for shipment to the mills of the Lake States, which have practically exhausted the local supply of spruce and are now largely dependent upon Canadian timber. These efforts are of great economic importance because of the possibility of retaining in the United States the news-print industry, which for the past few years has been moving rapidly to Canada.

One of the most important problems of the lumber industry has been an efficient utilization of low-grade material. Low grades are used in a large percentage of the wooden boxes now manufactured. The railroad companies of the United States are paying annually claims amounting to many millions of dollars because of damages to goods in shipment. Much of this damage can be prevented through properly constructed boxes. Tests conducted at the laboratory indicate for canned-food boxes an increase in strength of 300 per cent by the use of four additional nails in each end. The results of these tests are being adopted rapidly by manufacturers and canners.

In the kiln drying of lumber the most important developments of the year were the discovery of a method of piling which improves circulation, the perfection of a method for southern-pine lumber which permits drying in 39 hours from green to shipping weight with a loss of less than 1 per cent, and the perfection of a method for red gum, one of the most difficult and refractory woods to dry, which reduces ordinary commercial losses of approximately 15 per cent to less than 1 per cent. These processes have been developed on a semicommercial scale. The drying of maple shoe lasts, of which a great number are used in the United States, has been difficult because of the size of the blocks from which they are manufactured. On a semicommercial scale the period required for drying has been reduced to seven weeks from nearly two years without increased loss.

The dyeing principle of the Osage-orange wood was not used prior to the investigations conducted in the laboratory. The value of this material has been so conclusively shown that from \$750,000 to \$1,000,000 worth of the dye is now being manufactured annually in the United States and practically all from material which was formerly wasted.

A new process has been developed on a semicommercial scale for the manufacture of kraft or wrapping paper, and the suitability of 13 National Forest species for its manufacture has been shown. In

addition to improving the quality and increasing the strength, the process promises reduced costs of at least 10 to 15 per cent and increased yields of at least 5 per cent. Paper has been manufactured which exceeds in strength and appearance any which it has been possible to secure from American or foreign sources.

A very considerable number of promising methods and processes have now been developed on a semicommercial scale and their industrial application awaits only tests on a commercial scale. In this important phase of its investigations, the logical consummation of all primary investigations, the efforts of the laboratory are greatly handicapped through inadequate funds. This list includes the manufacture of kraft paper from a considerable number of species, including southern yellow pine, western yellow pine, Douglas fir, etc.; improved processes of kiln-drying southern pine, red gum, western larch, and other species; a process of purifying the sulphate turpentine secured in the manufacture of kraft pulp from longleaf pine; the use of sodium fluoride to prevent blue stain; and the manufacture of wallboard from spruce bark.

FOREST POLICY OF THE STATES

[SOURCE: Special article above cited.]

The movement for national forestry has been followed by a widespread development of State forest activities. New York and Pennsylvania, the pioneers in this field, inaugurated State policies before the work of the National Government had awakened general interest in forestry, but in most of the States forest work has been, either a direct outgrowth of Federal activities or indirectly due to them. Ten or twelve years ago few States were giving their forest problems any serious consideration; to-day 32 have forest departments, 27 employ professionally trained foresters, and practically all have recognized the need for a State forester's policy.

State work has comprised activities along the lines of (1) education of public sentiment regarding the value of the State's forest resources and importance of their conservation; (2) the giving of technical advice to private owners regarding the application of forestry on their holdings; (3) the development of a systematic State forest fire protective system; (4) the provision of forest planting stock for citizens; (5) the modification of tax systems to lessen the burdens imposed on those who plant forests or otherwise apply forestry with a view to permanent timber production; (6) the formation of State forests or reserves. Each State has developed

its own forest movement along its own lines, largely determined by varying natural and economic conditions.

The appropriations for the yearly support of the several State forest departments vary greatly. The smallest is \$500; the largest, \$315,000. Those which appropriate over \$25,000 are: Pennsylvania, \$315,000; New York, \$178,000; Minnesota, \$118,000; Michigan, \$105,000; Massachusetts, \$78,000, in addition to \$175,000 for the suppression of gipsy and brown-tail moths: Maine, \$73,000; New Jersey, \$43,000; New Hampshire, \$39,000; Washington and Wisconsin, \$35,000 each; and Oregon, \$30,000.

New York has a State-owned "Forest Preserve" of 1,825,882 acres in the Adirondack and Catskill Mountains, under fire protection but not under forest management, which the State constitution forbids. The entire central portion of these two mountain regions, comprising 7,200,000 acres, is protected from fire by a State ranger system; in the rest of the State town officers are depended on to keep fires down. Private owners are furnished tree seedlings at cost from the State nurseries, which also grow material for reforestation denuded portions of the Preserve. Three laws give forest lands reduction of or exemption from tax assessment under certain conditions. Pennsylvania has more than 1,000,000 acres of State-owned forests and practices forestry on them, maintaining a State ranger training school at Mont Alto.

PUBLIC AND PRIVATE OWNERSHIP OF FORESTS IN THE UNITED STATES

[SOURCE: U. S. Forestry Publication, "Public and Economic Aspects of the Lumber Industry," by Henry S. Graves, U. S. Forester.]

Private ownership of timber in the far West at first began with the acquisition of some 1,200 billion feet from the public domain. Since about 1860 the United States has parted with title to approximately 54,000,000 acres of commercial timberland in the States lying west of the one hundredth meridian. Over 11,000,000 acres of this amount were purchased under the timber and stone act at \$2.50 per acre. Other vast quantities were obtained under the pre-emption and cash-sale acts at \$1.25 per acre, the homestead laws, and the public-land grants to States and transportation enterprises. The grants of land of all classes to these States, including swamp lands and grants in aid of wagon roads, total 68,290,000 acres, and to railroad companies within them 78,689,000 acres. A considerable part of the timberlands included in the State grants have subsequently been acquired by private owners, and the enormous railroad

grants have been a powerful factor in building up the larger holdings of the Northwest. Even after extensive transfers to lumber companies, the Northern Pacific and Southern Pacific Railroads controlled together 6,859,000 acres of timberland and 141 billion feet of stumpage in 1910.*

Many forces were behind this unparalleled transfer of natural resources from public to private ownership—the demand for quick settlement of the public lands and for aid in the economic development of new States, the speculative pressure in every new region, the push of lumbering, railroad, and other commercial interests, the “land hunger” which has been a powerful influence in every nation owning a public domain, and the western sense of local proprietorship toward the public lands which has viewed the Federal Government as a trustee charged solely with their distribution. It was indeed in keeping with the spirit of the times. It was part of the individualism which marked the commercial growth of the last quarter of the nineteenth century. Defective land laws and loose administration reflected the political pressure of all of these forces.

It is significant that private ownership of western timber is comparatively recent. In California, where it first developed, the transfer of public title was not well under way until the seventies; in western Washington and Oregon it was fully a decade later; and it was at least two decades later in the great interior basin of the Columbia River known as the Inland Empire. In other words, behind it was the example of profitable timber investments in the Lake States, the modern lumbering operation with its large sawmill requiring hundreds of millions of feet of stumpage, and the push of large amounts of capital made in lumbering and seeking reinvestment in kind.

The bulk of the public timberlands were disposed of under the mistaken and impracticable theory that they could be developed in small units like farm lands; a large part of them, indeed, were obtained under the identical laws designed to promote agricultural settlement. This was at total variance with the physical and economic requirements of the situation. The western forests, in regions of limited transportation facilities and distant from any considerable lumber market, had to be grouped in comparatively large holdings before exploitation was practicable. Yet before the creation of the National Forests there was no adequate law under which public timber could be obtained in the quantities required for manu-

* Report of the Bureau of Corporations, “The Lumber Industry,” Pt. I.

facture under the industrial conditions in the far West.* Concentration of timber claims was impelled by economic laws, however at variance with statute law. It was often accomplished by fraudulent practices, largely sanctioned by the "public land" conceptions of the West and for a long time inadequately checked by Federal administration.

The concentration of timberlands west of the Rocky Mountains reached its climax between 1907 and 1910. Its extent in the latter year may be summarized from the report of the Bureau of Corporations.† In the Northwest 20 owners of 5 billion feet or more each controlled, all told, 436 billion; 131 owners of 1 billion feet or more controlled 664 billion; and 313 owners of 250 million feet or more held, altogether, 757 billion. In the southern pine region 3 holdings of 5 billion feet or more comprised, together, 22 billion feet; 67 holdings of 1 billion feet or more aggregated 152 billion; and 307 holdings of 250 million feet or more had a combined total of 263 billion feet. About one-third of the private timber in the Northwest was in the hands of 8 companies. In the South, where concentration has been marked but there are fewer very large holdings, about one-sixth of the standing pine timber was found to be in the ownership of 29 companies. Beginning about 1905 and extending until 1910, there was a well-defined movement among yellow-pine manufacturers, impelled in part by an anticipated shortage of stumpage, to acquire timberland. The bulk of the yellow-pine stumpage was blocked up in large properties during this period.

It is evident that the acquisition of timberland went far beyond the requirements of practical exploitation and to a large extent took the form of speculations in stumpage.‡

Five of the Western States contain 888 billion feet of privately owned timber. This region is the great national reservoir of stumpage. Its disposal is a matter of concern to the public and at the same time the largest problem of the lumber industry.

The sawmills in these five States are cutting something under 9 billion feet a year. Twenty years' supply of stumpage may be taken as the most that the productive industry can carry. This is equiva-

* The act authorizing cash sales in unlimited amounts was repealed in 1889 and was relatively of little importance in the far West.

† "Investigation of the Lumber Industry," Pt. I—Standing Timber.

‡ "Speculation" is used in this report not in the strict economic sense of any purchase of commodities in anticipation of an ultimate rise in value but with the colloquial meaning of buying for a quick turn rather than for manufacture or for an investment of long duration.

lent to 180 billion feet, less than a fourth of the total in private ownership. The remaining 708 billion feet is a surplus, or reserve. In the interests of the public and the industry alike, this should not be forced upon the lumber market in advance of a real demand. The rate at which the cut of western timber will increase does not affect these basic conceptions. Whenever there is a larger demand for lumber the surplus will be drawn upon for the supply of additional sawmills. The point is that a large reserve in some form of strong ownership is essential.

There are two ways of carrying the surplus timber :

A more stable type of private forest ownership may grow out of the present conditions. This will result from a greater or less loss on individual investments, from the partial liquidation of some of the more highly capitalized properties, and from the elimination of the speculative element in timber buying.

A second solution is the enlargement of the public forest holdings. Public ownership, as exemplified by the administration of the National Forests and of the timberlands of some of the States, can meet the requirements of stability more readily than ordinary private ownership. The National Forests carry 623 billion feet of stumpage.* Their timber can be purchased only for immediate use. Speculation is taken out of the business. The operator is a manufacturer pure and simple, and aside from his manufacturing investment, is under no pressure to cut when the market is out of joint. Under the methods of cutting prescribed raw material is worked up with less waste than that common on private lands, and the regrowth of the forest is assured.

This kind of public ownership extended to more of the surplus stumpage in the West would aid powerfully in solving its forest problems. At the same time it would meet other economic needs, particularly the conservation of water, the reduction of flood damage, and the protection of navigable rivers. Extensive forest activities are now proposed solely on this account, and it is more than likely that sooner or later the public will have to acquire and protect many forested watersheds. Here, then, is an opportunity to solve two great economic problems at once.

A fundamental requirement of public ownership is to provide an adequate return to States and counties for the income lost through the withdrawal of property from their tax rolls. This obligation must be recognized by assuming the construction and maintenance of a just share of community improvements or by provision

* Estimated lumber cut, not log scale.

for community revenue from the use of public lands. Both means are used in the case of the National Forests.

Stable forest ownership might be secured by administering public and private lands as a single holding, publicly controlled as to rate and methods of cutting. Most of the advantages of outright public ownership could thus be assured. The ultimate solution of the whole problem must come through the general practice of forestry, cutting in each region no more than the current growth of its woodlands. Public regulation of private forest lands will have a necessary and important part in this development. But in the face of many economic, business, and legal obstacles the process must be one of gradual adjustment.

Viewing the whole situation, there can be no question of the desirability of enlarging the public forest holdings. The burden of carrying a surplus of 708 billion feet is too heavy for the industry alone. The waste of this resource will be too great and its ultimate effects upon the public interests too serious to permit leaving the correction of present bad conditions wholly to slowly developing changes within the industry.

Large public forests, furthermore, will work both ways. When the industry is dissipating its resources through overproduction, as in 1914 and 1915, a conservative policy in the administration of public holdings will aid to maintain more normal and less wasteful conditions. But if tendencies toward monopoly develop, perhaps as the result of depreciated values, possibly as the outgrowth of large private holdings, extensive public forests can be equally effective in keeping the industry competitive. Ownership of a considerable part of the timber surplus would keep the hand of the public on the throttle. It is by far the most effective check which could be devised against any dangers to the public interests which may grow out of the abnormal conditions in the lumber industry.

The public now controls about 679 billion feet of timber—545 billion feet in the National Forests,* 14 billion on unreserved public lands, approximately 50 billion in national parks and Indian and military reservations, and some 70 billion feet in the holdings of various States. The public owns something over one-fifth of the timber in the States, and one-fourth of the total including Alaska.

Obviously the cardinal point in our public forest policy should be to retain the timber which the people now own until required

* Including the National Forests in Alaska, the total estimate is 623 billion feet.

for manufacture. The demand for public timberlands at the terms fixed by the homestead and timber and stone acts is ever insistent. It is raised repeatedly in the name of local development, of local revenue, of self-government as contrasted with long-range, bureaucratic administration. But it is at bottom a demand for speculative gains rather than for real use or economic development. Wholesale yielding to this demand during the 40 years prior to the creation of the National Forests is the primary cause of the present serious conditions in the lumber industry. The industrial conditions which have come to a head within the last five years have not only shown the necessity of the National Forest policy but the urgency of retaining every acre of public timberland which is not best suited to agriculture or other special forms of use.

Unreserved public timberlands not suited for agriculture should be placed in National Forests. The principle of reserving in public ownership all timber not required for present manufacture should govern the disposition of any lands which the Federal Government may acquire through cession or forfeiture. There is an immediate demand for this policy in the disposition of the Oregon & California Railroad grant in Oregon, whose 50 billion feet of stumpage, if placed in the way of speculation, will seriously accentuate the bad conditions in the overloaded manufacturing industry of the West Coast. How much better for the public to hold this timber and sell it to unhandicapped manufacturers as the lumber market affords a place for it.

The same principle applies to the States. The policy of disposing of timber only as required for manufacture and retaining the land for reforestation, except as it may be more valuable for agriculture, should govern the 10 million acres of forest now in State ownership and other timberlands which the States may acquire.

The second step should be to extend the public forests. This is probably most desirable in the less accessible timber of the Northwest, the portion of the surplus which could be acquired most cheaply and which, in the nature of things, must be carried the longest time before there is need for its manufacture. Much of it is in the vicinity of the National Forests and could be cheaply protected and administered as additions to them.

The Problem of Accumulating Cut-Over Lands

The cut-over pine lands in the Southern States have been estimated roughly at 64,000,000 acres. They are increasing at the rate of some 2,000,000 acres a year. Estimates furnished by the owners

of large areas class 75 per cent of them as agricultural, although their use for farming purposes will come about slowly and many tracts could doubtless produce a merchantable stand of second growth before they will be taken for tillage.

Aside from these regions which were covered by the present study, the Lake States are estimated to contain 27,000,000 acres of cut-over lands which are partly restocking, the Northeastern States 38,000,000 acres, the Central States 54,000,000 acres, and the hardwood sections in the South 41,000,000 acres. Aside from these vast areas there are probably 100,000,000 acres in various parts of the country which have been logged off and burned, or become barren, where but little forest growth is taking place.*

How to use these enormous and increasing areas of logged-off land is one of the large economic questions of the country. To many owners, particularly in the West, they are a problem, and a questionable source of profit. Stagnation is overtaking communities through the depletion of their timber, with no compensating development of its residual product—stump land. The potential agricultural values are often large, but their development under the high cost of clearing, inaccessibility from market, and lack of roads and other community facilities is exceedingly slow. Often it has been set back by speculative or ill-advised efforts at exploitation and by overcapitalizing stump-land values.

The present areas of denuded land have large possibilities in the production of wood. It has been roughly estimated, for example, that the yellow-pine lands now cut over are capable of producing upward of 6.5 billion feet of timber annually. Including the areas of young trees on virgin lands, it seems probable that the present cut-over and restocking forests of the United States have a potential yearly growth if protected from fire of at least 35,000,000,000 board feet.

* Report of the National Conservation Commission, 1908.

CHAPTER XII

ROADS

THE maintenance of roads by governmental agencies is scarcely to be considered an example of collectivism—at least in those cases where the local beneficiaries pay for the roads in the form of taxes.

But as soon as roads are constructed by nations or by large divisions of nations, such as the American States, the chief and most direct beneficiaries of this expenditure, and the chief classes of taxpayers who pay for it, become widely different bodies. Large expenditures for public roads in an agricultural country are thus usually a form of subsidy to agriculture, and in so far an example of partial collectivism. (See Introduction.) If, furthermore, we find that only a small part of the nation's taxes are paid by this same agricultural population, then we have a far more clear and complete case of collectivism or State Socialism—a point already reached in most foreign countries.

THE FEDERAL ROAD ACT

[SOURCE: Semi-Official Statement in Democratic Textbook, 1916.]

The Federal Aid Road Act (Public—No. 156—64th Congress), approved by the President July 11, 1916, appropriates from the Federal Treasury the following amounts to be expended in co-operation with the states in the construction and improvement of rural post roads: For the fiscal year 1917, \$5,000,000; 1918, \$10,000,000; 1919, \$15,000,000; 1920, \$20,000,000; 1921, \$25,000,000; total, \$75,000,000. As the states are required to make available at least an equal amount *or its equivalent* in labor and materials, there will be available not less than \$150,000,000 for co-operative construction work extending over a period of five years.

The Act provides among other things:

That the Secretary of Agriculture and the state highway department of each state shall agree upon the roads to be constructed therein and the character and method of construction.

That the state highway department of any state desiring the benefits of the Act shall submit to the Secretary of Agriculture project statements setting forth proposed construction; that the Secretary of Agriculture may approve or disapprove a project; and that no money shall be paid out of the Federal Treasury under the act on any approved project until the plans, specifications, and estimates therefor shall have been submitted to and approved by the Secretary of Agriculture.

Roads and Trails in the National Forests

The Federal Aid Road Act, in addition to appropriating \$75,000,000 for the next five years for rural post roads in the state, appropriates \$1,000,000 a year for 10 years, of Federal funds for the survey, construction, and maintenance of roads and trails within or only partly within the National Forests, when necessary for the use and development of resources upon which communities in or near the Forests are dependent. The Act provides that this expenditure shall be reimbursed eventually by the application of 10 per cent of the annual revenues from the Forests within or near which the roads and trails are located. This aid to road building in the National Forest areas is highly equitable, because the Federal Government is the owner of assets in many communities of the West to the extent in some instances of 50 per cent or more. Without this Federal aid, these communities, many of which are just beginning their existence, either would have to bear the full cost of roads or do without proper means of communication.

It has been estimated that for several years past the Nation has been expending the equivalent of approximately \$225,000,000 a year for roads, much of it through inadequate machinery, with consequent waste. Through the improvements of machinery, methods, and processes which this Act will effect there will result greatly increased efficiency in handling the additional local funds.

In addition to the \$85,000,000 appropriated by the Federal Aid Road Act, the Federal Office of Public Roads and Rural Engineering has been generously supported. This office makes available to county highway supervisors a corps of expert Federal highway engineers for laying out road systems, designing bridges, and supervis-

ing construction, and maintains complete laboratories for testing local road building material.

The importance of providing better farm homes and equipment and of helping farmers in solving their sanitary problems received its first Federal recognition by the establishment, under this administration, of a rural engineering service. The experts of this service have prepared and distributed plans for farm houses, barns, hay sheds, silos, and other buildings. In addition, they have devised cheap and practical methods for supplying the farm home with running water and for the disposal of farm sewage.

WORK OF THE UNITED STATES OFFICE OF PUBLIC ROADS

[SOURCE: Report of Secretary of Agriculture, 1912, pp. 208-212, inc.]

During the past 16 years the Office of Public Roads has grown from a small organization with an annual appropriation of \$8,000 and employing seven persons to a thoroughly developed organization with 165 employees and an annual appropriation of \$202,120. There is also an appropriation for the current year of \$500,000, made by Congress to be expended under the direction of this department on post roads. It is provided that in order to avail themselves of this appropriation the States or localities interested shall contribute \$2 for every \$1 contributed by the National Government. The Department of Agriculture, through its Office of Public Roads, will thus direct the expenditure of \$1,702,120 this year (1912).

From 1897 to 1912, inclusive, 343 object-lesson and experimental roads have been constructed. It has been found that object-lesson roads built under the direction of engineers from the office are a most effective method of carrying information concerning standard construction. The cost of construction is borne by the localities in which roads are built.

Much has been accomplished in the development of the physical tests of rock for road building, and the methods here adopted are now practically standard throughout the United States.

Research work in concrete has been productive of promising results. The properties of oil-mixed Portland cement concrete have been investigated, and indicate this material to be one of merit for damp-proofing purposes. A public patent has been granted for this material, so that any one may now use it without the payment of royalties. Measurements of the expansion and contrac-

tion of concrete while hardening, which are of value to concrete engineers, have aroused considerable interest.

Experiments have been conducted to determine the efficiency of oils, tars, asphalt, and other preparations used for the purpose of preventing dust and preserving macadam roads under modern traffic conditions. Laboratory experiments have been accompanied by service tests and experiments in the field. The office has also conducted investigations to determine the feasibility of building sand-clay and burnt-clay roads in the Southern States and in the Mississippi Valley. Such construction has been found to be practicable for certain regions where materials are available and climatic conditions favorable.

Successful efforts are constantly made to bring about a more general use of the split-log drag in the maintenance of earth and gravel roads.

Models of Types of Roads

In order to better demonstrate the fundamental principles of road construction, the office has built a number of models of various standard types of roads and bridges and of road-building equipment, including road machines, rollers, and crushers. A set of models was first exhibited at the Alaska-Yukon Exposition. Similar exhibits have been shown in many parts of the United States through the medium of expositions and by means of exhibit trains operated by various railroad companies. The cost of making such demonstrations has been paid by the expositions or by the railroad companies interested. Lecturers and demonstrators from the office have accompanied exhibits.

Training Highway Engineers

The office inaugurated a plan in 1905 whereby a number of graduates in engineering are appointed each year from engineering schools and colleges after competitive examinations. These men are given a thorough training in road building, while they also render practical service to the Government.

Investigations

The office has investigated the decomposition of rock powders under the action of water and discovered important facts with reference to their use as road materials. Investigations into the corrosion of iron and steel culverts and fences have also been productive of important results, and the matter of protective coatings has been extensively studied.

Standard Systems

In May, 1907, the office inaugurated a project designed to introduce improved standard systems of construction, maintenance, and administration of roads into various counties throughout the United States. Under this plan experienced engineers are assigned to make thorough investigations on all phases of the road work and to prepare exhaustive reports with plans, estimates, and recommendations. This method has already resulted in the saving of thousands of dollars to the counties.

Office Equipment

The office has in its files 8,237 photographic negatives and about 5,000 lantern slides illustrating nearly every item of road improvement. During the year just closed 1,135 lectures were delivered by representatives of the office, nearly all of which were illustrated with lantern slides.

From 1897 to the present time the office has issued 28 bulletins, 73 circulars, 10 farmers' bulletins, 19 Yearbook extracts, 15 annual reports, and 1 lecture syllabus; a total of 146 publications.

Economic Benefits of Road Improvement

Investigations are now under way to determine the economic benefits resulting from road improvement and the particular relation of such improvement to agriculture. It is evident that when \$142,000,000 constitutes the annual expenditure for road purposes, improved business management is imperative. Much statistical work is therefore carried on, particularly on the subjects of mileage, cost, and financing. The method of financing road construction by bond issues is becoming very common and is receiving considerable attention from the office. In order that the office may be kept in close touch with road work, a collaborator is employed in each State to act as representative and corresponds monthly with the office.

Mileage of Roads

An investigation was begun in 1904 to ascertain the mileage of improved and unimproved roads, rates of levy, and sources of revenue in every county in the United States. This work was finished in June, 1907, and shows that there were then over 2,150,000 miles of roads, of which only 7.14 per cent were im-

proved. The expenditure in money and labor for that year amounted to nearly \$80,000,000. A similar investigation begun in 1909 shows that there were, in 1909, 2,199,645 miles of public roads in the United States, of which 190,476 miles, or 8.66 per cent, were improved. Information in regard to expenditures on all the public roads in the United States was collected during the year 1911. This investigation shows that the expenditures for that year amounted to approximately \$142,000,000.

Publications

The publications of the office, which furnish a fair index of its activities, increased from 39 documents, containing 2,600 pages, in 1897, to 85 documents, containing 4,761 pages, in 1912.

In 1897 a series of popular bulletins, known as Experiment Station Work and published in the Farmers' Bulletin series of the department, was begun. Up to date there have been issued 70 numbers of this series of bulletins, containing over 600 articles on a variety of topics of interest to the practical farmer.

STATE MANAGEMENT OF PUBLIC ROADS: ITS DEVELOPMENT AND TREND

[By J. E. Pennybacker, Chief of Road Economics, Office of Public Roads.
From Yearbook of Department of Agriculture for 1914, pp. 211-226.]

In the United States a movement for internal improvements was projected almost contemporaneously with the establishment of the Federal Government. This first took the form of highway improvement through the construction of toll roads by private corporations and the building of national highways by appropriations from the National Government. These appropriations for National highways were continued by Congress for a period of nearly half a century, and a total of about \$14,000,000 was thus appropriated. About 1832, however, the steam locomotive was first used in this country, and an era of railroad development followed. It was believed by many that the railroads would obviate the necessity for highway improvement, and, consequently, efforts at improving the public highways of the country were largely abandoned.

It should not be assumed, however, that all of our transportation problems have been solved, nor that there can be no further saving in our cost of hauling. The public roads throughout the country, which constitute the primary means of transportation for all agricultural products, for many millions of tons of forest, mine,

and manufactured products, and which for a large percentage of farmers are the only avenues of transportation leading from the point of production to the point of consumption or rail shipment, have been improved to only a slight extent. By reason of this fact, the prevailing cost of hauling over these roads is about 23 cents per ton per mile. More than 350,000,000 tons are hauled over these roads each year, and the average haul is about eight miles, from which it can readily be seen that our annual bill for hauling over the public roads is nearly \$650,000,000. The cost per ton-mile for hauling on hard-surfaced roads should not exceed 13 cents. It is therefore evident that if our roads were adequately improved a large annual saving in the cost of hauling would result.

Under the system of local management which succeeded the toll systems and the road-building activities of the Federal Government, tax burdens for road purposes rested almost entirely upon farm property. Since the cities generally escaped these responsibilities and burdens, this condition was inequitable, produced inadequate revenue, and resulted in a very widespread stagnation in the building of improved roads. A further inequity resulted from the fact that traffic in its development took no account of county and township boundaries, so that frequently the traffic from one county destroyed the roads of another county, which in turn found itself unable to obtain redress. Modern traffic gave rise to new and difficult problems of construction, which the limited skill of local officials was unable to solve. Road taxes were, to a great extent, worked out by untrained, undisciplined road hands; most of the road work consisted in patching from year to year, and little tangible progress could be shown for the money and labor expended. These conditions rendered State action ultimately imperative, and New Jersey in 1891 was the first State to take definite action through legislative enactment. The law, which became operative in 1892, provided a State appropriation of \$75,000 to aid road building in the counties, and placed the administration of the law in the State board of agriculture. In 1894 the administration of the law was placed in the hands of a State commissioner of public roads. Other States rapidly followed the precedent set by New Jersey, and this progress was greatly accelerated by the advent of the automobile. This new traffic soon became a source of revenue for road purposes through the payment of registration fees. It subjected stone-surfaced roads to exceptionally destructive wear, and thus emphasized the need for skilled management of construction and maintenance; caused a persistent demand and agitation

by automobile owners for an efficient system of highways; and for these several reasons materially seconded the primary causes already cited as responsible for State action. The 1,800,000 automobiles now registered in the United States are paying more than \$12,000,000 annually in registration fees.

Of the progress of State road management it may be said that 42 States have thus far established highway departments for educational or administrative work, and of these 30 have made actual appropriations in aid of road construction or maintenance. In all, \$208,000,000 had been appropriated from State funds between 1891 and January 1, 1915, for construction, maintenance, administration, and educational road work, and a total of about 31,000 miles of improved roads is the evidence to show that this expenditure was not in vain. These roads were built for the most part as a joint State and local undertaking, so that a large local outlay not included in the State total was involved. It is most gratifying, however, that within a period of 22 years a policy, begun on a small scale and cautiously extended, has produced a mileage of improved roads greater in extent than the entire "Routes Nationale" of France, and that in 1913 alone a total of 5,000 miles of State-aided roads were completed.

Massachusetts, which established its highway department in 1892, had expended out of State appropriations to January 1, 1914, about \$14,000,000, had completed more than 1,000 miles of State highway, and had aided in the improvement of more than 350 miles of small-town highways. The State obtains its funds for road work through the issuance of State bonds and the levying of automobile license taxes. In constructing the system of State highways the entire cost is borne in the first instance by the State, but the counties are required to repay to the State 25 per cent of the cost. The motor-vehicle fees are applied entirely to the maintenance of State highways and improvement of small town roads.

Connecticut, which established its highway department in 1895, had expended to January 1, 1914, about \$11,500,000, a portion of which was derived from the sale of State bonds. The aid granted by the State varies according to the taxable valuation of the towns, but has been usually from three-fourths to seven-eighths of the cost of the roads on which the State has granted aid. Like Massachusetts, the Connecticut system provides for the application of automobile revenues to road maintenance.

New York established its highway department in 1898 and expended some \$25,000,000 of State funds additional to the authori-

zation in 1906 of the first State bond issue of \$50,000,000 for road construction. A second State bond issue was authorized in 1912, amounting to \$50,000,000. This provided a total of \$100,000,000 through the issuance of bonds for the building of a system of State and county highways. The system as laid out divides the highways into four classes, namely: State highways, to be improved and maintained solely at the expense of the State; county highways, to be improved and maintained at the joint expense of the State, county, and town; county roads, improved and maintained by the county; and town highways, improved and maintained by the town with the aid of the State. The bond issue was originally intended for the improvement of a system of county highways aggregating 8,380 miles, and to this was added a system of State highways of 3,617 miles. Approximately 4,300 miles of the State and county system were completed up to January 1, 1914, with a total outlay of State funds aggregating \$67,155,000.

The efficiency of State road management has been impaired in some of the States through the influence of politics. Changes of administration have brought about upheavals which have proven prejudicial to the efficient and economical administration of the highways. This condition is gradually being remedied through the placing of nonpartisan commissions in charge of State highway departments, so that in the appointment of highway engineers and their assistants political considerations shall have no weight. Furthermore, competent engineers may be attracted to the work by the realization that they will not be disturbed in office so long as they render efficient service.

In the early stages of State road management, little or no provision was made for the maintenance of roads constructed with the aid of State funds. This condition has developed into a serious problem, and many of the States are finding it difficult to obtain sufficient funds to resurface and properly maintain the large mileage of roads already constructed. It was thought at first that if the States aided in the construction of roads the counties could be depended upon properly to maintain them. This has been found to be a case of misplaced confidence, and the only way in which the States could obtain proper maintenance was to place the work under the immediate direction of a State highway department. Automobile revenues are for the most part applied to the maintenance of roads, and many of the States are providing annual cash appropriations in sufficient amounts properly to meet existing conditions.

The realization has become quite general that, in order to render maximum service, State highway departments should be given some measure of control over the construction and maintenance of local roads. For this class of roads an amount exceeding \$160,000,000 is expended annually, with comparatively little result to show in the form of improved road mileage for this great outlay. The State of Iowa has met this situation by placing all the road work in the State under the direction of the State highway department.

Traffic is increasing so rapidly as to cause excessive wear upon the roads, especially in the vicinity of congested centers of population. This results in a heavy annual maintenance cost, averaging in the large eastern States not less than \$750 per mile per annum. Many experiments have been made in the effort to devise types of road which can be maintained at relatively low cost. Thus far, aside from the cheaper forms of construction, the States are depending upon the various forms of bituminous macadam, concrete, and vitrified brick road.

Summarized briefly, the essentials to successful State highway administration, as demonstrated by the experience of the various State highway departments, are as follows: (a) The elimination of politics as a factor in State highway work; (b) the control by the State highway department of all work on which State funds are expended; (c) adequate appropriations for continuous maintenance of highways under efficient supervision from the day the highways are completed; (d) State supervision as to surveys, plans, and specifications of roads and bridges constructed under bond issues, and supervision of such other road and bridge work as requires considerable cash outlay and the exercise of engineering skill and knowledge.

Highly desirable progress toward the attainment of efficiency in State highway management could be accomplished by a general revision of State road laws, so as to eliminate all obsolete and conflicting legislation and to reduce the really essential laws to a few simple, clear-cut statutes which would define duties and responsibilities and provide ways and means for conducting highway work. A literal compilation of the road laws of the several States has already been made. This great mass of legislation exceeds 4,000,000 words. It is difficult to imagine conditions in any State which would necessitate more than 10,000 words to deal adequately with all phases of highway improvement. If this average were maintained for the 48 States, it is evident that without any loss what-

soever in efficacy 3,500,000 words could be wiped off of our statute books.

State road management is a concrete manifestation of the universal demand of the age for efficiency and equity in the management of public affairs. Its advocates contend that only by State appropriations can the burdens of constructing roads of more than neighborhood importance be equitably apportioned; that only by reaching such adequate sources of revenue as are possessed by the State can sufficient funds be obtained to improve the roads commensurate with their importance; that only through the establishment of a State highway department can the best engineering and practical ability be obtained for the benefit of the entire State, as by any other plan only the wealthier counties could afford to obtain such assistance; that through this centralized management correlation of road work throughout the State may be obtained and the influence of local politics in some degree eliminated or modified; and that standardization as to methods, costs, and administration may be greatly promoted by such centralized control. It must be said as evidence of the efficiency of this system that no State is on record as having permanently abandoned the policy once it has been adopted. The whole development of State road management has been toward a larger measure of participation by the State through increased appropriations and more comprehensive State supervision.

[SOURCE: *The American Political Science Review*, November, 1916, pp. 735, 736, 741, 742.]

Highway Administration and State Aid.—During the year 1915, the States expended \$53,000,000 in state aid for road construction. In addition more than \$27,000,000 of county and township money was expended under state supervision, making a total of more than \$80,500,000 of road and bridge expenditures managed by the States under the system of grants in aid. In ten years expenditures of \$263,350,000 of state money in aid of highway construction have been made, and the annual expenditures have increased from \$2,500,000 in 1904 to \$53,000,000 in 1915.

This policy of grants in aid for highways began only 25 years ago when New Jersey established a state highway department, and began systematic construction and maintenance of highways. Since 1891, every State in the Union except Indiana, South Carolina, and Texas, has established some form of highway department with powers ranging from mere advisory authority to minute control of

local and state expenditures for highway construction and maintenance. Fifty thousand miles of roads have been constructed under the supervision of these departments up to January 1, 1916. The stimulus given to road construction by state aid has resulted in an increase of more than 250 per cent in road expenditures in 10 years. The total expenditures for public highways in 1904 was \$80,000,000. In 1915 it was about \$282,000,000.

Instead of granting a sum of money to the States with the vague statement that it should be spent for the promotion of good roads, the act in question appropriated the sum of \$85,000,000 to be expended in a co-operative enterprise between the States and the nation. After deducting the amount necessary for administering the law, the secretary of agriculture is directed to apportion the amount due to each State but no money shall be expended except under certain conditions. The law requires:

“That any State desiring to avail itself of the benefits of this act shall, by its state highway department, submit to the secretary of agriculture project statements setting forth proposed construction of any rural post road or roads therein. If the secretary of agriculture approve a project, the state highway department shall furnish to him such surveys, plans, specifications, and estimates therefor as he may require: Provided, however, That the secretary of agriculture shall approve only such projects as may be substantial in character and the expenditure of funds hereby authorized shall be applied only to such improvements.

Whenever any road has been constructed under this co-operative plan its maintenance becomes a duty of the States and the civil subdivisions, and if the secretary of agriculture shall find that any road is not being properly maintained, he gives notice to the highway commission and if within four months from the receipt of notice, the road has not been put in proper condition, then the secretary of agriculture shall refuse to approve any project for road construction in the State or civil sub-division, whose duty it is to maintain the road, until it has been put into a condition of proper maintenance. Here, then, is the co-operative arrangement worked out with extreme care to insure that the money of the national government granted to the States shall be expended efficiently for the purposes designed.

CHAPTER XIII

FISHERIES

BOTH in regard to time and in regard to the amount of money expended, the United States Government is far in the lead of all others in the aid it has extended to fisheries. Nearly all other governments have followed along similar lines and several have built up quite important departments. But in few, if any, directions has the Fisheries Department of the United States been equaled. In order to save space, therefore, we concentrate our attention on a few of the most important lines of work of the United States Bureau of Fisheries.

[SOURCE: The United States Bureau of Fisheries, 1908 (Official Booklet).]

The Bureau has labored to make its operations commensurate with the extent of the fisheries in public waters, and with the inevitable exhaustion of the native fish life in the smaller lakes and streams incident to the development of the country and the increase of population. The policy, as enunciated by Doctor Goode, has been to carry out the idea that it is better to expend a small amount of public money in making fish so abundant that they can be caught without restriction and serve as cheap food for the people at large than to expend a much larger sum in preventing the people from catching the few fish that still remain after generations of improvidence.

From this standpoint it is perhaps fortunate that up to the present the Bureau has not had to devote its major energies to the formulation and enforcement of fishery legislation, but has been able to work directly for the increase of fish life. *Public or Government fish-culture has in America attained tremendous proportions and exceeds in extent and importance that of all other countries combined.*

[SOURCE: Department of Commerce, 1915, Description, "Fisheries," pp. 36, 38, 39, 40.]

The Bureau of Fisheries owed its inception to the widely entertained opinion that the fisheries in general were diminishing in

value and importance on account of the intensity and methods with which they were prosecuted, a view which investigation has shown to be justified with respect to many fishes and other valuable aquatic animals. Congress passed a joint resolution, approved February 9, 1871, which provided for the appointment of a Commissioner of Fish and Fisheries, who was directed to conduct investigations concerning the facts and the causes of the alleged diminution and the feasibility of remedial measures. This was the beginning of one of the earliest and most effective conservation movements undertaken by the Federal Government.

Division of Fish Culture.—This branch of the service, under an assistant in charge, has direction of all operations connected with the artificial propagation and distribution of fishes. Its practical work in 1914 was conducted through 36 fish-cultural stations and 94 sub or field stations, located in 34 States and the Territory of Alaska, and five specially devised railway cars engaged in distributing their product. It is the endeavor of the Bureau to hatch and plant fishes in sufficiently large numbers to compensate for the depletion of the natural supply through the fisheries, and the volume of its output has steadily increased until in 1914 it aggregated 4,047,643,417 fish and eggs. As the effects of fishing are more markedly manifested in circumscribed waters, most of the hatcheries are located in the interior, where they can more readily supply the inland lakes and streams, but some also are located in the coastal States for the hatching of fishes, such as shad and salmon, which run from the sea into the rivers for the purpose of spawning, and directly on the coast for the propagation of particularly important marine species, such as the members of the cod family, flatfishes, and lobsters. These operations have materially benefited some fisheries and have saved others from extinction. This division has also carried on particularly successful work in introducing valuable fishes in waters to which they were not indigenous and in rescuing fishes from overflowed lands where the recession of the waters would leave them stranded to die. It carries on its work independently or, in cases where public interest dictates, in co-operation with the States.

Division of Inquiry Respecting Food Fishes.—This division under an assistant in charge continues the work for which the Bureau originally was instituted, enlarged to meet the requirements dictated by experience. The scientific work comprehensively covers the field of aquatic biology, as for a proper understanding of the requirements for the protection and fostering of the fisheries

it is necessary to know not only the complete life histories of species of direct economic value, but also the habits of the food and enemies of those species and their relations to their physical and biological environments. An important feature of the work is furnishing advice and facts relating to fisheries legislation and administration. The division also conducts investigations and experiments tending directly to the increase of economic aquatic animals, especially those which, like sponges, oysters, mussels, and terrapin, are from their habits and nature not susceptible to the ordinary methods of fish culture, and in this way has added materially to the value of the fisheries.

The investigations and experiments are conducted by field parties or at the biological stations, of which there are two on the Atlantic coast, one in the Mississippi Valley, and a fourth to be constructed on the Gulf coast. There are also one especially equipped steamer for deep-sea investigations, one for coastal work, and a number of smaller craft for inshore and river duty.

The small permanent personnel, which is concerned chiefly with the work of more direct economic application, is supplemented as occasion requires by the employment of experts and investigators from scientific institutions. The facilities of the laboratories are, under certain conditions, extended to qualified independent investigators.

Division of Statistics and Methods of the Fisheries.—Under the direction of an assistant in charge, this division performs another of the original functions of the Bureau. The first duty to which the Bureau of Fisheries was assigned, namely, the investigation of the reported decrease of food fishes in New England, necessarily involved the collection of statistics of production, personnel, and capital. Since that time this branch of the work has been conducted without interruption, and in it have naturally been included the various other subjects affecting the economic and commercial aspects of the fisheries. Among its functions are (1) a general survey of the commercial fisheries of the country; (2) a study of the fishery grounds with reference to their extent, resources, yield, and condition; (3) a study of the vessels and boats employed in the fisheries, with special reference to their improvement; (4) a determination of the utility and effect of the apparatus of capture employed in each fishery; (5) a study of the methods of fishing, for the special purpose of suggesting improvements or of discovering the use of unprofitable or unnecessarily destructive methods; (6) an inquiry into the methods of utilizing fishery products, the

means and methods of transportation, and the extent and condition of the wholesale trade; (7) a census of the fishing population, their economic and hygienic condition, nativity, and citizenship; (8) a study of international questions affecting the fisheries; (9) the prosecution of inquiries regarding the fishing apparatus and methods of foreign countries.

[SOURCE: Report of the Commissioner of Fisheries, 1915.]

The appropriations for the conduct of the Bureau for the fiscal year 1915 aggregated \$1,118,471.66, including:

Propagation of food fishes	\$350,000.00
Inquiry respecting food fishes	45,000.00
Protecting seal and salmon fisheries of Alaska	110,000.00
Completion of, extension of, and improvements at fish-cultural and biological stations	94,500.00

[SOURCE: The U. S. Bureau of Fisheries, 1908 (Official Booklet), pp. 67-80.]

Among the eastern fresh-water fishes that have been established and more or less widely colonized in the Rocky Mountains or in transmontane regions are the large-mouth black bass, the crappie, the yellow perch, several catfishes and sunfishes, and the brook trout.

The most noteworthy results of the introduction of native fishes into new regions have been seen in the Pacific States and represent two contributions from the Atlantic seaboard—the shad and the striped bass. The economic outcome of the acclimatization of these fishes is without parallel in the entire history of migratory species.

The colonizing of the shad on the Pacific coast was one of the greatest achievements in fish acclimatization. Aside from the important financial results, the experiment was noteworthy because of certain changes that have occurred in the habits of the species, and because the feat of transporting shad fry across the continent at that early day was justly regarded as remarkable, and had a marked influence on the development of fish transportation, which has now attained such perfection.

From the best information obtainable, the entire cost of the experiment was less than \$4,000, while the aggregate catch for market in California, Oregon, and Washington to the end of 1907 was approximately 15,000,000 pounds, for which the fisherman received \$330,000.

The history of the introduction of the striped bass on the western seaboard is quite similar to that of the shad, and the result has been equally striking.

The economic importance of the introduction of the striped bass on the Pacific coast may be judged from the fact that the entire cost of transplanting was less than \$1,000, while the value of the catch to the end of 1907 was about \$925,000, a sum representing a yield of more than 16,500,000 pounds.

International courtesy has prompted the donation of American fish eggs to foreign governments, and the hardiness of such eggs and the facility with which they may be transported out of water for long distances have resulted in the establishment of some of the best of our food and game fishes in distant lands. Thus the brook trout and other American salmonoids are now thriving in Argentina; the brook trout, the rainbow trout, and the black bass are widely distributed in Europe; the rainbow and brook trouts are found in several Japanese lakes; and some of the finest trout fishing in the world is afforded by the rainbow trout in New Zealand, where also the chinook salmon, the blueback salmon, and various other American fishes are now flourishing. During the past year about 4,000,000 eggs of salmon and trout were shipped abroad. When the Bureau is unable to supply such requests from its own stock, it acts as agent in the purchase from private fish-cultural establishments, supervising the packing and the transportation to the point of embarkation.

Quite a number of Old World fishes have been introduced into American waters, and some of them have become well known in various parts of the country. Of all the exotic fishes, however, none is so well known, so widely distributed, so abundant, and so valuable as the carp, which was introduced from Germany upward of 30 years ago. This fish had excited a great deal of criticism, mostly unfriendly, and it is to-day regarded with disfavor by many people, chiefly anglers, because of real or supposed habits that are reprehensible. As a commercial proposition, the bringing of the carp to America has been of immense benefit, for to-day it is one of the common food fishes of the country, it is regularly exposed for sale in every large city and innumerable small towns, it supports special fisheries in 15 States, and it is regularly taken for market in 35 States. The sales at this time amount to fully 20,000,000 pounds annually, for which the fishermen receive \$500,000.

It is not as a great market fish, however, that the carp is destined to attain its highest importance among us, but as a fish for private

culture and home consumption. The number of farmers and small landowners who are alive to the benefits of private fish ponds is increasing at a very rapid rate, and hundreds of thousands of such in all parts of the country, but particularly in the great central region, will find in the carp a fish well adapted to their needs and conditions.

It is probable that the commercial value of carp is insignificant compared with its importance as a food for other fishes. It is extensively eaten by many of our most highly esteemed food fishes and is the chief pabulum of some of them in some places. In a number of the best black-bass streams, like the Potomac and the Illinois, the carp is very abundant and is a favorite food of the young and adult bass, while in California the introduced striped bass has from the outset subsisted largely on carp and may owe its remarkable increase to the presence of this food.

The consumption of carp is certainly destined to increase greatly; but even if the catch reaches no higher point, the introduction of the carp into the United States will remain the leading achievement in fish acclimatization in recent times, and, with the exception of the original introduction of the same fish into Europe from Asia, the most important the world has known.

The long-continued and systematic field and laboratory work of the Bureau has resulted in a most thorough knowledge of the distribution, variation, abundance, habits, etc., of the fishes and other creatures of the interior, coastwise, and offshore waters of the United States, Hawaii, and Porto Rico—a knowledge which is indispensable to the Government in its fish-cultural work and to the various States and insular authorities in their legislative efforts to preserve their fishery resources. The practical results of this work are apparent in numerous specific instances.

For a number of years the Bureau has been engaged in an endeavor to develop a practical method of fattening oysters. It is the custom of many oyster growers to transplant their oysters, shortly before putting them on the market, to beds where the natural supply of food is luxuriant and oysters fatten rapidly. In many localities such favorable places are few or entirely lacking, and the oystermen are compelled to put inferior stock upon the market, and thus forfeit the full measure of profit. The experiments which have been carried on are intended to develop a method of producing these fattening beds artificially in localities where they do not naturally exist. By the use of commercial fertilizers it has been found possible to produce the desired abundance

of oyster food, and the only important problem yet awaiting solution is that of materially increasing the output of the artificial claire employed for the experiments. Considerable progress toward this end has been made recently, the yield of the claire in 1907 being 176 barrels, against 125 barrels in the preceding year; and, as with a given equipment the expenses of operation are not materially increased whatever the product, this increase, if it can be carried further, as present conditions indicate, will result in sufficient margin between the cost of the treatment and the increased value of the fattened oysters to warrant its recommendation as a commercial process. The oysters fattened by this method are as fine as any placed on the market, and have been used with satisfaction at some of the best hotels and clubs of New York, Philadelphia, and Washington.

Experiments in sponge culture have been in progress for several years, and have now developed a practical system by which sponges may be produced from cuttings at a cost much less than that entailed in taking them from the natural beds. In view of the more rapid depletion of the natural beds which will undoubtedly result from recent changes in the methods of the fishery, the Bureau is convinced that the preservation of the American sponge industry will depend upon cultivation; and as it is estimated that about \$1,500,000 worth of sponges were taken in Florida during the past year, the failure of the fishery would be a serious commercial loss to the State.

Important work recently undertaken is an effort to establish mussel culture in the Mississippi Valley. The supply of mussels in those waters, on which is based a pearl-button industry valued at about \$5,000,000 per annum, with an investment of \$6,000,000, is being rapidly exhausted, and the mussel fishermen and manufacturers recognize that without scientific co-operation of the Government the business is doomed to early extinction. The Bureau in one season's work has practically, though not conclusively, shown a method by which the pearl mussels can be propagated, and is demonstrating that the work can be carried on at a comparatively small expense in connection with the already established operations in rescuing fishes from the overflowed lands, the fish reclaimed being employed, without injury to themselves, in the dissemination of the larvæ of the mussels. There have been liberated 25,000 fish, bearing about 25,000,000 young mussels ready to drop and begin their independent existence, and already past the stage when they are most subject to fatality. The work is also capable of applica-

tion to waters under private control and will probably become a source of respectable revenue to farmers and others whose property embraces streams, ponds, and lakes. The importance of this work is urgently insisted upon by the National Pearl Button Manufacturers' Association, which embraces practically the entire capital invested in the business.

By the dissemination of information regarding new fishing grounds important fisheries have been inaugurated. Thus when the abundance of halibut off the coast of Iceland was made known by the Bureau, a fishery was begun which yielded from \$70,000 to \$100,000 annually to the New England fishermen.

The Bureau has experimented with various unused or little-used products in order to determine their economic value and to suggest the best ways of utilizing them. Less than 15 years ago there was practically no market for the silver hake or whiting (*Merluccius bilinearis*), and immense quantities incidentally taken in pound nets and other apparatus were thrown away. The Bureau pointed out the possibility of preparing a marketable salt whiting; and it is a significant fact that in a few years the sales of this fish in New England have increased from about 100,000 pounds to 5,000,000 pounds.

Owing to the appalling mortality among the crews of the New England fishing vessels, owing in large part to the foundering of the vessels at sea, the Bureau many years ago undertook the introduction into the offshore fisheries of a type of craft which would combine large carrying capacity and great speed with enhanced safety. By correspondence, discussions in the daily press, personal interviews, exhibition of models, and finally by the actual construction of a full-sized schooner (the *Grampus*) with the requisite qualities, the Bureau was able to inaugurate a momentous change in the architecture of fishing vessels, so that for a long time the New England schooners have been constructed on the new lines, with a consequent minimizing of disasters and a decided increase in efficiency. For other fisheries and regions the Bureau has likewise advocated improved types of vessels and boats especially adapted to local conditions, and has published plans and specifications embodying the results of studies of the fishing flotilla of the world. The results of the Bureau's efforts in this line, in saving life and property, in increasing the usefulness of the vessels, and in improving the quality of the catch as landed cannot be estimated, but the beneficial effects may be partly appreciated when it is stated that during the 10 years ended in 1883, when the old

types of vessels were in use, there were lost by foundering from the port of Gloucester alone 82 vessels, valued at more than \$400,000, with their crews of 895 men; while during the 10 years ending in 1907 the losses from this cause aggregated only a fourth as many vessels and men.

[SOURCE: Report of the Secretary of Commerce, 1915 (Fisheries), pp. 100-107, 109-111.]

Among the most valuable products of the Atlantic coast waters is the lobster, which supports an industry in all the States from Maine to Delaware. The supply in the regions of greatest abundance has steadily declined in recent years, and even the diminished catch has been made possible only by the use of larger quantities of apparatus and by the inducement for increased exertion on the part of fishermen afforded by inflated prices. In the 24 years ended in 1913, the United States lobster output decreased 60 per cent in quantity but increased 178 per cent in value to the fishermen.

The causes for this decline are well known and fully appreciated throughout the lobster-producing States. The conditions are what would naturally be expected from eight separate jurisdictions combined with inharmonious laws and with flagrant disregard for laws and for the welfare of the lobster industry among elements of the fishing and general coastwise population. Artificial propagation by Federal and State Governments has not been adequate to maintain the supply under these circumstances, and most radical action, forced and sustained by an awakened public sentiment, is now required.

The most valuable of the migratory river fishes of the Atlantic seaboard is the shad. It is taken for market in every coast State from Florida to Maine, and since colonial days has contributed largely to the food supply and wealth of the country. The question is now being seriously asked whether the shad is destined to go the way of the sturgeon. The Department has repeatedly sounded the note of alarm, and has pointed out the shortsighted and destructive course pursued by some of the States with reference to this most important fish. The most serious condition exists in the Chesapeake basin, where, in 1915, the fishery was the poorest ever known, following a season that was the poorest in a generation. The shad, coming in from the sea on its way to the spawning grounds in fresh water, receives no protection other than that afforded by the laws requiring certain channels or ranges to be kept open for the passage of vessels and boats. No limits are

placed on the operations of the fishermen, who seem blinded to their own interests; every stream which the shad can try to ascend is literally choked with nets; and only a pitiable remnant of the schools that run in from the sea in spring reaches the spawning grounds. Shad hatcheries built, maintained, and operated by the Federal Government at great expense have practically been put out of commission by the inability to obtain eggs for hatching purposes, and a calamitous failure of the crop in the near future may be expected as a result of the present foolish policy or absence of policy. The livelihood of many is being needlessly destroyed and the food of more is being taken out of their mouths.

The Bureau made a comprehensive canvass of the shad fishery of Chesapeake Bay and tributaries in 1915, and now has data on which to base a final appeal for proper treatment of the shad. Failing to secure adequate legislation, the next step must be the abandonment of fish-cultural work in localities where it is not appreciated and the concentration of effort in communities where the maintenance of the fish supply is regarded as a serious function of the State.

The pearl-button industry can not get along without the freshwater mussel, and the mussel fishery, which is carried on in the streams of the entire Mississippi Valley, depends largely for its output and operation upon the regular output of the Fairport (Iowa) Biological Station of the Bureau of Fisheries. The freshwater mussel starts life as a parasite in the gills and on the fins of fishes, and the Fairport laboratory makes it a part of its business to infect fishes with these parasites. In the fiscal year 1915 over 345,000,000 larval mussels were thus planted in the Mississippi River and its tributaries in Iowa, Wisconsin, Indiana, and Arkansas. To do this more than 207,000 fishes were infected and then liberated. Over 50,000 of these fishes were rescued from overflowed lands. Thus these latter fishes were not only saved, but they were put to work distributing the young mussels through the whole basin of the Mississippi River. The parasite does the fish no harm. The fish merely acts as a means of cheap transportation for the mussels to the places where they mature and become useful to commerce. This work is now in its third year and its utility is beyond question. In it the science of biology is made the basis on which is founded a practical fishery of large importance, on which in turn an important manufacturing industry depends. This industry is comparatively new in this country. Formerly our whole supply of pearl buttons came from abroad. A little parasite carried about by

fishes in the Mississippi River has thus altered an entire economic process and made possible a new industry with an output of many millions of dollars and employing many thousands of men, women, and children. Thus is justified the wisdom of Congress in providing a station for scientific research in advance of the known extent of its immediate utility.

I have spoken of rescued fishes. An important branch of the operations of the Fisheries Service is the rescue of young food fishes from the lakes and bayous of the overflowed Mississippi and Illinois Rivers and their tributaries. Operations were last year carried on at stations in Wisconsin, Iowa, Minnesota, Illinois, and Mississippi. In all, over 8,000,000 fish were thus salvaged. Over 500,000 of these were delivered to applicants and deposited in public waters, these distributions involving 34 carloads of fish. Other fishes of many kinds to the number of about 7,800,000 were rescued from landlocked waters and returned to the main rivers. Many, if not most, of these fishes would have perished from drought or from cold in winter if allowed to remain where they were found.

The sea mussel is good to eat and is found in great abundance on our coasts. Millions of bushels of these sea mussels have been growing in the bays and estuaries of our Atlantic and Pacific coasts every year, but, being ignorant of their actual value, we have been wasting a food resource, worth possibly a million dollars annually, by failing to utilize it. This is a very strange state of affairs when we realize that in Europe for centuries the sea mussel has been one of the most highly regarded shellfishes. France alone produces about four hundred million pounds annually and imports many millions more to satisfy the demand of the Parisian restaurants.

The investigators of the Bureau of Fisheries made chemical analyses of the mussel to determine the available food principles present, conducted metabolism experiments to determine the rate of digestion and the amount of nourishment absorbed by the body, and assured themselves that no poisons were present in the flesh. Then palatability experiments were made by having the bivalve served in different ways to the boarders of a large dining hall located near the Woods Hole laboratory. Persons who ate them were questioned concerning their texture, flavor, and the way they agreed with them, and the testimony was recorded. The actual cost of collecting and preparing the mussels for food was also determined.

The investigation revealed the surprising fact that the sea mussel, so long ignored by Americans, is superior to many aquatic articles which are commonly eaten. Hundreds of persons have pro-

nounced it to be equal in flavor, or even superior, to the oyster; it is easily digested, has high nutritive value, is always in season, and is exceedingly abundant and general in its range. Especially for persons living on the coast is it an excellent cheap food. Continued experiments revealed that the sea mussel is peculiarly adapted to preservation if proper care is exercised, and when canned or pickled will retain its flavor for months.

With these facts in hand, a campaign of education was started in Boston and vicinity in 1914 for the purpose of making known the qualities of the sea mussel. We were fortunate in securing the enthusiastic support of the president of the Boston Chefs' Club, through whom practically every first-class local hotel, club, and restaurant was induced to put sea mussels on the bills of fare, and we furnished small lots of mussels free of charge, with the understanding that they were to be given a conspicuous place and patrons were to be urged to order them. At the same time a circular containing a popular account of the mussel, with approved recipes, was extensively distributed. Printed placards extolling mussels were provided for wholesale and retail merchants who would handle mussels obtained through the Bureau from beds whose sanitary condition was above suspicion. A barrel of mussels was placed in every police station in Boston for free distribution to the members of the force, and next day every policeman in the city, as he went about his beat, was advertising the qualities of sea mussels. Pushcart venders carried this cheap and wholesome food among those who did not frequent hotels, clubs, and restaurants. Lectures were delivered and mussel dinners were arranged by agents of the Bureau, a lecture sometimes preceding a dinner. In a short time the press of Boston, Lowell, Worcester, Providence, and other cities was giving the sea mussel daily attention.

The completion of the Grand Trunk Pacific Railway to Prince Rupert, British Columbia, provides a shorter line than has heretofore existed between the eastern and central parts of the United States and Alaska. Special efforts have been made by the Canadian authorities to attract to this route the large supplies of fresh fish, chiefly halibut, caught in Alaskan waters and consumed largely in the United States. This caused, naturally, anxiety to the fishing interests of our Northwest Pacific States, for the reason that Prince Rupert is 500 miles nearer to the Alaskan fishing lines, whence the supply has chiefly come, than is Seattle, which is the headquarters of the halibut fleet. This, of course, would involve the increased sailing of 1,000 miles if the product was to be handled

from Seattle as heretofore. It became important, therefore, to determine whether a new source of supply for halibut could be found nearer to our own ports, sufficiently abundant and regular to warrant the establishment of a definite fishery.

The steamer *Albatross*, with her regular crew supplemented by some experienced halibut fishermen, began this work in 1914 and has carried it further during the summer of 1915. Meanwhile the discoveries made during the previous fiscal year have been charted and a report thereon with maps has been published. As a result, during the first two weeks of June, 1915, over 800,000 pounds of halibut were taken from these new banks, which are located close to our shores and near the ports of Oregon and Washington. New banks, furthermore, have been discovered directly off the mouth of the Columbia River where none was supposed to exist, and the survey of these was promptly taken up and was finished before this report was written. Its results will be promptly published. Certain banks have been definitely located which were only known by rumor, and fishery trials have been made thereon to show the commercial possibilities in halibut and other fisheries. It may be said that a new source of supply for halibut has already been developed and that this same source will be of greater value in the future for a supply of other fishes not now in demand.

The tilefish is said by Webster's dictionary to be extinct, but it is not. It exists over many hundreds of square miles in large quantities and is a deep-sea fish of great food value readily obtained. It is the purpose of the Fisheries Service to develop this fishery without delay.

[SOURCE: Report of the Secretary of Commerce, 1915, pp. 114-116.]

Believing, as has been already stated, that a desirable and convenient addition to the food supply of the home, together with significant collateral advantages, may be acquired by the rearing of fish in small ponds on the farm, experiments and investigations bearing directly upon the problems confronting owners of such ponds are under way. At the Fairport laboratory bass, bream, and buffalo-fish are at present under observation. Fry of the buffalofish from eggs artificially fertilized and hatched are being reared in artificial ponds, a hitherto unattempted venture, with encouraging results. As a pond fish, this species has the advantage of attaining a large size, of being without cannibalistic tendencies, and seemingly adapted for practical methods of artificial feeding. These experiments in the artificial propagation and rearing of this species

are to be regarded as of particular importance, since it is a valuable commercial fish that is regularly diminishing in numbers.

As the correspondence of the Bureau reveals a very widespread interest in the subject of frog culture, the services of a skilled investigator have been secured to conduct a searching inquiry into the feeding habits, rate of growth, and conditions of existence of commercial species. The problem appears to be one of providing such an abundance of food that a large proportion of the young may come to maturity and a desirable rate of growth secured. The Bureau hopes that means may be discovered for propagating the important species on a commercial basis.

At Woods Hole investigations relating to various phases of oyster culture, to the utilization of waste fishes for food and other purposes, to the toxic effect of various mineral salts which may be introduced into the waters either through direct or indirect means of pollution, to the oxygen requirements and metabolism of fishes, and to studies of the life histories, habits, food, and parasitic infection of the fishes have been prosecuted.

At Beaufort, in addition to the regular investigations of the food, habits, and parasitic infection of fishes, studies of protozoa and diatoms, very low forms of animals and plants, respectively, but forms which play a very significant part in the economy of aquatic life and in various direct and indirect ways bear upon the fortunes of life of the larger animals, are being conducted. The investigations respecting the protection of wood against marine borers is still in progress.

In order to assure a greater measure of success in the propagation of diamond-back terrapin, further experiments are now in progress to determine the proper proportions of the sexes for breeding, the best conditions for hatching, and the possibilities of cross and selective breeding and the prevention of mortality. Terrapin hatched in laboratory pounds in 1909 began laying this season, thus completing the life cycle. The practice of winter feeding of the young, which practically doubles the rate of growth for the first year, and a recent change of food which further accelerates growth, may shorten the life cycle of six years of the first experimental brood.

[SOURCE: Report of the Secretary of Commerce, pp. 121, 122.]

The Alaskan seal herd was found by special investigators in 1914 to contain approximately 294,700 animals, of which not less than 93,250 were females of breeding age.

A census of the herd taken by the officers of the Department upon the islands in July and August, 1915, showed a further increase to a total of over 360,000 animals, of which not less than 103,000 were females of breeding age.

On the recommendation of the special investigators, a maximum of 4,500 seals was fixed as the number that might be killed during the summer season of 1914 for the food purposes of the natives. The take, however, was but 2,735. This was found insufficient for a proper food supply at times during the winter of 1914-15, and since better storage facilities have meanwhile been supplied upon the islands a maximum of 5,500 has been fixed as the number which may be slaughtered during the season of 1915. At the date of this report the actual number killed is not known, but it approximates 3,500.

In February, 1915, Congress, by joint resolution, authorized the Secretary of Commerce to postpone the sale of sealskins then in his possession to such time as he might deem advisable. Under the law as it existed theretofore, the annual sale of sealskins was required. In the unsettled state of the international fur market arising from the European war a material loss in revenue would have resulted had the sale been forced during the past fiscal year.

There are now in cold storage 3,296 sealskins, to which should be added the number taken from animals slaughtered during the summer season of 1915. If war conditions continue so as to close international markets, it may be necessary to request from Congress authority to postpone the sale of the skins taken this season as was done last year. The Department has under consideration, however, a plan whereby all of these raw skins, those taken both in 1914 and in 1915, may be dressed and dyed in this country by the best process known anywhere for the purpose and not hitherto used in this country, which would result not only in saving the skins from any possible deterioration in storage but would permit their sale as fully dressed and dyed furs of the best quality at prices remunerative to the Government. This would save the purchasers the cost of shipment to Great Britain for dyeing and dressing, as has heretofore been necessary, the expense of reshipment to this country, and the duty heretofore imposed upon them when so reshipped.

The result of this arrangement would be to put into American control the entire process from beginning to end, to bring to this country an industry not existing here before and to save upon this valuable product a large amount of unnecessary expense which has

hitherto been imposed thereon by reason of our dependence upon a foreign source for dyeing and dressing.

When commercial killing of fur seals shall be renewed—and the rapid growth of the herd will make that soon both possible and desirable—other products of that herd than the fur skins should have a consideration which has never been given them. The seal carcasses contain materials of economic value which have hitherto been wasted and which are far beyond the power of the native community to utilize. The Department is giving the profitable utilization of seal meat and refuse careful thought. Valuable suggestions have already been made upon this subject by Mr. G. Dallas Hanna and others upon the islands. It is possible that not only may food products be made available but that in other ways the animals will be found to have economic value. To save only skins and waste the rest of the animal is no longer in accord either with scientific knowledge or good industrial practice.

CHAPTER XIV

WATER POWER

THE development of water power is of comparatively recent date. The practical transmission of electricity to considerable distances is less than a quarter-century old. As usually happens the first exploitations were entirely in private hands. The governments of certain European countries began to be interested about the beginning of the present century, but the time has not yet been sufficient for full control to develop anywhere. Our selections show, however, that the tendency in this direction is very strong all over the continent of Europe, and will soon dominate. They also show that the tendency in non-European countries is towards a leasing system where the government reserves title.

GOVERNMENTS AND WATER POWER IN EUROPE

[SOURCE: *The Collectivist State in the Making*, by Emil Davies, pp. 57-59.]

In Canada laws were passed reserving water power from sale with Government lands, and most of the provinces have their hydro-electric commissions controlling and exploiting these valuable national resources.* In Norway all concessions *and plants* revert to the State without cost.

In Germany, in connection with hydro-electric and electric power in general, an extraordinary amount of co-operation between companies, municipalities, and the State is in progress. For example, two great German electrical concerns, viz., the Elektrische Licht- und Kraft-Aktiengesellschaft and the Bank für elektrische Unternehmungen, *in conjunction with the city of Mulhouse* (which may be called the Manchester of Alsace), formed a company known as the Oberrheinische Kraftwerke, with a capital of £1,000,000, for the purpose of utilizing water power from the Rhine below the

* Ontario's Hydro-Electric Commission, through the allied distributive services of 45 municipalities, supplies light or power to 66,000 customers.

Swiss frontier. In Germany are to be found the greatest electrical concerns of the world. These, realizing more and more the advantages of concentration and centralization, are constructing enormous central works, as far as possible where water power is available, whence electricity can be supplied at exceptionally cheap rates over vast areas embracing many municipalities with their own works. One of these big works tried to buy up the municipal electricity works at Dortmund and offered the city £550,000 for works standing in the books at £335,000. The city refused. The result is that numerous towns have entered into contracts with these large companies to purchase current at very cheap prices; they have hedged the companies round with all sorts of restrictions, supervise the management, reserve the right in certain contingencies to run the works themselves, and finally are allotted a large number of shares in the companies and appoint directors on the boards. Bavaria has a State coal mine and electricity works for railways. Hesse, Saxony, and Bavaria are arranging large State works to supply municipalities.

The Prussian Government has expended about £500,000 on a power station as an extension to reservoirs the Government has already built in connection with its Rhine-Hanover canal. These power stations are connected with the Prussian railway plant at Cassel and with the existing municipal steam stations of Cassel and Göttingen, these steam plants being used merely for reserve purposes. This combination of State with municipalities carries with it the further interesting feature that the State will sell the power to the municipalities, which in turn will sell to private consumers.

Sweden and Norway have been reserving and purchasing waterfalls for years. In Sweden, which, in respect of total water power, ranks third among European countries, coming after Norway and Austria-Hungary, the Royal Waterfalls Board works large existing electricity plants and is preparing plant for State power stations all over the country. At the end of 1912 the State had expended about £4,000,000 upon these power stations, and a great part of the country is now intersected by electric conduits belonging to the State. Its works at Trollhattan, in which already over £1,000,000 has been invested, already supply 40,000 h.p. Out of 880,000 h.p. available in the country at the present time the State's share is 670,000 h.p. It is for railway electrification in particular that the State has planned this, and here again we see how the State ownership of railways leads to other State undertakings.

All the Swiss cantons have State falls and power stations, and many small towns combine to own such power plants.

PROPOSED GOVERNMENT WATER-POWER MONOPOLY IN GERMANY

[SOURCE: *Sozialistische Monatshefte*, January and March, 1916.]

Among the propositions toward relieving excessive taxation after the war in Germany, the creation of a power monopoly has been suggested. Reports now coming from Germany indicate that these projects find increasing support on all sides. In opening the Diet of Saxony, the King said that a firmer and more concentrated organization of the electrical supply of the country would be necessary, and that the government had already decided to take steps to carry out such a project. In Bavaria the matter has gone still further, a parliamentary financial committee having already authorized the starting of a large hydro-electric plant on the Walchensee.

Both water power and steam have been considered. An objection to the former is that, although a few of the large rivers might offer opportunities for hydro-electric development, they are more useful as inland waterways, and the erection of large dams might interfere seriously with the working of the complicated canal system connecting the different natural waterways throughout Germany. With the exception of certain minor streams and lakes in a mountainous section, as in the case of Bavaria, the rivers will probably not be interfered with. Steam power, however, seems to hold better promises, and it is proposed to erect large power plants at suitable places where coal can be obtained easily and cheaply, and to transmit the electrical energy to the industrial centers.

The first intention in creating a power monopoly in Germany was that of making it an enterprise of the empire. Now, apparently, the individual states have taken the matter into their hands, although it is claimed from some sources that this is only a preliminary step, and that finally the whole system will be concentrated under the control of the empire.

In carrying out the project the government will have to meet the competition of the present private and municipal enterprises without seriously hurting vested interests of long standing. It might do so by acquiring these interests or by slow assimilation. The first seems to be very improbable, because of the large capital invested and also because many of the plans are connected with other enterprises, such as electric railways, the acquisition of which

is not intended. It is planned to put these governmental plants on a thoroughly commercial basis, and it may therefore become an advantage for the existing enterprises to buy their energy from the government plants or, in the beginning, to buy power from this source to supplement their present capacity. It is thought that after a while the situation will be sufficiently ripe to concentrate all the power supply into the hands of the central government.

NEW ZEALAND WATER POWER

[SOURCE: New Zealand Yearbook, 1915, p. 626.]

Of 43,016 horsepower in use, 18,336 is distributed for public supply. Of this latter amount 6,380 is from two State plants, and all the rest, except 683, is from town plants.

WATER-POWER RESOURCES OF THE UNITED STATES

[SOURCE: Proceedings of the Conference of Governors, 1908 (Statement by H. St. Clair Putnam), pp. 294, 295, 297, 307.]

Using the data furnished by the census returns of 1900, 1902, and 1905 as a basis and applying the prevailing rate of increase in the industries included in these reports, and adding an equivalent amount for the steam railroads, it is estimated that the total installed capacity of prime movers in all our land industries for the year 1908 approximates 30,000,000 horsepower.*

	Installed horsepower
Manufactures, census 1905	12,765,594
Mines and quarries, census 1902	2,753,555
Street railways, census 1902	1,359,289
Electric light and power stations, census 1902	1,845,048
Telephones, telegraph, and fire alarm systems, census 1902	3,148
Custom flour, grist and saw mills, census 1900 (omitted from census 1905)	883,685
Steam railroads (data from Statistics of Railways, 1905), equivalent power	3,750,000

It is probable that the water power in the United States exceeds 30,000,000 horsepower, and under certain assumptions as to storage reservoirs this amount can be increased to 150,000,000 horsepower or possibly more.

On the basis of the lower estimate of water power already men-

* The following table compiled from the census returns gives the installed capacity of prime movers in the United States in the industries named at the dates mentioned:

tioned, namely, 30,000,000 horsepower, and applying the ratio which now exists between wages paid and power utilized in manufacturing and railroad industries, the development of this amount of water power implies an increase in wages paid amounting to about \$15,-000,000,000 per annum, an amount more than double the total value of our agricultural products at the present time.

Of the total estimated power produced by prime movers, about 26,000,000 horsepower is produced by steam engines, 3,000,000 horsepower by water motors, and 800,000 horsepower by gas and oil engines. These figures emphasize the position of the steam engine in our industrial development and the relatively much less important place now occupied by water power.

Of the total 30,000,000 horsepower, including the railroads, used in the country, it is estimated that 9,000,000 horsepower, or 30 per cent is now utilized electrically.*

PROPOSED LEASING OF WATER POWER IN THE UNITED STATES

[SOURCE: *Congressional Record*, Jan. 12, 1917, Report by Franklin K. Lane, Secretary of the Interior, pp. 1394, 1395.]

“Should the Government allow its dam and reservoir sites and other lands valuable for power development to pass from its hands forever?”

“(1) It has been the policy of Congress from the inception of power development in the United States only to grant permission to use such lands and not to sell or give away the lands in perpetuity.

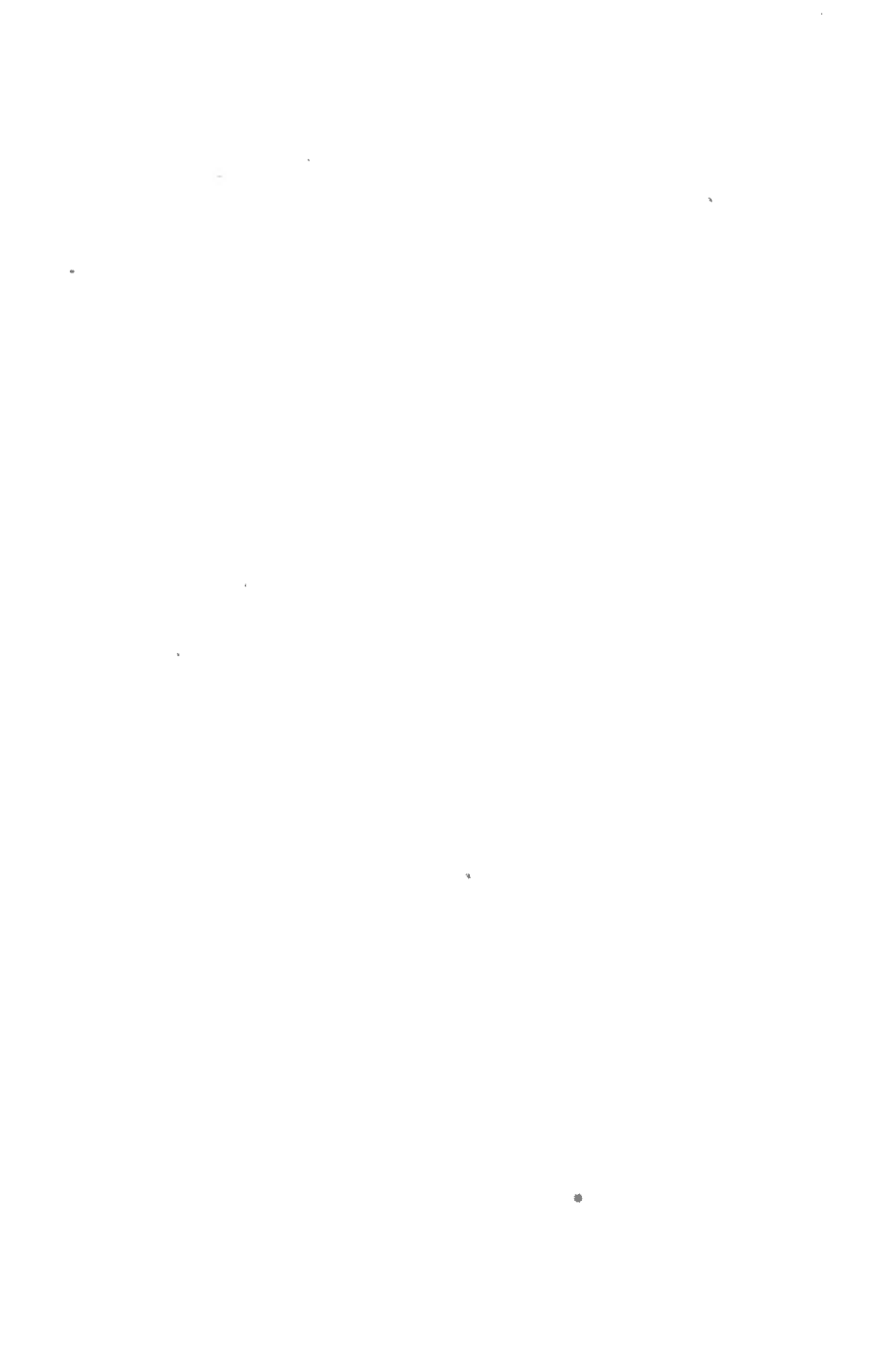
“(2) The general law applicable to the use of public lands for the development of electrical power, the act of February 15, 1901, authorizes the grant only of a permission to use public lands and reservations for this purpose, expressly providing that any such permission may be revoked by the Secretary of the Interior, or his successor, in his discretion, and shall not be held to confer any rights or easements, or interest in, to, or over any public land or reservation. The general law now in effect relative to granting of rights of way for transmission lines, the act of March 4, 1911, only permits the approval of such rights of way for periods not exceeding 50 years.

* This does not include the electric power generated in isolated plants and used for other purposes than manufacturing. These plants are not included in the census reports, and while they are individually small the aggregate electric power developed is large.

“With possibly few exceptions, the valuable power sites on lands not owned by the Federal Government have passed into private ownership in perpetuity. They can not be recovered except at a prohibitive expense, nor can control be exercised thereover in any manner, except it be by regulation of transmission and delivery as a public utility. Out of 7,000,000 horsepower developed in the United States in 1913, 20 companies or groups of interests controlled 2,710,886 developed horsepower and 3,556,500 undeveloped horsepower, or a total of 6,267,386 horsepower.

“As stated, it has never been the policy of Congress to dispose of these sites in perpetuity, the laws providing simply for the issuance of limited or revocable permits. Therefore, while some valuable sites have been acquired by private owners through the filing of scrip or entry of the lands under some one of the public-land laws not intended to apply to the development of such a resource, the major portion of lands valuable for this development remains in Federal ownership. A conservative estimate places the total available horsepower at 35,000,000, of which not exceeding 7,000,000 have been developed. Of the total undeveloped horsepower, 28,000,000, about 74 per cent, is in what are known as the public-land States, and 42 per cent of the total is within Government forest reserves. It is thus apparent that the extent and value of this undeveloped resource is large enough to require most careful consideration and disposition.”

PART III
TRANSPORTATION AND COMMUNICATION



CHAPTER XV

INTERNATIONAL WATERWAYS—THE PANAMA CANAL

FROM the Collectivist standpoint, interest in interoceanic canals is twofold. It lies both in their construction and in their operation by the State. But the operation of such canals is a very small matter when compared with their construction. And in view of the fact that Suez Canal was constructed so long ago, the construction of the Panama Canal is far more interesting and instructive. We have, therefore, limited our attention to the Panama Canal. This great governmental work is undoubtedly the largest single undertaking by any government in any period—unless we consider the construction of railways as being a single undertaking. Undoubtedly the Trans-Siberian Railway, for example, will ultimately involve a considerably larger expenditure, but it is carried over a long term of years, and its construction involves so many changes of policies and such varied problems stretched out half-way round the world, that it is difficult, if not improper, to regard it as a single project. At the same time, it can not be denied that the various governments of the world, in building up their railway systems, have successfully carried out enterprises greater than the largest private railways.

The fact that the United States Government has found it profitable to establish a State Socialist government in Panama has no necessary connection with the Canal. But it is, nevertheless, clear that the most practicable place at which to discuss this experiment is in connection with a consideration of other aspects of the great interoceanic waterway. .

COLLECTIVIST GOVERNMENT IN THE CANAL ZONE

[George W. Goethals, *Government of the Canal Zone*, Princeton University Press, 1915, pp. 3, 51, 79.]

“The housing and feeding of the force presented old problems in a new form, made more difficult because of the great numbers employed and the distance from the home markets; similarly with

the supply of materials so that construction might proceed unhampered."

"The U. S. provided furnished quarters for its employees with lights, fuel and water free of charge, and through the commissaries supplied them with foodstuffs and clothing, as well as luxuries of various kinds, at practically cost prices."

"The commissaries of the Panama Railroad had been constructed to furnish foodstuffs of all kinds and all varieties of wearing apparel and household furnishings for a force of employees. In connection with its commissaries, cold storage, and manufacturing plants, including laundry, ice and bakery, and a wholesale warehouse for commissary supplies, ample for the needs of the maximum working force, had been erected by the Panama Railroad and were in full operation."

[Arthur Bullard, "Panama," quoting Isthmian Canal Commission Reports, 1907 and 1908.]

15 hotels were established for white Americans, meals costing 30 cents.

18 mess-halls were established for Europeans, day's board costing 40 cents.

23 kitchens were established for West Indians, with day's board costing 30 cents.

3,375 of 4,800 European laborers preferred this system of living.

The Commissary is virtually "a modern department store."

"In the face of a constantly advancing wholesale market we are to-day selling goods cheaper *than at any period of our operations*. . . with the exception of pork products, on which the advance in (wholesale) price within the year has been phenomenal."

[*The Construction of the Panama Canal*, by William L. Sibert, Brigadier General, U. S. A., formerly Member of the Isthmian Canal Commission, and John F. Stevens, formerly Chief Engineer and Member of the Isthmian Canal Commission (D. Appleton & Co., 1915), pp. 92-108.]

The employment of the thousands of men necessary for the construction of the Panama Canal, under the conditions imposed and in a tropical climate, made imperative the provision of quarters not only ample in capacity, but also of such a character as to comply in every respect with modern sanitary requirements.

It will be obvious that the construction and fitting-up of proper quarters for an ultimate force of fifty thousand men of various ranks, races, and individualities involved a large and systematic program. To insure success, it meant that not only must a com-

prehensive plan looking to final results be definitely adopted, but also that an organization fully capable of its execution must be provided. The strict and very necessary regulations governing living conditions, which were promulgated and enforced to the letter by the Sanitary Department, added greatly to the time, cost, and general complexity of the problem. Requirements which had become recognized as standard by the custom of years were no longer guiding or limiting factors. The Americans took up this work on the same comprehensive and thorough lines which marked their methods in each and every direction.

Definite rules, based upon scientific research and conclusions, fixed arbitrarily the amount, not only of floor space, but also of the number of cubic feet per hour of fresh air that must be allotted as a minimum to each individual. The proportion of bathing accommodations to the number using them was fixed, as was also that of the other proper sanitary arrangements. Provision was required not only for ample lounging and sitting-rooms, but for the drying of clothes—a very necessary function in that wet climate.

All laborers' quarters were furnished ready for occupancy, and were as complete with regard to comfort and health as close supervision could make them. Owing to the natural indolence of these people, many of whom would only labor enough to secure daily bread, a rule was made that a certain minimum number of hours must be worked each week, to entitle them to the occupancy of Commission quarters and privileges. This rule worked well and tended to drive out the undesirable class, and promoted in a marked degree the efficiency of the whole.

The houses were of the two-story type, of two or four apartment capacity. They were designed to afford the maximum of air space and ventilation. They were placed well above the ground, to promote coolness and to protect from the ravages of ants. All doors and windows were thoroughly screened; also all porches or verandas, the latter generally being used as sitting or lounging-room, and the most popular one in the house. Shower baths of the most modern type were installed in every apartment, and all sanitary arrangements were of the best that our experts have produced. The interior finish of all houses was generally of planed lumber, painted white, no plaster being used on account of the dampness of the climate. Roofs were of metal, which answered admirably every purpose for the length of time the buildings were required.

Of all the buildings turned over to us by the French, about two-thirds, or some fifteen hundred of all classes, were rebuilt and

made to conform to requirements. They were of much value, especially in the saving of time. The assembling of the force of skilled laborers was delayed somewhat by the lack of necessary quarters, especially as it was advantageous to employ men with families, as far as possible. However, early in 1907, sufficient quarters had been provided to care for all men needed up to that time, and thereafter only such additional houses were built as the natural increase and changes in the force demanded, as new work was opened up, or existing work was brought to a finish.

Feeding the Force

In any study of the problem of properly feeding a mixed force exceeding fifty thousand people on the canal work, it must be remembered that the Isthmus and adjacent countries produce little of food supplies, especially for the force of white employees. Practically all of such supplies could come only from the United States.

During this period, an extensive and thoroughly modern refrigerator plant, provided with three grades of temperature, was built on the docks at Cristobal—the Zone port at Colon. An ice-making machine, a bakery, and laundry were included in this plant.

So perfect were the arrangements, that from the time fresh meats were loaded on shipboard at New York, they never came into contact with the outside air until delivered to the consumer. In addition to the handling of fresh meats by refrigeration, the same system was employed in supplying all varieties of perishable food—the list of which in a tropical climate was formidable. After the plan had been well established and its successful working demonstrated, the demand for increased varieties was met. In addition to all kinds of vegetables, dressed fowls, eggs, butter, milk, and even fresh strawberries, were successfully handled. At first, most of the fish supply was sent from the United States, but later, arrangements were made to secure from local parties ample quantities of the finest food fishes in the world.

While all these plans were being perfected, the Commission, probably having little faith in their success, awarded a contract to a private party to furnish meals to employees. The prices fixed in the contract were to be much higher than those which had been demonstrated were necessary, and which had already been established. A vigorous protest against such a contract was made by the Chief Engineer, with the result that it was canceled. If carried out, it would have resulted in disaffection and trouble through-

out the entire organization, and in large unwarranted profits to the contractor at the expense of the employees.

Thus, the policy of the Commission of feeding and supplying the material wants of its great force of employees was continued. And so perfect were the arrangements, and such care and business ability were displayed, that the cost of living on the Isthmus was materially less than for the same standards in the United States. The Commission was able to effect this result by cutting out the usual profits of all middlemen, and the only advance that was made over first cost and transportation was enough to cover handling and amortization of cost of plants. For example, the Chief Engineer, who paid the same prices as everybody else, had daily on his table the very best cuts of fresh meats, in superb condition, at materially lower cost than he paid in Chicago—not five miles from the slaughtering pens—for the same quality.

The same results were obtained in a greater or less degree all through the long list of goods supplied by the Commissary. On such as might be called luxuries, a larger advance in price was made than on the necessities. But the aim from the first was to furnish all supplies just as near actual cost as possible. As methods improved, and experience showed that it could be done, prices were reduced from time to time. Weekly lists were issued, giving the current prices of all necessities, and attention called to all changes. The "increased cost of living" was never an issue on the Isthmus, and no such advances in the price of supplies were ever made, as were in effect in the United States during the same period. A careful study and close analysis of the reasons why the Commission was able to carry out its policies so successfully might throw a flood of light onto a problem which has been for some years a burning issue with the American people.

SANITATION IN PANAMA

[Surgeon General W. C. Gorgas, *Sanitation in Panama* (Appleton), pp. 275-283.]

[Havana work by Gorgas in 1901 had cut down the annual death rate from yellow fever from 500 to zero, and the death rate from malaria from 400 to less than 20. There was only one case of yellow fever in the fifteen years following.]

In 1906, when our malarial rate was highest, we had eight hundred out of every thousand of our employees admitted to hospitals on account of malaria. In 1913 we had only seventy out of every

one thousand of our laborers admitted for this disease. The yearly table for malarial rate is as given below:

1906	821	per 1,000
1907	426	" 1,000
1908	282	" 1,000
1909	215	" 1,000
1910	187	" 1,000
1911	184	" 1,000
1912	110	" 1,000
1913	76	" 1,000

Yellow fever was entirely eradicated. In 1904 we had a few cases, and in 1905 a sharp epidemic. In November, 1905, the last case occurred in the city of Panama, and in May, 1906, the last case in the town of Colon. Since that time no cases have originated on the Isthmus.

The work of the Sanitary Department of Panama has without question been a most useful adjunct in the construction of the Canal. It has enabled this work to be carried through with a minimum of loss, both in regard to sickness and death among employees engaged in construction work in the Canal Zone. We have no means of telling what was the sick rate with the French during the period of construction under the old French Company, from 1881 to 1889, but we know that it was very large.

Our Army in Cuba during the Santiago campaign had during the last two months of our stay there a constant sick rate of over six hundred per thousand. Undoubtedly, the French rate approximated this during their period of active work, and we can safely calculate that their constant sick rate was at least three hundred and thirty-three per thousand, or one-third their force.

Our force during the ten years of construction averaged thirty-nine thousand men. If we had had a similar constant sick rate, we should have had thirteen thousand sick employees in our hospitals every day during the ten years of construction. As it was, we had only twenty-three per thousand sick each day, a total of nine hundred for the whole force; that is, we had about twelve thousand fewer men sick every day than had the French. This twelve thousand men per day saved from sickness must be credited to the sanitary work done on the Isthmus.

Now let us consider the totals: We had an average of 900 men sick every day. For the year, this would give us 328,500 days of sickness, and for the ten years 3,285,000 days of sickness. If our rate had been 300 per 1,000, a very moderate figure compared with

what it was under the French, we should have had 11,700 sick every day. For the year, this would have given us 4,270,500 days of sickness, and for the ten years, 42,705,000, a saving of 39,420,000 days of sickness during this period. This saving must justly be credited to sanitation.

It cost us about one dollar a day to care for a sick man on the Isthmus. The Commission cared for the sick free of charge. Every day, therefore, of sickness prevented on the Isthmus lessened the expense which the Commission had to bear by one dollar. The Commission was therefore saved by this sanitary work, if we consider the whole ten years of construction, \$39,420,000.

During the ten years of construction, we lost by death seventeen out of every thousand of our employees each year. That is, from the whole force of 39,000 men, 663 died each year, and for the whole construction period we lost 6,630 men. If sanitary conditions had remained as they had been previous to 1904, and we had lost, as did the French, two hundred of our employees out of each one thousand on the work, we should have lost 7,800 men each year, and 78,000 during the whole construction period.

We therefore claim for the work of the Sanitary Department the saving of 71,370 human lives during the building of the Panama Canal. Where one man died, probably three would have returned home broken in health, with months and years of suffering and invalidism ahead of them.

[Report of the Department of Health of the Panama Canal, 1914.]

Statistics as to the death rate among employees of the Isthmian Canal Commission and Panama Railroad Co. for the calendar year just closed, compared with similar figures for the previous years since 1904, are as follows:

	Number of employees.	Deaths.	Rate per 1000.
1904	6,213	82	13.26
1905	16,512	427	25.86
1906	26,547	1,105	41.73
1907	39,238	1,131	28.74
1908	43,891	571	13.01
1909	47,167	502	10.64
1910	50,802	558	10.98
1911	48,876	539	11.02
1912	50,893	467	9.18
1913	56,654	473	8.35

The death rate among our white employees from the United States from disease was 2.50 per thousand. If we include American woman and children, it will raise the death rate of Americans from disease to 3.40.

Taking special diseases, the deaths among our employees have been:

	1905	1906	1907	1908	1909	1910	1911	1912	1913
Typhoid fever	12	42	98	19	13	13	10	4	4
Dysentery	14	69	48	16	8	21	13	8	6
Pneumonia	93	413	328	93	70	73	94	57	47
Malaria	86	233	154	73	52	50	47	20	21

[Report of the Department of Health of the Panama Canal, 1915.]

The total admission rate to hospitals only was 186.17, compared with 244.49 for 1914 and 351.10 for 1913.

The total death rate was 5.77, as against 7.04 in 1914 and 8.35 in 1913.

The constantly non-effective rate for the year, all causes, was 10.28, as compared with 12.22 for 1914 and 15.97 for 1913—a net reduction of 36 per cent since 1913.

Stated in another way, these figures mean that had our various rates remained the same in 1915 as for 1913 we would have had 6,915 more admissions, 90 more deaths, and 72,243 more sick days than we did have.

It is hard to estimate the actual saving in money, but the following figures will give an idea of what it is, taking the average pay of a white employee at \$150 per month, and the cost of his treatment in hospital \$1.82 per day, and the average pay of a black employee as \$30 per month and his hospital treatment at \$0.87 per day.

The saving in days lost by white employees in hospital, 25,061 days, at \$5 in salary and \$1.83 for hospital treatment, equals \$171,166.63. Black employees in hospital, 27,984 days at \$1 per day salary and \$0.78 per day for hospital treatment, equals \$49,811.52, or a total saving of \$220,978.15.

With regard to malaria, which is our principal cause of disability, the admission rate, hospital, and quarters, was 51.20 as compared with 81.52 in 1914—a reduction of 37 per cent from the latter year. The death rate was 0.23 in 1915, 0.16 in 1914, and 0.37 in 1913—a net reduction of 38 per cent since 1913. Two whites and six blacks died of this disease; 1.19 employees per thousand were constantly sick with malaria in 1915.

In my opinion, all the permanent towns for employees in the Canal Zone are now practically free of endemic malaria, except Cristobal, Colon, and Gatun, and these towns will be free of it when the improvements planned are completed. It should be clearly understood, however, that these conditions obtain only in sanitated areas, and that exposure outside these areas will always involve danger of malaria; also, that the immunity at present enjoyed in sanitated areas will continue only as long as the present maintenance work is kept up.

[In the ten years of construction \$20,000,000 was expended for sanitation, 700,000 gallons of oil being used for the extermination of malarial and yellow fever mosquitoes.]

OPERATION OF THE CANAL

[George W. Goethals, op. cit., p. 96.]

The President is authorized to build and maintain dry docks, ships' coaling stations, wharves, and other facilities, for providing coal and other materials to vessels of the government, and incidentally for supplying ships with such necessaries, at reasonable prices, as they may require.

[*The New Statesman*, Supplement on State and Municipal Enterprise, May 8, 1915.]

How much the *canal administration* provides (in addition to the waterway, the locks or hydraulic lifts, and the wharves and quays) varies from place to place. On the Panama Canal the United States Government acts as shipping agent without charge, performing at request all agent's services (other than soliciting cargo), such as coaling, provisioning, chandlery, and payment of tolls. Repairing shops and fuel oil plants are already in operation, and Government dry docks and coaling plants will be at work shortly. On the Teltow Canal in Germany the Government provides towage by electric tractors on the bank, and on the St. Quentin Canal in France the Government does the haulage by tugs on a sunken chain—this union of haulage with canal administration is apparently to be the rule with electric traction on the new German canals. Up to the present the haulage, like the provision of the canal boats, has usually been left to capitalist enterprise. Yet in some countries there are Government services of canal barges—this may, by electric traction, become once more an important means of transport; and on the new Rhine-Hanover Canal there is to be a State fleet of electrically driven barges available for consignments, large or small.

[Report of the Panama Railroad Co., June 30, 1914, p. 5.]

In order to facilitate canal operation and develop the railroad's earning capacity in other directions than from its continued local and through business to Panama city, it was decided to push to completion improvements at its terminals on both oceans to effectively furnish berthing facilities for the loading and discharging of vessels, cargo handling, transfer services, fuel, material, and supplies, and for necessary repairs to vessels using the canal at prices slightly in excess of cost.

[Official Handbook of the Panama Canal, pp. 16-26.]

For a steamship owner or agent to send a vessel through the canal is one of the simplest matters in all his business. Practically all he has to do is to make a deposit with the Government to cover the vessel's canal expenses. The Government will attend to everything else,—and return his change as soon as the vessel has cleared from the canal.

By whichever method the advance payment is made, it should be amply sufficient to cover the estimated tolls as well as any other probable expenses, such as for fuel, supplies, cable messages, etc. Whatever balance is due the depositor after the vessel's expenses have been paid will be refunded him, by check on the Treasurer of the United States, directly after the vessel has cleared from the canal. If the depositor expressly requests it, any balance due him will be left to his credit, to apply on future bills.

In line with its policy of making the canal thoroughly serviceable in a commercial sense, the Government is equipping it with all requisite facilities to minimize the incidental delays and expenses of vessels passing through it.

The facilities are now ample for the present traffic, except for the lack of a large dry dock. The concrete is now being placed for the permanent dry dock at Balboa, which will accommodate the largest vessels afloat, and is to be finished by the end of 1915.

Extensive fuel-oil handling plants, with which are connected tanks belonging to individuals and companies, as well as those erected by the Government, have been established at both terminals of the canal. Oil can be supplied to ships at the rate of 1,200 barrels per hour to each vessel.

The permanent coaling plants, now under construction at both terminals, will each be able to load coal into bunkers of vessels at the rate of 2,000 tons per hour. The plant at the Atlantic entrance

is to have a storage capacity of a little over 400,000 tons, and that at the Pacific entrance will have a capacity of 200,000 tons. Both will be equipped with unloading and loading cranes. These plants are to be completed early in 1916. The present means of supplying coal to vessels are from lighters at the Pacific entrance, and from lighters, or from cars alongside the wharves, or by cantilever crane at the coal wharf at the Atlantic entrance.

Water is supplied from the mains on the terminal wharves and piers. The water in Gatun Lake is fresh, but is not safe for drinking purposes in an untreated state. The water sold at the docks is drawn from the regular water-supply systems and has been purified.

As The Panama Canal and the Panama Railroad Company are together operating a large number of vessels of a variety of classes, from tugs to ocean-going passenger and freight vessels, supplies for practically any kind of vessel are kept on hand on the Isthmus. Such supplies are for sale to all ships using the canal, or calling at the terminal ports. The storehouses at Cristobal and Balboa have in stock all standard lubricants, light and heavy hardware, cordage, and miscellaneous ship-chandlery supplies.

Foodstuffs and the general variety of merchandise handled by the commissary department of The Panama Canal may be purchased for ships. The fact that the supply department is supplying regularly most of the food and wearing apparel of approximately 50,000 people is a warrant that its operations are on a scale which can easily include the needs of ships now coming to the canal. Prices are generally lower than the retail prices in the United States, or possibly about 10 per cent higher than the wholesale prices there, and compare favorably with prices in any port of the world.

A large stock of fresh meats, vegetables, fruits, canned groceries, bakery products, etc., is always on hand, and advance arrangements can be made for supplies of any article obtainable in the markets of the world.

Ice may be purchased in any reasonable quantity.

Laundry is handled quickly. No advance notice is required, and ship's laundry can be returned on the same day it is received. A vessel entering the canal can forward its laundry by rail to the plant at Cristobal or the one at Ancon and receive it back by the time it is ready to clear from the other end of the canal. Passengers' laundry can be handled with corresponding dispatch, but it is preferred to have at least two days for the work.

Except for the limitations imposed at present by the absence

of a large dry dock, and of lathes for turning the largest crank shafts and longest line shafts of modern vessels, the canal shops can do practically any repair work which a vessel might bring. Sufficient materials, including heavy billets and all sizes of plates and angles, are kept on hand to meet every probable need. The foundry can make steel castings up to 5 tons in weight, and iron castings up to 10 tons, as well as brass castings of any ordinary size.

The shops at Balboa are equipped with a 540-ton hydraulic forging press, an open-side extension planer with capacity to plane 132 inches wide, 96 inches high, and 24 feet long, lathes large enough for ordinary line-shaft work, and the usual accessories of fully equipped machine, boiler, and shipfitters' shops. The shops alongside the dry dock at Mount Hope can do small machine work of moderate size, and practically any plate work likely to be required. By submitting to the delay necessary to transport parts to Balboa, all the facilities of the Balboa shops are also available for work at Mount Hope. The Mount Hope Dry Dock can take ships drawing $13\frac{1}{2}$ feet of water and 300 feet long; the permanent dry dock now under construction at Balboa will take any vessel that can pass through the canal.

The Balboa shops contain a plant for the generation of oxygen and acetylene, and both they and the shops at Mount Hope are equipped with tools for all kinds of cutting and welding. Compressed air, steam, water, oil, and electric current are available at the repair wharves in the maximum quantity required. Locomotive and wrecking cranes are available at the wharf side for lifting, and a derrick barge with a lifting capacity of 40 tons may be brought into service if necessary. Two floating derricks of 250-tons capacity have been erected and are practically ready for service.

Contracts for doing repair work at a stated cost can not be made by The Panama Canal, though estimates of probable cost can be furnished from the shops. Charges are made on the basis of actual cost of repairs, plus a percentage to cover overhead expenses, prescribed by The Panama Canal.

The Hotel Washington at Colon and the Hotel Tivoli at Ancon, adjoining Balboa, and the Hotel Aspinwall, on Taboga Island, are owned and operated by the Government for the accommodation of the traveling public. Reservations can be made in the same way as at privately owned hotels.

Ancon Hospital is equipped with 800 beds. It treats about 35,000 cases a year, in which approximately 7,000 surgical operations are performed. Its staff of physicians and surgeons includes

men of marked experience and ability and several experts in tropical medicine. The treatment of cases from neighboring countries and from ships is a part of its regular work.

Direct cable connections extend from the Isthmus to New York and to the west coasts of Mexico, Central and South America. The radio stations at Colon and Balboa handle commercial business.

CHAPTER XVI

INLAND WATERWAYS

THE extraordinary development of inland waterways on the Continent of Europe has been almost wholly the result of governmental enterprise. This has been due partly to a preference of these nations for public enterprise in all great transportation systems, and partly to the fact that it is almost as difficult physically to deliver canals into private hands to-day as it would be to surrender rivers or harbors.

Canals are to be viewed as related on the one hand to rivers and on the other to railways. They are often developed as a substitute or supplement of railways, and the two means of transportation are nearly always more or less in competition with one another. The government ownership of railways and of canals are in reality but two parts of a single problem of inland transportation. Therefore the government ownership party often regards the nationalization of canals as the best opening wedge for the nationalization of transportation generally, though opponents of the government ownership of railways often admit the entire legitimacy of the nationalization of canals.

It is thus clear that the government ownership of canals has a double importance. It throws a certain light on the success or failure of government in the field of transportation—and especially of construction—and it helps us to decide whether we are moving in the direction of government railways. Especially when canals have been highly successful, and when all the most promising projects have already been developed, we usually find that the public begins to demand the nationalization of at least a part of the railways.

Our material is drawn from the very full report of the United States Waterways Commission [U. S. Senate Document No. 469, 62nd Congress, 2nd Session, pp. 91-94, 75, 76, 475, 483, 20, 21.]

The general policy of almost all European countries has been toward the development and improvement of their waterways, though of late years in a few instances projects already adopted have been abandoned or prosecuted without assurance of early completion. It is difficult to make reliable comparisons between the amounts expended for waterways in those European countries in which the General Government appropriates money for this purpose, and the amounts spent in the United States, partly because in Europe the expense of improvement is often shared by the state and the provinces, districts, and individuals affected, and partly because far greater amounts have been expended for wharves, ice harbors, local basins, and other facilities for harbors and river-borne commerce than is customary with us. Inland harbors especially are developed on a much more extensive scale in Germany, France, and Belgium than in the United States. The city of Frankfort, for example, is now carrying out new harbor works, the cost of which, including land purchase, will be approximately \$17,640,000. The whole amount will be defrayed by the city without state aid.

From 1814 to 1900 the Government of France spent on inland waterways approximately \$301,000,000 for improvement and construction (including levees, revetments, etc.), and over \$148,000,000 for maintenance and heavier repairs. Belgium spent for the construction of state waterways from 1831 to 1905 about \$77,000,000, and for current improvements and maintenance about \$24,000,000. Between 1813 and 1906 Prussia spent for waterway construction and improvements about \$129,000,000, and for maintenance in 1905 about \$4,000,000. The congressional appropriations in the United States for the survey, improvement, and maintenance of harbors and waterways from 1802 to March 2, 1907, amounted to almost \$553,000,000, of which sum about \$69,000,000 were spent up to 1906 upon canals and canalized rivers. In an official document published in 1903 the relative amounts appropriated for rivers, harbors, and canals to and including December 31, 1902, is stated, namely, \$221,869,759 for rivers, \$147,448,903.32 for harbors, and \$33,237,857.24 for canals. But it must be remembered that the United States is about 18 times as large in area as either France or Germany, and the length of its navigable rivers and canals is nearly four times as great as in France and more than four times as great as that of Germany. In all these cases what the central governments have appropriated for waterway improvements is only a part of the total amount expended. In the United States, for

instance, about \$214,000,000 have been spent upon canals by States and corporations.*

Sedulous care is taken by most European countries for the protection of inland water-borne traffic against railway competition. In France this is accomplished by enforcing a differential of 20 per cent in favor of the waterways as against railways, with the evident intention of maintaining both methods of transportation. In a majority of the other countries in which water transportation has reached its highest development the railways wholly or partially belong to the state. This is true in Germany, Austria, Hungary, Holland, and Belgium. The well-established policy in these countries is to secure co-operation between railways and waterways by official control of railway rates, with a view to maintaining profitable traffic on the latter. The following tables, compiled from Volume VI of the Report of the Royal Commission on Canals and Waterways, show the comparative mileage and the comparative tonnage of the railways and waterways of Belgium, France, and Germany:

BELGIUM

Year.	Length (in miles).		Tonnage (in 1,000 tons).	
	Waterways.	Railways.	Waterways.	Railways.
1888	998.4	2,364.7	24,836	40,352
1890	1,018.2	2,378.4	25,242	42,990
1895	1,009.7	2,407.8	30,242	46,664
1900	1,015.6	2,881.2	38,178	55,108
1903	1,015.6	2,874.4	49,020	59,297
1905	1,015.6	2,873.8	53,345	65,319

FRANCE

1880	6,782	14,315	18,000	80,774
1885	7,676	18,500	19,573	75,192
1890	7,670	20,634	24,167	92,506
1895	7,614	22,469	27,174	100,834
1900	7,533	23,436	32,446	126,830
1903	7,589	24,149	33,340	129,305
1905	7,483	24,459	34,030	139,000

*Census Report, Transportation by water in 1906, p. 44.

GERMANY

1875	* 6,200	16,430	20,800	167,000
1885	6,200	22,940	27,600	200,000
1895	6,200	27,780	46,700	331,000
1900	6,200	30,750	73,000	487,000
1905	6,200	33,730	103,400	588,700

* Although new waterways, with a length of several hundred miles, have been constructed since 1875, other waterways, aggregating about the same length, have entirely lost their importance and are therefore excluded, so that the total length is accepted as unchanged. If all abandoned or insignificant lines are included, the total length of German waterways may be estimated at from 7,709 to 8,500 miles.

The commission has had under consideration the question of the construction of artificial canals adapted to the passage of seagoing ships. An examination of this subject has led to the conclusion that this class of waterways is only profitable under certain well-defined conditions, of which the following are the best illustrations:

First. Canals connecting navigable waters located near to each other, between which large traffic would naturally exist, except for rapids, a barrier readily overcome, or the existence of a comparatively narrow strip of land. The Sault Ste. Marie Canal, connecting Lakes Superior and Huron, is perhaps the best example. This canal, 1.6 miles in length and constructed at a cost of about \$9,300,000, renders the almost unlimited resources tributary to Lake Superior available to the other lakes and provides for a return commerce considerably less in value. Other illustrations are the Welland Canal, 26 $\frac{3}{4}$ miles in length, with 26 locks, connecting Lakes Erie and Ontario, and the Lachine Canal, constructed for the purpose of obviating rapids in the St. Lawrence River.

Second. Comparatively short canals, which save a very great sailing distance, such as the Suez Canal, 87 miles in length, which furnishes a substitute for the voyage around Cape of Good Hope and saves in the sailing distance from Northern and Western Europe to Calcutta 3,700 miles, and to Hongkong, by the Straits of Sunda, 3,300 miles. Also the proposed Panama Canal, 49 miles in length, which obviates a voyage around Cape Horn and saves in the sailing distance from New York to San Francisco more than 8,000 miles. Another illustration is the Kaiser-Wilhelm Canal, 53 miles in length, which, though constructed primarily for military purposes, is largely used for commerce and saves in distance for vessels bound from the English Channel to the Baltic about 200 miles.

Third. Canals from the sea to large cities situated not far from the coast, where communities have grown to large size and become great producers or consumers of freight without connection with the ocean. In these cases, with increased commercial and manufacturing importance, it has become a practical necessity to establish communication with the sea. The best illustration of this class is the Manchester Canal, 35½ miles in length, with a least depth of 28 feet. The canals in Belgium, from the North Sea to Bruges, to Ghent, and to Brussels, are also good examples of this class.

The reasons for the disadvantages of canals as compared with natural waterways are obvious. In a narrow channel a boat moves with much less speed and with far greater difficulty and danger than in a natural waterway where there is sufficient sea room. Since the speed of the slowest boat determines the speed of all, it is not probable that any time could be gained by using a canal unless the distance saved were very considerable.

[SOURCE: Appendix IX of above report, by E. O. Merchant.]

The history of inland water transportation may be divided into three periods. During the first period, which began with the sixteenth century and closed with the advent of railway building, the waterways furnished the principal means of transportation. Their only competitors were the pack horse and the highway or turnpike, and the advantage which they enjoyed often made them profitable enterprises. The second period was one of competition with the railways, which resulted in a marked decline of water transportation and generally left the waterways in a decadent condition. The third period is marked by the revival of water transportation, which began in France, Germany, and Belgium as early as 1870.

The period of railway building commenced about 1830. In Europe within 10 years competition between the railways and waterways became severe. This continued for the next 30 or 40 years, at the end of which time the waterways were generally left in a decadent condition. The first railroads often intersected the waterways and served as feeders. As soon, however, as parallel lines were built active competition began. The passenger traffic was the first to pass to the railways. In fact, many of the first railways were intended primarily for the purpose of transporting passengers, and their facilities for carrying freight were very limited. Following the loss of passenger traffic, the higher grade freight business, in which speed was an essential factor, was next to pass to the railways, and finally when the railways had amalgamated sufficiently

to form through routes and to offer cheaper rates, they also secured most of the coarse, bulky traffic carried by the waterways.

The period of active canal building in the United States ended with the panic of 1837. The depression which followed caused the failure of many speculative canal enterprises. Also by this time the railroad had demonstrated its usefulness, and people turned their attention to railway building with the same enthusiasm previously shown for canal enterprises.

In the course of a few years practically every one of the private canal companies in New York, Pennsylvania, and New Jersey passed into the hands of their railway competitors, and in Pennsylvania, owing to the dissatisfaction of the people with the results of canal construction and popular discontent caused by the heavy burden of debt incurred, the State system of canals during the period 1845 to 1859 was also sold to the railway companies. New York and Ohio retained control of their principal State canals despite popular dissatisfaction which at times manifested itself. Since 1837 the aggregate length of the canals which have been abandoned is about 2,244 miles, representing an original investment of more than \$80,000,000.

Renewed interest in the development of water transportation began in France during the sixties and in Germany during the seventies. In England, also, investigations were made about the same time and legislation passed to protect the waterways against railway competition. This renewed interest was due principally to a growing hostility toward the railways, which was engendered by discriminations, high rates, and lack of adequate service. In France in 1861 a congestion of traffic took place, which the railways were unable to handle, and great losses resulted to shippers. Furthermore, the railways insisted that they could not make any further reductions in their rates. The high charges which they exacted wherever they enjoyed a monopoly caused much dissatisfaction and the people began to turn their attention to the possibility of relief which their neglected waterways might afford.

The agitation for waterway improvements in France resulted in the adoption of the Freycinet program in 1879, which provided for the taking over of most of the concessions, the improvement and standardization of the waterway system, and the construction of new canals, aggregating some 800 miles in length. The carrying out of this program would have meant an expenditure of nearly \$140,000,000. But many of the projects then adopted have never yet been undertaken. From 1871-1905 extensive improvements were

also made on the German waterways. The rivers were deepened and linked together with canals. And the largest expenditures for improvements in Belgium were made during the years 1870-1900, when the waterway system was enlarged and standardized to accommodate 300-ton barges.

The striking feature of this movement for the revival of water transportation in Germany, France, and Belgium was the nationalization of the waterways and large expenditures by the central Government upon their improvement and maintenance. Since 1879 France has acquired all but 158 miles of waterways, the principal exceptions being three short canals belonging to the city of Paris. Belgium has acquired all but about 17 per cent of her waterways. The ship canal from the Rupel to Brussels was constructed by a society of communes, and several of the other canals are still operated by private companies under concessions which have not yet expired. The German States have also taken over most of their waterways. The principal exception in Prussia is the new Teltow Canal, near Berlin, completed in 1906, which was built and is administered entirely by the district of Teltow.

Where the revival of water transportation is in progress the shallow-draft canals are being replaced by modern canals of standard dimensions. The old methods of towage by mule or by man power are now being superseded by towing steamers or electric tractors. Terminals are being built and equipped with the latest appliances. Better types of boats and barges are being used. The tendency also is to make use of rivers whenever their improvement is practicable, rather than to construct lateral canals.

The growth of water transportation in Germany, France, and Belgium during the last four decades has been phenomenal. From 1875-1909 the traffic on the German waterways increased 433 per cent. During the period 1880-1909 the traffic on the French waterways increased over 90 per cent, and in Belgium, during the years 1890-1907, the traffic on the inland waterways increased almost 115 per cent. The table on the following page shows in parallel columns the growth of traffic in these three countries.

While the statistics for Russia are not so complete, it is reported that during the last decade water-borne traffic has increased 100 per cent. In Austria-Hungary during the same period the traffic on the inland waterway system has increased about 10 per cent.

The growth of traffic on the inland waterways of France, Germany, and Belgium has been more rapid than the growth of traffic on the railways, and this notwithstanding the fact that the length

Year.	Germany. ¹	France.	Belgium.
	<i>Tons.</i> ²	<i>Tons.</i> ²	<i>Tons.</i> ²
1875.....	13,600,000	.....	.....
1880.....	.....	18,000,000	.....
1890.....	.....	24,167,000	25,242,000
1895.....	30,000,000	27,174,000	30,242,000
1900.....	46,600,000	32,446,000	38,178,000
1905.....	67,000,000	34,030,000	53,345,000
1907.....	.....	34,702,000	54,164,000
1909.....	73,357,000	35,624,000	.....

¹ The figures usually given for Germany are much larger than these, since they include total receipts and shipments. In 1909 they amounted to 118,495,448 tons. But they could not be compared with those of France and Belgium, from which all duplications have been removed.

² In these three countries the metric ton of 2,204.6 pounds is meant.

of the waterway systems has scarcely increased while that of the railways has increased about 25 per cent in Belgium, 50 per cent in France, and 100 per cent in Germany. During the period 1875-1909 the rail tonnage in Germany increased about 350 per cent; in France during the period 1880-1907 it increased about 72 per cent; while in Belgium during the last two decades the increase of traffic on the railways has been about 62 per cent.

The importance of water transportation in Germany is shown by the fact that at several of the largest inland cities the receipts and shipments by water are nearly as large as those by rail. Since 1885 the waterways focusing at Berlin have carried from 40 to 50 per cent of the total receipts and shipments. Until recently the receipts by water have exceeded those by rail. At Hamburg the receipts by river are nearly equal to those by rail, while the shipments by river are several times those by rail, as shown by the following table:

Receipts and Shipments from Hamburg

Year.	Rail.		River.	
	Receipts.	Shipments.	Receipts.	Shipments.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
1900.....	2,360,877	1,306,414	2,606,920	3,457,214
1905.....	2,865,154	1,697,773	3,001,172	4,643,465
1908.....	3,357,477	1,879,246	3,082,776	5,522,724

In collecting tonnage statistics both for the railways and waterways in Germany the country is divided for convenience into what are known as traffic districts. Inasmuch as these are the same for both agencies of transportation, the opportunity is afforded for making comparisons between their respective receipts and shipments.

The following table shows a number of examples where the water traffic is almost as large, if not larger, than that transported by rail. The first district includes Hamburg.

*Receipts and Shipments in Traffic Districts for the Year 1909*¹

	Receipts.	Per cent.	Shipments.	Per cent.	Total.	Per cent.
	<i>Tons.</i>		<i>Tons.</i>		<i>Tons.</i>	
Lower Elbe, Geesthacht and vicinity:						
Rail	4,898,238	48.8	3,541,897	40.9	8,440,135	45.2
Water	5,129,766	51.2	5,111,115	59.1	10,240,881	54.8
Berlin and suburbs:						
Rail	13,274,424	55.1	3,627,062	86.4	16,901,486	59.8
Water	10,812,659	44.9	572,401	13.6	11,385,060	40.2
Duisburg-Ruhrort:						
Rail	16,393,262	77.3	6,064,011	30.2	22,457,273	54.4
Water	4,822,761	22.7	14,018,210	69.8	18,840,971	45.6
Mannheim and Ludwigs-hafen:						
Rail	2,224,538	21.6	4,059,776	68.9	6,284,314	38.8
Water	8,074,222	78.4	1,830,996	31.1	9,905,218	61.2

¹ Statistik des Deutschen Reichs, Band 235, I, 1909, Part I, pp. XII and XIII.

If either the receipts or shipments by rail and by water of some particular commodities such as coal are compared, it will be found that the waterways sometimes handle as much as 90 per cent of the traffic. This is especially true of the coal receipts at a number of Rhine ports, such as Mannheim, Gustavsburg, Rheinau, and Strassburg, and of coal shipments at Kosel on the Oder. It is also true of the receipts of sand, gravel, and building stone at Berlin and a number of other cities having a large population.

At some of the Belgian ports, particularly Bruges and Ghent, the receipts and shipments by water compare very favorably with those by rail. At Paris the waterways handle nearly half of the total receipts and shipments, as shown by table on the following page, which is for 1910.

There are also a number of cities in France where the waterways carry more than 30 per cent of the total traffic and more than 50

per cent of either the receipts or shipments, taken separately, while for some particular commodities like coal, the shipments by water at Denain on the Escaut, Douai on the Scarpe, Bruay on the Canal d'Aire, and other cities in the coal-mining districts of northern France greatly exceed those by rail. At some other ports, such as Bordeaux on the Saône and Lyon on the Rhone, the receipts of sand, gravel, and building stone by water exceed those by rail.

	Shipments.		Receipts.		Total.	
	Tons.	Per cent.	Tons.	Per cent.	Tons.	Per cent.
Waterways.....	2,357,712	44.0	6,563,749	47.0	8,921,461	46.0
Railways.....	3,016,911	56.0	7,389,065	53.0	10,405,976	54.0

Holland has never nationalized her waterways to the extent that France, Germany, and Belgium have, the reason being that they have never encountered as severe railway competition nor experienced a similar decline in traffic. The waterways exceed the railways in mileage and, it is stated, carry 90 per cent of the total freight traffic. The river system in Holland, comprising about 560 miles, is under the supervision of the national Government, while the canal system, aggregating about 2,408 miles, is under the supervision of the following authorities:

Under governmental authority	1,902 miles
Under private authority	372 miles
Under mixed authority	134 miles
Total	2,408 miles

The national Government maintains and improves the waterways under its supervision which are the most important, while the minor political subdivisions and private interests improve the remainder. The national Government also provides the entrances to harbors, while the municipalities furnish the docks and terminal facilities, except for several harbors of refuge which are owned by the Government.

The Control of Water Terminals

[Pp. 20 and 21 of above report.]

Undoubtedly the most essential requirement for the preservation and advancement of water transportation is the establishment of adequate terminals properly controlled. Under present conditions

the advantage of cheaper transportation which the waterways afford is largely nullified by the lack of such terminals.

According to the report of the Commissioner of Corporations on water terminals, private interests control nearly all the available water front in this country, not only at the various seaports, but also along the Great Lakes and the principal rivers. Only two ports in the United States, New Orleans and San Francisco, have established a public control of terminals at all comparable with the municipal supervision existing at most European ports.

The above-mentioned report on water terminals also shows that a large proportion of the most available water frontage is owned or controlled by railway corporations. Through this ownership or control they practically dominate the terminal situation at most of our ports, and they have generally exercised their control in a manner adverse to water traffic. In many cases they hold large tracts of undeveloped frontage which they refuse to sell or lease, and which are needed for the construction of public docks. This railway control of terminals is one of the most serious obstacles to the development of water transportation, for the control of the terminal means practically the control of the route. An independent boat line has small chance of success where it is denied the use of docks and terminal facilities or is required to pay unreasonable charges for their use. The high terminal charges at many of our ports make it impossible for small boat lines to enter at all.

The commission believes that the proper solution of this terminal question is most vital to the future of water transportation. It is, however, more a local or State than a Federal problem. The Federal Government should improve channels, while the municipalities should co-operate to the extent of providing adequate docks and terminals. It is absolutely essential for the growth of water transportation that every port, whether located on the seacoast or on some inland waterway, should have adequate public terminals, at which all boat lines can find accommodations at reasonable rates. Inasmuch as the indifference of communities to their responsibilities in this matter largely nullifies the benefits of expenditures by the Federal Government for channel improvements, the commission emphasizes the recommendation made in its preliminary report that further improvements in rivers and harbors be not made unless sufficient assurance is given that proper wharves, terminals, and other necessary adjuncts to navigation shall be furnished by municipal or private enterprise, and that the charges for their use shall be reasonable. It can not be too strongly urged that in many cases it is not

the condition of channels so much as it is the lack of terminals that is retarding the development of water transportation.

Where water frontage necessary for the establishment of public terminals is held undeveloped by railway or other private interests, a special act of the legislature should be passed, empowering State or municipal officials to condemn such property for public use. This plan has already been followed in a few cases and should be more widely adopted. The proposal has sometimes been made that the Federal Government should condemn private property and establish public terminals along the rivers and in the harbors which it is improving in order that the benefits of such expenditures may not be nullified. The commission, however, would not recommend the adoption of such a policy *unless* it shall be found after a fair trial that the States and localities can not adequately solve the problem. [Our italics.]

CHAPTER XVII

SHIPPING

GOVERNMENT ownership and operation of steamships, while still somewhat exceptional, is more widespread than most persons realize. Our selections show that such ownership and operation already exist on a large scale in Belgium, Brazil, Australia, and New Zealand, on a smaller scale in Russia, Italy, Rumania, Sweden, Japan, France, and the United States.

On the other hand, governmental subsidies accompanied by a large and growing measure of government control are the rule rather than the exception. It is useless to give a list of countries which give subsidies, as it will include nearly all the nations of the world. Moreover, when the principle has once become general, the tendency is for all nations to be compelled by competition with others to follow a similar policy. Of course a governmental subsidy without a large measure of control would be rather a support to private industry than a step in collectivism, but it will be seen from our quotations that a growing measure of control is usually present.

The probability that the governmental control of shipping for war purposes will—in some measure—survive the war has been mentioned in our Introduction. However, these policies are still shifting rapidly and we therefore confine our attention here to well-defined tendencies of the last quarter century.

GOVERNMENT-OWNED STEAMSHIP LINES

[SOURCE: Report on Government Aid to Merchant Shipping, by Grosvenor M. Jones, Published by U. S. Department of Commerce, 1916, pp. 26-29, 73, 74, 185, 203.]

State-Owned Steamship Lines

A number of countries own steamship lines. Belgium has owned for many years a number of vessels that have been operated between

Ostend and Dover in connection with the Belgian State Railways. *Lloyd's Register* shows that the Belgian Government owned, in 1914, 11 steamers, 3 turbine and 8 paddle-wheel boats. The turbine steamers are of about 1,700 tons gross capacity and have a speed of 24 knots. Three of the other steamers have a speed of 22 knots, and three others a speed of 21 knots. It is interesting to note that the speed of the 24-knot steamers is exceeded only by that of the *Mauretania*.

The relations between the Russian Government and three of the most important Russian steamship lines have been very close for a number of years. Almost from its organization, in 1878, the Volunteer Fleet has been under the control of the Ministry of the Marine and the Ministry of Commerce and Manufactures. It would appear that the relations between the Russian Government and the Volunteer Fleet are even closer than the relationship between the United States Government and the Panama Railroad Co. Line.

The property of the Russian Danube Steamship Co. was purchased by the Russian Government in 1903, when the company went into liquidation, and is now managed by a board appointed by the Chief of the Bureau of the Merchant Marine.

Upon a reorganization of the Archangel-Murman Steamship Co., in 1895, the Russian Government subscribed for about 56 per cent of the new capital stock.

By a law of April 5, 1908, the Italian Government intrusted to the State Administration of Railroads the operation, after July 1, 1910, of certain lines of navigation between the mainland and Sardinia and Sicily. Twelve steamships, with an aggregate gross tonnage of 30,250 tons, are operated in these services. Four of these vessels have a gross tonnage ranging from 3,262 to 3,497 tons and have a speed of 20 knots.

The bulk of the tonnage under the Rumanian flag is owned by the Government. In 1897 the Rumanian Government began the operation of a line of mail steamships between the Black Sea port of Constantza and Constantinople and Alexandria, and a line of cargo steamers between the Danubian ports of Rumania and Rotterdam. In addition, the Government operates a local line of steamers on the Danube. Four of the five mail steamers have a speed of 18.5 knots, while the other has a speed of 17.8 knots. Three of these steamers have a gross tonnage of more than 3,100 tons each. The five cargo boats that are operated on the line to Rotterdam range in tonnage from 2,125 to 2,255 gross tons, and three have a speed of 9.5 knots, while the other two have a speed of 10.3 knots.

Brazil owns the Lloyd Brasileiro, which is the largest steamship company flying the Brazilian flag.

The Swedish State Railways own three steamers, two of which are of more than 3,000 tons gross capacity and 16.5 knots speed.

Western Australia owns a line of small steamers, which "was established in 1913 to save to the settlers of the south coast the advantage of steamer service, which was in danger of being discontinued by the Commonwealth government owing to the prohibitive demands made by the private company formerly operating this line." *

The Imperial Government Railways of Japan own four steamers—two of 1,521 gross tons capacity and 18 knots speed and two of 3,107 gross tons capacity and 15 knots speed. These steamers are operated in connection with the Government Railways in the Korean Channel service between Shimonoseki and Fusan.

The United States Government operates, through the Panama Railroad Co., a line of three steamships plying between New York and Colon. The Government owns all of the stock of the Panama Railroad Co. excepting a few shares.

The State Railroads of France own eight steamers, which are operated in the channel service between France and England. Two of these steamers, the *Newhaven* and the *Rouen*, are turbine steamers with a capacity of 1,656 gross tons and a speed of 23.5 knots.

State Control of Privately Owned Steamship Lines

A striking tendency in the more recent mail contracts has been the provision for a large participation by the State in the affairs of steamship lines receiving the subventions. For example, the contract of the Austrian Lloyd Steamship Co. provides that three directors out of nine shall be named by the Austrian Government, the chairman to be named by the Emperor and two other members by the Minister of Commerce. The contract also provides that routes, ports of call, and freight rates shall be subject to approval by the Minister of Commerce, who may order changes therein. Important transactions affecting the property of the company must also be approved by the Minister of Commerce.

Reference has already been made to the close relations between the Russian Government and several of the larger Russian steamship lines, in particular the Russian Volunteer Fleet.

* From an unpublished monograph on the Government steamship service of Western Australia, prepared in January, 1916, by the Legislative Reference Division of the Library of Congress.

Under the recent mail contracts made with the leading Japanese steamship lines the Japanese Government has practically as much control over the affairs of these companies as would be possible under direct Government ownership. The extent of governmental control is indicated by the fact that all passenger fares and freight charges are subject to modification by the Minister of Communications, who must be consulted also in regard to arrangement of routes, ports of call, number of voyages to be made, and time of voyage.

Attention should also be called to the more recent mail contracts of the French Government, which provide for a large participation by the French Government in the affairs of these companies.

In a mail subvention contract for the Java-China-Japan Line the Government of the Dutch East Indies stipulated that the election of directors and representatives of the company, as well as the adoption of statutes and by-laws, should be subject to the approval of the Dutch Government, and that the Government should have the right to be represented at all meetings of the company and have power to examine all of its books and papers.

Even in connection with the small subsidies paid by the Norwegian Government there are a number of requirements restricting the independence of action on the part of the company. For example, a common requirement is that a certain amount be set aside for boiler-replacement fund, while another stipulation is that the Government may require special financial statements to be kept as it may direct.

State Participation in Profits of Steamship Companies

The first mail contract providing for a division of steamship earnings with the State was that of the Royal Mail Steam Packet Co., which was made in 1868 and provided that the British Government should receive one-half of all profits in excess of 8 per cent.

The contract of the Austrian Lloyd Steamship Co. has long provided for a division with the Austrian Government of all profits in excess of 6 per cent. On the one hand this policy may be urged as tending to limit subventions to an amount sufficient to pay a fair return on the capital invested. On the other hand, however, this policy has been criticised as discouraging enterprise. Nevertheless, the tendency is strongly toward a division of profits above a fair return on the investment.

Under a contract made in 1895 with the Royal Hungarian River & Sea Navigation Co. the Hungarian Government received one-

third of the net earnings between 5 and 7 per cent, and one-half of the net earnings above 7 per cent.

The recent contracts of the French Government with the Compagnie Générale Transatlantique, the Compagnie des Messageries Maritimes, and the Compagnie de Navigation Sud-Atlantique provide that the Government shall share in all profits in excess of 5 per cent after proper allowances have been made for interest, depreciation, and amortization.

Bulgaria, by reason of its ownership of one-fourth of the capital stock of the Bulgarian Steam Navigation Co., has participated in the profits of that company.

The Russian Government, which owns about 56 per cent of the capital stock of the Archangel-Murman Steamship Co., requires that three-eighths of all net profits in excess of 6 per cent shall be applied toward the diminution of the subsidy received by this company.

The Dutch East India Government receives from the Java-China-Japan Line two-fifths of the net earnings of this company of more than 5 per cent but less than 9 per cent, and three-fourths of the net earnings in excess of 9 per cent.

On the route between Vladivostok and the ports of the Okhotsk and Bering Seas four steamships were to be used and routes covering 55,000 miles per year were to be traversed.

In the Tartar Straits two routes were stipulated as follows: Between Vladivostok and Nikolaiefsk, which is on the Amur River; and between Vladivostok and Post Alexandrovsk. On the former route 12 voyages were to be made during the season of navigation, and on the latter route four voyages. The contract specifies also that two steamships should be used on the latter route.

The law of March 29, 1911, stipulated that the speed of the vessels to be used in the various services in the Far East was to be not less than 10 knots an hour, and the annual subvention for 1912 was fixed at 331,000 rubles (\$170,465).

The law provided also that the Volunteer Fleet was to build in Russian shipyards six new steamships, each with a freight capacity of not less than 8,000 tons and drawing not more than 15 feet of water when loaded. It was stipulated also that these steamships should have accommodation for not less than 10 first class, 30 second class, and 300 steerage passengers. The law provided that the Government should advance to the Volunteer Fleet for the purchase of the six new steamships a loan of 3,000,000 rubles (\$1,545,000) to be repaid in 20 annual installments without inter-

est. Provision was also made for the payment of shipbuilding bounty to the shipyards constructing these steamships. For this purpose 900,000 rubles (\$463,500) were to be paid in the year 1912 and 900,000 rubles also in 1913.

The degree of control exercised by the Russian Imperial Government over the affairs of the Volunteer Fleet is clearly indicated by the fact that the new charter and by-laws for the Volunteer Fleet were provided for by a law approved July 5, 1912, by the Imperial Council and the Duma. Clause 2 of article 1 of the new law and by-laws states that the "Volunteer Fleet shall be under the supervision of the Minister of Commerce and Manufactures." Article 7 provides that in case of a partial or general mobilization, or any other emergency, every vessel and any property on shore belonging to the Volunteer Fleet shall be transferred by order of the Minister of Commerce and Manufactures to the temporary use or to the full possession of the war and navy departments.

The extent to which the Russian Government controls the affairs of the Volunteer Fleet can best be learned by a reading of the entire charter and by-laws, which are reproduced in full in Appendix E, page 249.

On January 1, 1914, the Volunteer Fleet comprised 32 steamers, with an aggregate gross tonnage of 116,422 and a net tonnage of 65,651.

In further reference to the service that is now maintained by the State of Western Australia, the following extract from an unpublished monograph prepared in January, 1916, by the Legislative Reference Division of the Library of Congress will be of interest:

No formal act establishing the service was enacted, but a provision of the loan act of 1912 (3 Geo. V, No. 50 of 1912) allowing "Other State undertakings," £100,000 (\$486,650) for "steamships," and an item of the appropriation act of 1912-13 (3 Geo. V, No. 68 of 1912) granting £897 7s. 2d. (\$4,367) for the "Government steamship service," gave authority for the undertaking.

Four vessels have been put in operation at an initial cost of £105,634 2s. 4d. (\$514,068). Two of the ships are engaged in cattle trade between the southern and northwestern markets, one in mail and passenger service to the south coast, and one in carrying fish for the State fish supply.

The service is operated as a department of State under the Colonial Secretary, practical administration being in the hands of

the manager, who has wide discretionary powers. His decisions are subject to the approval of the Minister.

The fleet of the Western Australian Government steamship service comprises four vessels: * The *Western Australia*, 3,000 tons, twin screw, 18 knots, fitted with wireless and refrigerated space; capacity, 400 bullocks or 6,000 sheep. The *Kwinana*, 3,000 tons, capacity 700 bullocks or 10,000 sheep; the *Eucla*, 564 tons, 11 knots; the *Una*, 150 tons.

The authorizing act † for this service made provision for a £1,000,000 loan (\$4,866,500).

New Zealand

The Government of New Zealand has paid postal subventions since 1869, when a contract was entered into between New Zealand and New South Wales on the one hand and the Union Steamship Co. and the Pacific Steamship Co. on the other. The contract provided for a monthly service between Sydney and San Francisco via Auckland, and was made primarily to facilitate the dispatch of the colonial mails to and from England, the use of the newly completed transcontinental railroads in the United States shortening the time considerably.

The subvention amounted to £37,000 (\$180,060) per year, of which New South Wales paid £25,750 (\$125,312) and New Zealand £11,250 (\$54,748), and was continued until November, 1890, when a new contract was entered into and the amount of the subsidy largely reduced, the amount being based upon the weight of mail carried.

Various changes were made in this contract, but the last contract between the New Zealand Government and the Oceanic Steamship Co., an American line, terminated on November 10, 1906. From that time until April 12, 1907, this company carried the mails at Postal Union rates.

In 1907 the New Zealand Government entered into a mail subvention agreement with the Union Steamship Co., a New Zealand corporation, for a monthly service between Sydney, Wellington, and San Francisco.

Union of South Africa

For many years prior to the formation of the Union of South Africa, Cape Colony entered into a contract with the Union Castle

* Statement by Premier of Western Australia.

† 3 Geo. V, No. 50 of 1912.

Mail Steamship Co. for a weekly service of steamers between Cape Town and Southampton. The present contract, made in 1912 and running until 1922, provides for an annual subvention of £171,000 (\$832,172). An average speed of 16 knots per hour is required of the steamers operated on this line.

Italy

The Italian law of April 5, 1908, intrusted to the State Administration of Railroads the operation after July 1, 1910, of certain lines of navigation between the mainland and the near-by islands.

The *Annuario Statistico Italiano* for 1914 (p. 278) shows that in the year 1913 there were engaged in this service 12 steamships, with a total gross tonnage of 30,250 tons, which operated during the year on routes averaging 602 kilometers (375 miles) in length. The average number of persons employed during the year was 709; the number of passengers carried was 254,650; the quantity of baggage, 343 metric tons, and of merchandise, 26,994 tons.

Local Services

[SOURCE: *New Statesman*, Supplement on State and Municipal Enterprise, May 8, 1915.]

Local services are common enough, from the ubiquitous humble river ferry, for which a publicly provided boat may be propelled by the common ferryman for a customary fee, up to such highly organized steamboat enterprises as that of the Birkenhead Town Council across the Mersey; the canal service of the Venice Municipality; the steamboat service on the African Lakes maintained by the British East Africa Government, or the still more elaborate train ferries of the Government Railway Departments of Germany, Denmark, Norway, and Sweden, which cross the Baltic.

The Panama Steamship Line

[SOURCE: Report of the Panama Railroad Co. (G. W. Goethals, President), 1915, pp. 29-32.]

The company's steamship line was operated during the year without accident, its schedule and itinerary practically maintained, with a resultant net revenue of \$499,853.42, an increase of \$185,557.06 over the previous year.

The satisfactory results indicated were accomplished despite the fact that the company did not avail itself of the opportunity afforded by the scarcity of ships and other ocean freight conditions that prevailed throughout almost the entire fiscal year to increase its freight rates, as was done by practically all other steamship lines operating on the Atlantic, but maintained the policy by which it has been guided since the United States became the owner of the company's property of assuring shippers that so far as lies within its power stable, reasonable, and justifiable rates would be maintained.

As the result, the large tonnage carried by the company's steamship line to the Isthmus for the construction, maintenance, and operation of the Panama Canal was carried at rates much lower than those charged by other steamship lines on traffic to and from ports in the Bahamas and West Indies that are nearer to New York than those in the Canal Zone; while shipments to ports on the Pacific coast, to the north and south of Panama, were carried at rates at least as low as those established by foreign steamship lines on European traffic with the Pacific coast. This company, as the initial carrier in outward traffic to the Isthmus and points beyond on the Pacific coast, has steadfastly continued in effect reasonable rates that might have been doubled with perfect propriety; in fact, recently competing lines, owing to constantly increasing demands upon their capacity for the transportation of heavy bulky freight, have advanced their open rates 40 per cent beyond those by Panama Railroad Steamship Line, with the practical effect of concentrating the pressure upon our line. Rates obtainable by independent lines or tramp steamers for new business are governed more by the urgency of the shipper than any existing tariff. Rates on traffic in the reverse direction to New York from points beyond the Isthmus on the Pacific coast have been very materially advanced by Pacific Ocean carriers, over whose action this company has very little, if any, control.

The operating expenses of the Steamship Line have been charged with \$163,326.99, the proportion chargeable to 1915 of the expense incurred last year for a complete overhaul of the entire fleet. No opportunity was afforded during the year for repairs other than those incidental to regular drydockings. The company's steamers are being maintained in good condition; they regularly pass the strictest requirements of the steamboat-inspection laws of the Department of Commerce, are equipped with modern wireless outfits, with emergency electric lights that are operated automatically when the dynamos of the steamers are stopped for any

reason, and are being equipped as rapidly as required with all additional life-saving apparatus found necessary in the judgment of the inspectors of the department.

The provisions of the so-called seamen's act bear heavily upon the expense of all steamship lines and that of this company is no exception. Several items of expense are important, as, for instance, that for the installation of separately operated electric emergency lights at all entrances and exits on the ships and for increased life-boat capacity, including the installation of motor lifeboats that have now been placed on each of our steamers. This company, as United States Government owned property, is required to and does rigidly and as promptly as possible conform to all demands of the United States steamboat-inspection regulations.

Availing of an option held, the company decided to extend its contract with the Ebensburg Coal Co. for the supply of bunker coal to its steamers at the per-ton price of the contract of the previous year. The present contract expires on April 16, 1916.

The company's stock of coal on the Isthmus to meet requirements estimated at 600,000 tons per annum, is now maintained through the services of the naval colliers *Achilles* and *Ulysses*, constructed under congressional appropriations and placed in this company's service for that purpose, supplemented by an occasional diversion of steamships *Ancon* or *Cristobal* to the carrying of coal to the Isthmus. The longer the colliers mentioned are operated the nearer the minimum per-ton cost of transporting the coal to the Isthmus is approximated. Under the very advantageous Earn Line contract the price was \$1.39½ per ton; by the operation of the colliers an average price of \$1.68 per ton has been arrived at, which figure includes an allowance of 3¼ cents per ton to cover three per cent interest on capital cost and three per cent for extraordinary repairs and replacements of the colliers.

Those colliers, each of 12,000 tons capacity, are expected to jointly carry to the Isthmus about 35,000 tons per month; they have actually transported 216,000 tons in seven months, or at the rate of 30,000 tons per month. Better results will be accomplished with them following their recent final test for Government acceptance, but unless contracts can be made to advantage for commercial tonnage (the ruling figure for which now is about \$4 per ton), it will become imperative that additional colliers be procured by purchase or construction in order to maintain our supply of coal at the Isthmus to meet expected demands when anything like normal conditions are restored.

Negotiations with the Pacific Mail Steamship Co. for the purchase of that company's pier and adjoining property in Colon were concluded, and title transferred to this company upon payment of \$150,000.

During the year, at the instance of the different departments of the United States Government interested in the development of closer relations with the Central American and South American countries, consideration has been given by the board of directors to the expediency and advisability of extending the service of this company's steamship line through the canal and otherwise to various commercial ports in several of those countries and the West Indies, but as yet no conditions sufficient to warrant such a measure have become apparent.

THE UNITED STATES SHIPPING BILL

[SOURCE: Senate Report (No. 689) of the Committee on Commerce, 64th Congress, 1st Session, on Creating a Shipping Board, a Naval Auxiliary, a Merchant Marine and Regulating Carriers by Water Engaged in the Foreign and Interstate Commerce of the United States, July 19, 1916, pp. 22, 23.]

Every reasonable objection to the ownership and operation of merchant vessels has been removed in the bill as reported by the committee. Those who favor such ownership and operation are of opinion that the committee has gone too far in limiting such ownership and operation.

The bill provides that the board may, if in its judgment such action is necessary to carry out the purposes of the act, through a corporation or corporations to be organized, in which the United States shall own the majority of the stock, own and operate such vessels. The time within which vessels may be so operated is limited to five years after the present war in Europe shall end. The committee regards this a necessary power to be vested in the board. Whether it may have occasion to exercise it or not will depend upon the readiness of private interests to take over either by purchase or charter of the vessels constructed or purchased by the board, and employ them in serving our foreign commerce, particularly with the east and west coasts of South America, and from our Pacific ports to the Far East. The board may, if that trade is not being adequately served, employ such vessels in the trade with Alaska, Hawaii, and Porto Rico, in addition to the Panama Canal Zone, the Philippine Islands, Guam, and Tutuila.

The American Hawaiian and Luckenbach steamship companies

have withdrawn most of their vessels from the intercoastal trade, and they are now employed in the foreign trade, leaving the coastwise trade inadequately served. They justify themselves upon the ground that their earnings are much larger in the foreign than in the coastwise trade. This is no doubt true, yet they are not in a position to object to the board exercising the powers vested in it to see that that trade is adequately served to the limited extent provided in the bill.

The question resolves itself into this: Shall the great commercial interests of the United States be paramount to the interests of the vessel owners who, under existing law, have the monopoly of the coastwise trade, and yet exercise the right to withdraw their vessels from that trade whenever it suits their convenience or profit?

[SOURCE: House of Representatives Report (No. 659, Part 2) of the Committee on the Merchant Marine and Fisheries, 34th Congress, 1st Session, on Creating a Shipping Board, etc. (Minority Views), pp. 3, 4.]

Under the modified plan limiting operation to a definite period because the Government, having once embarked upon the sea in a competitive way, there can be no reliable assurance that the limitation will not be removed and the enterprise be continued indefinitely. With that contingency existing as an unknown quantity, the modification is without practical effect.

In view of the express reservation of Government control over the vessels of the proposed corporations by a Government agency, the question whether the status of such merchant vessels would not be such as to render the Government liable to the responsibilities of neutrality which, under international law, are charged upon the sovereign, presents itself as one of vital moment. Irrespective of all other considerations, it is submitted that in the absence of convincing assurance that the Government interests and control would not involve such responsibilities, the procedure thus contemplated is one at least of doubtful wisdom.

[SOURCE: Act to establish a U. S. Shipping Board, etc., 64th Congress (H. R. 15455), pp. 10, 11.]

SEC. 26. The board shall have power, and it shall be its duty whenever complaint shall be made to it, to investigate the action of any foreign Government with respect to the privileges afforded and burdens imposed upon vessels of the United States engaged

in foreign trade whenever it shall appear that the laws, regulations, or practices of any foreign Government operate in such a manner that vessels of the United States are not accorded equal privileges in foreign trade with vessels of such foreign countries or vessels of other foreign countries, either in trade to or from the ports of such foreign country or in respect of the passage or transportation through such foreign country of passengers or goods intended for shipment or transportation in such vessels of the United States, either to or from ports of such foreign country or to or from ports of other foreign countries. It shall be the duty of the board to report the results of its investigation to the President with its recommendations and the President is hereby authorized and empowered to secure by diplomatic action equal privileges for vessels of the United States engaged in such foreign trade. And if by such diplomatic action the President shall be unable to secure such equal privileges then the President shall advise Congress as to the facts and his conclusions by special message, if deemed important in the public interest, in order that proper action may be taken thereon.

SUBSIDIES AND OTHER FORMS OF GOVERNMENT AID

[SOURCE: Report on Government Aid to Merchant Shipping, by Grosvenor M. Jones, Published by U. S. Department of Commerce, 1916, pp. 8-21, 92, 102, 142, 149, 189, 200, 218.]

The first subsidy law in France, that of January 29, 1881, was adopted after careful investigations by a special commission and was intended to assist the domestic shipbuilding industry as well as the shipping under the French flag. It was hoped that the bounties provided under this law would check the decline in the French merchant marine that had been going on steadily since the steamship became the principal carrier of the world's over-seas trade.

Much of the benefit that might otherwise have accrued from the liberal bounty expenditures of France have been negated by the almost irreconcilable conflict between shipbuilders and shipowners. As stated above, French subsidy legislation has attempted to distribute bounties between construction and navigation in such a way as to promote the interest of both the shipbuilder and the shipowner. Apparently this result has not been attained, since the shipowners accuse the shipbuilders of absorbing not only the construction bounty but much of the navigation bounty by raising unnecessarily the prices on domestic-built ships.

By reason of extensive experiments the French system has undoubtedly been improved, but with each new law on the subject the requirements have become more exacting. Since the advent of the steamship the natural economic conditions in France have not been favorable to the development of a large merchant marine. A serious obstacle has been the lack of an extensive iron and steel industry capable of producing iron and steel as cheaply as they can be produced in Great Britain, Germany, and the United States. The rivalry of French ports and the character of the exports of France have been handicaps. Although the exports are high in value, they are low in tonnage and do not provide full return cargoes as do the exports of Great Britain and Germany.

It is extremely doubtful whether any system of bounties can under present conditions sufficiently overcome the handicaps of natural conditions so as to enable France to take higher rank among the merchant navies of the world.

Although the results obtained under the bounty systems of France have not been encouraging, those systems have nevertheless been used as models by Italy, Austria, Hungary, Japan, and Spain.

Italy adopted a system similar to that of France about four years after the passage of the first French subsidy law, that is, in 1885. Moreover, Italy has made changes in her subsidy system about as frequently as France, and on the whole has been little, if any, more successful. Both countries have been handicapped by the lack of a highly developed iron and steel industry such as would enable them to manufacture iron and steel vessels cheaply. Italy has been further handicapped by the heavy burden of taxation and lack of coal.

Japan rivals France in the extent to which Government aid has been extended to merchant shipping, but has been much more successful. The Japanese merchant marine has developed more rapidly than that of any other country during the past 35 years. In 1880 the economic condition of Japan, measured by European standards, was poor. Likewise the shipping industry of the country was comparatively insignificant, and consisted largely of junks suitable only for navigation in coastal waters or trade with China and the neighboring islands.

The industrial development of Japan since that country adopted European methods of manufacture and commerce has been truly remarkable, and accounts in a large measure for the development of the merchant marine. The Japanese merchant marine has de-

veloped from almost nothing, and shows a remarkable rate of increase largely for that reason. Nevertheless, the increase in Japanese shipping has been substantial, and it is due in part to the payment of liberal subsidies.

The bounty systems of the Kingdoms of Austria and Hungary are quite similar to that of France. Both were instituted in 1893, the Hungarian antedating the Austrian by about six months. In the Austrian law, despite the use of other terms, the grants really amount to general navigation and construction bounties. The laws have been changed from time to time in an attempt to make the system productive of better results, but comparatively little success has been attained, although large amounts have been paid out in bounties. The fact of the matter is that with its seacoast limited in extent and remote from the richer agricultural, mineral, and manufacturing sections of the Empire, Austria-Hungary is under a serious handicap. The Danube and the Elbe are used to a great extent for the transportation of Austrian exports, and Hamburg is therefore in many cases a much more convenient port than either Trieste or Fiume. It is a question whether under present conditions or those that are likely to obtain in the near future Austria or Hungary can overcome the natural handicaps, even with the expenditure of large sums in bounties.

Spain now rivals France, Italy, and Japan in the extent of Government aid to shipping. For many years the only direct aid was in the form of mail subventions for rapid communication with the Spanish colonies. A subsidy system was not introduced until the enactment of the law of June 14, 1909. This system closely follows that of France. It is difficult as yet to say what the net result of the law has been. It is interesting to note that the law has been suspended since the outbreak of the present war in Europe, largely at the request of a majority of the subsidized lines, which were making such large profits as to be quite independent of the subsidies and desired to avoid the restrictions imposed by the subsidy laws.

A number of countries pay subventions to foreign steamship lines. The principal purpose of such grants has been to utilize foreign steamship services operating to remote points.

Italy has for many years paid a subvention of 70,000 lire (\$13,510) to the Netherland Steam Packet Co. for the transportation of Italian mails between Genoa and the Dutch East Indies.

Belgium has paid subventions either in direct grants or in reimbursement of pilotage dues, port charges, etc., to three German

lines, namely, the North German Lloyd, the German-Australian, and the Kosmos, and to a Danish line, the United Steamship Co. of Copenhagen, for the purpose of having the steamers of these lines call regularly at Antwerp. Bulgaria had the same object in view in making annual grants to the German Levant Line and to Fraissinet et Cie., a French steamship line, for making regular calls at Burgas and Varna.

Other countries that have paid or are paying subventions to foreign steamship lines are: Brazil, which contracted in 1913 with four Italian lines for a service between Brazil and Italy; Chile, which formerly granted a subvention and now grants valuable wharfing privileges at Valparaiso to the Pacific Steam Navigation Co., a British line, for carrying mails between Chile, Peru, and England; Mexico, which has granted subventions to American, British, Canadian, and Japanese lines; and New Zealand, which paid a subvention to the Oceanic Steamship Co., an American line, for the transportation of mail between Auckland and San Francisco.

Great Britain.—England was the first country after the advent of the steamship to pay subsidies or subventions. It is probably accurate to refer to the original grants to the Peninsular & Oriental Steam Navigation Co. and the Cunard Line as combinations of subsidy and subvention, since the element of bounty predominated in those years, although the endeavor to promote faster communications to India and Australia and to Canada was also strongly emphasized. In its early stages rapid steam navigation was a good deal of an experiment and expensive, as the experience of the several subsidized American lines of that period abundantly proved, and the British Government deemed it expedient to contribute toward the expense of maintaining the new lines.

State aid to merchant shipping may take a number of forms. In the commonly accepted version of the term Government aid means the payment of bounties, subsidies, or subventions, but its scope is, in fact, much broader, since substantial assistance is often rendered by the grant of privileges whose benefits can not be computed in terms of money.

Under the head of indirect aid are considered (a) reservation of coasting trade; (b) exemption from import duties on shipbuilding materials; (c) preferential railway rates; (d) loans to shipowners; (e) reimbursement of canal dues; and (f) other indirect aid, such as exemption from port dues, taxation, etc. Under the head of direct aid are shown (a) bounties or subsidies, divided, as a rule,

into three principal classes, namely, construction, general navigation, and special navigation bounties; and (b) subventions, divided into two classes, namely, postal and admiralty.

The United States, France, Italy, Austria-Hungary, Spain, and Belgium, among the more important maritime countries, have long reserved their coasting trade to national ships, while Japan has reserved all of its coasting trade to its own ships only since 1910.

Russia has long reserved the trade between Russian ports on the same sea for Russian ships, but it was not until the issuance of the royal decree of May 29, 1897, that the trade between all Russian ports was restricted to Russian ships.

All shipbuilding materials have been exempt from customs duties in England since the adoption of the free-trade policy. Such materials have been exempt for many years also in Germany and the Netherlands. Belgium has granted free admission to shipbuilding materials since April 12, 1864. All shipbuilding materials have been on the free list in the United States since the tariff act of 1909, although many such materials had been exempt from duties since the tariff act of 1894.

France, Italy, and Spain levy duties on materials used in the construction, repair, and equipment of ships, despite the fact that their iron and steel industries can not under present conditions compete with those of Great Britain and Germany, and many products of these industries must be imported. These countries wish, however, to protect domestic industries, even though bounties must be paid to shipbuilders to offset the duties. The fact that these countries levy import duties on shipbuilding materials must be borne in mind when reference is made to the fact they pay bounties on ship construction.

The Scandinavian countries impose important duties on shipbuilding materials but allow drawbacks. Sweden allows a drawback of duties actually paid on materials used in the construction in Swedish yards of any ship of 40 tons and over. Denmark allows a drawback equal to not more than 2 per cent of the selling price of all ships built in Danish yards. And Norway makes in lieu of a drawback a grant amounting to 2 per cent of the selling price of new steamers of more than 300 gross tons and to 1 per cent on new steamers of 50 to 300 tons and sailing vessels of 50 tons and over, as well as a grant equal to 1.5 per cent of the cost of repairs on vessels of 300 tons and over, if the cost is at least 1,000 kroner (\$268).

Prior to 1898 Russia levied a duty on shipbuilding materials as well as ships. In 1898 specified shipbuilding materials and iron or steel steamships for over-seas trade were put on the free list for a period of 10 years. This policy has been continued from time to time by subsequent decrees.

For many years no country of importance with the exception of the United States has required that ships flying the national flag shall be of domestic construction, although practically every country has made this requirement in the case of steamships receiving postal subventions.

England has granted registers to foreign-built ships, in other words has pursued the "free-ship" policy, since about 1850. At that time wooden sailing vessels were predominant and these could be secured more cheaply in the United States, which had larger supplies of timber and naval stores and a more efficient ship-building industry. As a result of this free-ship policy the merchant marine of Great Britain received large accessions during the Civil War, when more than 750,000 tons of American shipping secured foreign registers to avoid capture or destruction.

Germany has also pursued the free-ship policy but at the same time has given much encouragement to the domestic production of ships by making low railroad rates on materials transported from the iron and steel manufacturing centers in the interior to the ship-yards along the coast and by requiring that subventioned steamers should be of domestic construction.

Assistance in the form of lower rail rates on goods shipped over specified steamship lines is a practice that has been followed in Germany with respect to the German Levant and the German East Africa Lines since the years 1890 and 1895, respectively. These differentials have a double purpose, since by enabling German manufacturers to sell their products at lower prices in the countries reached by these lines they develop German trade and at the same time increase the traffic on the preferred steamship lines.

France, like Germany, has made use of differential export railroad rates to assist in the development of traffic on certain French steamship lines, as well as to promote the foreign trade of France.

Preferential railroad rates of the character just described should be clearly distinguished from the system of general preferential rail rates on export commodities. The latter rates are applicable to all export commodities without regard to the nationality of the ships in which they are carried, and are given solely to promote foreign

trade, while the former apply only to national ships and are intended as an aid toward the development of those lines, as well as the extension of the trade of the country.

Both Germany and France have a general system of export rail rates, as well as a special system of rates for goods carried by specified steamship lines. The general system is to be found also in the United States, Norway, Sweden, Denmark, Belgium, the Netherlands, and Spain.

The policy of granting loans to shipowners at low rates of interest or without interest was begun, it is believed, by Austria.

The only instance of a loan to a steamship company by the British Government was the loan made to the Cunard Steamship Co. under the mail and admiralty subvention contract of 1903. Under this contract the British Government loaned the steamship company £2,600,000 (\$12,652,900) for the building of two steamers (the *Lusitania* and the *Mauretania*) that should be faster than any afloat and suitable for the use of the Admiralty. The loan was made at the rate of $2\frac{3}{4}$ per cent, which is about 2 per cent lower than the rate at which the company could have borrowed a similar amount in the open market.

The policy of granting loans at low rates of interest was instituted in Sweden under the law of 1903, which established what is known as the shipowners' fund (Rederilane-fonden). The object of this fund is to provide loans at low rates of interest and on favorable terms to Swedish steamship companies.

Russia instituted the policy of making loans to shipowners in 1904. A law of that year provides for loans at the rate of 3.8 per cent interest to persons constructing ships in Russian yards. The loans may not exceed two-thirds of the value of the Russian materials used in the construction of the ship, and are payable in 20 years.

Denmark and Belgium are the only important countries that have extended aid to shipping by granting exemptions from, or making reimbursement of, port dues.

The policy of granting indirect aid to shipping by reimbursement of canal dues was instituted by Russia in 1879. This practice has been extended from time to time and now provides for the reimbursement of the full amount of the canal dues paid by Russian steamers bound for or sailing from any Russian port in the Far East and for a reimbursement of two-thirds of the full dues paid by Russian steamers bound for or sailing from ports on the Indian Ocean and non-Russian ports on the Pacific Ocean. In the period

from 1879 to 1906 the Russian Government expended approximately \$4,400,000 in reimbursement of Suez Canal dues.

The Austrian Government makes a reimbursement of Suez Canal dues paid by the steamers of the Austrian Lloyd.

Sweden instituted this policy in 1911.

The policy of making a reimbursement of Suez Canal dues paid by French steamships was instituted in the contract made on December 30, 1911, with the *Compagnie des Messageries Maritimes*.

This form of indirect aid has, so far as can be ascertained, been granted only in the Kingdoms of Austria and Hungary.

The granting of postal subventions to steamship lines antedates the bounty or subsidy system and is in more general use throughout the world. The United States and France soon followed the example of Great Britain. The first formal mail contract made by the French Government was in 1851, and was with the *Compagnie Générale Transatlantique*.

Germany did not adopt the policy of paying postal subventions until 1886, when a contract with the North German Lloyd was concluded. A number of other countries, for example, Norway, Sweden, Italy, the Netherlands, and Brazil, adopted the policy of mail subventions before Germany took it up. At the present time the payment of postal subventions is the only form of direct financial assistance that has been extended by the German Government.

The Dominions of Canada and New Zealand, the Commonwealth of Australia, and the Union of South Africa pay large amounts annually in the form of mail subventions. When these subventions were established the primary object was to promote faster and more regular communication with the mother country. In more recent years, however, the commercial motive has entered into the payment of these grants. This motive is clearly shown, for example, in the recent contracts of the Canadian Government, which require that in the assignment of cargo space preference shall be given to Canadian goods and to Canadian shippers.

Construction bounties are given in Russia, Hungary, France, Italy, Spain, and Japan. In every case certain standards are prescribed, so that governmental control over shipbuilding is direct and effective. Outside of an immense number of naval vessels, however, governmental shipbuilding is still comparatively rare.

CHAPTER XVIII

RAILWAYS

IF we measure by mileage or by capital invested, by far the larger part of the railroads of the world are still under private ownership. On the other hand, in a considerable majority of the nations of the earth the railways are governmentally owned. Among the great nations only Great Britain and America are still completely under the system of private ownership—though within these two is the larger part of the world's railway mileage and capital. But while the railways of Great Britain are privately owned, this is by no means true of the British Empire. Government ownership prevails in Australia, New Zealand, South Africa, Egypt, and India. Moreover, in most of those countries where a mixed system of public and private ownership is to be found, government ownership preponderates and is steadily encroaching on private ownership. Already a large majority of the railways of Russia are governmentally owned, while France, Mexico, Brazil, and the Argentine Republic have all moved a long way along the same road and are progressing steadily towards complete government ownership.

The question of government versus private ownership involves all other questions of railway policy. It is therefore obviously impracticable to attempt even the briefest statement concerning conditions in all countries, in view of the limitations of space to be assigned to this subject in the present volume. We have accordingly laid special emphasis on those nations which are considering public ownership at the present time, such as Canada, and on those which have lately adopted government ownership, like Italy and Switzerland. We give a brief indication of the success of the Western Railroad recently purchased by the French Government. Finally, we reproduce a brief for government ownership presented to the last official investigation of the subject in Great Britain and extracts from the statements of the

leading witnesses on both sides in the recent Congressional investigation at Washington.

PRUSSIA

[Schumacher, Hermann (Director of the University of Commerce at Cologne), *The Nationalization of Railways in Prussia: Its Causes and Sequels. In Royal Economic Society, the State in Relation to Railways*, pp. 29, 43-49.]

* * * From the standpoint of the community at large the railways may be considered a "means" in various ways. They may be thus considered from the general economic, the financial, the commercial-political, and the military point of view. They may be looked upon as a means of political power, of revenue, and of traffic. Of course, all these points of view have been taken into consideration in the nationalization of the Prussian railways, but the decisive and dominant factor was first and foremost the general economic aspect of railways as a means of traffic subservient to the development of the economic powers of a nation.

* * * The nationalization of railways was not a *bad* bargain for the Prussian State, but a brilliant stroke of business, perhaps the most brilliant ever transacted by a modern State. It was soon found in practice that a universal monopoly in railway matters offers almost unlimited scope for economies. In the first place it does away with expenses hitherto inevitable. The numerous arrangements and treaties and more especially the settlements of accounts which were hitherto necessary between the various railway administrations are now dispensed with in the same way as the manifold special expenses involved by the complicated organization of a joint stock company. Still more important is the saving of the expenses for the separate arrangements of the various railway administrations with regard to stations and the whole technical equipment. Moreover, the advantage of the State for obtaining money at cheaper rates than a joint stock company could procure it means a reduction of expenditure. But, after all, the most important point is that the broad basis of combined working on a large scale, suited to the peculiar nature of railways, made it possible to carry through consistently the economic principle in administration, working, and construction. Thus, in particular, a considerable saving can be realized by the better utilization of the rolling stock and of the staff, and by directing all trains over the shortest and cheapest routes. The unification of construction, both in the permanent way and in the rolling stock, has also exercised an in-

fluence on the manufacturing industries, which might be described as "standardization on the largest scale." Thus, in 1885, a uniform standard type of rail was introduced, and since 1907 the type of construction for trucks, especially as regards the equipment with brakes, pipes, and the like, has been made uniform, not only on all Prussian railways, but on all German railways generally. This technical simplification of the permanent way, the construction of locomotives and carriages, the signaling, etc., has contributed a great deal to develop enterprises on the largest scale in the industries supplying railway materials. The uniformity of demand thus arrived at has cheapened the production in many ways; the introduction of the standard type of rails, for instance, considerably relieved the rolling mills in steel works. Petty and expensive specializing in manufacture—a relic of the past—was thus once for all done away with. This was of still greater importance for the development of the German iron industry than to the finances of the Prussian State railways.

The result of all these economies is a magnificent one. The aggregate revenue of the Prussian State railways has risen, during the twenty-five years from 1883 to 1908, from 536,000,000 marks to 1,910,000,000 marks, or from 34,503 to 52,795 marks per kilometre of railway track. Although the expenses, both of the staff and of the stock and plant, have increased very considerably (the cost per kilometre per axle was 5.43 pf. in 1895 and 7.4 pf. in 1908), nevertheless the gross working profits have increased from 222,000,000 marks in 1883 to 548,000,000 marks in 1908; so far, the maximum obtained was in 1906, namely, 698,000,000 marks.

These extraordinary working profits, which in the aggregate amount, since the nationalization of the railways, to a total of nearly 12,000 million marks, have greatly benefited the Prussian State railways. They enabled them to meet nearly the whole of the cost of construction of existing railways out of current revenue. In contrast to the over-capitalization of many foreign railways, the object aimed at and achieved has been the under-capitalization of the Prussian State railways. This is the solid foundation on which the Prussian railway finance is based.

But this does not exhaust the financial success of the Prussian State railways. Although, as has been pointed out, it was by no means the original intention, railways have nevertheless become, under the combined influence of the above-mentioned factors, a considerable source of revenue to the State. A total of nearly 3,000 million marks has been placed at the disposal of the Prussian Gov-

ernment for other state purposes out of the surplus of the railways. Thanks to its railways, the Prussian State was in a position to participate financially at once in the great rise of prosperity in German industrial life. Hence the fact that Prussian finance presents on the whole such favorable conditions is largely due to the Prussian State railways.

The nationalization of railways is now generally looked upon in Prussia as being a natural fact justified by the historic development, and from year to year the number of those is increasing who, at least as regards Germany, agree with Professor Schmoller's opinion that Bismarck's railway policy was, from the point of view of political economy, the greatest achievement of the last century.

[N. B.—See section on the United States in this chapter. A large part of Mr. Brookhart's testimony in favor of government ownership is taken up with a very careful and detailed discussion of the relative efficiency of Prussian and American railroads.]

RAILWAY COUNCILS IN GERMANY

[From U. S. Special Commercial Agent Report on Commercial Organizations in Germany.]

To effect an expeditious method of consulting the interests of commerce and industry in connection with the administration of railways and the improvement of waterways, there are organized in Germany a number of railway and waterways advisory councils as semi-official consulting organizations.

The idea of such advisory councils originated in Alsace-Lorraine, where the management of the Imperial Railways founded a railway committee for Alsace-Lorraine, consisting of representatives of the railways and of chambers of commerce and of trades. So successful was the working of this committee that the Prussian Administration of State Railways advocated the introduction of similar committees for the rest of the Kingdom of Prussia. The Grand Duchy of Oldenburg, the Kingdom of Württemberg, the Grand Duchy of Baden, the Kingdoms of Bavaria and Saxony, and the Grand Duchy of Hesse followed suit. In the course of time these committees received a permanent form regulated by law.

After the first attempts to bring about periodic conferences between the administration of the railways and the representatives of commerce and trade in various sections, the Prussian Parliament passed laws in 1906 and 1910 providing for the establishment of the Railway Advisory Council for Prussia. By virtue of the treaty existing between Prussia and Hesse for the common administration

of railways in their respective dominions, the advisory council in Prussia extends its operations to both territories. This council consists of 49 members. The president and vice president are appointed by the King for five years; the Ministers of Agriculture and of Commerce appoint 3 members each, the Ministers of Finance and Public Works name 2 members each, and 37 members are delegated by the district advisory councils for railways, some being representatives of industry, others of commerce, and still others of agriculture and forestry. Two members of the council come from the Grand Duchy of Hesse and five from the remaining States of the German Empire.

The Railway Advisory Council for Prussia is consulted in the drawing up of passenger and freight rate schedules, in the general regulations for the application of freight rates and the classification of merchandise, in the application of exceptional and differential tariffs, and on proposals to change traffic regulations, provided these are not of a technical nature. The advisory council must furnish expert opinions upon the request of the Minister of Public Works in all important matters relating to the public railway traffic.

The Minister of Public Works is instructed to assist the council in the preparation of its reports and in its investigations. The council selects a permanent committee for the guidance of its activities. The minutes of the sessions of the council are to be submitted by the Minister of Public Works to the Prussian Legislature. The members are not paid for their services, but receive free transportation and per diem expenses. German States whose territory is touched by the Prussian-Hessian State Railways may send representatives to the council with the approval of their respective governments.

To secure direct consultation of the representatives of local commercial interests by the management of the State railways there exist in a number of districts sectional advisory councils for railways, composed of representatives of commerce, industry, agriculture, and forestry. The members of these councils are chosen by chambers of commerce, commercial organizations in general, and chambers of agriculture. The list of organizations entitled to nominate members of the council is drawn up by the Ministers of Public Works, of Commerce, and of Agriculture. There are 9 district advisory councils in Prussia: (1) At Breslau, consisting of 45 members who are nominated by the various organizations in the territory of which Breslau is the center, including 12 chambers of commerce, 1 chamber of trades, 9 manufacturers' associations, 3

chambers of agriculture, and 4 forestry associations; (2) at Altona, with 29 members, 24 being nominated by Prussian chambers of commerce and of agriculture and other organizations, and 5 by chambers of commerce in Hamburg, Lübeck, and Rostock, the Hamburg Chamber of Trades, and the Association of Hamburg Ship Owners; (3) at Bromberg, with 42 members; (4) at Berlin, with 31 members; (5) at Magdeburg, with 33 members; (6) at Hanover, with 52 members (7) at Frankfort on the Main, with 68 members; (8) at Cologne, with 80 members; and (9) at Erfurt, with 49 members.

Each of these district advisory councils acts for a certain defined section of the Prussian-Hessian railway system. Particularly at Hanover, Frankfort on the Main, and Cologne the delegates of independent manufacturing and commercial associations are strongly represented.

An advisory council for railways has existed in Bavaria since 1881. It was reorganized in 1909 and includes now in its operations the entire Kingdom of Bavaria. It is an adjunct of the Bavarian Ministry of Means of Transportation and is required to advise it in all important matters of railway transportation and river and canal navigation, so far as they affect commerce, trade, or industry. It passes on all important changes, particularly of freight charges and schedules. It may bring before the ministry, of its own initiative, suggestions, complaints, and requests reflecting the needs and desires of the commercial and agricultural interests. For the local needs of the Rhenish dominions of Bavaria there is a special traffic committee at Ludwigshafen. The Bavarian advisory council consists of 28 members appointed by the King and chosen from chambers of commerce, agricultural associations, and the Bureau of Commerce and Industry. This council meets at least twice each year.

An advisory council for railways was founded in Saxony in 1881 and after several changes assumed its present form in 1905. It is an adjunct of the Royal Administration of Saxon State Railways and has the same aims as the councils for Prussian and Bavarian railways. It is composed of 23 members, 9 nominated by chambers of commerce and trades, 5 by agricultural associations, and 9 appointed by the Ministry of Finance. The council meets twice each year under the chairmanship of the general director of the State railways.

By royal decree there was founded in Württemberg in 1878 an advisory committee of representatives of commerce, trades and agriculture to assist the general management of means of

transportation. In 1881 it received its present form and name. It is an adjunct of the traffic bureau of the Royal Ministry of Foreign Affairs. It is composed of 16 members, 8 being representatives of chambers of commerce and 8 being appointed by the Bureau of Agriculture. Its aims and objects are the same as those of the advisory councils in other parts of the German Empire. It meets twice each year and has a permanent committee of six members to pass on urgent matters arising between meetings.

Similar advisory councils for railways exist in the Grand Duchy of Baden as an adjunct of the Administration of State Railways, in Mecklenburg-Schwerin, in Oldenburg, and in Alsace-Lorraine.

At the suggestion of the Prussian Minister of Commerce in 1877, a permanent tariff commission, consisting of the representatives of the various German State railways and certain private railways, was called together, and a permanent committee of representatives of commerce and industry interested in traffic matters was suggested. These bodies were to meet together twice each year to discuss freight and passenger rates.

The permanent tariff commission was composed at first of 16 railway administrations, 6 of them of private lines. In the course of time, owing to the absorption of private railways by the State, only one private administration remained on the commission. The committee of representatives of commerce interested in traffic matters was composed first of 10 and later of 16 members. In 1883 representatives of Swiss railways were admitted to the sessions of the commission without the right to vote. Since 1890 the presiding officers of the committee and representatives of commerce have been permitted to attend the sessions of the commission but not to participate in the discussions.

At present there are 14 members in the permanent tariff commission, 5 being representatives of the Prussian and Hessian railways, 2 of the Bavarian railways, 1 of the Saxon railways, 1 of the Württemberg railways, 1 of the railways in Alsace-Lorraine, 1 of the Baden railways, 1 of the railways in Schwerin, 1 of the railways in Oldenburg, and 1 representative of the private railway between Lübeck and Büchen. The representatives of the Swiss State Railways and of the St. Gotthard Railway participate in an advisory capacity in matters of interest to Swiss railways.

The permanent committee of representatives of commerce is composed of 16 members, 5 of whom are nominated by the German Council of Agriculture, 10 by the Handelstag representing the interests of commerce and trades, and 1 by the Bavarian State. The

members of this committee serve six years and may be re-elected. It meets three times each year and the minutes of the meeting are submitted to the annual general conference of the German Railway Administration. Both the tariff commission and the committee of the representatives of commerce interested in traffic matters have for their object the discussion, separately and in common, of all matters relating to railway freight rates and their application and to the classification of freights. Matters relating to passenger and baggage transportation are within the scope of the tariff commission only. Both the tariff commission and the permanent committee are also charged with the preparation of resolutions to be passed at the general conference of the German Railway Administrations. At this general conference the number of votes is based on the mileage of the railway divisions represented.

A representative of the railway administration at Berlin presides at the meetings of the tariff commission and at the common meetings of the tariff commission with the permanent committee.

Membership in both bodies is honorary, but free transportation on German railways is provided.

FRANCE

[*The Case for Railway Nationalization*, E. Davies, pp. 148, 150, 152, 153.]

The first concessions for railways were granted in 1833 and in 1842 an extensive policy of railway construction was commenced under which the State was to build the permanent way (except laying the rails) and the bridges and stations, while the companies to which concessions were granted had to lengthen rails and provide the necessary rolling stock. Concessions were only granted for ninety-nine years and on their expiring the railways revert to the State, which would purchase the whole stock and rails.

In 1857 a check (in the growth of the railway system) was caused by the disinclination of the public, which had become alarmed by the large expenditure on branch lines, to provide the necessary capital. The State thereupon . . . laid down a general project of guarantee of interest.

The relations between the state and the companies are (now) regulated by a series of specifications which date from the years 1857-59 (and which contain among others the following provision) : At any time after the expiring of the first fifteen years of the concession, the Government shall have the right to purchase the line.

Making use of this provision, the French Government acquired the *Ouest* system on January 1, 1909.

Now that the Western Railway has been acquired the total extent of the State system is 7,425 miles. . . . The reasons which led the Government to exercise its right of purchase of this line before the expiration of the concession were that the company had found it necessary to have recourse to State assistance to a very large extent, and it became increasingly obvious that it would not be able to repay the sums advanced. . . . And that the company's management was so atrocious that the name of the *Ouest* system had become a by-word throughout France.

The acquisition of the Western Railway is kept fresh in people's minds by the activity of the opponents of nationalization who leave no opportunity of citing it as a marvel of inefficiency. The following extract from a British *Blue Book* on foreign railways, however, hardly seems to justify these adverse criticisms:

"But it should be mentioned that from our inquiries at points on the Western Railway, we ascertain that the passenger trains are running more punctually than in the days of the company, and that there is a tendency to betterment also in the way of goods transport."

[SOURCE: Edmund Fisher in *Die Sozialistische Monatshefte*.]

Least of all in France does the deficit of the state-owned railways speak against government ownership, for the railroads now belonging to the state had also worked with losses when they were in the hands of private capitalists. Before 1875 there were no state-owned railroads in France. That year the state took over a then insignificant line between Bordeaux and Nantes which had to contend with financial difficulties. This road was then gradually prolonged to Paris and is known today as the *old* State Railway. Its length is 3,000 kilometers, which is about one-sixteenth of the entire length of all French roads. The capital invested in this line bears interest at a rate of less than 2 per cent. In 1908 the government took over the Western Railway, which serves Brittany, Normandy, and Havre, and Cherbourg, Brest, and Nantes. The length of this road is 6,000 kilometers. Thus the government possesses today a railway system of 9,000 kilometers. However, the Western Railway still had a deficit of 27 mill. francs in 1908, which serves to prove that this line was not paying from the very outset. Under government management, however, the deficit increased to 38.5 mill., in 1910 to 59 mill., in 1911 to over 71 mill., and last year (1912) to 84.5 mill. francs. These growing deficits are attributed by the budget commission to the rising expenditures in wages, which increased by 52 mill. francs since the government took over the lines.

The private company had a great deficit even when it paid the most miserable wages. This naturally could not become smaller when wages were increased. But the French Government does not yet own even one-fifth of the entire railway system, and has the most unprofitable lines, while the paying lines are still in the hands of capitalists.

[Chambre des Deputés. Dixième Législature, Session de 1914. Annexe au procès-verbal de la séance du 10 février, 1914. Rapport fait au nom de la commission du budget chargée d'examiner le projet de loi portant fixation du Budget Général de l'exercice 1914 (budget annexe des chemins de fer de l'Etat), par M. Albert Thomas, Député, Paris, 1914, 695 pages, folio, pp. 1, 2.]

Gentlemen:—It is indisputable nowadays that the State system of railroads is assuring a normal service to the people whom they serve. Former critics are appeased. Bad impressions are effaced. Manufacturers, merchants or travelers, together, declare themselves satisfied. The service of the State is as good, it appears, as that of the companies. In certain cases, indeed, it is already better.

Your chairman of committee (*Rapporteur*) has proposed to examine in the most objective and the most critical fashion both the financial and economic results of the operation of the system. It is, in fact, impossible to separate one from the other.

This first survey, still incomplete, had led us at least to the conviction that if the system is still far from being the model system which the advocates of nationalization wish it may become, if its operation continues to receive numerous criticisms which indicate its failings to us, if its management is still imperfect, the work, which has been prosecuted with perseverance, discretion, and skill for the past five years, has not been without results. We are convinced that with continued effort for a few more years the system will contribute an important part in the prosperity of the country.

NEW ZEALAND

[Irish Railways Commission, 1907.]

Before the Irish Railways Commission in 1907, Sir Joseph Ward, Premier of New Zealand, made the following statement:

Our policy has been to develop the natural resources of the country upon the basis of charging moderate rates, and no differentiation of rates to any one class of people. The smallest man in the country is able to obtain the same rate for the carriage of his produce as the largest user of the railways. Our rates are fixed on the basis of a return of about 3½ per cent. With all our earn-

ings over 3½ per cent we have been in the habit of making concessions by way of reductions both upon the carriage of farm produce, wool, grain, meat, and timber, and passengers, in order to carry out the policy of utilizing the railways for the purpose of developing the country. We have returned by way of reductions several hundreds of thousands of pounds during the last few years. They had no complaints in the ordinary way about the rates for agricultural produce. The passenger mileage rates were uniform in New Zealand. The same rate applied on all sections of the railways. They did not have fluctuating rates for holiday excursions. There was a return fare at a single rate over all their railways.

We carry the children free of charge to and from the nearest school. The majority of our schools are owned by the Education Department, which is a State institution. If we had not adopted that policy we should have had to build the schools closer together than they are now, although we have a great number of schools throughout the country. In the case of certain denominations who have not got their schools within easy distance we carry the children free to schools of the denomination to which they belong. That has been our policy for many years, and it has worked admirably.

Although the population of the islands was small, the people were spread over the whole country. He was quite sure that the railway policy of the Government had played an important part in that development. They believed in New Zealand that no one could afford to take as little out of the railways as the State found it necessary to take. As a matter of fact, they preferred to allow the consolidated earnings and the revenue of the country to make up the deficit, and keep low rates for the benefit of the producers and the traveling public, rather than keep up high rates and retard the development of the country.

In his opinion, and he thought in the opinion of others also, nothing had done more to make New Zealand prosperous than an efficient system of railways, affording comparatively cheap rates to the people of the country. The State railways in New Zealand were controlled by a Minister responsible to Parliament, and through Parliament to the people. For a few years they had Railway Commissioners, but it was found that the Commissioners were indisposed to reduce rates for the purpose of developing the industries of the country to the same extent as the Government was prepared to reduce them. For that and other reasons that system of management became unpopular, and it was superseded by Ministerial control. General managers for all the different branches were

appointed by the Minister for Railways. They were permanent appointments.

ITALY

[Great Britain, Board of Trade. Continental Railway Investigations. Reports of the Board of Trade on Railways in Belgium, France, and Italy, London, 1910.]

As to the benefits or otherwise of nationalization in Italy, one cannot at the moment express an opinion beyond saying that as yet everything is in the experimental stage. Whether or not the hopes now entertained will be justified cannot be foreseen.

The private railways, handicapped by Government restrictions, were certainly not able to cope with the traffic, insufficient accommodation and shortage of rolling stock being largely responsible. No company could be expected to incur large expenditure on new works and the provision of rolling stock with the prospect of State purchase ever present.

The decision to nationalize the railways was very rapidly come to. It was not unopposed, especially by Northern Italy, where the principal trades find their home, they being much more concerned with the general question of railway facilities than the inhabitants of the south; having regard, however, to the position in which the railways were at that time, whatever may have been the reason—the limitations imposed on private management by the State control certainly being a factor—it was really felt that any change would be desirable if only based on hopes of improvement.

The condition into which affairs had degenerated was evident when nationalization was really effected, the insufficiency of rolling stock and accommodation resulting in a state of chaos. The Government at once recognized that large sums of money would have to be spent, and without delay; much outlay is now being incurred, and it is only fair to assume that the resultant benefit should do much to relieve the difficulties from which the railways at the present time are certainly suffering.

Whether or not the condition today is better than in the days of private companies is a matter upon which there is much diversity of opinion. The time is too short for the moneys which have already been spent to have shown their return, but day by day the situation cannot but improve with the increased accommodation which is being provided.

The chief point is whether, assuming that the private companies had been granted a free hand, resulting in their providing the accom-

modation themselves, they would have been in quite as good or in a better position than the State today, or as the State will be when the new works are completed. By some the opinion is held that the same results could have been achieved by the private companies at a much less outlay.

Traders generally cannot unrestrictedly disparage the private management in their relationship with the trade. It was quite recognized that the granting of concessions might result in mutual benefit, and today the tariffs bear traces of many concessions inaugurated by private enterprise; it is in respect of these facilities that a great many traders bemoan the loss of the private companies, as they fear that with a complete monopoly of State ownership those concessions which were granted from a business point of view by private railways will be unattainable under State management. However, that remains to be seen; the State have certainly always taken a considerable interest in the tariff question, and at their request several rates of a national character have been adopted by the private companies, the State themselves recouping the private companies for any loss which the inauguration of the tariffs might entail. In some cases where the State was entitled to participate in the profits of a private company, such participation has been waived in consideration of tariffs being reduced.

The State is now grappling well with the situation both as regards accommodation and a revision or rather unification of the tariffs. By a ministerial decree of October 28th, 1907, a Commission has been appointed. The Commission consists of:

Four representatives of the State Railway Administration.

One representative from the Special Railway Board in the Ministry of Public Works.

One Parliamentary Deputy.

The President of the Associated Chambers of Commerce.

Two other Railway Experts.

A representative of the State Railways as Secretary.

This Commission at the end of the three years has to submit a report, and a scheme for the modification and placing together of the tariffs and regulations on a general basis, adopting, as far as possible, the arrangement of the Conference of Berne. The reason for this is self-evident. The present tariffs are a combination of the tariffs of the private companies, which, although in their general basis, under the State control, were on somewhat of a parity, yet, to meet individual circumstances or probably from purposes of competition, had certain anomalies. It is these which under this

unification will disappear, and there are no grounds for anticipation that the public will suffer in the process.

The Chambers of Commerce have all been requested to send in their views, and very lengthy documents are now in process of compilation embodying their suggestions.

Even to-day, however, it is stated that the Italian railways compare very favorably with their neighbors in their freight charges, especially in the matter of through rates, this no doubt in many cases arising from the tendency in Germany, Austria, and other countries not to give any facilities to imported goods. By way of comparison, the following figures show the rate per 10-ton wagon per kilometer on the Italian portion of the line and the foreign portion of the journey in exported consignments from Messina:

TARIFFS

Vienna,	L. 0.311	on the Italian section and	L. 0.910	on the foreign section
Antwerp,	L. 0.313	" " " " " "	L. 0.605	" " " "
London,	L. 0.313	" " " " " "	L. 0.803	" " " "
Berne,	L. 0.316	" " " " " "	L. 1.025	" " " "
Berlin,	L. 0.327	" " " " " "	L. 0.750	" " " "
Paris,	L. 0.307	" " " " " "	L. 0.744	" " " "

[Luiggi, Luigi, *Italian Railways. Results of Ten Years of State Management*, by Prof. Luigi Luiggi, D. Sc., Member American Society of Civil Engineers, President Italian Society of Civil Engineers, Former Member of the Italian State Railway Board, Rome, Italy. *In Transactions of the International Engineering Congress, 1915* (Vol. I), Railway Engineering. San Francisco, California, 1916, pp. 124-129.]

The railways of Italy can be divided into two systems: *Principal Lines* owned and worked by the State, and measuring a total of about 13,500 kilometers (8,400 miles); and *Secondary Lines*, owned and worked by many independent private companies, measuring about 6,000 kilometers (3,700 miles). The latter act as feeders for the principal lines and are of great benefit to the public, as they reach places in the mountains where, the traffic being very small, an ordinary line could not run at a profit.

Italy being a country generally hilly, and in some parts quite mountainous, railways are costly to construct—as tunnels, viaducts, and important bridges are very numerous; they are also very costly to work, owing to heavy gradients—up to 1 in 40 and in a few cases even 1 in 28—and to the fact that all the coal is imported, mainly from England and in smaller quantities from Germany and America. Thus the average working expenses in 1913 on the State Lines were 36,650 francs per kilometer (\$11,200 per mile).

On the other hand, the revenue is rather low, as in Italy there are no great mines nor forests, and the goods traffic consists principally of agricultural products, which, in general, cannot afford a high tariff. The passenger rates also are very moderate. Thus in 1913-14 the revenue on the State Railways was 44,950 francs per kilometer (\$13,750 per mile), which makes the "coefficient exploitation" (operating ratio) 81.5 per cent of the revenue.

Traffic Conditions.—To understand this "coefficient" and compare it with other lines, it is necessary to know under what condition Italian State Railways are worked and the class of traffic they carry.

First of all, tariffs are rather low—the law requires that for the first-class tickets the rate shall not exceed 2 cents per kilometer (about 3 cents per mile); for second-class, $1\frac{1}{2}$ cents; and for the third-class, 1 cent. On a few lines there is even a fourth-class, at the rate of $\frac{3}{4}$ cent per kilometer. And these trying conditions are aggravated by another law, which requires that on all lines, regardless of the extent of the traffic, three couples of trains, at the least, must be run daily. Thus, on several lines many trains run almost empty, especially in winter.

By this arrangement the public is certainly well served and the traffic is encouraged very actively; but, on the other hand, the financial situation of Italian railways belonging to the State—and more or less the same can be said of private companies—cannot be very flourishing. The result of the high coefficient of exploitation and high cost of the lines is that the traffic barely pays an interest of 1.6 per cent on the invested capital, and for some private lines there is a deficit; so that the State is obliged to pay annual subsidies of from \$1,000 to \$3,000 per mile of line. In such cases, however, after 50 to 70 years the lines become State property.

Italian Railway Policy.—Although from a purely financial point of view this policy may not seem satisfactory, the results from the standpoint of the general national interests are very important.

Many regions of Italy, especially in the South, were still very backward up to some years ago; agriculture was very rudimentary and the population poor and ignorant.

The construction of State railways was a national duty, in order to bring moral and material progress into those regions, regardless of high cost of the lines, which were very difficult to build owing to mountains, ravines, and material zones.

Thanks to this provident policy, the State railways, with their

“*differential tariffs*,” have cemented the political unity of Italy and have given an enormous impetus to commerce.

Regions that for centuries have been subject to a systematic abandonment—if not actual spoliation, while they remained under semi-foreign rulers—are now beginning to develop considerably. Agriculture is improving steadily everywhere, but especially in the South, and new industries are being started, especially in the North. The railways, with their low rates, are a great help in exchanging the products of the different provinces.

Private and State Management.—The most marked improvements, however, have taken place since the advent of the State Railway Board, in 1905.

Before that time, the railways, although for the greater part belonging to the State, were worked by three private companies, the “Mediterranean,” the “Adriatic,” and the “Sicilian” R. R. Co.’s.

The interests of these companies were different from those of the State. Each company worked its system with the object of getting the largest revenue with the smallest expenditure; therefore, tariffs were kept at the highest rate allowed by law, trains were slow and barely sufficient for the local needs, the rolling stock was old and not kept in good repair, and the personnel was underpaid and dissatisfied. Thus, both the public and the personnel had continual grievances against the railway companies. Strikes and systematic hindrance to the service—“*ostruzionismo*,” that is literal application of rules, by which there was great delay in the running of trains—were becoming alarmingly frequent. Parliament protested; several Ministers had to resign; and in 1905, when the contracts with the private companies expired, they were not renewed.

The State took over the control of all its own railways, and of a few other private lines necessary for the public interests. The lines were put in good working order by renewing the permanent way, doubling many trunk lines and sidings, and improving the stations and workshops, then the rolling stock was renewed and augmented, more and faster trains were run on the main lines, and third-class carriages were attached to all trains. The tariffs, also, were rearranged, in order to facilitate the transportation of agricultural products for long distances, and a “*differential tariff*” for passengers also was started, by which the rates per mile diminish rapidly with the increase of the length of journey.

All these reforms gave immense satisfaction to the public, which, being encouraged to travel and having better and cheaper means for the transportation of goods, was able to start new industries and

extend the centers of business. The National Wealth and the railway revenue increase compensated amply for the increasing expenditure, which, notwithstanding all drawbacks, is well below the revenue. The conditions of the "personnel" were also greatly improved, so that strikes became more rare and easily arranged, and peace, as far as possible, was restored between employees and employers and the service greatly benefited.

Thus now, after ten years of State railway management, the improvements for the public have been so marked, that no one would wish to return to the old régime of private control.

SWITZERLAND

[*The Case for Railway Nationalization*, E. Davies, London, 1913, p. 156.]

"The actual taking over of the lines by the State dates from 1897, when the recommendations of the federal council in favor of the taking over of the principal railways was adopted by Parliament and confirmed by the referend of February, 1898, there being 386,000 votes in favor and 182,000 against. . . . In 1900 the necessary government Departments and District Councils were created and a start was made by taking over the Central Railway. Then other lines, the Nord-Est, the Union Suisse, and the Luna-Singslon, were acquired in the three following years, and the last great line, the Gothard, was taken over in 1909."

[Holcombe, A. N. (Professor in Harvard University), *The First Decade in the Swiss Federal Railways*. In *Quarterly Journal of Economics*, February, 1912 (Vol. 26), pp. 354-361.]

"The law of July 27, 1901, not only established a satisfactory system of rate making, but also provided for the redemption of the pledges for improved service. The number and speed of trains and the supply of rolling-stock has been increased, terminal facilities have been improved, and ways more solidly maintained. The reports of the chambers of commerce of Swiss cities and of other bodies authorized to speak in the name of the economic interest of the country are full enough of specific criticisms of the service and suggestions for its improvement, but there is no disposition to disparage the capacity of the railway administration or to condemn its conduct of affairs. . . ."

There has been a widespread impression, in recent years, both in Switzerland and elsewhere, that the federal railways have proved a financial failure. This impression is founded largely upon the annual official budgets. Each year since the revised rates of wages

and passenger and freight tariffs were put into effect, the railway management itself has estimated that the next year would close with a deficit. Thus in a sense it is true that the federal railways, year after year, have been having to face deficits. These deficits, however, have been more apparent than real. The actual financial results have regularly been more favorable than the budgetary estimates with the single exception of the year 1909, and the federal railways have regularly earned a surplus over and above the amount required for the interest and amortization charges except in the two years 1908 and 1909. This is indicated by a statistical table, computed from the official reports, showing in parallel columns the estimated deficits and the actual results.

Since, however, a portion of the earlier surpluses were employed for extraordinary amortizations, the balance sheet at the end of 1910 showed a net deficit of one and a half million francs on the eight years' operations, or a little more than one-tenth of one per cent of the present funded debt of the federal railways. The amortization charges for a single year, which are a species of profit, would wipe out this deficit several times over. Since all interest and amortization charges have regularly been paid, this nominal deficit may be disregarded. Indeed it should have been wiped out by the results of the first quarter's operations in 1911. So near an approach to the ideal zero of surplus profits must be considered a sufficient disproof of the charge of financial failure. . . .

The second decade of the Swiss federal railways begins auspiciously with an estimated surplus, the first budgetary surplus since the government's policies have been in effect. The truth is that the Swiss federal railway management is to be highly commended for its energetic and sagacious handling of a difficult situation. In any undertaking in which the margin of profit is calculated so closely as in the Swiss federal railways, abnormal conditions may temporarily produce abnormal profits or losses; but over longer periods of time these should offset one another. There is no reason why the equilibrium between income and outgo should not be permanent.

Our examination of the financial history of the Swiss federal railways leads us to certain definite conclusions. Mr. McPherson's statement that the railways have become a drain upon the taxpayers is not supported by the evidence. For Mr. Vrooman's prediction, on the other hand, that the existing railways will have paid for themselves out of profits in about sixty years, there is substantial foundation in the record of governmental management.

Without venturing, however, to predict, we may observe that the Swiss federal railways have already reduced rates, improved the service, raised wages, and made a profit. In short, the evidence of the first decade of the Swiss federal railways is that the policy of "business opportunism" is justifying itself.

GREAT BRITAIN

[Memorandum of Nationalization of Railways, submitted to the Royal Commission on Railways, 1913-14, by National Boots Trades Federation.]

(1) It is submitted that the contributions of the railway managers to the report issued by the Board of Trade Railway Conference, 1909, indicate that in the judgment of the managers the railway system becomes increasingly efficient as it comes increasingly under one control.

(See p. 21, General Manager, Great Central.)

(See pp. 24-27, General Manager, North Eastern.)

Particular notice is called to the following paragraph on p. 24:

"Unless, therefore, we are prepared to admit the possibility of the whole railway policy in the past having been in a wrong direction the inference is irresistible that combination between railways up to a point is desirable, and the only question to be considered at any particular time is whether that point has been reached, *leaving out of view the policy of uniting all railways under one management*, which would almost necessarily mean the management by, or on behalf of, the State." P. 35, General Manager, Great Western:

"(a) That consolidation of railway interests are beneficial to the country generally." Pp. 36-37, General Manager, Caledonian; p. 39, General Manager, London and South-Western; pp. 45-46, General Manager, Taff Vale; p. 50, General Manager, Midland:

"Whether more extensive benefits might not be attained by a more complete and systematic elimination of competition, short of State purchase, by a scientific grouping of railways, constitutes an alluring field for speculation and enquiry."

(2) Nationalization would presumably secure *uniformity of rates*. For *goods* traffic there are no less than 21 different "Scales" of charges.

There are about 37 variations from "General Conditions" and 22 "Special Conditions" in connection with the above.

Passenger Service

It is submitted under State control:

(a) Duplication of trains would be abolished.

(See pp. 45-46, Report Board of Trade Railway Conference, 1909, Manchester and London trains.)

(b) Reduction of return fares would be made uniform.

(London to Grange, 268 miles reduction on first-class return fare, 1s. 11d.)

(London to Lancaster, 230 miles, reduction on first-class return, 4s. 6d.)

Germany, no returns; Belgium, 20 per cent reduction; Switzerland, 25 per cent reduction.

(c) Uniformity would be secured in regard to availability of return tickets.

(Now, some six months, some eight days.)

(3) Financial effect of nationalisation:

Capital.—Assuming that the State paid 25 years purchase of average net receipts of three years, 1910-1912 (£47,755,569), the cost of purchase would be £1,193,889,225.

Revenue.—The net receipts of all companies in United Kingdom for 1912 amounted to £47,329,074.

To pay 3½ per cent on issue of government stock on purchase money would absorb £41,786,115, leaving a surplus of £5,542,959.

No account is taken of:

(a) Saving in administration: It is stated that in 1912 12,591 fewer persons were employed on the railways than in 1909, which I assume to be the result of amalgamations and pooling.

(b) Making ordinary stock a trustee investment.

CANADA

[*The Case for Railway Nationalization.* E. Davies. Collins Clean Type Press, London and Glasgow.]

“The Government railways of Canada consist of two lines, the Inter-Colonial Railway and the Prince Edward Island Railway. The total length of the State-owned and operated lines is 2,072 miles which were built at a cost of \$119,515,666, on the credit of the Dominion on the provinces concerned. In addition, the building of lines is encouraged by Government subsidies and the guaranteeing of interest on bonds. At the 30th June, 1911, the guarantees, subsidies, and land grants by the Dominion and Provincial Governments were as follows:

“Cash subsidies, \$202,179,256; guarantees, \$148,336,357; land grants, 55,256,429 acres.

[*Railway Age Gazette*, vol. 61, No. 14. Article by J. L. Payne, Comptroller of Statistics, Canadian Department of Railways and Canals.]

The Intercolonial was built and is operated by the government of Canada, but it was not built and it was not operated to show the soundness of state ownership. It was built as an essential part of the bargain of confederation. When the provinces of Nova Scotia and New Brunswick were approached in the early sixties on the subject of union with the provinces of Ontario and Quebec they were both unfavorably disposed. Nova Scotia was particularly hostile. “Our market,” said the Nova Scotians, “is the Eastern States. It lies right at our door. It is open the year round. Ontario and Quebec are a thousand miles away and are accessible to us for not more than seven months in the year. We should lose by casting in our lot with the proposed confederation.” These were strong and sound objections. They were put forward with equal candor and forcefulness by New Brunswick. They had to be met or the union of the upper and lower provinces had to be abandoned. The Intercolonial was the solution of the difficulty. “We will build and operate,” said the delegates at the famous conference in Quebec, “a railway which shall be open throughout the year, and will enable trade to flow between the eastern and western parties to confederation.” On that specific pact the road was constructed. It ran from Halifax, in the east, to Levis, opposite the city of Quebec, in the west. There it formed a junction with the Grand Trunk which ran further westward to the Detroit River.

Section 145 of the British North American Act, which Americans would regard as the Canadian Constitution, reads as follows:

“Inasmuch as the provinces of Canada, Nova Scotia and New Brunswick, have joined in a declaration that the construction of the Intercolonial Railway is essential to the consolidation of the Union of British North America, and to the assent thereto of Nova Scotia and New Brunswick, and have consequently agreed that provision should be made for its immediate construction by the government of Canada: Therefore, in order to give effect to the agreement it shall be the duty of the government and parliament of Canada to provide for the commencement, within six months after the Union, of a railway connecting the River St. Lawrence with the City of Halifax in Nova Scotia, and for the construction thereof without intermission and the completion thereof with all practicable speed.”

All arguments respecting the Intercolonial which ignore this historical reason for its existence are certain to lead to erroneous conclusions. The road was not built as a government project because it was believed that form of ownership was preferable to corporate control. It was built solely to secure and maintain confederation. It has accomplished that purpose, and it stands today as the absolute seal of a solemn compact entered into at the birth of the Dominion. No corporation wanted to build it. The undertaking had to be carried out by government. Moreover, no existing corporation would today take over the road and operate it on the terms which were tacitly, if not explicitly, made a part of the primary conditions of union. I shall endeavor to make it perfectly plain a little farther along what bearing this fundamental situation has on rates and operating results, as to which Mr. Dunn gave such an excellent and painstaking analysis.

Mr. Dunn did not get to the root of the matter when he pointed to the location of the Intercolonial as an illustration of the economic mistakes which he seems to assume are inherent in state ownership. He fell into the error of taking it for granted that the government of Canada had a free choice in the matter of route. Certainly no corporation which had commercial results in view would have selected the needlessly long and roundabout course through the wilds of New Brunswick and the south shore of the St. Lawrence in Quebec which was actually taken. That was where the Imperial government came in. For the purely strategic reasons to which Mr. Dunn has alluded the home authorities imperatively insisted that the line should keep as far away from the American boundary as possible. The Dominion government felt bound to concur, and in doing so a section several hundred miles in length was established which does not even now produce any traffic of consequence.

If the Intercolonial be accepted as a fair example of government ownership, and the question of success or failure be determined upon operating results, then Mr. Dunn has made out an unanswerable case. It happens, however, that there is a very big and very important other side. Despite the splendid array of statistical facts which he has given, and the skill with which he has woven those facts into an indictment, he has clearly been misled. With his finding that the government road has never earned fixed charges, and has cost the people of Canada a very large sum of money in interest charges, I cannot find fault. All that is unhappily true. But it is not precisely pertinent. With a large percentage of corporate owned roads in the United States in the hands of receivers it is

a little dangerous for an opponent of State control to make net earnings a test of the underlying principle. The advocates of public possession see in large net earnings one of their strongest arguments. Be that as it may, the point I desire now to establish—and it is the kernel of this whole matter—is that the Intercolonial has not paid, in the commercial sense, simply and solely because its freight and passenger rates have been too low.

The natural and logical question an uninformed reader would ask is this: "If low rates account wholly for poor operating results by the Intercolonial, why does not government raise them up to the Canadian Pacific level?" The answer carries me back to the historical aspect. Rightly or wrongly, the people of the maritime provinces believe it was an absolute and fundamental part of the original agreement that the rates of the government line should never produce more than operating expenses. They are firm in the assertion that it would be a flagrant breach of faith to attempt the earning of interest on the cost of the road. There are two further reasons: First, the Intercolonial is exposed along its entire length to water competition for seven months in the year, and for the full year along its most productive mileage. That fact should not, however, be given undue importance. The second reason goes much deeper. The canals of Ontario and Quebec, from which the people of New Brunswick and Nova Scotia do not obtain a particle of direct benefit, are free. They cost in capital outlay about \$10,000,000 more than did the Intercolonial, and require an annual expenditure of \$1,700,000 for operation and upkeep. The Canadian Confederation is not so perfect that the maritime provinces would consent to pay the fixed charges of the Intercolonial while the upper provinces went scot free on account of the canals. Mr. Dunn will probably find just as costly sectionalism as this in the United States. No government in Canada has felt warranted in disregarding these grounds for resisting rate increases, whatever merits they may have in the eyes of disinterested onlookers.

[Official Report of the Debates of the House of Commons of the Dominion of Canada. Sixth Session—Twelfth Parliament. 6-7 George V, 1916, vol. 125. Ottawa, 1916, 2973-4156 pp., octavo.]

Pages 3871-3872. (May 12, 1916.)

Mr. W. F. MACLEAN: Having listened to the discussion of the merits and demerits of public ownership, I still think that the arguments in favor of that system are sound and that it is the proper railroad condition for this country. I tried to make it clear this afternoon that the opportunity to bring about public ownership in

this country is here, in this crisis created by the war or by something else, when we find two railroads asking government assistance. But the thing that strikes me in this debate is that the Grand Trunk Railway, the Canadian Pacific Railway, and the Canadian Northern Railway are very much afraid that we are very near the open door of public ownership in this country, and they would like to see the country get past the present situation. That situation presents itself to Parliament, and it is upon Parliament I urge that that situation should be used for the purpose of trying out the system of public ownership. I would like to see public ownership tried with at least one of these railroads of the East which has connecting lines in the West. *We have the Grand Trunk Pacific on our hands or we have to finance it; and we have the Transcontinental certainly on our hands and are running it. We have also the Intercolonial* and are buying other lines in the East. So, I say take over one line that is profitable in the East and is linked with these lines in the West, and let us see what we can do in competition with the other roads. My suggestion was to give a sum of money—I mentioned a certain sum as a feeler—to get possession of the road. The only road that I see in immediate sight is the Canadian Northern, which, I believe, would sell its interest for a very small consideration. The suggestion I made is entirely my own. These negotiations afford us an opportunity to take over a good system that affords connection with our cities in the East. And with that one road, whichever it may be that we take, we should link the great transcontinental system that will give competition with the other lines. The operation of such a road would be more effective in moderating rates in the West than anything else I know of. It would do more for the public of the West than the Railway Commission with all its powers of regulation can do. It may be that we shall be forced to take them all by our still further experience or on the recommendation of the commission that we are going to appoint. I am not going to object to that commission, and, of course, its report may be in favor of public ownership. But I am not going to be guided by that.

Pages 3973-3974.

Sir Thomas White (Minister of Finance): . . . We are confronted with a railway situation which it is our duty to solve, and which we propose to solve by taking the best expert advice that we can get, looking to a permanent settlement of these difficulties which annually confront the government. My own view is that the solution of that railway problem may involve, and probably will in-

volve, the government of Canada taking over one or more of the railway systems of Canada. As I stated in my speech when introducing these loans to the House, it is possible that it may lead to the nationalization of the railways of Canada. But I stated at the same time, and I state now, that whether a war is on or not, it is not a light undertaking to take over all the railways of the Dominion of Canada. We should have to consider many things; as, for example, the effect upon our credit of taking them all over at once. The honorable member for South York (Mr. Maclean) seemed to suggest that it was a very easy thing to take them all over. Well, it is not an easy thing to take over all the railways of Canada and assume all the activities now being carried on by them, activities connected with immigration; activities connected with transportation upon the Atlantic and upon the Pacific; the operation of all those roads; the financing of their needs. That would not be a light undertaking at any time, even if we had no war. But I desire, in conclusion, to say that we are in this war; we are confronted with heavier responsibilities by far than have ever fallen to the lot of the people of Canada before; that the end of this war is not in sight; that we are increasing our national debt at the rate of twenty or twenty-five million dollars a month, some two hundred and fifty or three hundred million dollars a year; that we shall probably be confronted with a debt at the end of this war of one thousand million dollars. In time of peace it would not be a light undertaking to bring about the nationalization of all the railways of Canada; it would certainly not be a light undertaking to do so in time of war. But this situation must be faced; there must be an end of this annual coming to the government of Canada by these two railway companies for relief. The policy which we have adopted has been stated to be no policy. I say it is the true policy in the situation in which we find ourselves. We are not in a position to say what should be the permanent solution of Canada's railway problems. We are in this position, that we do not want these railway companies to collapse. The policy which has been before this committee, and I know it has met with approval in this House, is the true policy at this time, and it is not the less the true policy because it provides temporarily for the situation. It bridges time; it enables these roads to continue—these roads which are so vital, so essential for the welfare of this country—until such time as, upon the best advice that we can get, we shall be able to suggest some permanent solution, which I believe will probably involve the taking over by this government of one or more of the

existing railway systems of Canada and which, as I stated, may involve later on the nationalization of all the railway systems of Canada.

THE UNITED STATES

[Hearings before the Joint Committee on Interstate and Foreign Commerce, Congress of the United States, Sixty-Fourth Congress, First Session. Extract from remarks of Senator Newlands in opening the Hearings, Monday, Nov. 20, 1916 (p. 10).]

The people will look for simplicity in whatever plan of relief is proposed, and unless we unify and simplify the control of transportation in a few thoroughly regulated great national corporations, whose finances and operations can be easily understood, and whose functions will be entirely taken out of politics, they will drift into national ownership as the easiest solution.

The argument in favor of national ownership is an attractive one. Outside of the United States three-fifths of the world's trackage is in national ownership, and not a single nation that has entered upon national ownership is inclined to withdraw from it. Japan, only recently coming out of the stress and strain of a great war, has passed an act for the purchase of all private railroads in Japan, at a cost of \$250,000,000.

The plan of acquiring national ownership would not be difficult. It would not involve the entire readjustment of the present system. It would be easy to authorize the Interstate Commerce Commission to institute suit and condemn the shares of stock of all the railroads in the country engaged in interstate commerce, leaving the bonds outstanding as a lien upon the property. Thus the interests of the stockholders would be purchased by the Nation and the Interstate Commerce Commission could step into the position of director of the various corporations, with their present organization of officials and employees, and could gradually work out a method of national administration.

The present gross revenue of all the railroads would be amply sufficient to pay all the fixed charges of the companies and the low rate of interest upon the Government bonds issued for the purchase of stock and produce a surplus which would make ample provision for betterments and extensions, and also provide a sinking fund which would extinguish the debt before many years.

Or, should the country determine to take hold simply of the new construction of the future, leaving the existing railroads in the hands of their present owners, the Government could easily build a rail-

road of 3,000 miles across the continent from the Atlantic to the Pacific, which would become the spinal column of a great governmental system.

Government ownership presents no difficulties, either constitutional or practical, and the country will certainly drift to it unless the existing abuses of uncontrolled monopoly, of overcapitalization, of accomplished union between the producing and transportation interests of the country, of political control, and of unjust preferences and discriminations are done away with. Even assuming that the Government management may not be economical, the time may come when the people will regard equality of service as of more importance than economy of service. But the plan of national incorporation would give the country the benefits of Government ownership with none of its dangers. It would abolish the evils which have arisen from unrestricted monopoly, automatically bring about a reduction in rates, put the railroads out of politics, and retain the management of the able men whose genius created our present efficient system of transportation. No complaint can be made as to this efficiency; no complaint can be made as to consolidation properly controlled in its capitalization. No attempt should be made to raid the property of railroad investors. No attempt should be made to destroy or impair the existing values of their securities. Unity of control, simplicity of organization, certainty in valuation of railroad property and in return upon such valuation to the stockholders, certainty in taxes, fair recognition of the dangerous character of the service of the employees, proper provision for insurance against accidents and old age, conciliation of disputes between the carriers and their employees, are parts of the full and comprehensive legislation which this subject requires and which would differentiate our legislation from the incomplete and fragmentary legislation in which Congress has thus far indulged regarding interstate transportation.

[Extracts from statement of Mr. Smith W. Brookhart, representing the Railroad Commission of the State of Iowa.]

The next subject I desire to consider is the proposition of the unearned increment of real estate. The railroads are constantly capitalizing unearned increment and claiming a return upon it. This claim has been resisted, but the Supreme Court of the United States has finally decided that the railroads ought to be satisfied to receive a return upon the increase in the value of the real estate. (Minnesota Rate case, *Simpson v. Shepard*, 230 U. S., 377.) This theory constantly adds the unearned increment to the value of rail-

road property. Under private ownership this added value belongs to the stockholders. Under Government ownership it would be a saving to the Government. It is impossible to tell the exact amount of this saving. The record of the past will not be known until the valuation of the railroads is completed. I can only give a concrete example and estimate the total. In the Minnesota Rate case, above cited, the master determined the cost and the present value of the real estate for terminals of the Northern Pacific in the cities of St. Paul, Minneapolis, and Duluth.

Up to 1908 he found the original cost to be \$4,527,228.76. He found the present value at that time to be \$17,315,869.45. This finding was not approved by the opinion of the Supreme Court, but it did announce a theory that allows about thirteen and one-third millions, or nearly 200 per cent, advance. If the Government had owned the Northern Pacific, every dollar of this would have been saved. Under private ownership the stockholders not only get a reasonable return upon their original investment, but in this instance they got a present of over eight and three-quarter million dollars, and are allowed to collect a return upon it from the public forever. The same thing has happened with every railroad in every city of the United States. In the Western Advance Rate case, 1910 (20 I. C. C. Rep., 243), it was found that the increase alone of the land values of the Burlington Railroad amounted to three-fifths of the total original investment of the entire Burlington system.

The CHAIRMAN. State that again, please.

Mr. BROOKHART. I will repeat that. I am glad to have that noticed, because it means much in this proposition.

It was found that the increase alone of the land values of the Burlington Railroad amounted to three-fifths of the total original investment of the entire Burlington system. The figures will come later.

On page 340 Commissioner Lane, now a member of the President's Cabinet, in writing the unanimous opinion of the commission in referring to the claims of the Burlington Railroad that it should be permitted to continuously increase its rates because of (first) betterments out of income, and (second) increase in land values, stated:

“If the position of the Burlington is sound and is a precise expression of what our courts will hold to be the law, then, as we are told, there is certainly the danger that we may never expect railroad rates to be lower than they are at present. On the contrary, there is the unwelcome promise made in this case that they will con-

tinuously advance. In the face of such an economic philosophy if stable and equitable rates are to be maintained, the suggestion has been made that it would be wise for the Government to protect its people by taking to itself these properties at present value rather than await the day, perhaps 30 or 50 years hence, when they will have multiplied in value ten or twenty fold."

The same thing has happened as to all of the right of way of all of the railroads. The amount of unearned increment already capitalized is a fabulous sum. It will be more in the future than in the past. The growth and development of our country is only begun. Eminent authority has estimated the future unearned increment of our railroad real estate at an average of at least \$300,000,000 per year. The increase in land values for one railroad has been estimated by the Interstate Commerce Commission. This railroad was accepted as typical of the western territory, it being the Burlington. The increase alone amounted to \$150,000,000, that company having a capitalization at that time of \$320,000,000. Of course the capitalization was higher than the original investment, but \$150,000,000 was three-fifths of the original investment.

It will be impossible to find any accurate statement of the total land values in the United States, but considering the fact that the enormous terminals are in the East rather than in the West, that the proportion of terminals to the railroad right of way is very much greater in the East than in the West, and when you consider not only the increase in land values but also the original cost, it would seem safe to estimate that the total land values in the United States, including the enormous terminals, is \$6,000,000,000, exclusive of improvements. It is probably safe to estimate that land values have increased 100 per cent in the last 15 years. If they increase 100 per cent in the next 20 years, the annual increase by reason of this unearned increment will amount to \$300,000,000. I also desire to call your attention to the fact that the writers of books against Government ownership of railroads do not discuss this item. Although this item is so important that it alone might be sufficient to decide this great question, still it is not mentioned by the advocates of private ownership. It deserves a thorough investigation by this committee.

I think, gentlemen, that the unearned-increment proposition, even if you do not go to Government ownership but decide to go ahead with Government regulation, is one that deserves serious consideration at your hands. I believe it should be ended. If we give them an honest valuation and give them enough returns to collect

6 per cent in all years, that is sufficient, as they are not entitled to get a speculative value out of property of this kind. They are nothing more than public trustees—trustees for the public—for performing this work. We have surrendered this into their hands, and it is no more right that they should profit out of that trust than that a guardian or administrator of an estate should profit out of the advance of real estate which he controls.

The third great economic loss of private ownership of our railroads is the waste of competition. The details of this subject are myriad. I shall not attempt to present them. Those who favor uniting our railroads in a single giant private corporation rely upon the facts showing the great waste in the present system through duplication in everything. With these facts I agree. Nor is there a vast difference in the remedy I propose. I, too, believe in a single giant system, but I want all of the people of the United States for stockholders and the Interstate Commerce Commission for the board of directors. The Government of the United States is the only agency which our people will trust with so great power. But as to the waste of competition, I shall only give the conclusions of the most eminent authority, Mr. C. P. Huntington, president of the Southern Pacific Railway, who said that the local waste in New York City alone amounted to \$100,000,000 annually. (U. S. Ind. Com. IX, 985.) In reference to the waste of competition under the English system, Clement Edwards, page 28 *Railway Nationalization*, says:

“What do the wastes of the present system, with its manifold ownership and divided management, amount to? Only an approximate figure can, of course, be given, in the present defective state of railway statistics. The secretary of the London & North-Western Railway Co.—and he would not be likely to err on the side of exaggeration—estimated the loss as 20 per cent of working expense. A similar estimate has been made by Sir Edwin Chadwick, C. B., the eminent engineer. Another railway authority, Capt. Laws, manager of the Lancashire & Yorkshire, has placed the estimate at 24 per cent.”

Mr. Edward Dudley Kenna, former vice president and general counsel of the Santa Fe, in his book on *Railway Misrule*, page 111, says:

“English experts estimate that the wastes from competition are equal to 20 per cent of operating expenses. They are scarcely less in the United States. As the operating expenses of the railways for 1912 were \$1,958,963,000, the reasonable inference is that \$400,-

000,000 of this was waste, all of which the people were called upon to supply. This sum exceeds the total of all dividends disbursed during the year given by railway companies and is also greater than the annual disbursements for military, naval, and post-office expenditures by the Government."

Of course, Mr. Kenna's book was written a few years ago, before the great increase in military expenditures.

This is high authority, and it seems reliable. Government ownership would remove this waste and in this third great item would save to the people \$400,000,000 per year. Summarized, we have:

Annual saving because of superior Government credit . .	\$500,000,000
Annual saving of unearned increment of real estate . .	300,000,000
Annual saving of waste of competition	400,000,000
Total annual saving of Government ownership . .	<u>\$1,200,000,000</u>

This is more than one-third of the gross revenues of all the railroads. Until recently it is more than the entire appropriations of the Congress of the United States. And this does not include all of the waste and extravagance of private ownership. There are many smaller items, like legal expenses, advertising, and soliciting, which I will not attempt to estimate; however, there are two others so large that they ought not be omitted from consideration. The first is the waste through the alliances with subsidiary supply companies. This waste is nearly all concealed. I will only quote you what a distinguished United States Senator has said: "Enough is known to make it reasonably certain that hundreds of millions of railroad expenditures annually reported as necessarily paid out to maintain the railroad and meet its operating expenses are not honestly expenditures for such purposes, but represent instead wrongful payments to 'insiders' who work a legalized form of graft, taking a rake-off on everything that enters into railroad construction, from the money to finance it to the oil that lubricates the engines. The directors of the United States Steel Co. own and control more than one-half of the railroad mileage of the United States. They sell steel rails to themselves at 'most satisfactory figures.'"

I can illustrate this by a personal experience. Some years ago, in connection with the promotion of a little interurban railroad, I got the B. J. Armour Co. to estimate on the price of furnishing steel rail, and the only price they quoted was \$28 per ton f. o. b. factory.

The same year I had some business in Canada with the Canadian Pacific Railway Co., which was building an extension through some land that was owned by a company which I represented, and I went up there, and during the course of our business I made inquiries of the parties in charge of this extension about their steel prices, and they said they were quoted to them at \$20. That is the way the Steel Trust is doing business today.

In this connection, gentlemen, I have another exhibit which I desire to present to you, and I want to show you something about the power of this item in the history of the United States. In this same rate case, when we were examining their prices, etc., we made an investigation of the subject of steel rails as compared to the several items of steel. The exhibit which I have here, the top line running highest through that variation [exhibiting] is wire nails. There is a line in there—and I have marked it with pencil so you can find it easily—which indicates the steel rails.

Now, there are several other items of steel on that page, and they are going up and down, year after year, from 1898 to 1914, in compliance with the law of supply and demand, and perhaps there were manipulations, but you see the variations that happened all the way through on all the other steel products. The comparison of the percentages will show that if steel rails brought \$28 per ton, that wire nails brought about \$31 per ton, which is a remarkable thing, considering the difference in manufacture. Now, what happened to steel rails in 1901? In 1901 starts this black line [exhibiting] representing steel rails, and from 1901 it has proceeded as straight as the point of the compass. It never varied up or down until the end of 1914, and that is as far as this exhibit shows. Since the war began I understand it has varied up, but it is proceeding along in the same deadly parallel. Who was it that repealed the law of supply and demand? It has never been done before in the history of this big round world. Here is a private corporation or an association of private corporations that have exerted a power greater than the Roman Emperors' power or the Czar of all the Russias could exert. The Congress of the United States can not draw another black line like that by law. You never can do it unless you take over these railroads and own both the railroads and control the manufacture of steel rails at the other end, as these men did. Owning a majority of these roads and selling these rails at the prices they desired, they were able to repeal the law of supply and demand and draw the blackest line—the only black line of its kind—in all human history.

Then we have the alliances with subsidiary transportation companies. Our American railroads have failed to perform the very functions for which they were created. They have admitted their inefficiency and incompetence by farming out the express business, the telegraph business, the sleeping-car business, the tank-car business, and even a large part of the refrigerator and other freight business. These companies are all profitable. The receiver's court has no terrors for them. Even a Government parcels post has but slightly affected the express business. Under Government ownership nearly all of the net profits of these parasite companies would be saved to the people. The extravagance of governments is proverbial, but the extravagance of private ownership of railroads has never yet been told.

Having pointed out the economics of Government ownership, it is pertinent to inquire if there is anything on the other side of the account to offset them. It will be conceded that some things do so operate. According to Mr. Dunn, Government ownership of railways has been adopted in whole or in part in 53 different countries, and since his book was written the United States has started in Alaska. This gives a wide field for observation. A review of the change from private to public ownership in all of these countries will show that labor has received better treatment and better pay under Government ownership. This costs something, and would absorb a part of the savings I have indicated. Upon this subject Mr. Dunn says, on page 338:

“As to the intensity of the labor required from and done by employees, it is likely to be greater under private than under public management. As has been shown elsewhere, when railroads have been transferred from private to public ownership, there is almost invariably an increase in the number of employees, and under similar conditions State railways ordinarily employ more men than private railways. This must mean that on the average the individual employee on the latter is required to do more work than on the former. Indeed, it is one of the common complaints against capitalistic employers that they work their employees harder than Governments.”

Again, on page 441, he says:

“However, it is significant that where there are State and private railways in the same country, it is found that the State railways pay a somewhat higher scale of wages, and seldom or never is it found that the opposite is the case.”

These conclusions may be treated as the admissions of the best-

informed opponents of Government ownership. They are true except as to the high-salaried general officers. In Germany the minister of public works has charge of more railroads than any other one man on earth, and he manages them better, but his salary is only \$9,000 per year and house rent. Suppose, therefore, we admit that \$300,000,000 of the saving we have pointed out would go to increase the number of employees and to increase their pay. This would mean better labor conditions, greater safety, and better service for the public.

Who is there would regret if the \$20,000,000 now paid to general officers, largely as financial experts, legal experts, or political experts, were transferred to the section hands who do not draw a decent wage? Three hundred million dollars would be more than railroad labor has ever asked. This would leave \$900,000,000 still to be used in lowering rates, improving the service, or extending the facilities. We could have 1-cent passenger fare if we wanted it, or we could save an immense capital for new development. This is the other side of the account, and the balance remains large in favor of public ownership.

But now you ask for a concrete example. You say this is all theory, and you want to see the record of the country that has done these things. For this purpose I will make comparison to Germany. There are several reasons for this. The German roads are well managed. I do not favor Government ownership in this country unless the management is something like German efficiency. This does not mean an autocratic management. Contrary to popular belief, the German roads are under a very democratic management. The attached note is from Prof. Frank Parsons, and gives the workings in detail. A similar system is the most suitable for this country.

Now, gentlemen, I want to read to you a note about how the Prussian railroads are managed. They are really State roads in Germany. Prussia is the greatest State. Over and above the Prussian management there is a sort of supervising office that brushes down any distrust among the States. It does not exercise anything like the authority of our Interstate Commerce Commission as to private ownership. The real management, after all, is in the hands of the States over there, and this note that I read you now gives the management of the Prussian railways, and I think you will find it is both co-operative and democratic, exceedingly so, and as compared with the system which these railroads are proposing here now of abolishing practically all the State commissions and giving all the

authority of all the management into the hands of the commission appointed by the President and Senate alone, the autocracy of the plan proposed here in the United States would be beyond expression, when you compare it with the so-called autocratic management in Germany. Now, let us see:

“Railways are managed by the minister of public works at the top (with a national advisory council), 21 railway directories, 6 classes of local officers (operating, machine, traffic, shop, telegraph, and building). One of the principal duties of the local traffic office is to maintain a ‘living union’ between the railway administration and the public. The chiefs of these offices are required to get into intimate relations with the people of their localities. Each local traffic chief ‘by numerous personal interviews and observations must inform himself concerning the needs of the service in his district, investigate and remedy complaints and evils without delay, and take such measures as will secure the most efficient service.’ It is also one of his duties to inform the public concerning the organization and administration of the railways. The management has nothing to hide from the public, but, on the contrary, desires the public to know exactly what is being done and why.

“The local advisory councils are composed of representatives from chambers of commerce, labor organizations, farmers’ unions, dairy associations, merchants’ clubs, etc.; all sorts of industrial and social combinations are represented in these advisory councils, and the law requires the directories to consult these advisory bodies. The people organized according to their interests into various forms of industrial union (chambers of commerce, labor unions, farmers’ associations, etc.) elect the members of the local advisory councils, and these councils in turn elect 30 out of the 40 members of the national advisory board, the other 10 members being appointed, 3 by the minister of agriculture and forests, 3 by the minister of trade and industry, 2 by the minister of finance, and 2 by the minister of public works, State officials being ineligible. These advisory bodies do actually discuss with the greatest force, clearness, and effectiveness all sorts of questions about rates and classification and the conduct of the railroads; they make their recommendations and suggestions, and they are almost always adopted—always, in fact, except in those rare cases where conditions beyond the control of the railway management prevent adoption from being reasonably possible. So that in Germany today the railway system is practically in the hands of the people to manage and direct. The roads are actually operated in the interest of the people on one of the

most democratic and co-operative plans it would be possible to imagine.

“Each railway directory must consult the circuit council on all important matters concerning the railways in its circuit. This applies especially to time-tables and rate schedules. On the other hand, the council makes recommendations to the directory. In case of emergency the directory may act according to its own judgment independently of the council, but it is required to report all such cases to the standing committee of the council and to the council itself. This provision supplies the elastic element which enables the railway management to combine full efficiency and executive force with the council system. Each council has a standing committee which receives petitions, gathers and sifts evidence, and reports to the council.

“If, for any reason, the circuit council and the local directory can not agree, or the question in hand is too large for local settlement, the matter goes up to the national council and the minister. The national council meets at least twice annually and deliberates on such matters as the proposed budget, normal freight and passenger rates, classification of freight, special and differential rates, proposed changes in regulation governing the operations of railways, and allied questions. The law requires it to submit its opinion on any question brought before it by the minister of public works, and it has the right to make any recommendations it sees fit in regard to any matter relating to the railways. Its proceedings are regularly submitted to the Landtag, where they are considered in connection with the budget, thus establishing ‘an organic connection’ between the national council and the Parliament. In this way the proceedings are made accessible to every one, and an opportunity is given to approve or disapprove what the council does through parliamentary representatives. The system is one of reciprocal questioning and answering on the part of the minister of public works, the national council, and the Parliament.”

For the purpose of this comparison, I will take my figures from Mr. Dunn's book. When they are unfair they are also unfavorable to Government ownership, so I use as my basis the concessions of the opposition. The mileage of the Prussian Hessian State Railways in 1910 was 23,325 and the cost per mile was \$114,000. (Dunn, p. 180.) The net earnings were \$170,000,000 (Dunn, 311), but from this should be deducted \$21,000,000 for taxes not collected. (Dunn, 313.) This would leave \$149,000,000 of profit to the Prussian Government in 1910, after paying all expenses and

taxes as great as ours, and this vast sum was earned on 23,335 miles of line. The mileage for the United States was 238,609, or more than 10 times as great. At this ratio the American roads would have earned more than one and a half billion dollars, and deducting from this the entire interest charge would have left over 1,135 millions net. This is a wide margin over a billion dollars, and it shows that Germany actually did what I claim the United States ought to do.

No claim is more persistently made than that the American freight rates are the lowest in the world. You see it in newspapers, in magazines, in pamphlets, and in books. Mr. Dunn excepts Japan alone (p. 296). This claim has even reached Congress, and near the close of the last session Senator Works said: "The truth is that our freight rates are materially less than are the freight rates of any country in the world, and that passenger fares, with the exception of third and fourth class fares in European countries, are as low as are the rates in other parts of the world." Mr. Dunn has used seven pages of his book, 296-302, to demonstrate that our passenger rates are almost as low as the German and our freight rates much lower. I desire to join issue with those conclusions and assert that not only are American passenger rates highest in the world, but American freight rates for the same service are highest also. The issue is sharp and is also important. Now for the facts.

When we seek to compare freight rates in two different countries we first look for the average cost of hauling 1 ton of freight 1 mile. In the table given this average cost in Germany is 1.248 cents and in the United States 0.753. If this were all to consider, the American rate is much lower than the German. But this is only the starting point. Every rate is made up of two things—one the terminal expense, the other the haulage expense. All freight must be loaded and unloaded, and facilities must be provided therefor. That is terminal expense. It must be moved. That is haulage. The terminal expense is about the same for a short haul as for a long one. Therefore the length of haul becomes the next great item in a freight rate. The above table gives the average German haul at 68 miles. That is Mr. Dunn's figures. Other eminent authority gives it as 60 miles; but again I use the conceded figures. In my table the American haul is given as 249.88 miles. In Mr. Dunn's book, on page 176, the "average haul miles," "railways of the United States," is given as only 138 miles. Now, we are coming to the issue. On page 296 he says the length of the American haul is double the German, and this statement is repeated on page

299. He makes no explanation of these figures, and states them as a positive fact and without qualification. Where did he get those figures? Look on page 59 of the statistics of railways.

What is the answer to this fatal achievement? In the main we hear two. First, it is loudly proclaimed that wages in the United States are double what they are in Germany, and, second, the American freight rates are the lowest in the world. The first is more than offset by the greater cost of railroads in Germany, and the second I challenge and will seek to disprove. In order to make the comparison I submit the following table. The German figures are from Mr. Dunn's book and the American from *Statistics of Railways*, I. C. C., 1910, which is the same year used by Mr. Dunn:

	Prussian, Hessian- State.	United States, Private.
Mileage operated	23,335	239,609
Capitalization or cost of construction per mile of road	\$114,000	\$62,657
Passenger density, passengers carried 1 mile per mile of line	693,921	138,169
Average journey, miles	14.45	33
Average rate per passenger mile, cents ....	.88	1.938
Freight density (tons hauled 1 mile per mile of line)	1,150,490	1,071,086
Average haul, miles	68	249.68
Total compensation American railway em- ployees, 1910 .....	.....	\$1,143,725,308

Average wage (Dunn, 177), Prussian about one-half of American.

If the German wages are only one-half the American wages and all other conditions were equal, then it is certain American earnings would be less. A glance at the foregoing table shows other conditions are not equal. The first great discrepancy is in the cost of the road. We find that the German roads cost over \$51,000 per mile more than the capitalization of the American roads. If, therefore, the American roads cost as much there would be an additional \$12,000,000,000 upon which to earn a dividend. If we took half of the American wages shown in the table for that purpose they would yield about \$572,000,000, or about 4.77 per cent. But on page 311 Mr. Dunn shows the German roads earned 6.48 per cent upon their entire cost of \$114,000 per mile. Therefore the one item of greater

cost of road more than offsets the difference in wages. In addition to this the German employees are so well protected by State insurance against injury and loss of employment with pensions that the real difference in wages is much less than the nominal difference.

Where did he get those figures? Look on page 59 of the *Statistics of Railways*, I. C. C., 1910, and you will find them under the heading, "Typical haul of the average railway." Does that mean the average haul of the railways of the United States? It does not. It means the average haul of one; that is, the average railway. In the next column on the same page we find "The typical haul of all the railways regarded as a system," and that is 249.68 miles instead of 138. And there you find the two figures side by side, in the same book, and yet Mr. Dunn uses the typical haul of the average railway and never says a word about it, as the average American haul. In order to maintain that claim that American rates are lower at all, it is necessary to split that haul and reduce it down to 138 instead of 260 miles as it is today. It was 250 miles, in round numbers, at the time I made the comparison.

In our country there are many thousand hauls over two or three or even more roads. You can start a trainload of freight at New York over the New York Central, take it over the Lake Shore and over the Big Four, down to St. Louis without that train being broken up, every car going at the same time, under the same motive power, under the same crews. You can do all of that, and yet in Mr. Dunn's figures the typical haul of the American railway—that through haul is broken up and reported as three hauls, and there would be three terminal expenses. The unfairness of that proposition has enabled them to publish continually and put in statements and pamphlets and books and everything the fact that American freight rates are the least in the world. The cars are loaded at the beginning, switched from one road to another, and not unloaded until the journey end. So far as terminal expense is concerned this is one haul. Under the figures used by Mr. Dunn, if a car passed over three different roads that trip is broken up into three hauls, and he figures it as loaded three times and unloaded three times, when, in fact, it is only loaded once and unloaded once. He is not only wrong, but is grossly unfair in using these figures without explanation or comment.

If the Government owned the railroads, his figures would disappear from the table. There would be nothing from which to make them up. If private ownership is charging a terminal expense which

includes its share for loading and unloading every time it switches a car from one road to another, it is taking an extortionate toll that will be wiped out by Government ownership.

Why is this so important? When we find out the amount of terminal expense we shall see. I have made a careful investigation of this question and have had it figured out by an expert. Under the McGraham system established many years ago the railroads actually charge 6 cents per 100 pounds for terminal expense on sixth class, and they charge the same for the short haul as for the long one. Sixth class, the rate from New York to Chicago is 25 cents, and if you will read Prof. Ripley's book, which is favorable to the railroads, he describes how that rate was established 30 or more years ago and brought down to date—paying it today. It is divided 6 cents for terminal and 19 cents for haulage. Now, of course, for higher classes, both the haulage and the terminal are increased. For the sums of the commodities they are the same. The sum of the division, however, is made on any commodity where the rate is 25 cents per hundred. On the commodities that are lower, surely both the haulage and the terminal is reduced in the charge.

Now, gentlemen, in order to make this terminal average for the United States safe, I have taken all of that reduction off the terminal and have not allowed any on the haulage at all. For the higher class rates they charge more and for the commodities less. The average terminal charge for all freight in the United States figures to be at least 4.25 cents per hundred pounds. That is what it figures out, allowing all this reduction, if there is any, on the terminal alone, taking nothing off of the haulage, leaving it as high as it is on the sixth class. On some local short hauls they charge less. In the Minnesota rate case the State commission fixed the charge for first class at 11.02 cents, and the average terminal charge for all freight in the United States figures out to be at least 4.25 cents per hundred pounds. This is the average terminal charge in the rates we now pay the railroads, and it is not modified by the fact that shippers load and unload carload lots. Therefore the average terminal charge alone on each ton of freight in our country is 85 cents. Now, gentlemen, I would like to have you remember those figures. The average terminal charge which we are now paying the railroads in the United States is 85 cents for each hundred pounds. In Germany, for terminal movement and all, it costs 1.248 cents to move each ton 1 mile. Therefore, to move a ton the average haul of 68 miles would cost only 84.9 cents. The terminal

charge in the United States alone is higher than the whole German rate.

In other words the terminal expense alone in the United States is more than the whole German rate. If the length of haul is 68 miles in Germany and 250 in the United States, then the American is 3 2-3 times the German instead of double as claimed by Mr. Dunn. This means we must add 2 2-3 terminal expenses to the American rate to make the comparison. When this is done the American rate becomes 2.886 as against 1.248 for the German. Instead of being the lowest in the world our freight rates are more than 50 per cent higher than the German and there are no other facts to change this conclusion. We have already seen that our highest wages are more than offset by the greater cost of roads in Germany. The table shows the freight density to be about the same in the two countries. This is a surprise to many, but some years it is even greater in our country. There are many other facts which tend to increase the American rates in the comparison. German rates include express, which is high and increases the average. Express is not included in the American rate. The American rate is cut down by large amounts of freight carried for the companies themselves, but the German rate includes only freight actually paid for. The proportion of bulky low-rate freight like coal, iron, and timber is very much greater in this country. Much of this goes by water in Germany. About one-third of our tonnage is coal and that reduces the average rate. In Germany the proportion of manufactured goods is very much greater and they always go at a higher rate and increase the average. These considerations are fatal to the claim that the American rates are lower. *About 1905 the German commissioners, Hoff and Schwabach, visited this country for the purpose of comparing freight rates. They reported that for the same service the American rate would be 1.44 cents per ton-mile as compared to the German rate of 0.95 of 1 cent. They also found the American rate to be almost 50 per cent higher.* I have searched in vain for higher freight rates than the Americans' upon a fair comparison. England is the nearest approach, and England enjoyed the blessings of private control until the war wiped it out.

In Germany the average passenger fare is 0.88 of 1 cent per mile. About 4 per cent must be added to this for baggage charges and a little more for tickets through gates to parties seeing friends off on trains. After all is considered the German rate is less than half the American rate of 1.938 cents per mile. The American accommodations are better than the German lower classes, and the German

density is more than five times the American. However, density does not count so much on passenger as on freight rates. In our country the passenger rate in the East is higher than in the less dense Middle West.

In the recent advances allowed by the commission, they allowed $2\frac{1}{2}$ cents for the eastern district here, but in the western district they only allowed 2.4 cents for interstate traffic, so the greater density is paying the higher rate here in the United States, and the railroads themselves figured it out in the same way, prior to that.

The average journey in Germany is less than half the American, but neither is length of journey so important as length of haul in freight. *When all is considered it is found that for the same service the American passenger rate is almost double the German and the freight rate more than 52 per cent higher, but still upon those low rates Government ownership in Germany had a net earning of \$170,000,000 in 1910 and the mails and parcel post were handled free.*

A proper and fair analysis will reach the same conclusions in all the world. The United States is the best natural railroad proposition on earth. I used to feel we could not make a comparison. You might make a success in a little country like Switzerland, but you might fail in a big country like the United States, but the investigation of this subject proves conclusively that the larger the country the more sure you are to make a success. The railroad consolidations prove that. The attempt they are making now to get them united under a single management proves the same thing. It is easier to make a success of Government ownership in the United States than in any country in this world. Germany is next. Superior management has put the German first. In other countries the results are not so great, because the propositions are not so good. The management in Switzerland under the most democratic form of government is in all respects as good as the German. The results are as great in proportion to the opportunities. In Australia the same is true, except the ownership has been by States instead of national. The same is true of Belgium, New Zealand, Japan, and South Africa.

Until very recently they have had a poor State management. Some States had narrow-gauge roads that went up against broad-gauge roads in other States. They have had an economic loss on them, but recently they have had national management, which will unite them all together, with the result that they will be as good as in any other country.

Even in Italy, where the proposition is so bad it is a failure under every management, still it is better under Government ownership. This is the only country that ever relapsed from Government ownership, but it soon came back. In all other countries the question is settled where the Government owns the railroads, and I believe there is no other settlement for it in our country.

Is Government ownership compatible with our system of government? The committee has asked that question, and I would reply to this by saying that private ownership has certainly proven incompatible to our system of government. If we go into the history of the manipulation, the looting, and the wrecking of American railroads, we find it without parallel in the history of the world. Legislatures, courts, and even Congress have been unable to stop these evils. They have continued right down to date in the New Haven and the Rock Island. Their participation in government has been evil, sinister, and universal. Count up the thousand newspapers on the pay roll of the New Haven, and who can ascribe to it any other motive than the corruption of public sentiment and the subversion of free government? Its schemes would have failed if government had not been chloroformed.

How much better is the recent campaign for higher rates through newspaper advertising? In Iowa more than 500 papers published this advertising, which was so false and unreliable that the attorney for the railroads was forced to repudiate it in the trial of the advance rate case. And all of this scheme of deceiving themselves was paid by the people in railroad fares. Why, at this moment, do the railroads have 350 political attorneys retained in the State of Iowa and other thousands throughout the United States? Why have the railroads offered my newspaper and every newspaper throughout the country free plate accounts of the hearings before this committee? It is because private ownership is not compatible with free government. The railroads will never get out of politics until the Government owns them. Then nobody will conduct a political campaign for higher rates. Nobody will corrupt a legislature for a charter to water the stocks. The political attorneys will all be discharged. The United States attorneys will protect the Government's interests. Congress can investigate every subject of transportation and no free plate matter will be sent out to edit or distort the facts.

On June 30, 1915, the United States Government was running more than 28,000 miles of railroad—more than the Prussian Empire. I think the number at the present time—I have seen it stated,

at least—to be 42,000. This was reported from the Interstate Commerce Commission at that time.

These great properties in control of our courts do not threaten our Government. They would be better still in the hands of the Interstate Commerce Commission, which knows so much more about them, but the courts run them better than these private owners who have wrecked them.

As to whether Government ownership will suit local needs, we only need to look at the Post Office Department. Its establishment of the rural free delivery is an answer full and complete. Every system of Government ownership does more to suit local needs than private ownership. It is one of the charges against Government ownership that it does too much and goes to extravagance.

I should favor the acquiring of the properties by the Government either by purchase or condemnation. The old stock issue should be retired and speculation forever cease in our public highways.

In conclusion, I will point out in my opinion why regulation is doomed to failure. A very large percentage—over two-thirds—of our railroads can live and prosper on a given set of rates. They are doing it now. It is unjust to the public to raise the whole rate structure in order to give the other one-third more revenue. It might be done in one giant corporation plan, but that looks too much like a private monarchy. The American people will not tolerate it very long. The other and only alternative is Government ownership.

[SOURCE: Testimony of Robert S. Lovett, Chairman of the Board of Directors of the Union Pacific Railway, before the Congressional Commission investigating railways, March 19, 1917—as reproduced in press dispatches.]

Immediate nationalization of railroad control was urged today by Robert S. Lovett, chairman of the board of the Union Pacific, in testifying before the congressional committee investigating all phases of the railway problem.

Final disposition of the control question, he declared, would prove a great factor in the grave problem of obtaining new capital with which to continue railroad development.

About \$1,000,000,000 new capital will be required annually during the next ten years to develop railways properly, Mr. Lovett said, and he believed that when the present “abnormal” prosperity passes it will be difficult to obtain money.

“ Everything we use has gone up,” Mr. Lovett said. “ Hence I am afraid our gross earnings will dwindle.”

Great factors constituting the problem of railway operation, he said, were multiplicity of regulation in respect to securities; regulation of rates so as to unduly reduce revenues; inability of the interstate commerce commission to perform its duties under existing laws; absence of compulsory strike settlement laws; increased taxation and the general effect of these conditions on the investing public.

CHAPTER XIX

TELEGRAPHS AND TELEPHONES

TELEGRAPHS and telephones are so widely owned and operated by governments that the scientific discussion of government ownership is without special difficulties. Our selections are from the leading Congressional expert on the question, and the passages quoted are all in answer to arguments against government ownership, which are either expressly stated or clearly, if indirectly, indicated. We include also some of the questions of one of the chief opponents of government ownership.

UNITED STATES POSTMASTER GENERALS RECOMMEND GOVERNMENT OWNERSHIP

[SOURCE: Report of the Postmaster General, 1913.]

Postal Telegraphs and Telephones

A study of the constitutional purposes of the postal establishment leads to the conviction that the Post Office Department should have control over all means of the communication of intelligence. The first telegraph line in this country was maintained and operated as a part of the postal service, and it is to be regretted that Congress saw fit to relinquish this facility to private enterprise. The monopolistic nature of the telegraph business makes it of vital importance to the people that it be conducted by unselfish interests, and this can be accomplished only through Government ownership.

The act of July 24, 1866, providing for the Government acquisition of the telegraph lines upon payment of an appraised valuation and the act of 1902 directing the Postmaster General "to report to Congress the probable cost of connecting a telegraph and telephone system with the postal service by some feasible plan" are evidences of the policy of this Government ultimately to acquire and operate these electrical means of communication as postal facilities, as is done by all the principal nations, the United States alone excepted.

The successful operation of the parcel post has demonstrated the

capacity of the Government to conduct the public utilities which fall properly within the postal provision of the Constitution.

Every argument in favor of the Government ownership of telegraph lines may be advanced with equal logic and force in favor of the Government ownership of telephone lines. It has been competently decided that a telephone message and a telegram are the same within the meaning of the laws governing the telegraph service, and therefore it is believed that the statute enabling the Government to acquire, upon the payment of an appraised valuation, the telegraph lines of the country, will enable the Government to acquire the telephonic network of the country. While it is true that the telephone companies have not complied with the requirements of section 5267, Revised Statutes, this can not be held to nullify the intent of the law, since the nonperformance on the part of the Government of any of its constitutional privileges in nowise surrenders the right to exercise these privileges whenever the best interests of the Nation demand.

The department has been conducting a careful investigation to determine the desirability and practicability of extending the Government ownership and control of means of communication, with a view to the acquisition by the Government of the telegraph and telephone facilities, to be operated as an adjunct to the postal service.

[SOURCE: Report of the Postmaster General, 1914.]

That it has been the policy of this Government to ultimately acquire and operate these electrical means of communication as postal facilities, as is done by all the principal nations, the United States alone excepted, is evidenced by the fact that the first telegraph line in this country was maintained and operated as a part of the Postal Service, and further by the act of July 24, 1866, which provided for the Government acquisition of the telegraph lines upon the payment of an appraised valuation, and again by the act of 1902, which directed the Postmaster General "to report to Congress the probable cost of connecting a telegraph and telephone system with the Postal Service by some feasible plan."

It is an interesting fact that, whereas policies of government have been advocated and some adopted, the constitutionality of which have been seriously questioned, the principle of Government ownership and control of the telegraph and telephone finds its greatest strength in the Constitution. This opinion has been shared by practically all Postmasters General of the United States, who have held that the welfare and happiness of the Nation depend

.. upon the fullest utilization of these agencies by the people, which can only be accomplished through Government ownership.

[SOURCE: Report of Postmaster General 1916.]

The data which the Postmaster General was engaged in reviewing when his last report was prepared has since been submitted to Congress in compliance with a Senate resolution and printed as a public document (S. Doc. No. 399). The firm conviction of the department is here reiterated that telegraph and telephone service is inevitably monopolistic and, when operated under private control, does not render the maximum of public service at the minimum cost to the whole people.

GOVERNMENT OWNERSHIP ABROAD

[SOURCE: Hearing before the Committee on the Post Office and Post Roads (House of Representatives, Sixty-third Congress, Third Session, on H. R. 20471), Jan. 15, 1915, pp. 3-28, 57, 90.]

The Postmaster General renews the recommendation embodied in his last annual report that Congress seriously consider the question of declaring a Government monopoly over all utilities for the public transmission of intelligence, and that steps be taken as soon as practicable to incorporate into the postal establishment the telegraph and telephone systems of the country.

In that report reference was made to the anomalous condition in this country under which the telegraph and telephone utilities, being vehicles for the public transmission of intelligence, infringe upon a function reserved by the Constitution to the National Government. They inherently, as well as constitutionally, belong to the Postal Service. That it has been the policy of this Government to ultimately acquire and operate these electrical means of communication as postal facilities, as is done by all the principal nations, the United States alone excepted, is evidenced by the fact that the first telegraph line in this country was maintained and operated as a part of the Postal Service, and, further, by the act of July 24, 1866, which provided for the Government acquisition of the telegraph lines upon the payment of an appraised valuation, and again by the act of 1902, which directed the Postmaster General "to report to Congress the probable cost of connecting a telegraph and telephone system with the Postal Service by some feasible plan."

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It is therefore recommended that early action be taken by Congress looking to the accomplishment of this end.

LIST OF COUNTRIES OWNING TELEGRAPH AND TELEPHONE

POSTAL TELEGRAPH AND TELEPHONE COUNTRIES

Australia, Austria, Belgium, Bosnia-Herzegovina, Bulgaria, New Caledonia, Dahomey, Denmark (at least part—State, private, and municipal), Egypt (part), Formosa, France, Tunis, Germany, Switzerland, Great Britain, Sweden (greater part), Greece, South Africa (Union of), French Guinea, Servia, Hungary, Roumania, India (British—State and private), India (Dutch—State and private), French Indo-China (Government), Italy (State and private), Norway (greater part), Japan (including Korea), New Zealand, Luxemburg, the Netherlands (State, municipal, and private), Russia (State and private), Siam (State and private).

COUNTRIES OWNING TELEGRAPHS ONLY

Abyssinia (Ethiopia), Alaska, Argentina, Bolivia (not all), Brazil, Chile (nearly all), Colombia, Costa Rica, Cuba, Mexico, Montenegro, Paraguay, Persia, Peru, Portugal, Spain, Turkey, Uruguay.

Mr. Chairman, all the civilized—yes, almost all the uncivilized—countries have postalized the electrical message, and it will be observed that Spain and Brazil only among the greater countries join the United States in licensing out the telephone agencies of communication to private parties. England naturally has been the last to yield, but since January 1, 1912, even she has assumed the entire postal function of conveying intelligence by taking over the Bell service. Some of the Provinces in Canada took the step a few years ago, so that our situation is now so exceptional as to be actually noteworthy. The causes for our condition are not different from those which for 40 years denied us the parcel post, namely, the

“tory” and the “system” largely consequent upon the private financiering of these natural monopolies.

Financial results, receipts, and expenditures of postal systems in respect to mail, telegraph, and telephone services

Country.	Receipts.	Expenses.	Surplus.
Germany	\$194,272,463	\$171,594,102	\$22,678,361
Austria	37,494,963	36,774,693	720,270
Belgium	11,276,039	7,286,550	3,989,489
Denmark	5,151,680	4,052,103	1,099,577
France	69,688,373	60,765,697	8,922,676
Great Britain	130,145,874	107,815,457	22,330,417
Hungary	18,779,415	13,217,728	5,561,687
Italy	22,922,406	17,580,193	5,342,213
Japan	31,884,235	16,557,372	15,326,863
Norway	3,849,538	3,242,909	606,629
Netherlands	7,786,553	7,418,162	368,391
Russia	68,222,406	33,590,294	34,632,112
Sweden	9,684,515	8,116,610	1,567,905
Switzerland	14,169,411	13,673,772	495,639
New Zealand	5,805,750	5,112,762	692,988
Total	631,133,621	506,798,404	124,335,217

GOVERNMENT OWNERSHIP OF THE TELEGRAPH

[SOURCE: Same as above.]

Analysis and Comparison

Let us briefly summarize the conclusions reached by the economists:

That the store and farm are competitive not monopolistic, in character, as shown by the circumstances that the prices are fluctuating. But the telegraph and telephone services are not truly competitive. Their prices do not tend to fluctuate. Thus they have the price characteristic of monopolies.

There being no competition, the rule of private financiering obtains, if the monopoly be privately owned; the higher the price secured the higher will be the profit.

The telegraph rate in New Zealand is 12 cents for 12 words.

Mr. Cox. For what distance?

Mr. LEWIS. Good for the whole island, and the island, I suppose, would represent in area the average State in the United States. As against the minimum rate under private financiering of 25 cents

in the United States, the New Zealand minimum rate is 12 cents. This illustrates the normal functioning of the telegraph monopoly as publicly and privately financed, for both rates are equally normal in relation to their facts of ownership. By which it is meant to say that if the private financier should discover that only the lowest rates would produce the maximum of profit, and the public financier that only the highest rates would insure the most extensive public service, we should immediately have the New Zealand rate in the United States and the American rate in New Zealand.

But is it true that the rule of private financing prevents the highest social service or full potential use of this particular form of monopoly? In answer I will continue the comparison with New Zealand:

Country.	Rate.	Number messages for 100 population.
New Zealand (1)	\$0.12	896
United States (2)	0.25 to 1.00	115

Thus, under what appear to be similar price and wage levels and social and industrial conditions, we have a telegraph institution under the rule of public financing yielding about eight times the social service attained by private financing.

From this experience we adduce another conclusion. The New Zealand State compares with one of our own of like extent and population. Its experience indicates a potential demand of eight telegrams per capita per annum for the United States, seven-eighths of which fails to find a permissible rate, and is thus suppressed by the relatively prohibitive tariffs under private financing. If this be the case, the defects are economically unpardonable; for in offending against the law of normal efficiency, by an almost complete failure to perform the function, the functionary's right to control becomes forfeit. A high rate, the highest rate, of profit, even at the cost of excessive prices, society may be willing to grant as a concession to the rights of the private financier; but a radical failure to consummate its function and afford effective accommodation for the normal requirements of society is fundamental delinquency.

Mr. STEENERSON. Might that not be somewhat explained by the fact that we have a more expeditious mail service?

Mr. LEWIS. Possibly, but I hardly think so, because although the figures show that the United States has the highest letter com-

munications of any country in the world, running at 102 letters per capita, still New Zealand comes next with 93 letters per capita.

Minimum rates and average receipts per telegram (12) (3)

Country. ¹	Minimum rate.	Number of words.	Each word extra.	Average receipt per telegram.	Country. ¹	Minimum rate.	Number of words.	Each word extra.	Average receipt per telegram.
	<i>Cents.</i>		<i>Mills.</i>	<i>Cents.</i>		<i>Cents.</i>		<i>Mills.</i>	<i>Cents.</i>
Luxemburg ..	6.7	10	6.7	10.1	Hungary	12.0	10	12.0	24.1
France	9.65	10	9.6	13.3	Australia	⁴ 12.0	16	20.0	} 25.9
Japan .....	...	...	...	12.6	Do.....	⁶ 18.0	16	20.0
Norway	9.65	10	13.4	19.5	Do.....	⁶ 24.0	16	20.0	
Belgium	9.65	15	² 19.3	11.2	Russia	³ 7.5	..	25.0	} 41.5
Netherlands ..	10.0	10	² 20.1	12.7	United States..	⁷ 25.0	⁷ 10	20.0	
Sweden	6.7	5	13.4	14.2	Do.....	30.0	10	20.0	} ⁶ 47.9
New Zealand	12.0	12	10.0	15.7	Do.....	35.0	10	20.0	
Great Britain	12.0	12	10.0	15.1	Do.....	40.0	10	30.0	
Switzerland ..	³ 6.8	..	4.8	13.0	Do.....	50.0	10	30.0	
Germany ...	11.9	10	12.0	17.2	Do.....	60.0	10	40.0	
Italy	11.6	10	9.7	...	Do.....	75.0	10	50.0	
Denmark ...	13.0	10	13.0	16.3	Do.....	100.0	10	70.0	
Austria	12.0	10	12.0	21.2				(13)	

¹ This table is confined to domestic telegrams.

² Each 5 words extra, up to 50 words, 2 cents; 2 cents for each additional 10 words beyond 50.

³ Basal charge; each word extra.

⁴ For 15 miles.

⁵ To any point within the State.

⁶ To any point in Australia.

⁷ Address and signature not counted.

⁸ Up to 150 miles. Up to 250 miles. Up to 350 miles. Up to 450 miles. Up to 700 miles. Up to 1,500 miles. Up to 2,400 miles. Any distance in United States proper. Distances roughly approximated.

Country.	Area.	Approximate maximum airline dimensions.	Maximum rate.	Country.	Area.	Approximate maximum airline dimensions.	Maximum rate.
	<i>Sq. Miles.</i>	<i>Miles.</i>			<i>Sq. Miles.</i>	<i>Miles.</i>	
United States..	3,026,789	3,000	\$1.00	Great Britain	121,400	770	.12
Australia	2,447,715	3,000	.24	Hungary	125,600	800	.12
Russia	8,647,657	7,000	.32	Italy	110,700	730	.12
Austria	115,800	800	.12	Luxemburg ..	998	50	.07
New Zealand ..	104,751	800	.12	Netherlands ..	12,600	210	.10
Belgium	11,400	170	.10	Norway	124,100	1,000	.10
Denmark	14,800	250	.13	Sweden	172,900	960	.13
France	207,000	700	.10	Switzerland ..	16,000	200	.12
Germany	208,000	900	.12				

As to the average journey of the telegram in the United States, it is stated by the Western Union that 38,564 messages originating in New York, Chicago, and San Francisco were analyzed and gave an average journey of 573 miles, but the average rate is not given. It is to be observed that these cities are rim or exterior points, and that the average parcel hauls from New York and Chicago run a much greater length of journey than they do for the rest of the country. Moreover, it is on the minimum rates that the private financier fails, and it is to these rates, covering the short distances, that the comparison is chiefly directed.

Telegrams and letters per capita

State.	Telegrams per person. ^{1 2}	Letters per person. ³	Rank in telegrams.	Rank in Letters.
New Zealand	8.96	93	1	2
West Australia	6.16	...	2	..
Queensland	3.63	...	3	..
South Australia	3.61	...	4	..
New South Wales	2.73	...	5	..
Tasmania	2.35	...	6	..
Victoria	2.30	...	7	..
Great Britain	2.01	87	8	3
France	1.64	34	9	11
Norway	1.62	28	10	13
Switzerland	1.61	70	11	4
Belgium	1.26	37	12	10
United States	1.15	101	13	1
Netherlands	1.09	38	14	9
Luxemburg .....	.99	39	15	8
Denmark .....	.97	49	16	6
Germany .....	.94	64	17	5
Austria .....	.73	45	18	7
Italy .....	.72	13	19	16
Sweden .....	.69	29	20	12
Japan .....	.65	23	21	14
Hungary .....	.64	19	22	15
Russia .....	.26	7	23	17

¹ 1912 data; see note 1.

² 1910 data; see note 3.

³ Includes international service and cables, but does not include telegrams handled in transit between sending and receiving countries.

Communications per capita

Country.	Telegrams per 100 persons.	Interurban messages per 100 persons. ¹	Total per 100 per- sons.	Rank.
Denmark	97	1,600	1,697	1
New Zealand	896	261	1,157	2
Luxemburg	100	891	991	3
Germany	94	651	745	4
West Australia	616	73	689	5
South Australia	361	112	473	6
Switzerland	135	336	471	7
Queensland	363	100	463	8
Sweden	69	328	397	9
Norway	158	233	391	10
New South Wales	273	93	366	11
Victoria	230	83	313	12
United States	115	(14) 170	285	13
Great Britain	202	80	280	14
France	164	100	264	15
Netherlands	109	108	217	16

¹ Includes interurban messages, but not local calls.

You will find from the above table that the United States ranks thirteenth as a user of the telegraph, and when you combine the number of interurban telephone conversations with the number of telegrams in the United States, you still find that this country ranked thirteenth.

Mr. MADDEN. With a combination of the two?

Mr. LEWIS. With a combination of the two; while it ranks first on the social use of the postal service.

Mr. STAFFORD. Can you give those countries in advance of the United States in the use of the telephone and telegraph?

Mr. LEWIS. I have that all in this table.

Mr. STAFFORD. Will you kindly mention them?

Mr. LEWIS. They are Denmark, New Zealand, Luxemburg, Germany, West Australia, South Australia, Switzerland, Queensland, Sweden, Norway, New South Wales, and Victoria. That is on the combination.

If the United States ranks thirteenth as a user of the service, we are first in the character of charges, because the telegraph rates in

the United States are the highest telegraph rates in the world. The connection between those two facts is sufficiently obvious to men who have given the subject any fair degree of attention.

Mr. MADDEN. What is the proportion of the rates?

Mr. LEWIS. Two to one, and higher. Our telegraph rates run twice as high as other countries, even including countries as large as our own, like Russia and Australia. It appears that we rank second in postal rates and first in utilization, while we rank eighteenth in the telegraph rate charged and thirteenth in resulting social service.

As to the question of the profitableness of the British telegraph. I first want to qualify what I have to say with the statement that almost uniformly in the reports the Postmaster General will say that he can not distinguish the postal from the telephone and telegraphic expenses because the services are fused. That is true of Germany and of nearly all the countries under study. It is a matter, however, of general reputation, whether the fact be accurately stated or not, that the British post office has not paid in its telegraphic department. In that connection it ought to be fully understood that comparing the telegraphic institution here with the telegraphic institution there a fundamental difference exists not only with respect to rates—the British rates being half our rates—but with respect to service. The commercial telegraph companies of the United States maintain only one office to seven post offices in the United States; the telegraphic department of Great Britain maintains a little more than one telegraph office for every two post offices in Great Britain, or, stated in another way, if the British post office would do what the Western Union and Postal Telegraph companies very naturally do—withdraw their services from all nonprofitable points—the British post office would show a profit quite as great at its 12-cent rate as do the Western Union and the Postal Telegraph companies. Now, I mention that circumstance with some emphasis because it should characterize all comparisons of our telegraph institutions with postal telegraph institutions the world over. I shall later refer to England again.

GOVERNMENT OWNERSHIP OF TELEPHONES

The telephone service subdivides itself into, first, the local and, second, the toll and long distance, and the statistics for each of these is twofold in character; that is to say, there are the varying rates fixed in the contracts corresponding, differing in the different cities

and towns of the country, by which the patron secures a limited or an unlimited local service, or a measured, or a one or more party line service, or by which for toll or long-distance conversations the rate is graduated into day and night distinctions. Then there is the rate which is constituted from the sum of all these; that is to say, the total number of conversations, local, toll, and long distance, for a year is taken, and for each class, respectively, is divided into the receipts from that class, thus giving the average local, toll, and long-distance rates collected. This rate is called the statistical rate or average charge; the former, the tariffs paid by the patron, is called the tariff rate. I shall first present the local rates for the different countries statistically and compare them with the letter rates prevailing in each country:

Subscribers' local telephone rates

Rank.	Country. ¹	Average local call rate.	Rank.	Country. ¹	Average local call rate.
		<i>Mills.</i>			<i>Mills.</i>
1	Sakhalin, postal.....	4.4	17	Denmark, private....	10.5
2	Norway, private.....	4.5	18	Hungary, postal.....	10.5
3	U. S. mutuals ²	4.7	19	Servia, postal.....	10.6
4	Japan, postal.....	4.8	20	Queensland, postal...	12.7
5	Neth'lands, municipal.	5.0	21	Tasmania, postal....	13.1
6	Netherlands, private ²	5.0	22	West Australia, postal	13.3
7	Norway, postal.....	6.2	23	Victoria, postal.....	13.9
8	Manchuria, postal...	6.2	24	Bosnia, postal.....	14.4
9	Russia, postal.....	6.6	25	Germany, postal.....	14.6
10	Bulgaria, postal.....	6.9	26	Belgium, postal.....	16.6
11	Formosa, postal.....	7.1	27	Switzerland, postal..	17.0
12	Sweden, postal.....	7.4	28	N. S. Wales, postal...	17.3
13	U. S., independents...	8.8	29	U. S., Bell (4).....	18.6
14	Chosen, postal.....	8.9	30	France, postal.....	19.9
15	Tunis, State.....	9.5	31	So. Australia, postal.	20.2
16	Austria, postal.....	10.1			

¹ Census 1907.

² Estimated.

A computation of all the local calls between subscribers for all the telephone institutions reporting the data, including the American independents, shows that, including such calls of the Bell system, according to its report in 1912, there were altogether 19,572,-244,474 such messages.

It is urged by Mr. Vail, in his report for the Bell system in 1913, that:

“ We are opposed to Government ownership because we know that no Government-owned telephone system in the world is giving as cheap and efficient service as the American public is getting from all its telephone companies. We do not believe that our Government would be any exception to the rule.”

And (12) the following table is cited in support of the declaration :

Average exchange revenue per telephone, by countries

Austria, 1912	\$24.96
Belgium, 1911	39.05
France, 1912	28.61
German Empire, 1911	22.69
Great Britain, 1912 (not including municipal systems)	32.60
Hungary, 1912	30.81
Switzerland, 1912	18.43
New Zealand, 1912	24.44
Australia, 1912	28.53
Average for foreign countries	<u>26.82</u>
Bell system, 1912	<u>30.93</u>

This method merely shifts one from the call or message to the phone as the unit of price measurement. But even so, the assertion is not sustained by the facts. The following tables are taken from official sources (1) and give the average revenue per phone from (a) local calls between subscribers and (b) the average revenue per phone from toll and long-distance messages.

Product and local revenue per phone compared with Bell system

Country.	Local subscribers' calls per phone.	In per cent of Bell calls per phone.	Receipts per phone.	Per cent of Bell receipts per phone.
Tunis	393	24	\$3.72	62
Norway, private	1,984	119	8.88	55
Switzerland	607	37	10.55	12
Norway, State	2,172	131	13.70	29
Sweden, State	1,842	111	13.76	34
Luxemburg, State	613	37	14.89	44
Tasmania, State	1,210	73	15.98	44
Denmark, private	2,634	158	16.21	48
Servia, State	1,592	96	16.98	52
United States, independents	2,013	121	17.64	52
Bosnia, Herzegovina, State	1,287	78	19.10	57
Sakhalin, State	4,352	262	21.03	68
Bulgaria, State	2,837	171	22.19	72
Japan, State	4,315	260	22.58	73
Germany, State	1,407	85	22.97	74
West Australia, State	1,668	100	23.84	77
New South Wales, State	1,583	95	24.90	81
France, State	1,162	70	19.25	62
Queensland, State	1,839	111	19.80	64
Austria, State	2,441	147	20.84	64
Victoria, State	1,883	113	25.47	86
Hungary, State	2,613	157	27.40	90
Formosa, State	3,919	236	28.18	91
Russia, State	4,466	269	29.72	94
Bell system	1,662	100	30.93	100
Manchuria, State	5,385	324	33.58	109
South Australia, State	1,672	101	34.16	110
Chosen, State	3,911	235	34.24	111
Belgium, State	3,129	190	47.15	152

Thus the Bell system ranks the highest but 4 among 29 in the gross amount collected per phone for the local service and the highest but 2 judged by price and product, France and South Australia alone exceeding it.

A like table for the toll and long-distance services is now submitted:

Country.	Toll and interurban calls per phone.	Per cent of Bell messages per phone.	Receipts per phone.	Per cent of Bell revenue per phone.
Denmark, private	612	1,275	\$3.04	195
Luxemburg, State	592	1,233	4.88	33
Germany, State	313	652	11.96	53
Tunis, State	205	427	16.46	130
Tasmania, State	176	367	11.19	179
Victoria, State	169	352	6.75	121
Norway, State	160	333	13.51	73
Bulgaria, State	150	312	17.95	147
Sakhalin, State	149	310	10.86	118
Chosen, State	144	300	9.15	99
Switzerland, State	143	298	17.56	191
France, State	143	298	12.87	140
Formosa, State	137	285	12.42	189
Sweden, State	134	279	12.20	131
Norway, private	133	279	2.38	26
Belgium, State	133	279	10.80	117
Bosnia, Herzegovina, State	108	225	14.10	153
West Australia, State	104	217	5.03	55
Russia, State	102	212	8.10	88
Japan, State	101	212	11.96	130
Manchuria, State	101	212	15.90	162
Queensland, State	94	196	11.38	124
Austria, State	76	158	10.76	117
South Australia, State	74	154	6.75	73
Hungary, State	64	133	10.47	114
Bell system	48	100	9.21	100
Servia	48	100	15.92	173
United States, independents	42	87	4.20	46
New South Wales, State	39	81	5.21	57

Thus, for what it does, the Bell phone secures the highest payment; on the subscribers' local call service greater than all other 29 systems, except France and South Australia, two belated telephone countries; on the toll and long-distance greater than all 29, except Servia. That is:

Rank of Bell system, local service, in 29, twenty-seventh.

Rank in toll and long-distance service, in 29, twenty-eighth.

The fact that the independents rank at a point representing the average of other countries precludes the defense of American price levels. The Bell system, because of its great size, not to speak of its initial advantages as the patentee, and excellent management in this respect, is said to cost less per phone than either the independents or foreign systems. (12.)

Mr. Cox. Have you investigated the question of the cost of the operation of the Bell telephone system in this country as compared with the operation of telephone systems in foreign countries, relating to wages in particular?

Mr. LEWIS. Yes. I will come to that in the course of my remarks, if I may. Now, then, what is the status of the American postal system with regard to rates? Its status is that it has the lowest postal rates in the world, with the single exception of Japan, where the letter rate is a cent and a half per letter. The argument that the difference in wages would make a difference in rates is answered by the circumstance that our independent companies here give a rate that averages as low as the rates of the postal telephone countries. Our postal establishment gives postal rates as low as those of other countries and does the second-class business of the Republic practically for nothing besides. In short, the American postal system, despite the difference of wage levels in our country, has given the people of this country as low rates for communication as other countries having lower wage standards. An effort is made to explain the disparity by the higher American wages paid, but the rates of the independents are but half those of the Bell system, and they work under American conditions. But there is a prodigious difference between the number of employees per phone and pole line unit between the two. It is possible that much of the current expense and personnel, as in the case of many railroads in the past, is being devoted to development and construction by the Bell system, which, if true, might account for the difference.

The Tariffs

The statistical charges give but a very deficient conception of the situation as to actual telephone tariffs. While there are points at which a phone may be rented on the basis of yearly tariffs of \$24 for business and \$18 for residence service, as a matter of fact, with the Bell system at least, the rule of 5 cents a call comes more nearly expressing the rate available to the city public. This is seen in the following examples, allocated according to the density of the different centers of population:

Table giving annual tariffs, unlimited, exclusive service, for leading cities of different countries

City.	Population.	Tariff.	City.	Population.	Tariff.
Christiania	227,626	\$21.44	Oakland, Cal.	150,174	\$84.00
Stockholm	351,000	24.44	Chicago ²	2,185,283	* 84.00
The Hague	271,300	26.00	New Haven	133,605	84.00
Copenhagen	608,000	32.00	Philadelphia	1,549,008	* 90.00
Tokyo	2,163,151	34.00	Seattle	237,194	90.00
Auckland, New Zealand		34.09	Cincinnati	364,463	100.00
Amsterdam	557,614	36.00	Boston	670,585	125.00
Rotterdam	417,900	36.00	Denver	213,381	138.00
Berlin	2,320,000	43.20	Washington	331,069	168.00
Budapest	830,000	57.90	Baltimore ⁴	558,485	174.00
Paris	2,940,000	77.20	San Francisco	416,912	180.00
London ¹	7,280,000	82.79	New York ⁴ (17) .	2,331,542	228.00

¹ See appendix for limited service rates.

² The Bell rate is \$125.

³ Competition.

⁴ Baltimore and New York limited to 5,400 and 5,700 calls.

Note 17 covers Manhattan only. See note 17 in appendices.

Comparisons based on the flat or unlimited service rate do not adequately present the field of traffic. While, except in small towns and for the resident service, the flat-rate business works out the lowest average charge per call, it does not reflect the degree to which a city use of the service may be had. To measure these possibilities we must go to the limited or measured service rates, under which the user is asked to pay in accordance to the number of calls. This comparison can not be made as simple as for the flat-rate tariffs without circumscribing, which I shall do by taking selected numbers of rates as, for example, the cost per call of the first 2,000, 5,000, and 10,000 calls for one-party business lines:

Rates per call for measured service in principal cities of the world

Country.	Per call		
	2,000 calls.	5,000 calls.	10,000 calls.
Switzerland, Berne	\$0.0140	\$0.0116	\$0.0100
Covington, Ky. ....	.0450	.0360	.0238
Belgium, Brussels .....	.0184	.0100	.0060
Baltimore, Md. ....	.0500	.0336	.0312
Australia, Sydney .....	.0197	.0106	.0086
Washington, D. C. ....	.0490	.0366	.0283
Italy, Rome .....	.0200	.0140	.0120
New Orleans, La. ....	.0400	.0280	.0240
Austria, Vienna .....	.0200	.0160	.0100
Cincinnati, Ohio .....	.0450	.0360	.0330
Germany, Berlin .....	.0216	¹ 0.0086	¹ 0.0043
Boston, Mass. ....	.0450	.0360	.0330
France, Paris .....	.0240	¹ 0.0154	¹ 0.0077
New York, N. Y. ....	.0555	.0420	.0400
Denmark, private .....	.0294	.0197	.0171
San Francisco, Cal. ....	.0648	.0487	.0265
Average postal telephone rate .....	.0197	.0123	.0085
Average American telephone rate ....	.0493	.0371	.0300
American rate exceeds postal (per cent)	167	200	215
American rate exceeds Australian (per cent)	150	250	250

¹ Computed on flat rates.

The Long-Distance Service

I have now to present, comparatively, the toll or long-distance rates for the different countries. Except in the United States and where otherwise stated, the service is postally conducted. (7), (11).

Mr. COX (interposing). What do you mean by the long-distance rate?

Mr. LEWIS. I mean the rate between here and Baltimore, for example; the nonlocal rate.

Mr. COX. Is there any fixed limit where the short-distance ends and the long-distance begins?

Mr. LEWIS. No.

Mr. MADDEN. It is just the difference between a local distance and a long distance message; that is the way it is designated.

Mr. LEWIS. In other countries they call it the interurban rate, which is descriptive, and I shall call it that in the rest of this discussion. Now, gentlemen, I am not here to abuse the telephone interests. I recognize that the Bell telephone system, technically

speaking, is a magnificent communicating organization, subject to the limitations of its nature and subject to the limitations of the principles which a private investor will employ in the use of his own property; but its long-distance rates are without justification even under private financing of this postal function.

Long-distance tariffs

Country.	100 miles.	300 miles.	500 miles.	700 miles.
(a) Sweden	\$0.08	(a) \$0.13	(a) \$0.20	(a) \$0.27
(b) France .....	.10	(k) .24	(k) .36	(k) .48
(c) Italy .....	.19	(e) .34	(n) .38	(b) .58
(d) Belgium .....	.19	(b) .35	(b) .53	(g) 1.12
(e) Norway .....	.20	(n) .38	(m) .81	(l) 1.26
(f) Denmark .....	.20	(c) .38	(h) .84	.....
(g) Japan .....	.20	(g) .50	(g) .87	.....
(h) New Zealand .....	.24	(f) .54	(o) 1.50	.....
(i) Great Britain .....	.24	(m) .61	.....	.....
(k) Germany .....	.24	(o) .62	.....	.....
(l) Australia .....	.32	(h) .72	.....	.....
(m) Austria .....	.38	(l) .80	.....	.....
(n) Hungary .....	.38	(i) .84	.....	.....
(o) Russia .....	.38	.....	.....	.....
(p) United States (Bell) ...	.60	(p) 1.80	(p) 3.00	(p) 4.20

NOTE: The letters preceding the name of each country are used to identify the countries to which the rates given for 300, 500, and 700 miles belong.

Mr. STEENERSON. Where do you get those figures?

Mr. LEWIS. They were taken from the rates of the Bell people, and are admitted to be correct by them. There are some developments along that subject—

Mr. STEENERSON (interposing). Are you sure about those rates?

Mr. LEWIS. Yes.

Mr. STEENERSON. I know the rate from St. Paul or Minneapolis to Duluth, a distance of 160 miles, is only 20 cents.

Mr. LEWIS. That is no doubt due to some special condition. Is that the Bell system, or an independent system?

Mr. STEENERSON. It is a local system.

Mr. LEWIS. Thus the Bell system gives the United States the fifteenth and last place in the scale of efficiency with respect to long-distance charges. This is a most serious circumstance for us economically and socially, in view of the American scale of distances,

as may be seen in our average freight haul, which is ten times that of Great Britain, and from four to five times as long as in the other countries. This circumstance but lightly reflects our need for utilizable rates over the telephone for the scale of distances which separate the centers of communication in the United States. The Bell telephone has an even rate of 6 mills a mile for a three-minute conversation; and a thousand miles therefore commands a Bell charge of \$6 per talk. This happens to be about the same rate (7.53 mills) the railways secure for hauling a ton of freight a mile. But the railways do not make their charge arithmetically progressive. If they were to do so, their rate on the longer distances would be so high as to sweep such traffic from the rails. What they do in fact, although not in theory, is to double the charge as the distance quadruples. Thus the charge for 25 miles might be 10 cents per 100 pounds, first class; the rate for 100 miles would be 20 cents; for 400 miles, 40 cents; for 900 miles, 60 cents; the rate increasing not arithmetically but according to the square root of the number of miles. Thus if the charge for a phone call were placed at 10 cents for 25 miles, on the square-root formula it would increase to 20 cents for 100 miles, 40 cents for 400 miles, 50 cents for 625 miles. In fact, such a rate would slightly exceed the long-distance rates on the Continent.

Mr. BUCHANAN. Will you put those figures in the record?

Mr. LEWIS. Yes. I have here a comparison of the Bell rates.

Bell rates and Continental rates for long-distance compared with square-root formula

Country.	25 miles.	100 miles.	300 miles.	400 miles.	500 miles.	700 miles.
Sweden	\$0.04	\$0.08	\$0.13	\$0.20	\$0.27	\$0.34
Norway .....	.07	.20	.34	.40	.....	.....
France .....	.05	.10	.35	.43	.53	.53
Italy .....	.10	.19	.38	.38	.38	.....
Belgium .....	.10	.19	.....	.....	.....	.....
Denmark .....	.07	.20	.54	.....	.....	.....
Germany .....	.06	.24	.24	.36	.36	.48
Austria .....	.12	.38	.61	.61	.81	.....
Hungary .....	.10	.19	.38	.38	.38	.....
Average Continental rate.	.08	.20	.37	.39	.46	(¹)
Formula rate .....	.10	.20	.35	.40	.45	.53
Bell rate .....	.25	.60	1.80	2.40	3.00	4.20

¹ Average is \$0.45, but rates of only three countries are given.

For 25 miles the average continental rate is 8 cents and the Bell rate 25 cents; for 100 miles the average continental rate is 20 cents and the Bell rate 60 cents; for 300 miles the average continental rate is 37 cents, whereas the Bell rate is \$1.80.

Mr. LEWIS. The rates given abroad are based upon a "take your turn" service, which is true of our telegrams here. I shall not enter into the question as to whether you have to "wait and take your turn" on the Bell system—

Mr. MADDEN (interposing). I know of cases where you have to go and put in your order—in Paris and London—and wait for half a day before you can get through a communication.

Mr. LEWIS. Yes; the rates are low there and the lines have a very high utilization as a result. But the answer to that point is this, that the postal systems of other countries give both kinds of rates and both kinds of service.

Mr. MADDEN. And, if you will allow me, should you happen to be away when the opportunity comes for you to get the use of the wire your name goes to the bottom of the list.

Mr. LEWIS. Yes; as I was going to explain—

Mr. STEENERSON (interposing). And if it happens to be about the time of the closing hour you are told to wait until the next day.

Mr. LEWIS. They have both kinds of rates and both kinds of service. If you want immediate service you will pay twice the usual rates, or three times the usual rates, as in the instance of Germany, and then you are entitled to the immediate use of the lines.

Mr. MADDEN. Are their rates for immediate service as high or higher than our rates?

Mr. LEWIS. No; not even then, because their rates run from one-fourth to one-eighth of our rates here. Now, the Bell admission being before you, that they could give rates for the same kinds of service more or less equal to those abroad, the case is admitted, and it follows that we ought to have a system here granting all kinds of rates, a night rate, a "take your turn" rate, and an immediate service rate, and no one, I should suppose, would object to the Bell Co. retaining their present rates for the immediate service, and giving us other rates for a take-your-turn service which would, in most instances, gratify our requirements.

It will be urged, of course, that prices are higher here; but they are not higher here, they are higher in Europe on the copper and metal poles, which mainly enter into the capital cost of a long-distance line; higher by the price of the transportation of such material from this country to the Continent. It may cost more to

conduct such a line here in the expense of personnel, but the difference could hardly be more than 10 per cent of the Continental rate. It is true, however, that a special charge is made abroad for an urgency, or preferential, use of the line, but its payment secures one the preference, while with the Bell system the charge is all the same and one has to wait his turn despite the rate.

Mr. STEENERSON (interposing). Is three minutes the minimum?

Mr. LEWIS. Yes; three minutes is the universal minimum or unit of conversation.

The effect of these abnormal rates upon the utilization of the long-distance service may readily be seen. The number of interurban conversations per phone in the different countries is as follows:

Interurban and long-distance conversations per phone

Country.	Number of conversations.	Rank.	Country.	Number of conversations.	Rank.
Denmark	761	1	Norway (private) ...	109	10
Netherlands	634	2	Italy (private)	73	11
Denmark (private) ..	348	3	Japan	69	12
Germany	301	4	Italy	62	13
Sweden	150	5	United States (1912,		
Russia	142	6	Bell)	48	¹ 14
Norway	135	7	Belgium	44	15
Switzerland	130	8	Austria	37	16
France	125	9	Hungary	34	17

¹ But see note 14.

GOVERNMENTAL PROJECT FOR CONTROL OF WIRELESS TELEGRAPHS

[Washington press dispatch, Dec. 15, 1916.]

Stronger Government control of radio communications is contemplated in the draft of a new radio act to be submitted to Congress, and which has just been completed by a board consisting of members from all the executive departments of the Government.

The bill, which was prepared by the inter-departmental board at the request of President Wilson, is not so drastic a measure as

military and naval experts consider essential from the standpoint of national defense, but, in the milder form in which it has been drafted, it makes an important stride in the direction of complete Government ownership and control over all high-powered radio stations in the country and its insular possessions.

Some of the basic features of the new radio bill, which is to supplant, supplement and strengthen the existing Federal law, are:

“First—It suggests Government ownership of all radio stations in the United States that communicate with ships at sea.

“Second—It is drafted so as not to force the present owners of these stations to part with them, but merely permits the Government to buy all such stations which their present owners are willing to sell to the Government.

“Third—It provides that hereafter all Government radio stations shall accept commercial messages.

“Fourth—It provides that no license to do business shall hereafter be granted to an alien company or to any company in which more than one-third of its capital stock is owned by aliens.”

The new bill was drafted by an inter-departmental committee on which every executive department of the Government had representation. Commander David W. Todd, U. S. N., Director of Naval Communications, is Chairman of the committee, which has been working quietly for the last few months considering the radio situation as affected by developments since the beginning of the European war. Interference with naval and other Government radio communication has impaired the efficiency of those services, and the Federal experts are contending that this will continue until the Government is vested with strong control over all radio communication.

If these experts had their way legislation would be enacted calling for the acquisition by the Government of all high-powered radio stations in this country before too many of them have been established to make the cost of their purchase run up into higher figures. The bill just drafted, and which is ready to be submitted within a few days for consideration in a Cabinet meeting before it is sent to Congress as an Administration measure, is considered a “mild” one by those who framed it. It is considered “mild” because it does not provide for the compulsory acquisition by the Government of those commercial radio stations it does not now possess.

Nevertheless, it is a Government radio ownership measure in the sense that it suggests the purchase of all stations that communicate with ships at sea, which means all high-power stations. But

under the terms of the bill these commercial stations may only be acquired when their owners are willing to sell them to the Government.

Under the provisions designed to prevent the further establishment in America of foreign wireless stations, the German stations at Sayville and Tuckerton, now operated by the Federal Government, would have to be disposed of to companies which are at least two-thirds American, or might be sold to the Government. After the war the question of the status of Sayville and Tuckerton would naturally come up for consideration.



PART IV
COMMERCE, INDUSTRY, AND MINING

CHAPTER XX

MINING

GOVERNMENT ownership of mines has advanced much farther than government operation. In many countries, including countries as far apart as Germany and Australia, governments reserve a large measure of mineral rights to themselves, including the reversion of all rights to mines they have leased—after a certain period of years. Government operation, on the other hand, is to be found chiefly in connection with other governmental enterprises, the most important example being the government ownership of several hundred coal mines by Prussia—for the purpose of supplying her railways. But at the same time a part of this coal is publicly marketed and thus serves in some measure to regulate the price.

Sporadic cases exist of government ownership of minerals and several of these are referred to in our quotations. But it has remained to Sweden to initiate the very important novelty of government ownership of iron mines. There are strong indications that a general movement towards government ownership of all coal mines is impending. As iron is even more rarely distributed than coal, and almost as fundamental in industry, it seems highly probable that the nationalization of iron mines will follow soon after that of coal mines. And there are indications that the process may be extended to still other kinds of mines.

We read in Davies' *The Collectivist State in the Making* (p. 49) :

Prussia has iron mines, iron works, potash and common salt mines, and chalk pits, whilst amber is a State monopoly. In Scandinavia there are various State silver mines. In the Dutch East Indies the Government mines produce tin of an average annual value of £800,000.

In 1909 the committee of the Chamber of Deputies on Mines recommended the nationalization of all the mines, oil wells, and

minerals of France—after having studied the results of the national mines of Prussia and Holland. (*Annales de la Régie Directe*, 1910, No. 10.)

GOVERNMENT OWNERSHIP OF COAL MINES

[SOURCE: *The Collectivist State in the Making*, by Emil Davies, pp. 45, 227.]

Coal.—State coal mines are worked in Germany, Austria, Hungary, Sweden, Russia, Holland, Victoria, and New Zealand. Often they have commenced merely as adjuncts to a State railway system, but as the production exceeded the requirements of the railways, the coal has been sold on the open market.

The Prussian State Mines supply not only the railways, but also the public, competition between them and the private coal mines being acute. There is a Coal Trust in Prussia which desired the Government to enter its ranks, but the Government refused unless it was given the right to veto any price increases. A compromise was arrived at, and a few years ago the State became a party to the trust, or rather the Cartel; but within a couple of years it withdrew. The Trust is continuing its efforts and the State is agreeable provided it retains the veto right named. The Prussian Government keeps on acquiring fresh areas and now possesses no less than 345 groups of coalfields. It is far and away the largest coal producer, in Westphalia, the principal coalfield of Germany, and is opening up fresh mines on all the coal deposits. It is also the largest shareholder in the Hibernia Coal Mining Company, one of the biggest coal mines in Germany, but this must be regarded as one of the Prussian Government failures, for it endeavored to acquire control of that company by purchase, but did not succeed in acquiring a majority of the shares; so for the time being the Government sits upon its shares, drawing its dividends. When next the group controlling the Hibernia Company requires some favor or other at the hands of the Government, the position may be changed. In South Germany there is great competition between the Coal Trust and the Prussian Government mines on the Saar coalfield. The sales of coal from the Prussian Government mines in 1912 exceeded £12,000,000 in value. The Prussian State Mines are probably the best equipped in the world and no money is spared in attempts to minimize the risks of the miners. Marvelous electric locomotives, controllable from a distance and doing away with human labor in the narrow underground passages, are now employed in

them,* and the chairman of the Rand Mines Limited, the great South African mining corporation, in a speech a few years ago, said that they were adopting on the Rand the method of sand filling so successfully in use in the Prussian State Mines. These two instances suffice to show that the State coal mines are not unenterprising, although it must be admitted that a decreasing ratio of accidents does not necessarily mean increasing dividends.

Holland is enormously extending its State coal mines.

Only in 1909 did Victoria commence to work its coalfields. It constructed a twenty-seven mile railway on the field, it built houses for its workers, it bought the land from the township and let it out in lots for building sites on twenty-one-year leases. The annual rental of these town allotments September, 1910, actually exceeded the purchase price of the whole area.

“The growing importance of rendering the Meuse useful for purposes of navigation is due largely to the rapidly increasing output of coal in the State mines in Dutch Limburg, and it is the intention of the Netherlands Government shortly to commence the canalization of a portion of the Meuse below Maestricht without waiting for the result of the negotiations with Belgium.

“In regard to the Limburg coal mines, mention may be made of the fact that two measures were passed by the Chamber in July for the extension of the State mining area. In 1896 the coal output amounted to 137,000 metric tons, and 460 miners were employed. In 1910 the output reached 1,292,000 tons, and 7,200 miners were employed. According to a statement made by the Dutch delegate to the International Congress at Amsterdam in July, the coal output might be expected to reach 8,000,000 tons in a few years' time, and to give employment to 40,000 miners. The industry has encountered some keen competition from the Rhenish-Westphalian Coal Syndicate.” (*Consular Report for 1912 on the Commerce and Finance of the Netherlands*, No. 5096, Annual Series:)

[SOURCE: New Zealand Official Yearbook, 1914, pp. 641-652.] *

The State Coal-mines Act of 1901 provided for the acquisition and working of State coal-mines in New Zealand, under the direct control of the Minister of Mines.

In pursuance of such authority two mines were acquired—viz., the Point Elizabeth Mine, situated on the Grey Coalfield, and dis-

* For technical description of these, see *Frankfurter Zeitung*, November 11, 1910.

tant about five miles from Greymouth, and the Westport-Cardiff Mine (subsequently renamed the Seddonville Mine), situated on the Buller Coalfield, and distant by Government railway about 29 miles from Westport.

In 1902 the Point Elizabeth Mine, included within a lease of about 4,840 acres, was taken over by the State from the Greymouth-Point Elizabeth Railway and Coal Company. The sum of £21,000 was paid by the Government to this company for the partly constructed line of railway from the mine to Greymouth, and the line was subsequently completed with funds set apart for State coal-mine purposes.

During the construction of this branch line of railway a new mine (the Point Elizabeth No. 1 State Colliery) was laid down near Runanga, the output stage being reached in 1904. As a State colliery this mine had produced up to the end of March, 1913, 1,737,574 tons of coal.

GOVERNMENT OWNERSHIP OF IRON MINES

[Sweden—Historical and Statistical Handbook, 1914, pp. 254, vol. 2, and 238, vol. 1.]

The total iron ore export of Sweden up to 1910, inclusive, was:

Iron Ore low or moderate in phosphorus	1,705,000 tons
“ “ rich in phosphorus from Central Sweden ..	11,315,404 “
“ “ “ “ “ “ Norrbotten, circa..	27,623,400 “
Total	<u>40,643,804 tons</u>

The ore export from the ore fields of Lapland, as well as from the export field of Grängesberg, in accordance with the agreements concluded in 1907, 1908, and 1913 between the Swedish State and the companies who own these fields (Luossavaara-Kiirunavaara aktiebolag, Aktiebolaget Gällivare Malmfält and Trafikakliebolaget Grängesberg-Oxelösund), has been restricted for the period from 1908 to 1932 to:

For Kirunavara	103,100,000 tons
“ Gällivare	30,650,000 “
“ Grängesberg	13,250,000 “
Total	<u>147,000,000 tons</u>

In connection with these agreements the State became a shareholder as to half in the Luossavaara-Kiirunavaara aktiebolag and the proprietor of the Luossavaara, the Mertainen, the Ekströms-

berg, and other mines, and also of the Svappavara and Leveäniemi and other iron ore deposits in the Län of Norrbotten, though with the proviso that there should be no export of ore from these fields prior to 1932. The State receives a royalty, calculated according to various considerations on every unit quantity of ore raised, and has the right to buy in all the shares in the companies in 1932, after a valuation of them has been made.

The revenue from the Productive Funds of the State, including the State share in the profits of the Bank of Sweden, for 1915 will be 11.5 per cent of the total amount of the "State Revenue Proper" and the revenue from the Productive Funds put together (deduction being made as in the case of "indirect" taxes). Revenue from such productive funds is of far greater importance in the budget of Sweden than in those of France and England, but of considerably less importance than in those of Germany (counting together those of the Empire and its constituent States).

The railway receipts in themselves bulk largest, but the yield on the capital invested in the Swedish State railways is not very high (3.58 per cent for the good year, 1913)—as, in fact, is the case with the railways, private or public, of most countries, with the exception of the state-owned Prussian railroads. Less imposing in themselves than the railways, but considerably more profitable, are the Post and Telegraph Services (yield in 1913, 35.93 per cent and 7.75 per cent, respectively). The receipts from the waterfalls are not yet large and the yield is low (1.98 per cent); but only one of the State's electrical power stations (Trollhättan) has so far been taken into use, and not even this is fully developed. The Crown demesnes comprise both forests (under the direct charge of the State) and landed estates (generally leased out). Their relative yield is put at 5 per cent. As pure net profit may be regarded the receipts from the State shares, i. e., the dividends in the State-owned preference capital of the Luossavaara-Kiirunavaara Co., thanks to the new contract between the State and the iron-ore companies—made in 1913 in connection with the increase in the export of iron ore—this amount already (1915) exceeds three and three-quarters of a million kronen (nearly one million dollars) and will rise to 10 million kronen (approximately two and a half million dollars), and will thus become one of the most important sources of revenue in the group.

GOVERNMENTAL QUARRIES

[SOURCE: Davies, *op. cit.*]

Prussia and many other countries own and work stone quarries. New South Wales has its own quarries, and in 1911 bought one as a going concern, with a steamer, etc., for transport. The metal requirements of various branches of the Department of Public Works are supplied chiefly from this quarry. Llandudno, in Wales, makes its roads with tar macadam manufactured from limestone from its own quarries and tar from its own gasworks. Many towns throughout the world have their own quarries for road-making purposes.

[SOURCE: Official Yearbook of New South Wales, 1914, p. 281.]

The operations at the Kiama State Metal Quarry resulted during the year 1913 in the production of 100,000 tons of broken stone, 75 per cent of which was despatched by steamer, and the balance by rail, to the metropolitan area for use by State Departments, municipalities, and contractors. Over 100 men are employed at this quarry, and two colliers of 300 and 370 tons carrying capacity are engaged.

At Port Kembla, 45 miles from Sydney, a large quarry is being worked by the State. During the year 1913 about 30,000 tons of crushed stone was sent away by rail. The plant is being extended to increase the output to 120,000 tons per annum.

GOVERNMENTAL OWNERSHIP AND LEASING (WITHOUT OPERATION OR SHARING OF PROFITS)

[*The Engineering Magazine*, March, 1911, p. 845, Dr. Franz Erich Junge, Hermsdorf.]

All mineral resources in the German Empire are "regalia," as they once were in the Roman Empire, it being the prerogative of the State to preserve or to exploit the mineral treasures of the land in a manner and at a rate best suited to the common concern.

On June 18, 1907, a law was passed in Prussia reserving the searching for and mining of coal and salts exclusively to the State. On May 25, 1910, the now famous "Kali law" was enacted, regulating the production, delivery, and price of potash salt.

[SOURCE: Great Britain—Diplomatic and Consular Reports, 1906-8, pp. 5, 6. Japan.]

Mining rights.—A landowner in Japan owns the surface and products of the surface of the land only; all minerals under the

surface appertain not to him but to the Japanese Government. Moreover, should the Government or its nominee wish to extract the minerals lying under a landowner's property, the latter, though he would of course receive compensation for loss, cannot object on legal ground to the development of those minerals.

Hence the procedure adopted by intending oil producers is—similarly to that followed in the case of other minerals—briefly this: An oil company ascertains that a certain property shows promise of the presence of oil in sufficient quantities to warrant exploitation. They accordingly lodge a claim with the Government to be allowed to prospect. A mining right for trial mining is granted. Should results be favorable, if or when the company wishes actively to carry out its project, it obtains from the Government a proper mining right, to which the owner, receiving due compensation for any loss incurred, cannot object.

If prospects are not good for exploitation the trial mining right can be relinquished, and if operations are not commenced within two years of the issue of such trial mining right, it lapses automatically. The mining rights are taxed at 40 sen per 1,000 tsubo for trial mining rights (4 sen equals 1d. and 1 tsubo equals 36 square feet), and 60 sen per 1,000 tsubo for the real mining rights per annum; in addition to these taxes, which are payable whether minerals are actually extracted or not, there is a royalty or production tax of 1 per cent on all minerals produced.

Arising out of the compulsory acquisition of land for mining there are many places in Echigo which, while yet under cultivation, have become the site of mining operations, so that oil wells may be seen in the middle of paddy fields in which the young rice is rank with oil.

[SOURCE: Bulletin 505, United States Geological Survey, "Mining Laws of Australia and New Zealand," pp. 25-27, 174, 175.]

Among the factors which make these [West Australian] laws important for comparison with the statutes of other countries are:

(1) In Western Australia the population is largely made up of those interested in mining.

(2) Western Australia is a country of great mineral wealth, having produced in each of the last eight years between 1,500,000 and 2,000,000 ounces of fine gold, or several times that produced by Alaska, and has for the same period had a greater total annual mineral production than any of the other Australian States or New

Zealand, except New South Wales, which surpassed it in 1906 and 1907.

(3) It contains enormous areas yet undeveloped, the State having an area of almost a million square miles, or more than the combined areas of California, Oregon, Washington, Nevada, Idaho, Utah, Colorado, Wyoming, and Montana, and a total population of less than one-twentieth of that of all these States or less than that of the single State of Utah.

(4) It is a country in which mineral lands were sold outright and its mineral laws have therefore been evolved from a basis similar to that which now is, and for many years past has been, commonly accepted as the rule and practice in the United States.

(5) The desire of the government to promote and encourage the development of its mineral wealth in every way is emphatically shown by the policy of government aid. This policy in the past has involved enormous expenditure in connection with water supplies for the mining districts, the Coolgardie water system alone (built to pump 5,000,000 gallons a day 351 miles to an elevation 1,200 feet above the supply point) involving an expenditure on the part of the government of over \$18,000,000.

The policy of the government in this regard is strikingly shown in the "mining development act of 1902," which provides for:

(a) Government loans at 5 per cent to aid in development work.

(b) Government loans to miners to aid in prospecting.

(c) The erection of public-crushing, ore-dressing, cyaniding, and smelting works, and the subsidizing of persons or companies that will erect such works for testing or treating ores for the public.

(d) The conduct of exploratory boring operations for water and minerals either entirely at the cost of the government or in connection with individuals.

(e) The direct expenditure or the loan of money for constructing drainage tunnels, sinking shafts to great depths, and transporting miners to undeveloped regions.

The provision for government loans to aid miners in prospecting is not regarded by the mines department as having yielded entirely satisfactory results. Loans are now made to working miners only on the security of machinery. The money invested in public batteries and exploratory boring is, however, believed to have been well spent.

The mining act of 1904 must, therefore, be regarded not as a theoretical attempt of political economists, but as the matured law

of a State which has had large practical experience in mining matters, in which, in fact, mining is the principal industry, and in which vast areas await settlement and development; a State which has, moreover, in many ways conclusively demonstrated its desire to permit and encourage the development and settlement of its territory.

The Western Australian mining law of 1904 rests on two rather closely related and interlocking principles:

(1) That land shall be utilized for that purpose for which it is most valuable; and

(2) That no man may hold any mineral rights without development, without, in fact, so far as can be reasonably demanded, the constant employment of labor and expenditure of capital.

In accordance with the doctrine that all land must be utilized for that for which it is most valuable, this law provides:

(1) That after January, 1899, all minerals shall be reserved to the government in lands alienated in any way.

(2) That where minerals are found in lands where the surface rights have been alienated the government may either (*a*) resume the land, paying the owner its value other than for the minerals contained or (*b*) permit mining, provided the surface owner is indemnified for any damage resulting from such operations.

(3) That as regards unreserved minerals in lands that were alienated before January 1, 1899, the government may permit mining therefor under certain conditions.

In Western Australia the development of the mineral land laws has been particularly simple. At the time of the first mineral discoveries in 1842, mineral lands were sold under the same conditions as agricultural lands. Later the purchase price was fixed and the option of lease provided. In 1872-73 the erection of a satisfactory mining plant was made a prerequisite to purchase of the land and the rate of lease rent was reduced. Then, after the gold finds of 1885, the abandonment of the principle of sale became a state policy, and in 1898 provision was made that land grants should contain a reservation of all minerals. Thus, in Western Australia the system of leasehold and claim hold on the condition of bona fide development came at a time most opportune for the test of practice. For the five years comprising 1881-1885 the average annual mineral production was less than £9,000, while for the past five years the annual output has exceeded £8,000,000. Not only was the law subjected to this practical test of great expansion in the mining industry, but an investigation by a commission on mining showed

that throughout the gold fields the verdict was overwhelmingly in favor of leasing.

The same general satisfaction with the leasing system is found in the Collie coal fields, although the coal operations are not comparable with the gold mining. The coal-land law has promoted the development of the industry in this field, which is not so favored by natural conditions as most of the American coal lands. The provisions of this law encourage prospectors by granting exclusive prospecting rights over a considerable area for a limited period, followed by either reward or ordinary leases when discovery has been made. Continuous development is secured by the terms of the lease. The decision was reached in Western Australia that 2,560 acres is a sufficient maximum for a single holding, except where the coal seam is at a depth of over 1,000 feet, in which case 5,120 acres is allowed, a decision which is in striking accord with the opinion independently reached in this country and embodied in one of the coal-land bills recently presented in Congress.

The Western Australian mining law is, in short, a wonderfully symmetrical and carefully balanced enactment, and while it may not be, as a whole, applicable to American conditions, it contains many suggestive provisions which merit careful consideration, as they are not the idle vision of some theorist, but the mature enactment of a legislature whose members are chosen entirely by the voters of a great democratic mining State, a State which ranks among the greatest mining countries of the world and which as recently as 1904 has reorganized and revised its mining laws to meet the practical workaday conditions of a mining region.

The mining law of Western Australia is that of a State in which the mining industry is of pre-eminent importance. The mineral exports of the country are from five to six times the total value of all other exports. It is, moreover, a mining community in which the capital employed in development is almost wholly of foreign origin. On these accounts the evidence furnished by the development of mining laws in South Australia is to a large degree supplementary to that afforded by Western Australia.

South Australia

South Australia is a country in which mining occupies the subordinate position, the mineral exports amounting to less than one-tenth the value of the other exports, so that the mining law is that of the agricultural holder and local capitalist.

In South Australia the alienation of minerals has been carried

further even than in the United States, yet here, too, the principle of leasehold has developed and been fully tested. The history of the mining law of this country becomes of especial interest to Americans, as it shows the practicability of introducing a system of government leasehold after important mining properties had passed into private ownership.

There has resulted a surprising unanimity of opinion in favor of government leaseholds for all minerals. Mining engineers, operators, and capitalists unite in asserting that mining development is promoted more by leasehold than by freehold. The leaders of the several political parties agree that the matter of government leasehold is not a party question. It is important to note that the mining laws of both Western Australia and South Australia were developed under Conservative or Tory governments, and while a Labor government has been in power for some years in South Australia, these mining laws can not be characterized as "radical labor legislation." They are, in fact, nonpartisan enactments which antedate the present supremacy of the Labor party.

Victoria

In Victoria the national mining law has been enacted under conditions strikingly like those under which the American mining law developed, but with very different results. Here, as in California, there was, at the time of the discovery of gold, no law governing mining on the public lands. In both countries the discovery of valuable gold fields resulted in an enormous immediate influx of population, and while the United States delayed dealing with the situation the Victorian government attacked the problem at once, and by the time of the passage of the American act of 1866 had evolved a very comprehensive mining law. In Victoria the development of the coal resources has been practically all under government leases, notwithstanding the fact that considerable areas of coal land are in private ownership.

Tasmania

The mining law of Tasmania has been commended in the Australian mining press as the model among the Australian laws from the standpoint of the capitalist. This State was the first to provide that no lease should be forfeited for noncompliance with the development conditions during suspensions of work due to strikes. The last mining act also meets the demands of investors for more secure tenure, by providing for the expression of the development

covenant in money instead of men and by allowing, under certain restrictions, the excess of development expenditure in one year as a credit on the requirements of the next. In Tasmania, at the time of the early discovery of coal under the existing policy of alienation of lands, the coal lands passed into private ownership. Yet, to-day all the working coal mines are reported as operating under government leasehold, showing that the terms of leasing must have proved satisfactory. The present act permits consolidation of leases to any extent in the discretion of the minister of mining.

New South Wales

New South Wales is the most important of the Australian States from the standpoint of its coal production. In this State there is the same general indorsement of mineral leasehold; indeed, it may be said that there is absolutely no demand for private ownership of minerals.

Proposed Government Ownership of Coal Mines in the United States

[From statement of Director of the U. S. Geological Survey, Nov. 27, 1916.]

No immediate relief is in sight for the users of coal, according to George Otis Smith, director of the Geological Survey. Mr. Smith, co-operating with experts in the Survey, has made an exhaustive study of the coal situation, and makes a number of suggestions, which, if carried out, he believes, would eventually benefit the public. His most sensational conclusion is that government operation of the coal fields and of the coal industry would be beneficial to the public.

“Looking backward as well as forward,” he declares, “one need not be an alarmist to suggest that in the whole field of productive business the coal industry seems the one most likely to be threatened with government operation. The foodstuffs are produced on land owned and operated by the millions, and so far as the production of raw material for them is concerned ‘monopoly’ is an unknown word, but when we think of coal, terms like ‘barons’ and ‘trusts’ instinctively come to mind.

“Public regulation, however, will be fair, and, indeed, in the long run will prove beneficial to the land owner as well as the consumer, to the mine worker as well as to the operator, because any such agency as the Federal Trade Commission, in its control of prices, must determine costs, and as we interpret the present attitude of the whole coal-mining industry, the operators are willing

to rest their case on a fair determination of actual costs, on which their profits may then be figured."

In Mr. Smith's estimate of the cost of coal, he reckons that the mining costs, which include labor, materials, general expenses, taxes, and selling expenses, may be placed roughly at \$1 a ton for bituminous, and at nearly \$2 for anthracite. The transportation cost of coal varies with the distance of the consumer from the mine, but Director Smith places an average figure for this item of nearly \$2 a ton for bituminous, and somewhat more for anthracite—probably \$2. But the largest item in the cost of coal is one which is generally overlooked. To this Mr. Smith gives the description "resource cost," that is to say, what the operator has to pay for the coal in the ground.

"To bring this right home," he says, "it may be said that if the anthracite we burn in our range this winter happens to come from a particular property we will pay fully \$1 a ton into the treasury of the city trust that owes its existence to the far-seeing business sense of a hard-headed citizen of Philadelphia." The lease in question is held by a large coal land owner in Pennsylvania, and provides for the payment of 27 per cent of the selling price of the coal at the breaker. The Geological Survey does not pass on the question of whether this rate is excessive or not.

"The fact remains," says Mr. Smith, "that this is the tribute paid to private ownership."

The present average royalty rate on anthracite is somewhat lower than this figure. It is placed at between 32 and 35 cents a ton, or from 12 to 14 per cent of the selling value at the mine. The tendency is upward.

In his detailed criticism of the coal industry, attention is called by this expert to several items generally overlooked or forgotten. A few cents a ton has been added to the cost of coal by the "safety first" movement, but this is characterized as "a small price to pay for the satisfaction of having the stain of blood removed from the coal we buy." Workmen's compensation laws alone have added 2 to 5 cents a ton to the cost of coal. The purchase of coal from distant fields instead of fields near at home is the cause of a considerable fraction of the annual coal bill of the American people. Another economy is suggested in the delivery situation, and one authority declares that dealers are paying 50 cents more a ton than is necessary for this service. But these are relatively small items, and the elimination of those of them which could be eliminated would not afford substantial relief.

More important, in Mr. Smith's opinion, is the loss incurred by reason of the fact that a large number of coal mines are not working at full capacity. The average number of days worked last year in the anthracite mines was 230, and in the bituminous mines only 203. This meant not only inefficiency and dissatisfaction on the part of the laborers, but a distinct economic loss to the capital invested.

Summing up his investigations, Director Smith comes to the following conclusion:

“As coal is more an interstate than intrastate commodity, any regulation of prices needs to be under Federal control, and to benefit both consumer and producer such control cannot stop with transportation and mining costs, but must stand ready to exercise full rights as a trustee of the people over the coal in the ground. The private owner of coal land, which derives its real value from society's needs, has no more sacred right to decide whether or not that coal shall be mined when it is needed by society, or to fix an exorbitant price on this indispensable national resource, than the coal operators have to combine for the purpose of exacting an excessive profit from the consumer, or the railroads to charge all that the traffic may bear.

“The proposal to bring landowner under the same rule as mine operator and coal carrier may seem radical, but where is the point at which coal becomes the resource upon which industrial society depends for its very life?”

CHAPTER XXI

PETROLEUM

THE present importance of the petroleum industry has developed largely since its use for the purpose of generating power. As long as it was used for light only and for its by-products, it was still of secondary importance when compared with coal. But now that it is used for automobiles, gasoline engines, warships, and aeroplanes, it has developed an importance scarcely secondary to coal itself. It is undoubtedly for this reason that government control and ownership of petroleum have developed much later than the government ownership and operation of coal mines. On the other hand, the present grounds for government control are even stronger than in the case of coal on account of its immense importance in war time. There are many indications, some of which are mentioned in our selections, that henceforth the development of government ownership in the petroleum field may be even more rapid than in the coal mines.

GOVERNMENT OWNERSHIP IN ARGENTINE REPUBLIC, AUSTRIA, HUNGARY, AND SERVIA

[SOURCE: *The Collectivist State in the Making*, by Emil Davies, pp. 47, 48.]

Petroleum.—In July, 1913, the Argentine Government forwarded to Congress a project of law dealing with the development of newly discovered old-fields; this comprises the acquisition of 12 boring machines, the drilling of 100 wells, steel tanks, distillers, transport pipes, and all necessary machinery for loading and the acquisition of tank steamers. To meet the expenditure called for, the Government proposed to issue bonds to the value of \$15,000,000 bearing 5 per cent interest with a 1 per cent sinking fund, and to be named "Bonos de la Explotacion del Petroleo de Comodoro Rivadavia." The service of the bonds to be met by the sale of oil from the fields. Part of the oil-bearing area may be worked by companies, but in such fashion that the Government will have a

majority of seats on each Board and a share in the profits. Herr Hubert Platz, the German engineer engaged by the Argentine Government to report on the fields, concluded his report with the advice either to keep private capital at a distance, or that the Government should strictly control it, so that the greatest profit should not be extracted within the shortest possible time, "as this practice in other places has resulted in the waste of up to 70 per cent of the possible production of oil."

The Austrian and Hungarian Governments own and work large areas of petroliferous land and refineries, and in Servia petroleum is a State monopoly.

CHINA

AGREEMENT FOR THE EXPLOITATION OF THE NORTH CHINA OIL FIELDS BETWEEN THE GOVERNMENT OF CHINA AND THE STANDARD OIL COMPANY

[*Far Eastern Review*, February, 1914, vol. 10, p. 374.]

The following is selected from the text of the agreement between the Government of the Republic of China and the Standard Oil Company of New York for the exploitation of oil fields in Shensi and Chihli:

1.—Upon completion of the examination or at such time in the course of examination when in the opinion of the expert, or experts, sufficient data have been procured to show that the contracting parties can work to advantage the petroleum fields of Yen-Ch'and, Yen-An-Fu, or Chengtehfu, then an American-Chinese corporation shall be formed comprising both American and Chinese shareholders. The said corporation is to be chartered in the United States of America and registered in China, and shall begin operating the fields within six months after completion of the survey.

2.—The capitalization shall be 55 per cent Standard Oil Company of New York and 37½ per cent Chinese Government, this 37½ per cent to be in payment by the American-Chinese corporation to the Chinese Government for the franchise. It shall be optional with the Chinese Government to purchase the remaining 7½ per cent at par within two years from formation of the corporation. In the event of failure to take up this option, the ownership of this 7½ per cent remains with the Standard Oil Company of New York. None of the Chinese-owned shares mentioned above may be either sold to or owned by other than Chinese during the life of this agreement. Any increase of original capital necessary to work the petroleum fields mentioned in clauses one, two, and four shall be

in the same proportions and on the same terms. The absolute and entire control and management of the said American-Chinese corporation shall be vested in a board of directors, consisting of members of the Standard Oil Company of New York and Chinese in the proportion of the above allotment of shares. The name of the said American-Chinese corporation, composed as above, shall be mutually arranged between representatives of the Chinese Government and the Standard Oil Company of New York, as well as rules and by-laws governing the same, as soon after the signature of this agreement as possible. Chinese citizens may purchase shares in the American-Chinese corporation on the open market.

3.—The Chinese Government hereby promises the Standard Oil Company of New York that the working of petroleum in the Yen-ch'ang Yen-An-Fu and adjoining fields in Shensi Province and Chengtefu (Jehol) and adjoining fields in Chihli Province shall be exclusively entrusted to the American-Chinese corporation mentioned above, to develop, refine, and market, and that the Chinese Government will give every assistance and protection in doing the same, and furthermore will undertake not to give monopolies of petroleum territories to any other foreigners, but agrees that no concession whatever for petroleum-bearing properties in China be given to other foreigners until the proposed corporation's workings prove satisfactory to the Chinese Government and the Standard Oil Company of New York, which period shall not exceed one year from date of signing contract.

This agreement is for 60 years from the date of signature, during which term the Chinese Government promises that no other foreign individual or corporation will be allowed to produce petroleum or any of its products in the said districts.

In the event of the Yen-ch'ang Yen-An-Fu, Shensi Province, or Chengtefu (Jehol), Chihli Province, fields proving worthless, this agreement shall apply to any other district in Shensi or Chihli which the aforesaid experts shall on examination approve.

4.—The Chinese Government promises that all necessary facilities of transportation of petroleum or its products from point of production to tidewater, such as railway lines or pipe-lines, shall be granted the said American-Chinese corporation, which corporation shall construct, maintain, and operate such lines in the interest of the said corporation. Application for same to be made before construction to Board of Communications.

5.—The Chinese Government will arrange with all landowners, or lessors of land, or present workers of petroleum deposits in the

above-mentioned fields, that all such petroleum-bearing lands shall be worked by the American-Chinese corporation aforesaid and by none other.

All expenses in connection with vacating of any lands for this purpose will be arranged by the Chinese Government, but be paid for by the American-Chinese corporation.

Royalty on value of crude petroleum is not to exceed 1.5 per cent at place of production.

6.—Should the Chinese Government undertake to arrange for a loan with bankers in the United States the Standard Oil Company of New York agrees to give such loan its tacit support.

Signed and sealed at Peking this 10th day of February, 1914.

GERMANY

[SOURCE: "The Proposed German Petroleum Monopoly," by Dana G. Munro, *American Economic Review*, June, 1914.]

For several years the Standard Oil Company had little serious competition.

The almost complete control by one foreign concern of the import trade in so important a commodity as petroleum, and especially the extension of that control to the wholesale and retail business, has been looked on with much dissatisfaction in business and administrative circles. The Standard Oil Company has not, indeed, seriously abused its position, for it has greatly reduced the cost of putting kerosene on the market, and under its régime prices have gone down rather than up, although they were raised somewhat in the first months of 1912. Nevertheless, after it became clear that no private company could compete with the monopoly, there arose a strong demand for government intervention.

On March 15, 1911, the Reichstag, in a resolution, called on the government to investigate the conditions in the petroleum trade, in order to determine how much danger there was that the Standard Oil Company would obtain a monopoly of the German market, and to decide whether some form of government intervention were advisable. After more than a year of consideration, an extensive report was submitted to the Reichstag in November, 1912.

The Bundesrat accordingly drew up a bill providing for the creation of a corporation which should be given a monopoly of the import and wholesale petroleum trade for a period of 30 years. The proposed company is to confine its operations to Germany in all but exceptional cases, and is to deal only in large amounts of oil. At the end of 30 years the government may either allow the concern to

continue its activities, or it may take over and carry on the sale of kerosene itself.*

The monopoly is to be a private corporation operated for the benefit of the stockholders, who are to be on the one hand a group of great banks and on the other ordinary investors. The capital of sixty million marks is to be divided between two classes of stock. The shares of the first class will be taken by a group of banks, and will entitle the holders to an increased voting power, so that in the general assembly the *consortium* will have at least half of the votes. This stock is to be deposited with the Reichsbank, and is to be transferable only with the consent of the imperial chancellor. In the division of profits no distinction will be made between it and the second class of shares, which will be sold on the open market.

The new concern will be under the constant and close control of the government. To supervise its affairs, the imperial chancellor will appoint a commissioner, who will be entitled to take part in the directors' meetings and in the general assembly, and who may at any time demand reports in regard to the company's affairs from the directors or from the executive committee. The books and papers are open to his inspection, and if he finds that decisions or orders are inconsistent with the laws or with the constitution and by-laws of the corporation itself he may forbid their being carried out. Furthermore, the election of the board of directors, of their chairman, and of the executive committee must be confirmed by the chancellor. The latter will appoint a council of 20 expert advisers to assist the commissioner in his work and to supervise the business methods of the monopoly.

To protect the public from exploitation, a very elaborate scheme for the regulation of prices and the limitation of profits has been worked out. The earnings of the monopoly are to be divided as follows. After the deduction of all expenses, 10 per cent of the remaining profits is to be added to the reserve fund, until that shall have reached a sum equal to half of the capital, and the rest is to be apportioned between the stockholders, the imperial treasury, and a price-leveling fund. The amount received by each depends on the average price of kerosene during the year in question, 20 pfennigs a liter at the company's reservoir being fixed as the maximum which ought to be charged. At this price the company may pay a dividend of 5 per cent; and the imperial treasury receives

* The bill, with an explanation of its provisions, is printed in the *Begründung*. Spies criticises it from the standpoint of the petroleum dealer (*op. cit.*, pp. 90-140).

the profits remaining after this has been paid, up to a sum four times as great as that distributed to the stockholders. If there is still something left over it is turned into the price-leveling fund. When the company is unable to sell at 20 pfennigs, the Empire gives up its share of the profits, and the amount which the stockholders may receive decreases geometrically with the rising price. A maximum dividend of 4 per cent may be paid if the price is 22 pfennigs or above. If the average during the year falls below 20 pfennigs, the profits allowed to the stockholders, and the share of the Empire, which is four times that of the company, increase geometrically with the sinking price. All sums remaining after the payment of the permissible dividend and of the government's quota are added to the price-leveling fund, which is to be drawn on in years when without its use the price must be above 20 pfennigs. If the present steady decline in the consumption of kerosene continues, the company will be allowed slightly to increase the profit which it makes on each liter, in order that it may pay a reasonable dividend on its capital stock. By these measures the government aims to make it to the advantage of the monopoly to sell oil at the lowest possible price, and also hopes to secure for itself a considerable income, which it intends to use for social purposes, such as old-age pensions and workmen's insurance.

The proposed corporation will take over all plants and equipment heretofore used in the import and wholesale trade in petroleum, and will compensate existing firms for being forced to give up their business. It will also compensate such officials of these firms as it does not itself employ. In the course of competition the Standard Oil Company and its rivals have acquired a large amount of duplicate equipment which would be of no use to the new company, and there are also a large number of officials who would be superfluous under the new régime. These measures would thus involve a considerable expense, and in addition a fleet of tank-steamers must at once be provided, since without them it would hardly be possible to secure oil from the poorly organized independent producers. The cost of putting the monopoly in operation would therefore be very great, and in this matter alone the company would be in a much less favorable position financially than are the Standard's affiliated organizations at the present time.

The three most important arguments made by the opponents of the bill are: that the great banks interested in the project will derive undue advantage therefrom; that the new monopoly will be forced into dependence upon the Standard Oil Company for its

supply; and that the change will result in the sale of petroleum of inferior quality at prices as high as or higher than at present.

Those who advance the first argument point out that the Deutsche Bank and other financial organizations which will control the new monopoly also have extensive interests in one of the most important of the prospective sources of supply, the Roumanian oil wells. By charging exorbitant prices for the product of the latter, they could still exploit the consumers in spite of the profit-regulating scheme. However high the price of kerosene, they will still be allowed to receive a 4 per cent return on their investment in the monopoly, and so could afford to renounce the higher profits permissible with lower prices in Germany if they made a greater clear gain from their Roumanian wells. There seems little danger, however, that the banks will be willing or able to do this. Both the force of public opinion and the control exercised over the monopoly by the government would deter them from such high-handed robbery.

The second argument against the bill has received more serious consideration, for the ability of such a company as is proposed to obtain sufficient oil from sources independent of the Standard Oil Company is open to doubt. The government investigated this question before preparing the bill now under consideration, and it asserts that it has been able to make preliminary agreements, assuring a plentiful supply of kerosene at reasonable prices, with independent companies in Russia, Austria, Roumania, and America. According to these, about 300,000 tons of refined petroleum would be obtained from the three former countries, and the remaining 450,000 tons necessary to supply the German market from the United States. Kerosene will also be bought from the Standard Oil Company, if a satisfactory arrangement can be made.

In the light of present conditions in the world's great petroleum-producing districts, the government's assertions seem rather optimistic. Germany now consumes more kerosene than any other country which does not produce an important part of its own supply, having imported 755,199 tons in 1911. Whether this great quantity can be obtained without depending on the trust can only be determined by examining the nature and importance of the independent sources of supply. At present America produces by far the largest part of the world's output of crude oil, and in the production of kerosene its preponderance is still greater, because of the extensive use of petroleum for fuel in Russia and Roumania. Most of the American refineries are in the hands of the Standard Oil Company, or subject to its control through their use of its

transportation facilities. There are, indeed, independent companies; but how far they can be relied upon to supply the major part of Germany's annual consumption, and whether they will be able to maintain their present independence, is doubtful.

Next to the United States, Russia is by far the most important petroleum-producing country. The greater part of the crude oil from the Baku wells is used as fuel in the form of "masut"; and in 1911 the total exports of kerosene were only 475,000 tons, of which more than half went to Turkey, Egypt, and other countries near the Black Sea. The exports were decreasing, and the Russian oil was everywhere giving way before the American product. The producers are disorganized and are handicapped by the lack of transportation facilities; and their crude oil is of inferior quality, yielding only 30-35 per cent of refined kerosene, as compared with 60-75 per cent obtained from the crude oil of the Pennsylvania and Ohio wells. Russian oil, however, has always sold somewhat cheaper than American, except during the price war of 1890-1895. It has been greatly improved in recent years by better refining methods, and can now be burned in the same lamps as the American kerosene. The Baku wells will doubtless be able to furnish a considerable part of the supply of the new German monopoly, and in the future, with improvements in means of transportation, they will probably be able to offer increasing amounts at low prices.

The source of supply in which those advocating the monopoly have the most interest is Roumania. This country possesses great and rich oil fields which have thus far been only partially developed, owing to lack of capital. In 1900 and again in 1903 the Standard Oil Company attempted to get control of the greater part of these, but was repulsed by the Roumanian Government. Most of the crude oil output is used as fuel on the railroads and on the steamships, and only 323,012 tons of kerosene were exported in 1911. This went chiefly to Egypt, Great Britain, and Turkey, and less than 25,000 tons found its way to Germany. The most important of the Roumanian exporters, the Steaua Romana, is, however, controlled by the Deutsche Bank and operated as a German firm; and this company hopes to sell almost its entire product to the new monopoly. The oil is of good quality, and can be put on the market very cheaply, as the production costs are low and the Danube affords inexpensive transportation. Nevertheless, the limited quantity will prevent this kerosene, for the present at least, from doing very much towards solving the problem of supplying the German demand.

The fourth source from which the government expects to obtain

oil is Austria. The refineries of Galicia produced only 540,000 tons in 1911, and most of this was used within the dual monarchy. About 220,000 tons were handled by the Olex, the exporting organization of the combined refineries, and 161,719 tons of this came to Germany. The Deutsche Erdöl Aktien-Gesellschaft bought a majority of the shares of the Olex in March, 1912. Even if Austrian oil is obtained, it does not seem likely to be imported in very large amounts, since the product of the Galician wells has shown a tendency to decline in recent years.

The opponents of the bill further assert that the new monopoly, instead of protecting the public from extortion at the hands of the Standard Oil Company, will in reality be forced to raise the price of petroleum, in spite of the elaborate price-limiting scheme. They maintain that the company cannot otherwise be operated with a profit. The maximum established by the proposed law, 20 pfennigs a liter at the reservoir, would result in a retail price considerably higher than that which has been charged by the Standard Oil Company. They say the monopoly will not be able to do business even at this price because of the great initial expenses of organization, of building a tank-fleet, and of compensating those at present engaged in the petroleum trade.

The trust has already exerted itself to defeat the project, and may be expected to use all of its vast power in the effort to bring the new company under its control. Failure in this would mean the partial or entire loss of the Standard's best foreign market. It would also encourage other countries, perhaps, to follow the German example, and thus would break up the trust's control of the European petroleum trade. Independent oil producers in America would have a valuable support in their efforts to resist absorption, and the producers of Russia and Roumania would be able to sell their petroleum in markets from which they had hitherto been excluded by unfair competition. The development of the world's mineral oil resources would be stimulated and accelerated.

[Editorial Notes in *Sozialistische Monatshefte*, 1913, p. 1201 (Nos. 18-20).]

The eleventh Commission of the Reichstag has considered in two readings the drawing up of a law on the illuminating oil trade, which the Imperial Chancellor presented to the Reichstag, November 18, 1912, for a constitutional resolution, and, although a third reading is still to come, a preliminary account has been allowed to reach all members of the Reichstag. The form which the bill acquired after the two readings differs essentially from the govern-

ment's plan. A pure government monopoly is not projected, but a so-called "partnership business," in which, to be sure, the state has all the powers in its own hands, but the actual business dealings are given over to private concerns. Again, this bill, completed with the help of the social democratic members of the commission, which will also secure a safe majority in a full house, shows that the partnerships with the government have certainly a real tendency as transitional forms to move along the direct path of Socialist evolution.

The fundamental thought in Sec. 1 of the government's plan has been kept intact, namely, that the importation and manufacture of mineral oils, which are used for burning in lamps, as well as the wholesaling of them in the home market, are to be given over to the government exclusively. But the business concern, to which the above-mentioned powers are to be transferred, as far as the state itself does not exercise them, has acquired such a form that there is little left of the capitalistic form of the enterprise. The basic capital is to consist four-fifths of shares and one-fifth of bonds. The bonds are sent out in the state's name and are not transferable. Although the state has to contribute only one-fifth to the capital stock, the bonds (issued through the state) receive 52 per cent of the votes in stockholders' meetings, so that the government will always have the majority, thus controlling the direction of the business. The influence of the private capitalists is to be still more limited. At least a fifth of the shares are to be offered to such associations of retail trades (retailers, consumers' leagues, etc.), which are bound not to transfer these stocks further during a period of three years. In the stockholders' meetings the consumers' leagues also have a vote, one for every 1,000 marks ownership of stocks.

The corporation is to be wholly under the Reichstag's management. In paragraph 4 of the commission's plan, it is decided that the annual report and trial balance sheets, together with the profit and loss account, must be examined before their submission to the general assembly by one or more of the appointed and qualified auditors of the court of accounts, and are to be announced yearly to the Reichstag. The Reichstag can decide whether the business of the corporation wholly or in part shall be examined by the court of accounts or by a specially appointed commission. The report of the examination is to be placed before the Reichstag. The board of inspectors consists of 21 members, 5 of them being delegates from the Reichstag, chosen from the Reichstag by the Chancellor of the Empire; 2 are to belong to the Association of Retailers of

Illuminating Oil, and 2 to belong to consumers' leagues. Only for daily expenses is the board reimbursed. The accounts of the selling concerns are submitted yearly to the Reichstag.

Such a partnership with the government has been allowed to exist hardly anywhere up to now. It is possible that this transition type momentarily meets the situation better than the creation of a real government monopoly. The government may at any time take over the sale of illuminating oil into its own hands. Also in a pure government monopoly private capital would be divided in so far as the government had to secure its business capital through a loan, and pay interest. According to the commission's plan the interest on the capitalization of the selling business should not exceed 5 per cent. So far as in a fiscal year the dividable profits exceed 5 per cent, they are put into a liquidation fund. The interest flows into the sinking fund. When the dividable profits fall short of $4\frac{1}{2}$ per cent in a fiscal year, then an amount is taken from this sinking fund to bring the total up to this height. Moreover, it is used to steady prices. As soon as the sinking fund has reached the 15,000,000 marks point, the profits must be used exclusively to make the selling price of illuminating oil cheaper.

And so the organization, trading, price of products, and the net gains of the business concerns are all planned out. It is managed wholly by will of the government, of the Reichstag, and in paragraph 11 the forms are enacted according to which the selling concerns are to decide about tariff regulations with their employees and laborers or their associations. Employees and laborers' committees are to be elected by equal votes for the employees and workers of the business. The working and employment agreements must contain no clauses which prevent and exclude the right of combination of employees and workers' committees.

A monopoly in this form one can call governmental business, which makes for itself the profits of the commercial business, of a capitalistic undertaking, without the right of independent decision being accorded the interested managers and capitalists. This selling partnership business, anyhow, has very little of the earmarks of a capitalistic undertaking. It shows a Socialistic form; the most important items of the commission's plan were decided upon at the suggestion of the social democrats, and the law can as a whole get a majority only if the social democratic contingent vote for it.

CHAPTER XXII

GOVERNMENTAL "MONOPOLIES"

It is extremely difficult to decide whether to class the leading governmental monopolies under government manufacturing, under State Socialism in agriculture, or under the head of taxation. Undoubtedly the chief purpose, and usually the sole purpose, of government monopolies is to raise revenue by establishing a price level so high as to secure large profits and a large governmental income. Only in the case of tobacco and alcohol is this purpose somewhat mixed with the intention more or less to restrict consumption.

While alcohol is publicly controlled in several smaller countries, the Russian experiment so greatly overshadows all others that we have restricted ourselves to a somewhat detailed statement of that monopoly. In the case of tobacco, on the other hand, we refer briefly to all the leading experiments, as a large number of countries have undertaken a tobacco monopoly and no one nation stands out as exceptional in this field. The same is true of the governmental control of salt.

Sugar has been widely used for the purposes of taxation, though government monopolies did not come into existence before the war. On the contrary, almost all the world was engaged in giving competitive bounties for private sugar production, until this competition was ended by international agreement some years ago. However, the fact that sugar is widely used for the purpose of taxation led to a temporary monopoly in Great Britain soon after the war, and it is possible that we shall see a permanent control of sugar for taxation purposes in some countries after the war.

While the manufacture of armament and most explosives is to be considered as an industry entirely "subsidiary" to ordinary governmental war activities, gunpowder has a considerable use aside from war. We therefore give a brief mention of the

French monopoly in this field as well as other minor French monopolies. Finally, we may refer to the fact that many of the smaller governments of backward countries have established monopolies in natural products; for example, the government of Abyssinia has a monopoly in ivory and rubber. [Great Britain *Diplomatic and Consular Reports*, No. 5163, 1911-12, pp. 9, 10.]

THE RUSSIAN VODKA MONOPOLY

[By Arthur Sherwill, M. P., *European War*, 1914.]

What Witte plainly aimed at was to regulate the sale of vodka and to prevent abuses.

That M. Witte was also influenced in his decision by his predilection for State or centralized control of commercial and industrial enterprises is possible, and perhaps probable. Fiscal considerations, too, doubtless played their part. Certainly M. Witte does not appear to have shared the fears of his predecessor (M. Bunge) that the creation of a State monopoly would imperil the revenue.

At the same time it is but fair to add that in his circular to the excise officials in 1894, M. Witte made it plain that purely fiscal considerations were not to affect the administration of the monopoly. Anticipating the recent utterance of M. Bark, the present Minister of Finance in Russia, M. Witte reminded his subordinates that "The revenues derived from other direct and indirect contributions will more than compensate the Treasury for any loss of duties, for in proportion as the consumption of spirits shall be diminished, the general well-being of the masses and the moral qualities of the population will be developed." Therefore, even should the reform in the spirit trade which we contemplate result in a decrease in the fiscal revenues, but cause an increase in the general well-being of the population, this result of the reform would be considered as most satisfactory, and we should look upon it as a full and thorough success of the reform, due to the efforts of Treasury employees at the time when their services are to be rewarded.

A further indication of a serious social purpose is to be found in the fact that, coincidentally with the creation of the vodka monopoly, there was established in the monopoly districts an elaborate scheme of State-aided Kuratoria, or Temperance "Guardianships," whose function it was to wean the people from habits of intemperance by definite instruction, and by the provision of counter-attractions to the drink shops.

They are financed partly by annual State grants (taken from the profits of the vodka monopoly), and partly by voluntary subscriptions, and by the profits of some of the various agencies (e. g., tea-rooms, dining-rooms, theaters, night refuges, etc.) established by the committees. This last-named source has in recent years become of predominant importance.

The official memorandum, issued in 1897 for the guidance of the committees, lays particular stress upon their duty to combat the evils of intemperance by disseminating among the population accurate information as to the dangers of abuse. Among the leaflets and pamphlets recommended were the following: "What every mother should know about spirits"; "Let us stop drinking and treating others"; Tolstoy's "What strong drink does to man"; "It is time to recover"; etc., etc. Many of the leaflets are specially recommended for pasting on cardboard and placing on the walls of the committee's tea-rooms, reading-rooms, etc. Other publications of general interest, such as Hans Andersen's Tales, stories by Dickens, V. Hugo, Gogol, and many other writers, as well as numerous simple books on natural history, nature studies, etc., were also recommended.

In Petrograd, especially, remarkable results have been achieved. The scheme of work undertaken by the committee has been of an exceedingly comprehensive character, and its institutions include (a) the People's Palace, a magnificent building for the erection of which a special grant of £100,000 was made by the Finance Minister, in which a widely varied scheme of recreational and educational agencies, to which we shall presently briefly refer, is carried out; (b) the Petrowski Park, admission to which is free, where public fairs, open-air theatrical performances, concerts, acrobatic and conjuring entertainments, children's games and workshops, and illustrated lectures, together with a reading-room and library, soup kitchen and tea-room, etc., are among the agencies provided; (c) the Old Glass Manufactory, a disused factory now converted into a popular social center, where a great variety of agencies, including, in addition to those named above, classes for choral singing, dancing (in summer), free medical attendance, and a working men's cheap inn, with accommodation for 200 persons, are likewise carried on; and (d) the Taurischer, Wassiliostrowski, and Katharinenhofer Gardens, in each of which a very attractive scheme of activities, including open-air concerts, fairs, summer and winter theaters, dancing, lectures, children's games, etc., with skating and tobogganing in the winter, is carried on. In addition the committee have

established several Ambulatoria for drunkards under the charge of Dr. A. L. Mendelssohn, a specialist in nervous diseases and psychotherapeutics. Perhaps the clearest idea of the excellent work accomplished by the Petrograd Committee may be given in the form of a summary of the agencies connected with its principal center, the People's Palace in Alexander Park. Admission to the Palace costs 10 kopeks (about $2\frac{1}{2}$ d.).*

It will be seen that dramatic and similar entertainments play an important part in the program of the Petrograd Committee. This has been the case from the beginning, and experience has certainly justified the committee. In a period of 13 years no fewer than 56,672,689 persons visited the committee's theaters.

The choral classes, also, have been remarkably successful, while the children's play games have been highly popular. In the years 1899-1910, 386,783 children took part in the games on Petrowski Island; another 264,379 gathered at the People's Palace, where the games were instituted in 1902; and in the summer of 1910, 25,490 children attended the games in the Katharinenhofer Garden. The Workmen's Inn, also, has been a notable success. There, for the small sum of 5 kopeks (about $1\frac{1}{4}$ d.), a laboring man can obtain a night's accommodation (including a bed, bath, and a separate drawer for his effects). Up to 1911 the inn had been patronized by 422,413 men. It is claimed that the many-sided work of the committee has had an appreciable effect in diminishing the consumption of spirits in the districts concerned. In 1898, the year in which the committee was established, the consumption of spirits in Petrograd, according to an official report, amounted to 2.25 vedros per head of the population. In 1908 it had fallen to 1.70; in 1909 to 1.60 vedros, and in 1910 to 1.55 vedros. The diminution, it is stated, was much greater in the districts in which the principal institutions of the committee are situated. Thus, in the Old Petersburg quarter, owing, it is alleged, to the influence of the People's Palace, the consumption of spirits fell from 2.14 vedros per head in 1898 to 1.86 vedros in 1903, and to 1.43 vedros in 1908. In the Wassiliostrowski quarter, again, the decline in consumption from 2.05 vedros in 1898 to 1.74 vedros in 1903, and to 1.44 vedros in 1908, is attributed to the influence of the counteracting agencies in Petrowski Park. This claim may or may not be justified, but the figures are at least interesting and noteworthy.

* For soldiers the charge is 5 kopeks ($1\frac{1}{4}$ d.). The higher price charged for seats in the theatre are intended for the non-laboring classes.

The work of the Petrograd Committee must not, however, be taken as typical of the work accomplished by the 800 committees scattered throughout the Russian Empire. It is admittedly far in advance of what has been accomplished elsewhere, although in Moscow and in some other cities extremely valuable results have been achieved by similar efforts.

Considerable misapprehension appears to exist in this country as to the scope and character of the Russian vodka monopoly. It is important, therefore, to state that the monopoly is not concerned with the manufacture (i. e., distilling) of spirits, although the distilling industry is controlled by rigid excise laws, but is solely concerned with the rectification and sale of vodka. Distilling in Russia has continued in private hands, subject to certain restrictions as to output. The State (through the Ministry of Finance) purchases from the distilling companies the raw spirit that is required in each province, and it is then rectified and purified under State supervision, partly in State rectifying establishments and partly by private rectifiers at a fixed charge. Elaborate precautions are taken to secure strict purification. Each monopoly district has a chemical laboratory in which the purity of the spirit delivered is tested, and there are in addition two central laboratories (one at Petrograd and one at Moscow) to supervise and control the work of the provincial laboratories. Whatever defects in other directions the monopoly system may have possessed, it is undeniable that it effected an enormous improvement in the quality of the vodka sold to the peasants. The number of places of sale, which were severely simple and uninviting establishments, is, or rather was, fixed by the Minister of Finance, and the sites of the shops were chosen by the Department of Indirect Taxes in consultation with the Governor of the province. The salesmen were carefully chosen and had no financial interest in their sales. Vodka was sold in sealed bottles, at prices which were uniform throughout the country, for "off" consumption only. The bottles were in five different sizes, ranging from one-fourth of a vedro (about two-thirds of a gallon) to 1-200th of a vedro (about one-ninth of a pint), the last-mentioned size being the one principally sold. The quality, contents, and price of the vodka (as well as the price of the empty bottle, which was returnable at the option of the purchaser) were in each case plainly labeled. Each shop was divided into two parts by a grating in which was a window through which the money and liquor were passed. The public part of the store contained no furniture, the rules requiring the customer to leave the premises immediately he had received

his sealed bottle of vodka. It was forbidden to open the bottle on the premises.

While, however, the Russian Government possessed what was virtually a complete monopoly over the supply of vodka (but not other spirits, such as cognac, whiskey, etc.) for consumption within the monopoly areas, it had not a monopoly of its sale and retail distribution. Apart from certain outlying districts of the Empire, in which the monopoly had not so far been introduced, the State spirit shops represented only a proportion of the shops in which vodka and other spirits were sold in the monopoly areas, while there were, in addition, quite outside the State monopoly, a large number of beer and wine shops.

The total number of spirit shops in Russia (in the last year for which official statistics are available) was 61,376, as compared with 114,963 in 1894, the year in which the monopoly was authorized. The new system, whatever its defects, did undoubtedly effect a sweeping reduction in the number of spirit shops. In the provinces under the State monopoly, there were altogether 54,917 spirit shops, or one shop to 2,664 inhabitants. Only 26,971, or less than one-half of these, were State shops. The rest were privately managed establishments (i. e., restaurants, buffets, wine cellars, ordinary liquor stores, etc.), which bought the vodka from the Government stores at the ordinary prices and sold on commission. The commission paid was very small, amounting, outside of five cities, to only 20 kopeks (5d.) per vedro (2.70 imperial gallons). In Petrograd, where the highest commission was paid, it amounted to 40 kopeks (10d.) per vedro. A large proportion of these private establishments sold for consumption on the premises, but, except in the case of certain first-class restaurants, which paid a high license duty for the privilege of selling vodka by the glass, they could only sell the monopoly vodka in sealed bottles at the ordinary Government prices.

Contrary to general belief in this country, it is the fact that the number of State vodka shops had in recent years steadily declined, until there were 2,000 fewer last year than in 1904. On the other hand, the number of private establishments selling vodka on commission had increased by over 7,000 in the same period. The sales of the monopoly vodka (as distinct from the liqueurs, cognac, imported spirits, etc., which are not monopolized) in the private establishments were, however, relatively small, amounting to not more than one-tenth of the whole. In addition to these spirit shops there were in Russia some thousands of privately managed wine

cellars and other liquor stores where wine and fermented liquors only were sold.

It will be seen, therefore, that the so-called State "liquor monopoly" in Russia was decidedly limited in its scope.

The State monopoly, with all its faults and defects, had this considerable merit, that it removed the vodka trade in Russia from the control of private interests and, by eliminating the element of personal profit, cleared the path for drastic changes. This in itself was an enormous service which far outweighs in essential importance the system's unnecessary limitations and defects. It would indeed be easy for a defender of the monopoly to contrast, with crushing force, the ease with which prohibition was lately established in Russia, with the opposition which Mr. McKenna's exceedingly moderate "Temporary Restriction" Act encountered in the British House of Commons. The explanation of the contrast is, of course, to be found in the fact that, in the former case, there were no private interests (i. e., traders trading for private gain) to range themselves against the proposal, and to bring political pressure to bear against it. In the latter case, the proposed restriction necessarily involved (as all similar or greater restrictions must always involve) the pecuniary interests of a large number of licensed traders, who are able to make their pressure felt in political ways. That is a truth which British statesmen and reformers are now beginning to grasp, and substantial progress will date from the day of its full apprehension. So long as the trade in alcoholic liquors is left in the hands of those who sell for private profit, and whose pecuniary interests necessarily conflict with public interests, progress must be slow and opposition to reform be continuous. Eliminate private interest from the sale of alcohol and the path is cleared at once of a formidable obstacle against which public opinion and legislative effort have repeatedly advanced in vain. That is one outstanding lesson taught by the Russian vodka monopoly. The radical fault of the monopoly was over-centralization and its bureaucratic character.

In these and other respects it was decidedly inferior to the Gothenburg system of disinterested local control which has achieved such excellent results (under considerable limitations) in Norway and in Sweden. To identify the Russian monopoly with the Scandinavian (or so-called "Gothenburg") system of disinterested control, as is constantly done in this country, is to confound things that differ essentially. It is, for instance, of the essence of the "Gothenburg" system that, subject to central supervision and to the provi-

sions of statutory law, the traffic should be locally controlled. The control of a monopoly trade by the State, whose revenue benefits by an increase and suffers by a reduction of sales, is far removed from the local control of a monopoly trade by a body of men who can have no interest in its expansion, and whose reason for association with it is that they may restrict sales. In the former case, the inducement of the private trader to increase sales may be transferred to the State; in the latter case, if the necessary safeguards are provided, the element of interest in sales by those who control the trade is destroyed. This lack of control was one of the inherent defects of the Russian monopoly. That it was more difficult of achievement in Russia than it would be in Great Britain must, of course, be admitted.

GOVERNMENT TOBACCO MONOPOLIES

[SOURCE: *The State as Manufacturer and Trader*, by G. W. Madsen, London: Unwin, p. 16.]

Government control over the tobacco trade by means of legally maintained State monopoly exists in France, Italy, Austria-Hungary (where there are three separate administrations), Japan, Rumania, Serbia, Spain, Turkey, Portugal, and Sweden. It is either exercised by the responsible government itself through duly constituted State departments, or it is entrusted to private parties under a concession, the concessionaires enjoying a stipulated share of the monopoly profits in return for their services as tax-gatherers.

The monopolies in France, Italy, Austria-Hungary, Japan, Rumania, and Serbia are under direct State management and cover the exclusive right of the government to import, purchase, manufacture, and sell tobacco. In Spain, Turkey, Portugal, and Sweden the monopolies are leased to concession companies, which in Spain and Turkey control the whole industry from the purchase of raw materials to the retail sale of the finished goods; in Portugal and Sweden the law establishing the monopoly gave the concession company exclusive rights over purchase of raw materials and manufacture, but did not interfere with the freedom of individuals to trade either in monopoly products or in imported manufactures.

The present governmental monopoly in France, operated directly by the State, was established by the imperial decree of Napoleon I., dated December 29, 1810. The State monopoly does not embrace the actual cultivation of tobacco. The leaf-growing industry is in private hands. All leaf tobacco is delivered first of all to the raw-material warehouses, of which there are 32, some belonging to the

State and others being rented. The factories are 21 in number and all belong to the State. The products manufactured comprise cigars, cigarettes, cut tobaccos, smoking and chewing plug and twist, and snuff.

When the tobacco is delivered from the factories it passes into the control of the Indirect Taxes administration. The monopoly of the sale is carried on by means of intermediate agents called storekeepers, who supply the retail shops with their requirements, and by retailers, who supply the public. There are in France 357 wholesale stores, most of them rented by the State.

In 1912 there were altogether 47,500 shops. The total number of tobacco workers employed in the factories in 1912 was 17,968.

The right to sell tobacco is a privilege granted only to certain deserving persons, the income from the monopoly value of the shop being a substitute for or an addition to a state pension, and its amount determining to whom the shop will be granted.

The profit of 1912 from the State Tobacco Monopoly, as reported in the official accounts, was £17,421,300. It is proved, however, that the reported profit from the monopoly is at least £800,000 in excess of the true profit.

The direct control of the monopoly in Italy was resumed by the State on January 1, 1884. The tobacco warehouses, like the factories and cultivation agencies, are controlled and staffed by State employees. The wholesale depots, of which there are now 462, are managed by storekeepers paid by discounts on their purchases. There were in 1912-1913, 34,752 retail shops. The monopoly has provided continually increasing revenues. In 1912-13 the net profit was £10,075,400. The total amount of manufactured tobacco sold by the monopoly in 1912-13 was 45,938,950 pounds, of which 42,930,400 pounds were sold in Italy.

Control of the tobacco industry by the State of Austria was definitely established in 1784. The factories are 30 in number, and all are owned by the State. Manufacture being the exclusive privilege of the State, no private persons are allowed to take part in it.

The final step in the direction of the existing complete State monopoly over purchase, manufacture, and sale in Japan was taken in the law passed in April, 1904, when the need for increased revenues had again become imperative, owing to the costs of the Russo-Japanese war. The monopoly took effect on July 1, 1904. The net income derived from the monopoly was officially reported in 1912-13 as £5,698,200.

The Spanish Tobacco Monopoly is of long standing and has

passed through many vicissitudes of direct control, concession, and even temporary suspension. The present method of operation dates from 1887. In 1913 the monopoly provided to the State a revenue of £6,111,050.

On September 9, 1914, the Swedish Parliament, by a majority of 95 to 42 in the Lower Chamber and 130 to 74 in the Upper Chamber, passed an act prohibiting the manufacture of tobacco as an enterprise in which any person might engage, and establishing a government monopoly operated by a concessionaire company in partnership with the State. The monopoly came into force on June 1, 1915. The reasons for this legislation have been purely fiscal. The government simply desired increased revenues from the consumption of tobacco, and has had the problem of ways and means under discussion since 1902. Under the monopoly law the importation of raw material and the manufacture of tobacco products are an exclusive State privilege, and are conceded by the State to a tax-paying monopoly company formed for the special purpose.

GOVERNMENTAL SALT MONOPOLIES

[SOURCE: Special Consular Reports, No. 52, Foreign Salt Market and Industry, 1912.]

Colombia

[From Arthur Hugh Frazier, Chargé d'Affaires, American Legation, Bogota.]

Until January 1, 1911, the salt industry was a complete Government monopoly in Colombia; since that date the monopoly has been removed from marine salt. The interior sources of supply are the mines of Zipaquira and Nemokon and the product of these Government-owned mines far exceeds that of the marine plants. The Government makes no purchases of salt.

Ecuador

[From Consul General Herman R. Dietrich, Guayaquil.]

The Government of Ecuador exercises a monopoly of the salt industry in the Republic, and no salt is purchased from outside markets, except a very small amount of table salt brought from England.

Peru

[From Consul General W. Henry Robertson, Callao.]

Under a law of January 11, 1896, a monopoly of the Peruvian salt industry was created in favor of the Government. This monop-

oly was administered originally by the Ministry of Finance, the decree of July 18, 1896, creating a special department within this ministry for the collection of the tax. In 1901 this monopoly was farmed out to a private stock company. In December, 1905, another company took over the exploitation of the industry and continued to control it until February 5, 1910, when a new company under the same name as the original one took up the work and is the present concessionaire of the Government.

Venezuela

[From Consul Isaac A. Manning, La Guaira.]

The Government of Venezuela exercises an absolute monopoly over the manufacture and sale of salt and its importation is absolutely prohibited. The salt used in Venezuela is principally from the sea-water evaporating fields on Margarita Island; no other salt works are now in operation in the country.

France

[From Consul General Frank H. Mason, Paris.]

The mining, evaporation, and sale of salt in France are not, strictly speaking, under a Government monopoly, but are regulated by a code of laws and decrees which in effect give to the Government a practical control over the industry and product. The basis of the system is the law of June 17, 1840, which among other provisions prescribes that no saline spring or salt mine in France shall be worked except under a special concession granted under a royal ordinance by the council of state. The operation of salt mines and wells is governed by the general code of mining laws, which apply to mines of ore, coal, and other minerals. The area of territory, which may be granted under one concession for salt-mining purposes is limited by the statute.

Under the law each holder of a concession is bound to produce for consumption, and subject to taxation, not less than 500 tons of salt, and the statute prohibits the transportation of salt water or mineral salt from the well or mine to any other point or place than the factory or saline on the premises where the salt is evaporated, refined, and otherwise prepared for commerce. The violation of these provisions or the failure to produce the prescribed quantity of salt annually are punished by penalties.

Germany

[From Consul General A. M. Thackara, Berlin.]

Over one-half of the table salt and about one-tenth of the salt for industrial or agricultural purposes produced in Germany comes from native mines and salines either owned directly by the Government, as in Prussia, or as a private investment by the ruler of the State or members of his family, as in the Grand Duchy of Anhalt; the balance of the German production comes from the plants of private firms or companies. The Government of this country does not exercise a monopoly of the salt industry, although the product is subject to revenue taxation and is now practically all marketed through the German Salt Syndicate.

Italy

[From Consul General James A. Smith, Genoa.]

The manufacture of salt in Italy is a partial Government monopoly. With the exception of the salt produced in the island of Sicily and a small quantity in Sardinia and other less important islands, all of that manufactured in Italy is the output of Government factories.

Most of the product in Italy is marine salt produced exclusively by solar evaporation. There are, however, two so-called mineral salt works belonging to the State monopoly, located at Volterra in the Department of Tuscany and at Lungro in the Department of Calabria. In all Italy the annual amount produced is about 500,000 tons, of which 260,000 tons are produced in Government establishments and the rest in private factories.

Roumania.

[From Consul General Roland B. Harvey, Bucharest.]

The importation of salt is forbidden in Roumania, the salt market being a Government monopoly. The domestic supply is obtained by the mining and treatment of rock salt; none by the evaporation of brine.

Other European Countries

In Austria the Government produces practically the whole domestic output, though during 1909 industrial salt amounting to 16,580 tons was imported. In Hungary 11 mines produced 225,000 tons of salt annually, the supply being very extensive and of the finest quality. The trade in salt in Switzerland, under the Swiss constitution, is a monopoly of the separate cantons, which arranged

some time ago to acquire most of the shares of each of the salt mines in Switzerland. Although salt is imported when needed, it is not likely that American salt could be sold there. In Greece about 57,000,000 pounds are consumed annually, all of domestic production from the evaporation of ocean brine. Servia uses about 25,000 tons annually, all imported by the Government. At present a Sicilian firm has a contract to furnish 17,000 tons annually of first-quality rock salt until January 31, 1920. Turkey produces and exports salt, and importations by private individuals in Syria, as well as in European Turkey, are prohibited.

China

The trade in salt is a Government monopoly in China and importations are forbidden, though it is said that some foreign salt has been allowed to come in for the use of foreign residents, who find the native product too coarse for table use. Both the leased territories of Kiaochow and Kwangtung produce salt in large quantities, and there is no market for American salt in either. By Rule 3 of the treaty of 1903 between the United States and China the importation of salt into the latter country is absolutely prohibited.

Cochin China

[From Consul Hubert G. Baugh, Saigon.]

The trade in salt is a Government monopoly in Cochin China. The supply is obtained from certain districts of the country, the Government buying it from individual producers, who are granted permission to engage in the business and who are obliged to accept the prices fixed by the Government. There is, therefore, no market in Cochin China for American salt.

India

[From Consul General W. H. Michael, Calcutta.]

The production of salt in India is in the hands both of the Government and of private persons, the latter holding licenses issued by the Government. The annual domestic output amounts to some 1,200,000 tons. In the last five years the imports have ranged between 467,000 and 589,000 tons.

Japan

[From Consul General Thomas Sammons, Yokohama.]

The Government of Japan assumed the monopoly of the salt industry in this country in 1905. The greater part of the supply is

domestic, but certain quantities are purchased abroad, three importers having been licensed for the purpose. These are the China & Japan Trading Co. (Ltd.), of Yokohama, for American salt; Sale & Frazar (Ltd.), of Tokyo, for British salt; and Otto Reimers & Co., of Yokohama, for German salt.

A GOVERNMENT SUGAR MONOPOLY

The London *Gazette* of September 11th announced the appointment of a Royal Commission to inquire into the sugar supply of the United Kingdom. The Commission was composed as follows: The Home Secretary, chairman; Lord Lucas, Mr. Walter Runciman, Sir Henry Primrose, Hon. E. S. Montagu, Mr. G. S. Barnes, Mr. R. P. Lyle, and Mr. W. C. Slaughter. On Thursday night the Commission published a memorandum, explaining the steps that have been taken. In the days immediately succeeding the declaration of war sugar that was previously being sold in London at 15s. per cwt. rose to 42s. per cwt. In these circumstances, says the memorandum, the Government decided to take steps to ensure an adequate supply and to arrange for distribution on "terms that would be no more onerous to the public than the actual conditions make inevitable." The first steps taken put an immediate end to speculation in sugar and to the rise in the price. The memorandum continues as follows:

"The leading refiners were approached, and an arrangement was made that the whole body of refiners should stand aside from the market for raw sugars, leaving it free for the operations of the Government; that they should look to the Government alone for the supply of raw sugar for their factories; that the sugar should be issued to them at a fixed price; and that they in turn should sell their refined products to dealers also at a fixed price, the difference between the two prices being no more than sufficient to allow them a fair profit on manufacture.

"The price of raw sugar charged to the refiners was determined on the basis of protecting the Government from loss on their purchases, according to the best estimate that could be made of the prospects of the sugar market.

"Allowing for reasonable profit to the refiner, dealer, and retailer, respectively, this price permits the sale to the public by retail grocers of sugar at the minimum price of 3½d. per pound for good granulated, and 4¼d. per pound for good cubes, with other qualities at proportionate prices.

“As we pointed out recently, the greater part of our normal supplies consist of beet sugar from the Continent. The Government has prohibited the import through neutral countries of beet sugar from Germany. This prohibition may not, in fact, prove effective, and from the purely economic point of view, it may be questioned whether it will harm Germany more than ourselves. Holland has prohibited the export of sugar coming from Germany, and France has now forbidden sugar exports. If the Government's scheme has saved us from consistently high prices, it may deserve the gratitude of consumers in this country. But the possibility must be remembered that the sudden jump of prices would automatically have brought heavy supplies to this country, which would have led to severe price reactions to, it may be, a level lower than that fixed by the Government.”

THE GOVERNMENT MONOPOLIES AND INDUSTRIES OF FRANCE

[Great Britain—Diplomatic and Consular Reports, 1911-12, No. 5001. France.]

Revenue from monopolies, industries, etc.—In France the Government not only works the posts, telegraphs and telephones, but they have three special monopolies for the manufacture of tobacco, matches, and gunpowder, which are, therefore, of particular interest for the purpose of this report. They yield a large amount of revenue to the State, amounting to over £22,667,000 in 1911 (as estimated for the budget of that year).

The Government, it may be mentioned, also derived (since the purchase of the Western Railway) some revenue, about £474,000 in 1911, from its state railway and small sums from the Mint and National Printing Press. The yield of the three above-mentioned monopolies, however, produce about twice as much as the posts, telegraphs, and telephones together, which figure for some £13,745,000 in the same year.

The monopoly of gunpowder.—In view of a bill about to be presented to the Chamber of Deputies for the abolition of the Government monopoly for the manufacture of gunpowder, it will be interesting to briefly recall former legislation with regard to the production of explosives.

The Government monopoly dates back to very ancient times, and the beginning of the present exclusive rights to make gunpowder dates from a law of 1797, subsequently modified in 1819. It was not till the year 1875 that any manufacture of explosives was permitted by private manufacturers. A law dated March 8 authorized

establishments, other than those of the State, to manufacture dynamite and other explosives made of nitro-glycerine, and a decree of August 24, 1875, laid down the conditions of manufacture. The Government, however, retained complete power to stop such private factories from manufacturing these explosives or their sale, without granting any compensation, should they think it desirable to do so. This concession eventually led to a bill, put forward by the French Government itself in 1887, practically abolishing its old monopoly, which, however, never passed into law. But the idea has now been revived, inasmuch as a bill, abolishing the monopoly for gunpowder used in warfare and for cotons nitres intended for exportation, has been drawn up by the Government, which sanctions their manufacture by private manufacturers on payment of a kind of royalty and on deposit of a £2,000 security. The Government, as before, can stop this manufacture of explosives by a decree, and, in case of mobilization, they can attach the products.

Profits from sale of gunpowder.—Under the present arrangements this monopoly brings in large sums to the Exchequer. In 1911 the proceeds of the sale of powder brought in £900,989 gross profits, from which the expenses had to be deducted, and the net profits from the tax on dynamite were £161,255 (less cost of collection).

The net profits accruing to the Government from this monopoly were entered in the 1911 budget as £873,832 and were entered as £833,180 for 1912.

The match monopoly.—In France the Government has a monopoly for the production of matches, of which three kinds are sold to the public, i. e., (a) ordinary wooden matches, which will light on any surface; (b) wooden safety matches, which will only ignite on a special surface; (c) wax matches with ordinary phosphorescent tips.

The first category is by far the largest, with much over one-half the total production, and the second category (consisting of so-called "sulphured," "Swedish," and "Tilson") form the bulk of the remainder.

The quantity of wax matches is small in comparison, and the number of chemical igniters sold is very limited. In 1909 the total receipts were 40,884,933 fr. (£1,635,397), which showed an increase of 381,148 fr. (£15,246) over those of 1908. The total expenses in 1909 were 11,052,489 fr. (£442,100), or an increase of 2,669 fr. (£107) over the previous years. The consumption per head for that year was 1,146 matches, costing about 1s.

The net profit to the State was, therefore, 29,832,443 fr. (£1,193,298), or 378,478 fr. (£15,139) more than that for 1908. The net revenue to the State was put at £1,591,448 and £1,682,988 respectively in 1911 and 1912. Of the total production in 1909 of 44,921,011,480 matches of all kinds, only 111,268,000 matches were sold abroad.

It may be mentioned that this State monopoly gives occupation to 139 officials and to 1,752 workpeople (of whom 1,176 are women), as well as to about 400 more temporary workpeople. The average wages paid for the working day of nine hours was 5s. 10d. per day for the officials and 2s. 10d. per day for the workpeople.

[*Die Sozialistische Monatshefte*—"Government Ownership in France," by Edmund Fisher.]

The Government monopoly of tobacco has already been in existence over 100 years and serves solely fiscal purposes. With a gross income of 500 mill. francs, the Government derives from this monopoly a net income of 400 millions. The same holds true for the State monopoly for the manufacture of matches, which yields the Government 30 mill. francs annually from a gross income of 40 millions. Tobacco and matches are therefore very dear. Not perhaps because the State management does not work well, but because the price of the products is intentionally set so high. That is the only purpose of the monopoly: to fill the State Treasury. These arrangements are therefore to be attributable to the methods of taxation rather than to political economy.

Another government monopoly is that for the manufacture of powder for the army, the navy, mining, and sport. This, too, is almost 100 years old. Only military reasons were decisive in its establishment. The State-owned shipyards, in which over 30,000 men are employed, likewise serve primarily military purposes. When Senator Poirier said about these industries which are managed by the military authorities that the squandering of public funds in the military arsenals goes beyond imagination, he rendered a verdict of condemnation against the military administration and not against public ownership. The military authorities are also judged upon similarly in countries where the rest of the publicly-operated have attained the very best of results.

Yet it may be true that in France public management has not been a success. The Government printing office until lately also proved to have an almost monstrous management. This printing office dates back to the year 1789, and was then intended to prepare

Oriental printings for which private concerns possessed neither the type nor the necessary knowledge. Gradually this printing office also undertook the production of other printed matter. This it did at an almost exorbitant cost. During an investigation it was then found that for but 1,300 printers there were appointed 172 officers, an officer for every 8 workers.

Not the lack of a bureaucracy, but the old bureaucratic red-tapism, the narrow-minded mechanism of former times, which has dragged along for an entire century, prevailed in government enterprises, just as is the case today in most of the military organizations of all other countries. To this is to be added that France is a country developed very little industrially.

CHAPTER XXIII

MANUFACTURING

IN this chapter we consider governmental activities in the manufacturing field aside from "SUBSIDIARY INDUSTRIES," considered in the following chapter, and "GOVERNMENT 'MONOPOLIES,'" which were discussed in Chapter XXII. A larger part of governmental industrial activities fall under the two heads just mentioned, although there is a considerable number of smaller manufacturing activities of which we here give a few examples.

It must be remembered, moreover, that in certain directions governments are becoming an exceedingly important factor in *every* manufacturing industry, the chief of which are governmental control of credit, governmental control of transportation, and governmental aid to industrial science (for which see the corresponding chapter). We must also include the government activities discussed in PART V, since one of the most important collectivist policies is the raising of the industrial efficiency of the individual worker through governmental health and educational activities elevating the physical and psychological standards of the producing population.

Some of the instances of governmental manufacturing mentioned in this chapter might be classified as "subsidiary" industries. For example, the new American United States Government nitrate plant is meant partly to furnish nitrates for explosives, but its chief use is to furnish nitrates for fertilizers. Now it is undeniable that the importance of the fertilizer question has also been brought forward largely by the war. But it is equally certain that, now that the public interest is once aroused, many governments are going to promote the fertilizer business after the war, entirely independently of war possibilities.

It is also undeniable that the paper situation has been brought to a crisis by the war. But paper certainly cannot be considered as "a military necessity." There is therefore little if any doubt

that the developments of governmental control of paper, at least to the extent of regulating prices, will continue after the war.

In case of doubt we have classified governmental manufacturing under the head of "SUBSIDIARY INDUSTRIES," but in several cases there is no doubt which could justify such classification. For example, the governments of France and Germany, long before the war, had entered into the manufacture of certain art goods—the purpose being art education and the stimulation of artistic industries in these countries. Emil Davies, *The Collectivist State in the Making*, p. 63, mentions the chief of these undertakings:

The Governments of France, Prussia, Saxony, and possibly others unknown to me, carry on the manufacture of china and porcelain. These are usually carried on more for the encouragement of art than for purposes of earning revenue, and at most international exhibitions, e. g., Ghent in 1913, pride of place in the French Sections—always the most impressive at these international exhibitions—is given to the State manufactures, which, with the exquisite tapestries and furniture from the Government Gobelins factories and the superb porcelain from the Government works at Sèvres, and prints, etc., from the State printing office, easily carry the palm for beauty.

Nor can the Australian brick works mentioned by Davies (page 62) be considered either as having any connection with war or as being a mere branch of other governmental activities.

The New South Wales Government in 1911 opened brick works at Homebush Bay, near Sydney. The land covers 18 acres and the capacity of the works is 1,500,000 bricks per week. At Botany Bay the same Government has works for the making of sand-lime bricks with a capacity of 250,000 per week. According to a Reuter telegram dated September 24, 1913, the auditor-general's annual report shows that the State brick works, while suffering from a trade loss for the last year of £1,397, principally on the cost of delivery, resulted in a saving to the Government services in the purchase of bricks of £7,283, with a proportional saving of interest. The total gain to the State since the establishment of the works, after deduction of trade loss and adding previous profits, was £6,678. The State blue metal quarries show total profits since their acquisition

in 1911 of £4,332, besides a considerable saving in the cost of supplies to the Government department.

The French Government has developed a State drug factory since the war. But the success of the drug business carried on by the municipalities in Russia suggests that the French experiment may develop permanent elements entirely unconnected with the war.

We have not sought to multiply smaller cases of governmental activities. The artistic manufacturing above-mentioned in itself involves large sums of money and has a still larger significance in the totality of the industry of France and Germany. Indeed, we should undoubtedly have been justified in devoting a separate chapter to industrial art similar to our chapter on "INDUSTRIAL SCIENCE," were it not for the fact that space forbids—and that the governmental encouragement of art is relatively limited in extent—if we except art schools and museums (which we should probably be obliged to do, in view of the fact that these activities have been an accepted function even of the most anti-collectivist régimes

THE UNITED STATES GOVERNMENT NITRATE PLANT

[SOURCE: Public Act No. 85, Section 124, 64th Congress, pp. 56, 57.]

The President of the United States is hereby authorized and empowered to make, or cause to be made, such investigation as in his judgment is necessary to determine the best, cheapest, and most available means for the production of nitrates and other products for munitions of war and useful in the manufacture of fertilizers and other useful products by water power or any other power as in his judgment is the best and cheapest to use; and is also hereby authorized and empowered to designate for the exclusive use of the United States, if in his judgment such means is best and cheapest, such site or sites, upon any navigable or non-navigable river or rivers or upon the public lands, as in his opinion will be necessary for carrying out the purposes of this Act.

The products of such plants shall be used by the President for military and naval purposes to the extent that he may deem necessary, and any surplus which he shall determine is not required shall be sold and disposed of by him under such regulations as he may prescribe.

The sum of \$20,000,000 is hereby appropriated to carry out the purposes herein provided for.

The plant or plants provided for under this Act shall be constructed and operated solely by the Government and not in conjunction with any other industry or enterprise carried on by private capital.

THE UNITED STATES GOVERNMENT PAPER MILL

[SOURCE: House of Representatives Report No. 1244, 64th Congress, 2d Session, pp. 1, 2, 3, 4, 5, 7, 8.]

Mr. Barnhart, from the Committee on Printing, submitted the following report:

The Committee on Printing, to which was referred the bill (H. R. 17699) providing for the construction and operation by the Government of a print-paper mill, having had the same under consideration, reports it back with the recommendation that the bill do pass.

The bill (H. R. 17699) is as follows:

Be it enacted, etc., That the Public Printer is hereby authorized and directed to provide, either by purchase or erection, or both, a pulp and paper mill or mills for the manufacture of print paper for the Government of the United States, said mill or mills to have a daily capacity of not less than 50 tons of paper; to be located at a place or places approved by the Joint Committee on Printing, with special reference to utilization of the forests, minerals, water power, and other resources on the public lands.

The Public Printer is further authorized to construct, maintain, and operate, at or on any site or sites so designated, dams, locks, improvements to navigation, power houses, and other plants and equipment necessary or convenient for generation of power and for the production of pulp and other materials required in the manufacture of print paper for the Government.

SEC. 2. That for the purpose of manufacturing paper as provided herein the Secretary of the Interior and the Secretary of Agriculture are hereby authorized and directed to sell to the Public Printer at a fair price such available wood, minerals, and other materials on the public lands under their respective jurisdictions as he may require; and the Secretary of Agriculture and the Secretary of Commerce are hereby authorized and directed to render such assistance to the Public Printer as he may request and they may deem necessary to carry out the purposes of this act in the construction and operation of a suitable plant for the manufacture of paper for

the Government. If sufficient or suitable materials for the manufacture of paper can not be obtained from the public lands, the Public Printer is hereby authorized to purchase such materials in the open market at the lowest and best prices obtainable therefor after due advertisement; and he is hereby directed to give due consideration and encouragement by experiments or otherwise, in co-operation with the Department of Agriculture, to the manufacture of paper from corn and cotton stalks, cereal straws, grasses, and other fibrous plants.

SEC. 3. That the products of such mill or mills shall be used by the Public Printer for the public printing and binding to the extent that he may deem necessary, and any surplus which he shall determine is not so required shall be sold and disposed of by him at not less than cost, under such regulations as he may prescribe, with the approval of the Joint Committee on Printing, first consideration being given in the sale of such surplus to the needs of other branches of the Government service, which shall procure from the Public Printer at cost all the paper for their respective requirements that he may be able to furnish them.

The committee believes that a print-paper mill owned and operated by the Government will accomplish the following purposes:

First. Provide an adequate supply of print paper at all times and at a fair price, thus protecting the Government from the grasping combines that now refuse to furnish necessary paper for the operation of the Government except at exorbitant and noncompetitive prices.

Second. Obtain for newspaper publishers and the printing trade in general definite information as to the cost of the manufacture of print paper, so as to likewise protect them from excessive charges by unscrupulous manufacturers, who seek, under abnormal conditions, to advance their own selfish interests, entirely regardless of the public service performed by newspaper and other publishers in the distribution of necessary information to the people.

Third. Utilize the forests and water power on the public lands in the economical manufacture of paper for the benefit of the Government and to prevent further waste of these resources which the paper interests are seeking to have withheld from competition with their monopolistic ownership of wood pulp and power sites.

Fourth. Furnish adequate and practical means for the development of the manufacture of paper from corn and cotton stalks and similar agricultural products, which would be of vast benefit to the farmers of this country in providing a profitable market for a large

portion of their products which now go to waste. The use of new fibers, other than wood, would also be of inestimable value in the conservation of the forests of the United States, the destruction of which is largely chargeable to their extravagant use in the manufacture of paper.

[The House Report then continues as follows:]

The Government of the United States has long been at the mercy of paper combines and monopolies that undoubtedly have profited excessively in furnishing paper to the Government Printing Office, which is one of the largest consumers of paper in the world. This situation has become all the more intolerable during the past year, when the paper manufacturers have taken advantage of conditions alleged to be due to the European war to demand still more exorbitant prices for their products. Some of the manufacturers even repudiating their contracts with the Government, though these contracts provided in several instances for increases amounting to more than 50 per cent above the price paid for the same paper last year. These contractors, while refusing to furnish paper under their agreement for the year ending March 1, 1917, demanded two and three times their contract price when the Government sought to make open-market purchases of the paper necessary to continue operations of the Government Printing Office. Even at these outrageous prices the Public Printer was unable to obtain any real competition, practically only one bid being submitted in most instances, and that by the company which had refused to continue furnishing paper to the Government at its contract price. In other words, there appears to be a mutual understanding among the paper trade to refrain from competitive bidding for Government business. This conduct on the part of certain paper contractors has created a most serious situation. At times the Government has had the greatest difficulty to obtain sufficient paper to print the necessary records of the Government.

The paper situation in the Government Printing Office became so acute that on September 7, 1916, the Public Printer appealed to the Joint Committee on Printing for relief. In his letter the Public Printer stated:

“In view of the fruitless effort to interest manufacturers of paper in submitting quotations for Government requirements, I feel that the situation is imperative enough to request that some action be taken whereby the Government will be enabled to purchase paper for public printing and binding work at a reasonable price.”

The paper manufacturers, by their refusal to furnish or bid on

paper required for the public printing, had practically forced the Government Printing Office into a situation where it would soon have had to suspend all printing for Congress and the departments if an adequate supply of paper could not be obtained.

The committee on paper specifications, in its report which was adopted by the Joint Committee on Printing on December 18, 1916, has this to say concerning the erection and operation by the Government of a paper mill:

“The difficulties which have been encountered, not only by the Government Printing Office, but by other Federal departments, in securing bids at reasonable prices and of obtaining prompt delivery on accepted bids of paper complying with specifications, lead the specifications committee to give serious consideration to the establishment of a Government pulp and paper mill, and it recommends that the Joint Committee on Printing give immediate consideration to the establishment of a Government-owned plant. The Government uses approximately 30,000,000 pounds of print paper per annum, which is a sufficient quantity to absorb the output of a 50-ton mill.

“The numerous Government reservations afford sites having ample water power for the operation of a mill, and extensive forests and mineral deposits upon which to draw for the raw materials.

“Furthermore, such a mill will afford facilities for the commercial demonstration of the value of wastes of all kinds for paper making, on which materials the Government has spent considerable sums annually and with which demonstration on a commercial scale is possible. Again, a Government plant will furnish unlimited opportunities for studies in the commercial utilization and disposal of paper-mill wastes. These wastes embrace at least half of the raw materials used in making paper and are a menace to the public health as well as a detriment to industrial development.”

The Government already has done considerable experimenting with various materials other than wood pulp for the manufacture of paper. These experiments have been conducted largely by the Department of Agriculture. That suitable paper can be made from such material as cotton stalks, cornstalks, cereal straws, grasses, and various fibrous plants is no longer an experiment. It has been difficult, however, to induce paper manufacturers to take up the manufacture of paper from any of these materials. This attitude on the part of the manufacturers is believed to be due, in many instances, to their large holdings in wood-pulp mills and heavy investments in timberlands. It is quite probable that they fear that the success-

ful manufacture of paper from material other than wood pulp would greatly depreciate the value of their investment and encourage new and undesirable competition in the paper industry.

Consequently it seems that the only way to obtain a practical test of these other materials for the manufacture of paper is for the Government itself to undertake such a test. That can only be done by the establishment of a mill of adequate size to manufacture paper in commercial quantities. The proposed mill could be used for such a purpose, as its 50-ton capacity would be more than sufficient to supply paper for the immediate needs of the Government. Germany has already commenced the manufacture of paper from cotton stalks, and paper experts have no doubt but that print paper made from cotton and corn stalks will sooner or later be a commercial success. If the Government can advance that success it will be of immense benefit to the farmers of the United States who now find little or no use for their corn and cotton stalks.

If the proposed mill were to be erected with no other object in view than that of making a commercial success of manufacturing paper from these waste materials of the farmer it would more than justify the proposed expenditure.

In order to encourage the commercial production of paper from waste plant fibers, such as domestic corn and cotton stalks, flax and cereal straws, wild and cultivated grasses, and other plants not now used in paper making, the Joint Committee on Printing has included in its schedule of paper for the next year a proposition to purchase 2,000,000 pounds of such paper, if it can obtain a reasonable price. The Government has already spent thousands of dollars experimenting in the manufacture of paper from waste plant fibers. It has demonstrated that suitable paper can be made from such fibers, and it alone remains to work out the problem of manufacturing the paper on a commercial basis.

If the paper manufacturers themselves continue to ignore the growing necessity for the manufacture of paper from fibers other than wood pulp, then a Government mill is all the more essential for the development of such an industry that must sooner or later be established to conserve our rapidly diminishing supply of pulp wood and to insure an adequate supply of print paper, which the Federal Trade Commission has already stated it regards as "a public necessity."

GOVERNMENT CONTROL OF PAPER PRICES

[SOURCE: Washington press dispatch, Feb. 16, 1917.]

News print paper manufacturers, facing criminal prosecution in United States courts for alleged combination in restraint of trade, proposed to the Federal Trade Commission today that the commission fix a reasonable price for the output of the principal plants of the United States and Canada. The commission announced in a statement tonight that it had taken the proposal under consideration and would reply immediately. It is generally believed the answer will be an acceptance.

The action of the manufacturers give a signal victory to American newspaper publishers, who, in the face of advancing paper prices, have seen nothing ahead but ruin for many of their number. If the proposal is accepted, officials say it will mark an expansion of the functions of the Government, which, in arbitrating the differences between two industries, opens up a wide field of possibilities for the future.

The statement issued by the commission attaches particular significance to the outcome of the conferences as marking a "new era in American life."

"Already there is a belief," the statement says, "that the action of the paper manufacturers will be followed by other groups that have been charged with monopoly and extortion."

The investigation was put under way last summer under a resolution adopted by the Senate. Information gathered tending to show anti-trust law violations was turned over to the Justice Department, while all bearing on economic phases of the situation was collated by the commission. At hearings held last fall and as late as January the manufacturers, it is said, discouraged the commission's efforts to find a solution for prohibitive prices. After the Grand Jury proceedings were started they came voluntarily to Washington with their proposition.

It is estimated that if the proposal is accepted and reasonable prices are fixed, at least \$30,000,000 will be saved to American publishers this year. Nothing is said of increased production, but it is understood the manufacturers are willing to keep enough machines on news print to insure a paper supply for the entire country.

It was learned today that the Canadian Government, under orders in Council, would fix a maximum price of 2½ cents a pound on news print sold to Canadian publishers, leaving the price to be

charged Americans to be determined in this country. The two Governments have worked in concert in the situation, trying to find means of averting threatened disaster to publishers.

The Trade Commission's report to Congress on its investigation will be delayed until a decision is rendered on today's proposal.

The statement issued by the commission said:

"The offer, with its promise of lower prices and more equitable distribution, not only means the saving of millions to the great publishers of the country, but averts the absolute ruin that now threatens hundreds of the smaller publishers.

"The proposition is the outcome of the news print paper investigation that the Federal Trade Commission has been conducting for the last eight months. As a result of public hearings and the work of economists, accountants and financial experts, the commission arrived at the conclusion that the paper shortage was largely artificial, that prices were extortionate, and that free competition had ceased to exist."

It was not stated whether the proposition, if accepted, would affect the Federal Grand Jury investigation of the paper situation in New York, but the intimation made was that there was a close relation between the two phases of the matter.

"It was the evidence procured by the commission, and turned over to the Attorney General," the statement continued, "that led to the recent preparations for criminal prosecution by the Department of Justice.

"The proposition which has been taken under advisement by the Federal Trade Commission is said by Government officials to mark a new era in American life. The commission was created to provide an expert body for scientific and economic adjustment, rather than prosecution, in order that the public might not be compelled to wait and suffer for relief during the slower processes of the criminal law.

"The offer of the news print manufacturers is the first practical recognition of the new idea by American business men. Official Washington is amazed at the completeness of the commission's accomplishment, and already there is a belief that the action of the paper manufacturers will be followed by other groups that have been charged with monopoly and extortion.

“ If the commission accepts the offer, it is in a position, by reason of facts gathered in the last eight months, to make its decision before March 1. This done, the first step has been taken for the establishment of mutual relations between publishers and manufacturers, even while competition is freed from restraint and the public interest safeguarded at every point.”

[We reproduce the above at some length because of the possible influence of the government paper mill in achieving the result attained.]

CHINESE GOVERNMENT PAPER MILL

[SOURCE: United States Commerce Reports, July 14, 1916.]

The Minister of Finance, according to the *Peking Gazette*, is planning the establishment of a Government paper mill to meet the demands of the home market. The projected factory will be established at some place centrally located and will be known as the Central Model Paper Mill. It will be under the direct control of the Minister of Finance. A prospectus outlining the organization of the undertaking has been drawn up, according to which there will be a director, several chief engineers, and a number of other administrative officers.

The *Peking Daily News* says that it is intended that there shall be two sections for the factory—general and technical. The general section is to have charge of documents, accounts, investigation, statistics and reports, the purchase and transportation of materials, the disposal of manufactured goods, etc. The technical section is to have charge of arrangements for the factory, the manufacture of paper, the management of the business, plans, and inspection work. The chief of the technical section is to be a technical expert.

GOVERNMENT MANUFACTURE AND SALE OF DRUGS

The Paris correspondent of the *Daily Chronicle* says that early in the war the French Government decided to organize the State manufacture of drugs and pharmaceutical products needed for the army. The enterprise has proved to be an immense success, and has resulted in a substantial saving of money, in view of the increase in the market price of all chemical products.

The State Pharmacy, which is located in Paris, with branch establishments at Marseilles and Nantes, produces 55 tons per day. Between December 2, 1914, and September 3, 1915, it furnished the army with 1,373,000 tubes of serum, to mention only one among

the hundred medical necessities which it supplies to the French and Allied armies.

It is declared that the State, by manufacturing its own drugs, instead of buying them at ruling prices, has saved the nation already [within one year] a sum of £480,000.

[The Russian Yearbook, p. 492.]

The law of 12/25 February, 1912—giving town councils and zemstvos the right to open pharmaceutical establishments—opened a new field for municipal work. Hitherto the pharmaceutical business had been carried on by a limited number of individuals, who enjoyed a practical monopoly; the result being that not only were high prices charged for medicines, but individuals who had acquired the right to open pharmacies were able to sell these rights for considerable sums. According to the municipal paper, *Gorodskoye Delo*, the cost of a pharmacy dispensing 50,000 medicines per annum is about 150,000 to 175,000 roubles in Petrograd and Moscow, and about 125,000 to 150,000 roubles in the provinces, the value of the stock of such establishments not being more than 10,000 to 15,000 roubles.

Under the new law municipalities may open pharmacies in the ordinary way, i. e., simply by registration, without having respect to existing private ones or the population; in other words, the towns and zemstvos will get all the advantages of the pharmacy monopoly without the risk of the private owner. This will not only give the towns an opportunity to increase their finances, but will ensure cheaper medicines for the poorer classes.

Until the new law was passed there were but few municipal pharmacies. In 1911 there were only 29 with a free right of sale to 5,030 private pharmacies; of this number, two-fifths were leased out.

The advantages of the new law are numerous, one of the most important being the possibility the municipalities will have of freeing themselves from the control of Russian and German syndicates and wholesale dealers in the matter of the purchase of goods. Russian public institutions spend about 10,000,000 to 12,000,000 roubles a year on medicine, about 3,000,000 roubles in excess of what should be paid.

At a meeting of the Petrograd Town Council in 1912 it was decided to vote 800,000 roubles for the opening of 12 municipal pharmacies in the town in the course of six years.

CHAPTER XXIV

“SUBSIDIARY” INDUSTRIES

IN the INTRODUCTION (page xviii) we discussed briefly the question of “SUBSIDIARY INDUSTRIES,” pointing out that governments enter into many industrial activities as merely subsidiary to other governmental functions. In such instances it can not be said that the government has entered into a new industrial activity unless it produces a large part of the total product and enters into the new business beyond its original purpose of supplying itself with some needed article. To illustrate, we give a list of government railway shops in practically all of which the construction of locomotives, cars, and so forth takes place, as well as repairs. It is evident that it is the rule rather than the exception for governments to pass on from governmental operation of railways to governmental construction of railway material. But they do not stop there. We have also mentioned in the INTRODUCTION the fact that the Hungarian Governmental Iron Works export not only cars but other products, and we give a further selection in the present chapter showing that the Japanese Governmental Iron and Steel Works also enter into the iron business generally. It is because of their railways that so many governments of the world have entered into coal mining and seem likely to proceed very soon as far as a monopoly—the process having been greatly hastened by the war. Moreover, it is not surprising that the railways, which necessarily absorb a large part of every nation’s capital, should lead governments into the iron and steel business—so that it seems not at all improbable that before many years they will control the iron and steel industry and iron mines. This process will be greatly accelerated by governmental construction of ships for naval purposes—and possibly also by the active interest of governments in the construction of the ships for passengers and freight. We must, further, take into account the development of subsidiary industries in con-

nection with other large undertakings such as irrigation and canal construction; for example, cement works [see Chapter V].

THE UNITED STATES GOVERNMENT AS PRINTER AND PUBLISHER

[Official advertisement of U. S. Superintendent of Documents.]

The Government of the United States is the greatest of all publishers of scientific works. It employs thousands of scientists, who are engaged the year round in making researches and investigations in all branches of agriculture, in geology, in mining, in electricity, in chemistry, in astronomy, in engineering, in aviation, in preventive medicine, in forestry, in irrigation, and almost all other branches of scientific inquiry. The arts of war as well as those of peace are also actively cultivated. The greatest art of all, that of free government, is strenuously carried on by President, Cabinet, Senators, and Representatives.

The results of all these activities of the most comprehensive and effective organization ever known are constantly reduced to print and poured out in an incessant flood from the largest printing works in the world.

These publications of the Government Printing Office at Washington constitute the Public Documents of the United States.

The greater number of them are sold by the Superintendent of Documents, located in the Government Printing Office. The Government did not establish this sales office for purposes of profit, but as a public convenience. The prices charged cover only paper and printing, no charge being made for the services of the statesmen and scientists who are the authors of the astonishingly varied books, pamphlets, periodicals, and maps, and no commissions being allowed to anybody. The documents even have the freedom of the mails and are sent without cost.

The only condition is that payment be made in advance of shipment. The Superintendent of Documents is not authorized to supply free copies, and it is useless to ask him to do so.

The Government Printing Office is the largest printing plant in the world, and a limit to its capacity has never been reached, although it is necessary to make constant adjustments and rearrangements in methods of production in order to meet the demands for work, which are at times enormous.

The output consists of every conceivable class of printing and binding, ranging from envelopes, cards, and similar small work to

the most sumptuously illustrated and bound volumes. Evidence of the vast increase in the work of this office in recent years is shown by the fact that the number of blanks, envelopes, cards, etc. (not including over a billion postal cards), printed in one year now runs to about 2 billion copies, which exceeds the output of 1880 by over 1,200 per cent. Book work has increased in the same proportion, and the yearly output is now over 4 billion printed pages. The average production in the book-composing divisions is 7 million ems of type per day, and it is estimated that if necessity demanded it a publication of 1,800 pages could be set up, proof read, printed, and copies bound in one day.

The principal items of production during a year are as follows: Jackets written, 54,000; job work orders, 30,000; ems of type set, 2,300,000,000; square inches of electrotyping and stereotyping, 12,600,000; sheets folded by machine, 150,000,000; signatures gathered by machine, 106,000,000; copies wire stitched, 36,000,000; signatures sewed, 95,000,000; sheets ruled, 25,000,000. In addition, there are printed for the Patent Office about 45,000 different patents, designs, and trade-marks, with from 50 to 100 copies of each. During the sessions of Congress there is a daily issue of the *Congressional Record*, ranging in size from four to several hundred pages. Copy for the *Record* generally comes in late at night, some of it at times as late as 2 A. M.; the type must be set, plates made, and 34,000 copies printed, folded, gathered, wire stitched, and addressed for mailing in time to catch the early morning mail. Fifteen million copies of *Farmers' Bulletins* are printed for the Agriculture Department; in some years about 25,000,000 copies of speeches are printed for members of Congress and paid for by them; 500,000 copies of *Agriculture Yearbook* are printed annually, making 600 pages, profusely illustrated; over 1 billion postal cards are printed and shipped to points designated by Post Office Department; about 100 million money order blanks are printed, bound in books of from 50 to 200 copies each, and shipped to points designated by Post Office Department; the bound *Congressional Record*, covering entire proceedings of a session of Congress, at times makes as high as 19 volumes, in which case the total number of copies is about 120,000.

The total yearly expense of the Government Printing Office is approximately \$6,500,000, and this amount is divided and allotted between Congress, the Executive Departments, and the various bureaus of the Government, in accordance with their size and necessity for printing, each being allowed printing and binding only to

the amount of allotment. Existing law requires this printing and binding be done at cost, and charges, based upon a fixed scale of prices regulated by a system of costs, are rendered for each piece of work produced. About 70,000 bills are rendered annually. The approximate amount of paper used in one year for printing and binding is 32,000,000 pounds, with 65,000 pounds of ink.

Employees work eight hours a day, receive a compensation comparing favorably with union wages throughout the country, and are allowed 30 days' vacation with pay each year. Some divisions of the office run night forces throughout the year, and others only during sessions of Congress. Employees working at night receive a 20 per cent advance over day rates of pay.

The Division of Public Documents is a central distributing agency for all Government publications, and receives copies of all public documents printed. A specified number of these documents are distributed to certain designated depository libraries throughout the country, and other copies are sold at cost to the public, no more than one copy to any one person. Approximately 47 million copies of documents are sent out by this Division in one year, and the mailing list contains 850,000 names.

About 4,000 persons are employed in the Government Printing Office, and the entire plant is under the personal supervision of the Public Printer, who is appointed by the President.

RAILROAD EQUIPMENT

We read in Davies [op. cit.] :

The Hungarian State railway workshops employ round about 18,000 men. Some years ago, when there was not enough to keep these men employed on ordinary repairs and the manufacture of locomotives, etc., rather than dismiss the workers the Administration commenced to manufacture ploughs and other agricultural implements.

The Japanese Government has large steel works, which, when they are not fully engaged on Government orders, supply the requirements of private consumers, and the following is an extract from the British Consular Report (No. 5161 Annual Series) on Japan for the year 1912 with reference to these works :

“The output of the Government Steel Works amounted to about 180,000 tons all told, but with their new extensions they will soon be in a position to produce some 300,000 tons, so that in times when Government requirements are not very large, the competition

of this foundry, which enjoys considerable protection, must be taken into consideration."

[SOURCE: United States Special Consular Report, No. 60, "Foreign Markets for Railway Supplies and Equipment," pp. 12, 15, 37, 215, 233, 787.]

The locomotive and car-building works of the [Hungarian] State railways, the various other State-owned shops, and the Ganz-Danubius works turn out a grade of standard railway equipment so high that the demand from abroad and the consequent exportation is increasing. It is said that the State locomotive works are to be considerably enlarged.

In view of the law referred to above and the excellence of home industry, as far as standard railway equipment is concerned, it is doubtful whether any business can be done except in such novelties and machine tools as are unobtainable in Hungary.

The Austrian State railways have large repair *and construction* shops in Vienna; also repair shops in Linz, Innsbruck, Villach, Trieste, Pilsen, Prague, Olmutz, Krakau, Lemberg, Stanislau, and Czernowitz.

Repair *and construction* shops of the Prussian railways are located mostly in the principal city of each railway district; for instance, in Berlin and suburbs there are 10 shops, each in charge of an engineer.

Rapid increases in both passenger and freight traffic [of Australia] in 1910 and 1911 brought out the fact that not only was the amount of rolling stock inadequate but that the capacity of the railway's shops for new construction was not great enough to supply the locomotives and cars that were needed.

The Government has large construction works in different parts of the Dominion, and much of the rolling stock and other railroad supplies are made in New Zealand. [Our italics.]

CHAPTER XXV

INDUSTRIAL SCIENCE

THE public is familiar with the development of the United States Department of Agriculture. It is also aware of the fact that all the belligerent countries are making plans to extend many forms of scientific aid to industry after the war. It is far less widely known how far governments had already developed this aid to industrial science before the war, and that the leader in this direction was probably the government of the United States.

This last statement will immediately be challenged, unless we add further explanation. It is not denied that applied science was approximately as much developed in Germany before the war as in the United States (whether somewhat more or somewhat less developed is not a question of importance for our present purposes), but it must be noted that the major part of the development of technical science in Germany has come from the laboratories of great private corporations, which may best be illustrated by the great dyeing companies. In view of the immense chemical laboratories and the great number of chemists maintained by the dyers, chemical works, etc., there was very little call for similar large scale expenditures by the German Government. It has been precisely the absence of laboratories on the same scale in certain American industries that has led to the rapid development of scientific work at Washington. Of course some of our great corporations, such as the Steel Trust, can perfectly well bear comparison with the Krupps in this respect, but in a number of industries, perhaps a majority, properly equipped scientific laboratories are lacking. The scale of private expenditure on science in Germany is indicated by the following statement by Professor Maihle in the *Revue Générale des Sciences* (Paris):

Who can help admiring the indomitable energy with which the *Badische Anilin* conducted the experiments leading to the manufacture of sulfuric anhydrid and synthetic indigo? The former entailed an effort of five years and an expenditure of nearly \$1,250,000; the indigo experiments lasted fully 10 years and cost nearly \$5,000,000. Our [French] chemical companies, with their scant capital, could not think of experimentation on so vast a scale. Germany was aided in her industrial ascent by the thousands of young and able chemists which her universities, polytechnic academies, and special schools turned out yearly. Léon Vignon, in a recent report, stated that France had only seven chemists and England six to Germany's 250. Some of the German dyestuff factories employ from 100 to 200 chemical experts. Under these circumstances some of our fellow citizens and our friends in foreign countries view with dismal forebodings our prospects of damming the Teutonic torrent in the triple field of dyestuffs, perfumes, and pharmaceutical products.

We do not mean to imply that the German Government failed to promote science on a very liberal scale, especially through its higher technical schools, which up to the present time have certainly been superior to those of any other country. Moreover, the nationalized industries of Germany, such as the Prussian railroads, facilitate and even demand a large development of technical science. Davies points out some important examples (pp. 97, 98):

The Prussian State railways have an experimental track on which the most valuable experiments are carried out, such as the effects of high speeds upon rails, results of which are published in the *Archiv für Eisenbahnwesen*, which is published by the Prussian Ministry of Commerce. The results of these experiments are therefore available to the world at large.

Another example hailing also from Germany is that of the great experimental tank for which the Hamburg municipality early in 1913 voted the sum of £62,500. This tank is to have a length of over 330 metres and a depth of from $6\frac{1}{2}$ to $7\frac{1}{2}$ metres, and is intended for towage experiments on a hitherto unprecedented scale, as well as for experiments with model motor boats up to a length of 11 metres, driven by their own power. It is to contain 28,000 tons of water. Connected with it are extensive workshops equipped in a most modern fashion, which will permit the production of

wooden and paraffin wax models, as well as the construction of mathematically accurate model propellers. According to the *Liverpool Journal of Commerce* of August 27, 1913, the establishment will have, in addition to its director, a staff of first-class engineers with experience in all branches of the profession, as it is intended, besides the experiments with model ships, to make further important experiments in connection with the theory and practice of ship-building and aviation.

We must also take into account the almost certain increase in governmental aid to industry and science that is likely to follow the close of the war. As Great Britain had been behind Germany, France, and several other countries in this direction, its new plans for a Department of Scientific and Industrial Research are all the more remarkable. James Keeley, of the *Chicago Herald*, sums up the leading features of the plan as follows (see *N. Y. Times*, Jan. 11, 1917) :

The British Government, looking to the commercial problems of peace time, has established a department of scientific and industrial research under the joint control of the Lord President of the Council (Lord Curzon) and of the Board of Trade. A large sum of money has been placed at the disposal of this department, "to be used as a fund for the conduct of research for the benefit of the national industries on a co-operative basis." The universities are aiding in this direction and are doing research work for industry on their own behalf.

The Government has fostered the development of certain industries chiefly for war, but also, as in the case of dyes, for general needs. A new department of coal-tar industry and dyestuff research has been opened at Manchester.

The Government has appropriated \$500,000 for research work in a new dye company and made a loan of \$1,000,000 to the largest dye works established (Read, Holliday & Sons) on condition that British Dyes, Ltd., take it over. This was done. The maximum investment of the Government is about \$10,000,000. The amount of dyes used in Great Britain yearly is in excess of \$10,000,000.

The British Government is proceeding methodically to examine the conditions surrounding various industries in which foreign competition has injured English trade. A subcommittee of the Board of Trade has investigated 12 industries, including paper, printing, jewelry, cutlery, leather, glass, china and earthenware, and elec-

trical apparatus, "with respect to measures for securing the position after the war" of these branches.

It recommends, among other things:

1.—That the Government should institute industrial research and training on a large scale.

2.—That German and Austrian goods should be distinctly marked with the name of the country of origin, and that all other goods made out of the Empire should be labeled "foreign made" or "not British."

3.—Increased assistance to industry by joint stock banks to be urged by the Government, throwing over the old cautionary spirit of business loans.

4.—Establishment of a Ministry of Commerce.

5.—Reform of the consular system; it is to be "all British."

6.—Protection of infant industries when they are of "vital importance to the national safety or are essential to other industries," (i. e., key industries,) also general protection for increased revenue to reduce direct taxation.

For a more detailed study of the motives and possibilities of this development we may refer to the State Socialist organ, *The New Statesman*, of September 2d, 1916:

What is really an epoch-marking document has been published this week in the shape of the first Annual Report of the Committee of the Privy Council for Scientific and Industrial Research. It records the first serious effort ever made by a British Government to recognize the national importance of science and the indispensable function of the State in relation thereto. It also records the most important practical departure from our traditional policy of commercial *laissez faire* that has been made since the days when that policy was almost universally regarded as the beginning and the end of economic wisdom. Previous Governments have made sundry grants for the encouragement of science. The National Physical Laboratory has actually been receiving £7,000 a year from the Consolidated Fund, the Engineering Standards Committee has had a small subvention, and the Imperial Institute and the Imperial College of Science and Technology have both enjoyed Government support. But the sum total of these spasmodic benevolences as set forth in this report is so trifling that the record only serves to emphasize their almost grotesque inadequacy. The war, however, has changed all that. The defects which the absence of German

products quickly revealed in the methods and organization, especially of our scientific industries, were too glaring to be ignored. A very competent "Advisory Council" was appointed, and certain funds were placed at its disposal (£25,000 was voted last year, £40,000 this year); and the broad and far-seeing lines on which the Council has drawn its plans, and the amount of valuable work which in the first 12 months of its existence it has been able to accomplish, make it certain that there will be no turning back. It is safe to predict that the vote to cover the Council's expenses will, even in the hard times to come, be a rapidly growing item in the national accounts.

The neglect of science in this country in relation to industry is usually attributed to the sluggish conservatism of the British manufacturer. This verdict is, on the whole, confirmed in the First Annual Report of the Committee for Scientific and Industrial Research.* The Committee acts through an Advisory Council consisting of eight eminent workers in pure and applied science, and it is by this body that the report is drafted.

The Council found that a certain number of important investigations were already in progress before the war—under the ægis of various professional organizations—and its first work has been to save these from abandonment by grants of money and other assistance. But it is with the future that the report is mainly concerned. The Council recognize that their first duty is to convince the manufacturing world that scientific research is a paying proposition; and this they propose to do by devoting money and attention to pressing problems of manufacture, the need for whose solution is already recognized. The Universities and Technical Colleges may be induced—by grants and research scholarships—to undertake a great deal of special work which will benefit manufacturers and students alike and bring them both into very desirable contact. But fundamental work, which requires perhaps years of continuous application by the same investigators, is not suitable for university laboratories, and it is accordingly suggested that special Research Institutes should be established in close connection, wherever possible, with a teaching institution, but maintained partly at the public expense and partly at the expense of associations of manufacturers who would share in the control. Two schemes, more or less on these lines, are already in hand; one is a research laboratory in connection with the Stoke Pottery School, the other the proposed Research Institute for Glass at the University of Sheffield. But

the whole field is of vast extent, and the Advisory Council have already found it necessary to appoint strong Standing Committees to assist them in surveying particular sections of it. Three such committees on Metallurgy, Engineering, and Mining, respectively, are now at work, and the Council contemplate the early appointment of others on Fuel, on Rubber, on the Chemistry of Cotton and Paper, and on Textiles.

The cost of these activities will inevitably be great. "It is certain," says the report, "that it will, on any adequate estimate, have to be counted not by tens of thousands nor even by hundreds of thousands," but—the implication is—by millions (i. e., millions of pounds sterling). It is not suggested that this expense should all be borne directly by the State, but probably a good deal of it will have to be, in view of the necessity of maintaining national co-ordination and control. It is essential that, with hundreds of researches going on in different parts of the kingdom, there should be the fullest measure of co-operation and exchange of results. "If it is supposed," the report points out, "that modern industry can be developed or even maintained by a process of detailed investigations, a series of particular inquiries, however careful, the time, trouble, and expense involved will be largely wasted. Such a supposition is based on fallacious conceptions of the manner in which scientific research proceeds and of the way in which the great scientific industries have been built up. It is impossible for the most acute investigator to be sure that a particular line of research will lead to a positive result; on the other hand, it will often suggest a diverging inquiry that, if followed up, may produce results even more valuable than the original question. Such loose ends litter the laboratories of firms which confine themselves to questions of the moment. They lead straight to the basic theory of the subject, to the roots that strike down into pure science. They are infinite in number and interminable . . . but they often give results which revolutionize industries . . . and give that control over Nature which it is the object of all science to secure."

In any national organization of research that is worthy of the name these loose ends—neglected results which may provide clues of inestimable value to other workers—must not be allowed to remain loose, but must be gathered up, and, as far as possible, added to the common stock of knowledge and opportunity. The Council recognize that there must be a central Clearing House of information as to research, and already more than one of the Dominions has expressed its anxiety to share in the benefits of such an organiza-

tion. In Australia, Canada, and New Zealand movements of a parallel nature are on foot.

But there can be little question that the most remarkable experiment in governmental aid to industrial science, an experiment still in its early stages, and promising immense results in the near future, is that of the so-called Bureau of Standards of the United States, which might far better be named *The Bureau of Industrial Science*.

THE UNITED STATES BUREAU OF STANDARDS

[SOURCE: *The Department of Commerce*, published by the United States Department of Commerce, 1915, pp. 60, 61.]

The act of March 3, 1901, established the National Bureau of Standards. The scope of weights and measures has broadened in recent times to include power, light, heat, electricity, refrigeration, and services of other kinds, which must be measured and for which standards and methods of measurement are needed. Not less urgent are standards of quality, which rest upon the properties of materials, and which for certain materials are partially defined in "specifications." Units and standards are here needed relating to physical and chemical properties in addition to those of dimension and weight.

Few subjects directly affect more people than weighing and measuring, since practically all products involve measurement, whether grown in the soil or manufactured. Construction, commerce, and daily trade are based upon measurement. Measure and money are the two factors which fix price, and *measurement is the basis of science and technology*. *The Bureau's functions touch closely all who design and make, buy and sell, transport, or utilize materials, energy, or other services which require accurate standards and measuring instruments.*

[SOURCE: Report of Director of Bureau of Standards, 1915, pp. 15, 16.]

It must not be inferred that the Bureau's activities are devoted principally to the interests of the user or consumer. It may be said that the Bureau occupies somewhat the same position with respect to the manufacturing interests of this country that the bureaus of the Department of Agriculture do to the agricultural interests.

It is upon quality as well as upon price that competition must finally depend, whether in domestic or foreign commerce. The use of exact methods and scientific results is the greatest factor in the

improvement of quality, efficiency, or the development of new industries. The educational value of the Bureau's work in this respect is almost entirely unknown to the general public, and yet the Bureau receives hundreds of letters, as well as many personal visits from manufacturers, seeking information as to standards of measurement, how to use them, how to measure the properties of materials, or as to the fundamental physical and chemical principles involved; also, what is of even greater importance, how to initiate and carry out scientific investigations and tests on their own account in their particular fields of work.

The importance of maintaining scientific institutions having to do with standardization and the application of precise measurements to the industries has been recognized by all the leading countries of the world. Great Britain maintains the Standards Department of the Board of Trade, which is in charge of the standards and inspection service of the trade weights and measures; also the *National Physical Laboratory*, whose functions include matters pertaining to scientific and technical standards, physical constants, and to some extent the properties of materials. The *Laboratoire d'Essais*, of France, while not as extensive as the English institution, is charged with similar duties. Germany maintains three such institutions—the *Normal-Eichungs Kommission*, equipped with the buildings, personnel, and apparatus necessary in standardizing and controlling the weights and measures of trade; the *Physikalisch-Technische Reichsanstalt*, covering testing and investigations in connection with scientific and technical standards other than weights and measures; and the Prussian Government maintains the *Materialprüfungsamt*, a large institution devoted to the investigating and testing of structural, engineering, and other materials.

It is generally recognized that these institutions have been exceedingly important factors in the industrial progress of these countries.

[SOURCE: Speech of S. W. Stratton, Director of the Bureau of Standards, Boston, April 26-27, 1916.]

No one is more interested in the quality of a material than the man who makes it, and while we generally start with the man who uses it, we nearly always end up with the man who makes the material. His interest in the Bureau is growing stronger and stronger every day. We now have a hundred visitors to the Bureau where we had one a year ago, a hundred inquiries where we had one a year ago. The present conditions have brought manufacturers face to face with the necessity of paying more attention to the scientific

side of manufacturing. There is a tremendous progress along these lines. It began before the European war started; it began quite a while before that, but the present situation has only accelerated it. The Bureau cannot begin to comply with all the requests made upon it. Every industry, through its representative association, is looking toward the application of science, of scientific methods, not only in measuring, in testing, in specifying materials, but what is vastly more important, in the processes of manufacture.

[SOURCE: Report of the Secretary of Commerce, 1915, pp. 66, 67, 68, 70, 71-81.]

The Bureau works in close harmony with the great technical and engineering societies of the country and with the practical engineers who in many lines of applied science are doing the work of the world. It is an intensely practical service, bearing directly and daily upon the life of our people. At one end of its work is research into things as yet unknown. At the other end is the putting of things discovered and determined at the service of our people. It studies in co-operation with the technical staff of our great railways the problems that underlie our transportation systems. In co-operation with the staffs of the Army and Navy it studies the problems of the wireless telegraph. It deals with the principles involved in aviation, with the character and behavior of structural materials and their resistance to fire, weather, and wear, with the accurate testing of instruments and the development of new ones for improved methods of testing and research. It reaches into the home by publications showing how accurate knowledge is helpful in domestic life. It studies the problems of chemistry and electricity, and operates a varied mechanical plant, working out the problems that vex the industrial manager.

It investigates the scientific principles beneath public-utility services and places at the disposal of the public and their official representatives that same accurate knowledge of public utilities which is furnished to the operating companies by their own technical staff. It works out the principles and practice of refrigeration, and operates testing cars that run about the land saying whether track scales tell the truth. It tests textiles and rubber and paper and numerous other materials. It studies how columns of different kinds behave under stress, and gives close care to the accurate timing of watches. It deals with bridge construction and with the members of wireless towers. It investigates standards of colors, and tests photographic lenses. It studies illumination and

determines the accuracy of weights and measures. It does much more of the same general character.

It covers a site of 16 acres and occupies four laboratories 200 feet in length by 55 to 60 feet in width, four stories high. A fifth laboratory (the chemical laboratory) has been authorized, and on September 13, 1915, a contract was entered into for its construction at a cost of \$188,556. Future plans include two more large laboratories. Four smaller buildings for special work have been constructed, and a large water-current meter testing tank is just about completed.

The Bureau operates a mechanical plant at Pittsburgh, Pa., in temporary quarters in the old arsenal grounds, through the courtesy of the War Department. It has long conducted a cement-testing plant in the cement district at Northampton, Pa.

The Bureau co-operates with the Treasury and Agricultural Departments in the enforcement of the law requiring the quantity contained to be marked on package goods. The enactment of this law was the result of the movement toward correct weights and measures which has been going on throughout the country since the establishment of the Bureau. This law gives the consumer a direct knowledge of the net quantity of the product in most of the packages he buys.

It is not true, as is commonly supposed, that the need for precision standards of measurement arises only in connection with accurate scientific work. The requirements of the industries in this respect are often quite as exacting, sometimes more so.

In addition to the ordinary units of measurement, almost every industry has special units and methods of measurement, together with a variety of measuring instruments. The Bureau studies these with a view to their improvement. It certifies the standards by which such instruments are constructed and compared.

The Bureau is aiding the industries in this and other ways of basic importance. Modern industrial processes are often efficient in direct proportion to the precision of the methods of measurement used.

The relation of all forms of the Bureau's work to our industries has greatly increased in importance. Manufacturers are coming to understand the value of applied science to them. The day of rule of thumb is passing away and accurate knowledge—that is to say, applied science—is taking its place. There are some still so ignorant as to talk about what they call "practical methods" as compared with scientific ones; but this is after all often another way

of saying that they prefer not to know what they are about. A method is not less practical because it is scientific. If it is not scientific—that is, if it is done without knowledge of why it is done—it is very likely not to be practical. One of the great services the Bureau of Standards daily renders to the country is that of helping our industries to be more scientific; that is to say, to know their business better. Other countries have understood this better than we and have built up whole industries, which we have lacked, because they applied science to their processes. Unless we do this ourselves, we shall not hold a high place in the industrial race.

During the last year manufacturers have been compelled to introduce new methods, to use new materials, to develop new processes for making products formerly imported. The Bureau has striven to be of every possible use to manufacturers in this difficult period of transition, and many have taken advantage of its services.

The engineering professions have appealed to the Bureau more than ever before for facts concerning the properties of materials and for fundamental scientific data. The representatives of the organized scientific societies and technical associations of manufacturers render the Bureau valuable assistance by contributing information gained in practice and by pointing out the data which they most need. As examples may be cited the series of commercial steel columns which have long been under test in our large Emery testing machine to develop the fundamental laws of such columns. In this work the American Society of Civil Engineers and the American Railway Engineering Association co-operate. Both have given the Bureau valuable advice.

The determination of the fundamental constants needed by refrigerating engineers is nearing completion and constitutes one of the most difficult pieces of work undertaken by a physical laboratory. Many other illustrations of this sort can be given.

Manufacturers are intensely interested in the Bureau's work in the investigation of structural materials. It was first undertaken for the Government to secure information needed in its own structural work. This information is, however, precisely what the manufacturer of such materials needs to know, and its value to the public in this way is far greater than that through the Government service.

Manufacturers and the public likewise are interested in the Bureau's study of the fire-resisting properties of materials. Too little is known of materials of construction in this respect. The public anxiously awaits data upon which may be based reasonable

codes and regulations looking toward the prevention of the enormous annual losses due to fire.

The Bureau has in progress several important investigations for the cement industry to determine the properties upon which the value of this important material depends.

Manufacturers of clay products increasingly demand information about the properties of the materials they use. They seek such knowledge also of their manufactured product, whether it be pottery, terra cotta, building brick, tile, fire brick, fire-clay crucibles and retorts, or enameled iron ware. In few industries is there greater opportunity for improvement by the application of precise methods of measurement and of scientific knowledge. These industries are making rapid strides in the applications of science, and have been compelled to meet many new conditions during the past year. An item has again been included in the annual estimates providing for the continued study of this important line of industry.

During the year the production of chemical porcelain on a commercial basis has begun in this country. The clay products division of the Bureau of Standards, located at Pittsburgh, Pa., having worked the subject out fully, presented the results of their labors to manufacturers, and two concerns are now producing chemical porcelain ware of satisfactory quality. The same division of the service is working with success on the problem of producing optical glass of the best quality. Neither chemical porcelain nor optical glass of the best grade has heretofore been made in this country.

These are but examples of the intimate contact of the Bureau's work with industry. They show in part how its work is vital to industrial development. Similar examples from almost every industry could be given.

Another important service of the Bureau is the stimulus which it continually gives to the establishment of industrial research laboratories. Since the establishment of the Bureau this has become a distinct industrial movement in the country. Many large manufacturing plants now have well-equipped laboratories for scientific research. These utilize the work of the Bureau and are enabled to carry on investigations which would otherwise be impossible. These laboratories are notably increasing the applications of science to industry. The Bureau has shown the need for technical research by calling attention to unsettled problems, and in pointing out the values of specific researches by actual instances of service rendered.

The scientific laboratories of the higher institutions of learning

are engaged in investigational work in every branch of science. In all of these researches, especially in physics and chemistry, precision standards are needed. Before the establishment of the Bureau an investigator was frequently required to spend more time in the preparation of the standards of measurement used than in the main work at hand. During the year the Bureau has performed services of this character for practically every university in the country and especially for State universities.

The Bureau has thus become a testing laboratory for the Government, performing more than a hundred thousand tests during the year for its various bureaus and independent establishments.

This work is carried on in such manner that the experience gained may be utilized in drafting improved specifications—that is, in the development of standards of quality—and it has contributed largely toward placing Government purchases on a scientific and businesslike basis.

The Bureau has made many special studies of the properties of the more important structural materials, as well as paints, oils, varnishes, textiles, paper, rubber, inks, and other miscellaneous materials, with a view to securing the information needed in the improvement of Government specifications. Many of these materials are now purchased under definite specifications and the supplies delivered tested. The importance of chemical tests in this connection has increasingly engaged the attention of the Bureau. It has conducted many chemical tests in connection with the specification of purchases of Government supplies. By supplementing these chemical tests with physical tests, it is frequently found possible to select material which would best meet the service conditions and specify them in terms of susceptible measurement. Both the manufacturer and Government gain by the use of a definite specification of the properties of the materials desired. This is possible to a far greater extent than is realized. The useful character of the service being rendered by the Bureau in the testing of materials used in Government construction is evident when it is remembered that by this systematic testing efficiency and safety are guaranteed as fully as the present state of the arts will allow. The many rejections of unfit material are a partial index to the defective construction that might have been accepted without such testing. Furthermore, there is a growing conviction on the part of those experienced in such testing that it should be performed by an agency which is connected with neither the buyer nor the seller. This work leads to the adoption of standard specifications for materials for all pur-

poses, and the results which can be given to the public are perhaps of even greater value to it than to the Government service.

Publications and Information of the Bureau of Standards

The Bureau of Standards renders an important service in publishing information on subjects within its scope. During the year thousands of letters were received requesting information of the most varied character as to standards, methods of measurement, and properties of materials. These requests came from a wide range of sources, including Government bureaus, State institutions, public-service corporations and commissions, industrial laboratories and plants, commercial houses engaged in foreign trade, consulting engineers, educational institutions, and the general public. The replies ranged from a brief answer to a carefully prepared report, depending on the importance of the question involved and the service to be rendered. In a large majority of the inquiries the replies were in the form of one of the Bureau's publications. These were issued in three series: *The Scientific Papers*, of which 254 have been issued, contain the results of the Bureau's scientific investigations; the papers of the *Technologic Series*, of which 49 have appeared, contain the results of investigations pertaining to technological subjects; and a series of *Circulars*, of which 55 have been issued, each of which contains the information the Bureau desires to give on a particular subject. When the Bureau receives a considerable number of inquiries regarding a subject, one of these circulars is prepared on that subject, including the best information that can be obtained from any source. These are revised from time to time as new material is developed. They become the standard reply to many requests for information on the same subject but from widely different sources.

The Bureau can often suggest means of securing approved data for many industrial processes; in other cases it prevents costly experiments and minimizes the chance of failure, especially where standards of measurement are involved. The latest methods of measurement wherever developed are usually known or available to the Bureau, which thus serves as a clearing house for technical information as to materials, units, standards, instruments, and methods of measurement. While the Bureau is without police power to enforce its decisions, it has exerted a widespread influence by virtue of its unbiased attitude and its care to arrive at accurate results. The success with which the Bureau is making its

results available to the public through correspondence, consultation, and publications is recognized by national technical societies, through which the Bureau is exerting an important influence in current technical practice.

The Bureau's Work in Connection with Public Utilities

Another important and growing field of the Bureau's work has to do with the standards of measurement, of quality, and of practice concerned in the various public utilities, particularly electric light and power, gas, street railway, and telephone service. This work includes scientific and engineering research in connection with public-utility questions, the preparation of specifications regarding the quality of service, the methods of testing and inspection employed by municipalities and commissions, safety rules for use by the utility companies in safeguarding their employees and the public, and the collection and distribution of information regarding these subjects.

Regulations for gas service as made by city officials or State commissions include among other things requirements as to meter accuracy, the testing of meters, specifications as to the heat value or candlepower of the gas or both, the degree of chemical purity, the variations in pressure that may be allowed, and the frequency of tests necessary to determine whether the operating companies conform to their requirements. The Bureau made a thorough study of these questions relating to gas service, and prepared a circular on the subject which has reached its third edition. This publication has served a useful purpose as a basis for regulations which are fair both to the public and to the utility companies. It also contains model ordinances for the use of cities which control their own utilities, and rules suitable for adoption by State commissions which fix standards of service.

Many important investigations have been carried on by the Bureau in the past and are now in progress for the purpose of securing the proper scientific data upon which to base such laws and regulations. This knowledge was not to be had until developed by the Bureau. As an illustration may be mentioned a study which has been in progress at the Bureau for some time as to the conditions which result in the destruction of underground pipes and metal work by stray electric currents. The Bureau has studied this question for five years and has done a large amount of work in connection with it. This has included laboratory investigations concerning the

effect of electric currents on concrete and metal pipes, tests of pipe coverings, corrosion of metal in the soils, methods of measuring soil conductivity, and other experimental phases. The results of this investigation are now being utilized in many cities to mitigate electrolysis.

A study of the protection of buildings against lightning has been in progress for the past year. A publication on the subject will soon be issued. This includes a discussion of methods of lightning protection, results of experience as shown in vital statistics, and records of fire insurance companies, and other useful information. The Bureau has also been engaged in a study of life hazards in electrical practice and in the preparation of a national electrical safety code, also a national gas safety code along the same general lines. In the preparation of these codes the Bureau is receiving the cordial support and co-operation of the interests involved.

The Bureau aims to serve as a clearing house for information on the scientific and technical questions arising in connection with the regulation of such utilities.

The testing of textiles by the Bureau of Standards for the year just closed included 33,000 separate routine tests and over 300 co-operative tests. About one-tenth of these were for the Government departments. Many special investigations have been undertaken; for example, on the effect of cotton compression in baling upon the spinning qualities of the fiber. Bales now run about 25 pounds per cubic foot. If cotton can be further compressed without injury to the fiber, savings could be effected in bale covers, transportation, warehouse charges, etc. Compression tests up to a density of 50 pounds per cubic foot will be made.

In his Boston speech in 1916, above referred to, the Director of the Bureau gave several astonishing examples of exposed attempts to defraud the United States Government—attempts which might also be used against any other purchaser. For example, "the specifications called for a blanket containing 35 per cent wool and 65 per cent cotton. The Bureau tested a delivery of the fabric and found that it contained only 3 per cent wool and 97 per cent cotton, an entirely different fabric from that called for."

Another sample sold for 100 per cent linen was found to be made up of 100 per cent cotton.

Still another sample sold for 100 per cent silk was found to be made up of 50 per cent silk, etc., etc.

The total appropriations at intervals of five years since 1902 for the Bureau of Standards were as follows:

July 1, 1902	\$167,140.00
“ 1906	167,144.00
“ 1911	739,440.00
“ 1916	964,400.00

The number of employees for the several periods is as follows: July 1, 1902, 22; 1906, 87; 1911, 269; 1916, 415.

In the year 1915 no less than 315 scientists were regularly or specially employed.

Special Appropriations—1916

Testing Structural Materials	\$100,000
“ Railroad Scales	40,000
Public Utility Standards	25,000
Investigation of Fire-Resistant Properties	25,000
“ “ Railway Materials	15,000
“ “ Electrical High Potentials	15,000
“ “ Refrigeration Constants	15,000

A Scientific Statement of the Bureau's Work

The Report of 1916 contains as a frontispiece a scientific analysis of the functions of the Bureau. A part of this analysis is somewhat scientific and abstract, and it is too long to be included here. But some of the most important and interesting points may be re-stated as follows:

The work of the Bureau is divided into five parts:

Standards of Measurement.—The chief purpose of these is “to assist commerce in size standardization of containers and products.”

Standard Constants, i. e., “the fixed points or quantities which underlie scientific research and industrial processes when scientifically organized”—The chief purpose of these is “to furnish an efficient control for industrial processes in securing reproducible and uniformly high quality in output.”

Standards of Quality; or “specifications for material”—The chief purpose of this work is “to secure high utility in the products of industry by setting an attainable standard of quality; to promote truthful branding and advertising by suitable standards and methods of test.”

Standards of Performance; or “specifications for machines as to operative efficiency or action”—The practical importance of these tests is “to clarify the understanding between maker, seller, buyer, and user, as to operative efficiency of appliances and machines.”

Standards of Practice "for technical regulation of construction, installation, operation, and based upon standards of measurement, quality, and performance." The purposes of these Standards as given by the Bureau we quote in full, since they are purely of a practical character—"To furnish for each utility a single impersonal standard of practice as a basis for agreement of all interests clearly defined in measurable terms; to insure effective design and installation of utilities of all kinds; to promote safety and convenience in the maintenance and operation of such utilities; to secure uniformity of practice where such is practicable, and effective alternates in other cases."

[SOURCE: Report of Director of Bureau of Standards, 1916, pp. 17, 18, 43, 44, 47, 55, 56, 57, 58, 59, 60, 72, 73, 74, 78, 79, 93, 95.]

Organization

The organization of the Bureau's scientific and technical staff is based upon the nature of the expert service involved rather than upon the classes of standards. The division of weights and measures has to do with all matters pertaining to standards of length, mass (weight, as it is commonly termed), time, density, and similar questions, whether they arise in connection with the precision standards used in scientific investigation, the master standards of manufacturers, or the ordinary weights and measures of trade. A standard of quality or performance where any of the above measurements form the fundamental and most important factor would be referred to this division.

The division of heat and thermometry has to do with heat standards, the testing of heat-measuring apparatus, the determination of heat constants, of which there are many, and all investigations pertaining to quality or performance where heat measurement is the essential and predominating factor.

The electrical division is concerned with all the electrical problems that may be taken up at the Bureau, whether in connection with the various electrical standards of measurement, electrical constants, the electrical properties of materials, or the performance of electrical equipment.

Questions in optics enter into standards of all kinds to a greater extent than has been supposed; hence, there is an optical division provided, with experts in spectroscopy, polarimetry (used in sugar analysis), color measurement, the principles of optical instruments, and the measurement of the optical properties of materials.

Practically all investigations concerning the various classes of standards involve chemistry in one form or another. There are also many chemical standards and questions which arise in connection with chemical work generally, especially in the industries; hence, there is a chemical division, co-operating with every other division of the Bureau, as well as taking care of the questions of a purely chemical nature that come to the Bureau and which fall within its functions.

In the case of the more important technical fields, divisions have been formed dealing more specifically with large and important classes of materials, but many of the purely scientific questions involved would be handled by one of the above-mentioned scientific divisions or jointly with it. The work of the technical divisions is just as scientific in character, but deals more specifically with manufactured products.

The work of the structural engineering and miscellaneous materials division includes the investigation, testing, and preparation of specifications for these materials, such as the metals and their alloys, stone, cement, concrete, lime, the clay products, paints, oils, paper, textiles, rubber, and other miscellaneous materials.

The division of engineering research makes investigations and tests regarding the performance and efficiency of such instruments, devices, or machinery as the Bureau may take up that do not fall directly under one of the scientific divisions. The division is a small one and its work is devoted almost exclusively to assistance given other departments of the Government and the General Supply Committee in designing, specifying, or testing equipment. It should in time form one of the more important branches of the Bureau's work.

The questions pertaining to the manufacture, specifications, testing, and use of the metals and their alloys have become so important that a division known as the metallurgical division has been formed of the experts engaged in these problems.

SOME LEADING INVESTIGATIONS

Fire Resistant Materials

With an annual life and property loss conservatively estimated as some thousands of lives and exceeding \$300,000,000, a per capita loss nearly 10 times as great as that found in the leading European countries, and this in spite of the most expensive and efficient fire-

fighting equipment in the world, it would be a neglect of duty not to direct attention to the pressing needs for greater activities on the part of the National Government in the nation-wide movements to diminish this unpardonable waste of our national resources.

Radio Work

The equipment of the radio laboratory has been extended and facilities provided to increase the range and efficiency of the testing and to take up several investigations. Standard circuits are now available for measurements of wave length up to 20,000 meters.

The Bureau has been active in its efforts to promote safety at sea by means of radio instruments. A complete 1-kilowatt equipment for radio communication was designed and the construction supervised for installation at a newly established lighthouse. An equipment for a lighthouse tender was also designed and installed. These sets are provided with special features adapted to the needs of the Lighthouse Service. The equipment of the lighthouses and tenders with radio apparatus is making it possible for them to render greater service to navigation than ever before. The fog-signaling apparatus was also completed. This equipment is designed to send out automatically a characteristic signal once every minute on a short wave length, so that it will be readily received by all ships within a few miles of the lighthouse. It will be particularly effective when the ships use direction finders to receive the signal, as they can then get their bearings by radio.

A simple type of direction finder has been developed and has been found very useful. This apparatus replaces the antenna for receiving radio communication, although it is so small in size that it can be used in an ordinary room. Signals from European stations have been received on it. It determines the direction of the sending station with high accuracy. Several models have been constructed for receiving both long and short waves. The apparatus was developed primarily for use on ships in the promotion of safety at sea.

One of the important unsolved problems of radio communication is directive sending and receiving. The elimination of interference by stations other than those desiring to communicate would be a great advance. Experiments on this are in progress at the Bureau. Radiotelephony is also assuming importance, and it is hoped to make some investigations upon this.

The necessary expansion of this work has been made possible by an appropriation of \$50,000 for a radio laboratory building. This

building will accommodate the scientific investigations in connection with the radio work by the Bureau, and also that of the Army and Navy.

The building will be two stories in height, and will be connected by means of a tunnel with the electrical laboratory, so that all the generators and other facilities of the Bureau will be directly available.

Radium

Owing to a depressed condition of the radium market during 1915, the amount of radium the Bureau was called upon to measure during the first half of this fiscal year was small; sales increased markedly during the winter, with the result that the amount of radium measured for the public during the last half of the year was nearly twice as much as was measured during any previous corresponding period since the Bureau undertook this work. The total amount measured during the year was a little over 4.5 grams, which, at the current market price, is worth about \$540,000.

The measurement of radium emanation is essential to the determination of very small amounts of radium (such as are contained in therapeutic preparations, ores, etc.), of the radioactivity in natural waters, and of the effective strengths of radium emanation activators; that is, apparatus for the artificial preparation of radioactive water. Work of this kind has been carried out throughout the year. Several types of activators have been carefully studied, a number of them have been tested for the public, and numerous therapeutic preparations have been investigated. A number of radium solutions for the preparation of standards to be used in such work have been furnished to the public.

In response to urgent requests, the Bureau is about to undertake the testing of luminous preparations containing radium. These preparations are not only used for the illumination of watch and clock dials, but are most valuable in the construction of many military and naval appliances designed for use at night. The Bureau is informed that one company in this country is making regular monthly shipments abroad of large amounts of this material.

Part of the work of the radium laboratory is to act as a clearing house of information, to encourage the adoption and use of the best units, nomenclature, and methods of measurement, and the elimination of all others; and to endeavor to secure honest advertisement of radium preparations. This work is carried on by correspondence, conferences, and publication. A circular, setting forth in a popular

manner those facts concerning radium and radioactivity and their technical measurement which are of general interest or which should be clearly understood by all who desire to employ radioactive substances in any way, is nearing completion.

Life Testing of Incandescent Lamps

The lamps purchased by the Federal Government, amounting to about 1,250,000 annually, are inspected and tested by the Bureau of Standards. The specifications under which these lamps are tested are published by the Bureau and are recognized as standard by the manufacturers as well as by the Government. They are used also by many other purchasers of lamps.

The lamps are first inspected for mechanical and physical defects, this being done at the factory by Bureau inspectors. Representative samples are selected and sent to the Bureau, where they are burned on life test at a specified efficiency, at which they must give a certain number of hours' life, depending upon the kind of lamp. From 3,000 to 5,000 lamps are thus burned on test each year.

Economic Importance of the Electrolysis Problem

The subject of electrolysis of underground pipes, cables, and other metal structures is one which has been given more attention in recent years than formerly, but it still does not receive the attention in many quarters that its importance deserves. When considering the enormous value of the pipe and cable properties buried in the streets of cities and forming in many cases transmission networks between cities throughout the country, and when considering further that there are very few water, gas, or lead cable systems which are not more or less subject at some points to electrolytic damage from stray currents, it is possible to better form a judgment of the practical importance of this subject. The water and gas pipe systems of this country alone have an aggregate value at the present time of approximately \$1,500,000,000, and in addition to this a vast extent of underground lead-cable systems belonging to telephone and electric power companies and to municipalities. In addition to these vast properties in the earth, a considerable part of which may be more or less subject to electrolytic damage, there are possibilities of trouble in the case of bridge structures, portions of steel frame buildings, and piers, which are occasionally exposed to damage from this source. While it is impossible at present to determine with any accuracy the extent of the annual damage to pipe systems by

electrolysis, nevertheless the most conservative estimates place it at many millions of dollars annually.

It is not alone the property loss, however, or the possibility of such loss that makes the electrolysis problem one of importance. An important fact is the inconvenience to consumers of water, gas, and telephone service due to the interruption of the service when repairs are made necessary by electrolytic damage. Possible interruption of the service of police and fire alarm systems is also one of considerable importance to almost every municipality.

Wherever currents are permitted to flow on the underground pipe systems there is the possibility of electric arcs being formed when pipes are disconnected, or when different pipe systems make transient contact. Actual cases of accidents of this kind are rare, but they have sometimes occurred, resulting in a loss of life and a considerable damage to property. Cases have occurred also in which leakage of gas resulting from electrolytic corrosion of the pipe has given rise to explosions with disastrous results. Many gas explosions in basements and manholes have occurred, but it is difficult to determine what proportion is due to electrolysis, although undoubtedly many of them are traceable to this cause.

A pipe line weakened by electrolytic corrosion may even present a distinct fire hazard much greater than would result from interruption of water supply at normal times. In many cities it is quite common practice during bad fires to increase temporarily the water pressure in the district adjacent to the fire. It is very obvious that a badly corroded water main might be capable of withstanding the normal pressure on the system and thus give no warning of the weakened condition of the pipe, but at the critical juncture during a bad fire when the pressure is suddenly increased the pipe may burst, and thus seriously hamper the work of fire fighting.

The Bureau has been studying the electrolysis question for the past six years and has done a large amount of work in connection with it. The first problem investigated was that concerning the effects of electrolysis in reinforced concrete, after which special attention was given to electrolysis of underground pipes. This has included laboratory investigations concerning the effects of electric current on concrete and on metal pipes, tests of pipe coverings, the corrosion of metals in the soil, methods of measuring soil resistance, and various other experimental phases of the work; methods of electrolysis mitigation that have been used or proposed; field studies in actual practice with the application of remedies; and a determination of the cost and results obtained.

Extensive investigations have also been made into methods of electrolysis testing in the field for the purpose of establishing the best methods of procedure in diagnosing the cause of troubles actually experienced, determining the extent to which the underground metallic structures are being affected, and securing engineering data on which to determine the most effective and economical measures that may be applied in any given case to mitigate the trouble.

Public Utility Work

Few State commissions will ever be likely to have a force of engineers and inspectors large enough to enable them to take the initiative in each case and relieve the municipalities of all responsibility. On the contrary, if the municipalities are active and enterprising in their own behalf, and if the larger ones have well-equipped public-utility departments which can prepare the city's complaints or requests and take them up to the State commission for hearing and adjudication, the State commission would be better able to serve all the municipalities of the State, and the municipalities would enjoy in large measure the advantages as well as the responsibilities of home rule without its greatest disadvantages.

The sum available for the public-utility work of the Bureau during the current fiscal year, including a special appropriation for the safety work, is \$55,000. Many of the States spend more than this, and some States five or ten times as much. The people of the United States spend about \$2,000,000,000 a year for the service of the public utilities, or \$20 per capita per annum. This includes the telephone, gas, electric light and power, electric railway transportation, and miscellaneous utilities, not including the steam railways. The States through their public utility and railroad commissions spend \$4,000,000 a year regulating the utilities and railroads, and the cities a large amount in addition. A considerable sum could profitably be spent annually in an efficiently conducted co-operative study of the conduct of such utilities, defining standards of service, preparing safety rules, assisting in local studies as to service, acting as referee or adviser in cases of dispute, serving as a clearing house of information on all public utility and associated engineering questions, helping to secure uniform methods of accounting, especially where public service commissions are not yet established, carrying out laboratory tests and investigations to answer difficult questions, and making it possible for rules as to service and safety to be kept revised up to date, after they have once been formulated and adopted.

A Federal bureau well equipped with men and apparatus, and permitted to work in the very wide field of public utilities (outside of railroad transportation and such subjects as the Interstate Commerce Commission is concerned with) can accomplish great good for the public. It does not appear to be overestimating the value of such work to say that an average benefit equivalent to 5 per cent of the sum now paid for the service would result. It seems conservative to suppose that such benefit in improved efficiency and better service would seldom be less than 2 or 3 per cent and sometimes as high as 10 per cent. Five per cent of \$2,000,000,000 is \$100,000,000 per year, and this appears to be a reasonable estimate of the possible value of the service being considered, assuming such service to be efficient and ample. One cent a year per capita is only a hundredth part of this sum, and this does not seem too much for the people to spend co-operatively through the Federal Government to accomplish this result. At present the Bureau of Standards is spending about one-twentieth of this, and has accomplished enough to show how valuable such work is.

Tests of American Chemical Glassware and Porcelain

The difficulty and, indeed, impossibility at present of obtaining chemical glassware and porcelain of high quality from Europe has led several firms in this country to place new products of domestic and foreign make upon the market. Most of these are now undergoing test at the Bureau, in comparison with the best of the older foreign ware. The results, when obtained, will probably be published for the benefit of the public.

[SOURCE: Boston speech of S. W. Stratton, Director of the Bureau of Standards, April 26-27, 1916, pp. 42, 43.]

Porcelain from American Clays

The work on porcelains has been continued and a considerable quantity of Marquardt refractory porcelain has been produced, formerly obtainable only from the Royal Manufactory at Berlin. The composition and method of manufacture of this product have been made public. Table porcelain made entirely from American clays has been produced by the European firing process as well as by a modification of the American firing method. In the latter case a special leadless glaze has been worked out. Chemical porcelain has likewise been made.

The most easily fusing mixture of feldspar and steatite has been determined.

By means of microscopic examination, the structures of the important porcelains of the world have been studied and the process of vitrification and crystallization made clear.

Considerable co-operative work has been done for the purpose of overcoming practical difficulties. Numerous tests have been made of imported French flint used in porcelain manufacture for the purpose of determining the amount of admixed quartz.

Glazes and Colors

A considerable number of glazes have been worked out for different manufacturers of pottery and other products, representing various colors. For refractory porcelain, a special matt glaze has been developed having only a short softening range and which is useful for such products as pyrometer tubes, since it does not cause the latter to stick at the usual furnace and kiln temperatures.

Enameled Iron

Work has been undertaken upon the study of enamels for cast iron and steel. It was first necessary to secure proficiency in the proper treatment of the metal and the application and fusion of the ground coats and enamel. A number of excellent undercoatings and enamels have been developed, both for cast iron and steel. A study of enamels possessing maximum resistance to solution is under way.

Silica Brick

An extensive study is under way of the several quartzite rocks used for the manufacture of silica brick. This investigation deals with the expansion in volume which the materials undergo in firing, the change in specific gravity, and the crystalline transformation of the quartz to cristobalite and tridymite, determined by the microscopic examination.

Strength of Brick Piers

The investigation of the strength of large brick piers, which has been conducted during the previous two years, has been confined to brick selected from the important geographical districts east of the Mississippi. The bricks have been classified individually according to the tentative standards recommended by the American Society for Testing Materials. The experimental work of this investigation has been completed for piers constructed from the product of the Chicago and Pittsburgh districts. The work will be continued for

the remaining districts during the coming year. This research is being carried on in co-operation with the National Brick Manufacturers' Association.

Strength of Hollow Building Tile

During previous years, numerous tests of building tiles from different geographical districts have been made and the data is being studied and co-ordinated for publication. In addition, a number of tile walls have been tested under compression and transverse forces to determine the physical laws and most efficient types of construction, appropriate mortars, best type of bond, the relation of strength to hardness of burn, etc. This investigation will be continued during the coming year. It is hoped ultimately to furnish adequate data for outlining standard methods of testing tile and preparing consistent specifications for the use of manufacturers and and engineers.

The Clay Industries

[SOURCE: Speech of S. W. Stratton, Director of the United States Bureau of Standards, Boston, April 26-27, 1916.]

The clay industries in this country are generally operating in small units and they have a great many serious problems before them, but we have been studying carefully the nature of these problems, and the Bureau has already been of considerable assistance. I will give you just one illustration to show the value of studying our own products, and especially our own resources. In the manufacture of glass and similar materials the melting pots which are used are made of graphite and clay—graphite crucibles, they are called, but the graphite must be mixed with clay. Until recently that clay was brought from abroad. The only good clay that would stand this high temperature was originally imported. The Bureau investigated American clays and some were found to have greater strength and others a less shrinkage, but no one clay had all the desirable qualities needed. By testing these clays it was found that a mixture could be made which was actually better than the foreign clay. This work was done several years ago, but only a short time ago the Bureau received a letter from one of the largest crucible manufacturers in the country, probably making three-fourths of the total output in the United States, asking us to tell them where they could get a clay in this country, their supply of foreign clay having become exhausted. The Bureau, of course, furnished them the information. There is hardly a single thing

used from abroad that cannot be obtained in this country if the necessary effort is made.

[SOURCE: Report of Director of Bureau of Standards, 1916, pp. 99, 101-106, 115, 116, 118, 121, 122, 123, 129, 135, 138, 139, 142, 145, 148, 151, 152, 155, 164, 165.]

Paste and Mucilage

About the usual number of samples of paste and mucilage materials has been tested. The quality of some recent delivery samples of paste has been somewhat below the standard, and some very inferior mucilages have been submitted. The lowering of the quality of the pastes is probably due to the lack of dextrin made from potato starch. The appearance of some of the samples of mucilage was such as to indicate not only inferior raw materials but also gross carelessness in manufacture.

Chemical Properties of Selected Paper Pulps

A study of the chemical properties of selected paper pulps and of their susceptibility to oxidation and hydrolysis was finished.

A study is also being made of the changes that take place in rosin sizing when exposed, in contact with pulps, to the combined action of light and air.

Chemistry of Textiles

Several times during the year the Bureau has been called upon to bring samples of textiles to a bone-dry condition in a specially constructed apparatus. Numerous samples of fabrics have also been tested for permanence of dye and for the presence of size and fillers.

Inks, Typewriter Ribbons, etc.

Many samples of writing and stamp-pad inks have been examined during the year, both as an aid in awarding contracts and to check up deliveries. Owing to the dyestuff situation, there has been a tendency to lower the quality of the ink furnished to the Government departments.

The work of testing typewriter ribbons and carbon papers has been greatly facilitated by the recent purchase of an automatic typewriter.

Numerous samples of printing ink were analyzed during the year. Other materials, such as printers' rollers and printing-ink pigments, have also been analyzed.

Paint-Exposure Tests

The paint-exposure tests, begun over a year ago, are in progress, but several years may elapse before conclusions can be drawn. A record will be kept by means of photographs and inspection of the test panels, which, in three kinds of wood, have been painted with a number of well-known brands of white paints for outside exposure.

A large amount of matter has been prepared for use in a projected circular of information on paint materials.

A chapter on paint, paint oils, and varnishes has been prepared for the projected circular on household materials.

Soap Specifications and Soap Analysis

Tentative specifications for white floating, milled toilet, chip, salt water, liquid, and two types of laundry soap were prepared and submitted to a number of manufacturers for criticism. Some of the criticisms and suggestions received are now under consideration by experts in the Government service. These specifications, with some general information regarding soaps, will be issued in published form.

Investigation of Railway Materials

Investigation as to the causes of failure of rails and other railway materials and of their properties has been continued during the past year. A detailed investigation is being made of rails containing the so-called "transverse fissure," with the endeavor to ascertain under which conditions this type of failure is produced. Railway companies in different sections of the country are assisting in this investigation and have furnished, as a part of their co-operation, a great number of rails containing transverse fissures. It is also the hope of the Bureau to eventually produce, by known mechanical means, transverse fissures in supposedly sound rails, so that an insight may be gained as to the probable service or structural conditions causing their production.

The investigation upon railway material has extended beyond work in the laboratory. During the year an extensive trip was made to inspect track in which four or five transverse fissures had occurred in a single mile.

With a view of obtaining machines capable of reproducing surface conditions upon rails in the laboratory, a comprehensive study

has been made of such machines at present existing in laboratories of railroad companies in various parts of the country.

Metallurgical Examination of Failed Railway Material

The several lines of investigation in this subject were outlined at some length in last year's report and progress has been made in all the items mentioned, including (1) an exhaustive study of the type of failure known as "transverse fissure" in rails, in which several divisions of the Bureau and the railroads of the country are co-operating; (2) an examination of the soundness and other characteristics of steel ingots of several methods of manufacture and their suitability for use in the manufacture of railway material, such as rails, wheels, and tires, and in which the Bureau has the co-operation of several steel companies; (3) a co-operative investigation with the Pennsylvania Railroad of rails made from several types of ingots; (4) the determination of the internal heat stresses in car wheels caused by braking; (5) the heat treatment of locomotive and helical car springs; (6) the relation of combined carbon to annealing time for cast irons of car-wheel type in the course of which improvements in analytical methods have been made; (7) the temperature distribution over rail sections while cooling; and (8) the publication of *Some Foreign Specifications for Railway Material: Rails, Wheels, Axles, Tires*, including a summary of accident statistics.

Deterioration of Tinned Copper Roofing

An investigation is being made of the metallographic structure and properties, particularly the electrolytic electromotive force of the tin coating on tinned sheet copper. This was taken up, at the instance of the Librarian of Congress, where there is an interesting case of extreme local corrosion.

Protective Metallic Coatings on Metals

The Bureau has had a considerable amount of testing to do, mainly for the Government departments, of plated or coated metals, especially galvanized iron. A systematic study of the manufacturing limitations and properties of this class of material was considered desirable and has been begun; and together with a committee of the American Society for Testing Materials, the experimental data and experience are being accumulated for forming specifications for galvanized materials, including sheets, wire, and pipe.

Large Steel Columns for Long-Span Bridges

The investigation of the strength of large bridge columns, conducted at the Pittsburgh branch laboratory, has been completed and the results are ready for publication. In this investigation 22 columns were tested, the test specimens being constructed of various types of alloy and carbon steels. The results of these tests are of direct value to engineers and manufacturers in view of the relative scarcity of data upon the department of large compression members of bridges.

Cheaper Metal Substitutes

The past year has witnessed an abnormal rise in price of several of the more commonly used metals, and in consequence the Bureau has received numerous requests for advice and suggestions looking to the substitution of cheaper metals or alloys for various purposes. There are many factors involving manufacturing peculiarities, durability, and other physical and chemical properties which have to be determined. There is a very wide field for research here which would undoubtedly repay many fold the efforts put upon it. Some of the questions of this kind which have been put to the Bureau are substitutes for zinc, copper, and antimony for several manufactured products and in certain alloys.

Investigation and Testing of Cement, Concrete, and Stone

The work of the Bureau on cement, concrete, and stone is of three kinds:

(1) The determination of the physical properties of cements, concretes, sands, crushed stones, gravels, building stones, plasters, and drain tile, the investigation of the durability of these materials under various conditions, and the investigation of testing methods.

(2) Special investigations of the above and other similar materials at the request of Government offices to determine whether they are satisfactory under special-service requirements.

(3) The testing of samples of cement submitted by various Government offices to determine whether the cement meets the requirements of specifications upon which it is purchased, together with sampling of cements at the point of manufacture and supervision of shipments under Government seal.

Investigation of Integral Waterproofing Compounds

Many inquiries are received by the Bureau for information on the value of integral waterproofing compounds for use in cement mixtures. In 1912 a number of cement stucco panels, approximately 3 by 12 feet in size, were erected, in which various integral waterproofing compounds were incorporated. These panels have been exposed to the weather and observations made from time to time. Their present condition indicates that none of the so-called integral waterproofing compounds tested have material value when used in stucco to reduce dampness; some of them are deleterious and cause cracking and disintegration.

During the year a co-operating committee was organized, composed of representatives from Government offices, engineering societies, and the various industries, including all known manufacturers of waterproofing compounds. This committee co-operated in planning a series of field experiments, which contemplates the construction of concrete tanks by contract, both with and without waterproofing compounds. These tanks are to be located below grade near the Potomac River and subject to tidal water. A questionnaire was also prepared and submitted to architects, contractors, and engineers to gather information on the present usage of these materials. Results of this investigation should be available during the ensuing year.

Accelerator for Hardening Concrete

At the request of the United States Engineer Office at Memphis, Tenn., an investigation was made to develop a method of producing a concrete which would have considerable strength in a comparatively short time. A concrete of this character was desired as a substitute for willow mats for use in revetment work on the Mississippi River. The decline in the supply of willows available for this purpose necessitated the finding of a suitable substitute. The results so far obtained show that a 4 per cent solution by weight of calcium chloride in place of the mixing water would materially accelerate the hardening of concrete, but does not appreciably affect the time of setting. This acceleration varies somewhat with different cements. With some cements in 1:2:4 concrete, it was found that the strength increased about 100 per cent in 24 and 48 hours. This, it is believed, is due to the more complete hydration of the silicates and aluminates, since it was found that they were more completely hydrated when the calcium chloride was used. Its use

increases the cost of concrete 12 to 15 cents per cubic yard. For best results, it is important that the concrete be mixed to a quaking or mushy, but not fluid, consistency. Calcium chloride should be used with caution in reinforced concrete, as the presence of the calcium chloride will accelerate any corrosion of the reinforcement which may occur. The work is being continued.

Compressive Strength of Portland-Cement Mortars and Concretes

A study was completed of 20,000 tests of Portland-cement mortars and concretes collated from the many investigations made by the Bureau of Standards and the structural materials laboratories of the Geological Survey, which were transferred to the Bureau of Standards in 1910. These data have been published in *Technologic Paper No. 58, Strength and Other Properties of Concretes as Affected by Materials and Methods of Preparation*. The results show that several of the generally accepted methods for proportioning concrete mixtures are incorrect and that certain precautions are necessary in the fabrication of concrete to insure a product of known quality. The effect of variation in the quantity of cement used, the effect of different exposures while hardening, the effect of aging, etc., are discussed. The relative value is shown of various aggregates, such as gravels, limestones, granites, trap rocks, cinders, sands, and stone screenings, also the relative value of rounded and sharp-grained sands. Proper methods for testing and selecting aggregates are also suggested. This paper should be of particular interest to contractors and engineers.

Tests of Composite Concrete Floors

During the year loading tests were made on several concrete floors. The tests consisted of determining the deflection produced in the floors when subjected to a superimposed load equal to three times the working load for which the floors had been designed. Tests were made on several floors for acceptance in the new chemical building of the Bureau of Standards on solid two-way reinforced floors and on combination hollow tile and reinforced concrete floors.

A type of floor which is being introduced into Washington, known as the Schuster two-way reinforced hollow tile and concrete floor, was also investigated to the extent of making loading tests.

Value of Various Materials as Concrete Aggregate

In co-operation with State geologists and others, representative samples of mine tailings, crushed slag, sands, gravels, and stones are

being obtained for test to determine their suitability as aggregate for concrete mixtures. Many inquiries are received concerning the value of these materials. The results of the investigations will probably be published in State reports and subsequently in Bureau papers.

Investigation of the Value of a New Type of Concrete Mixer

This investigation was undertaken in co-operation with a contractor for the purpose of determining the value of mixing concrete by a new process. Over 300 concrete cylinders were made of concrete mixed by the new method and by a present commercial method in order to obtain comparative results. The tests completed to date show that the new method is not satisfactory and does not produce concrete equal in quality to that produced by present commercial methods.

Investigation of the Building Stones of the United States

In connection with the co-operative investigation of building stones which is being carried on in co-operation with the Geological Survey and Bureau of Mines, 200 samples of marble, limestone, sandstone, and granite have been collected from various quarries in all sections of the country. The testing work has been confined chiefly to the marbles, and includes the determination of compressive strength, on wet and dry specimens, on bed and on edge, transverse strength of perpendicular and parallel to bed, tensile strength perpendicular and parallel to bed, percentage of water absorption, specific gravity, weight per cubic foot, porosity, hardness, coefficient of expansion, heat conductivity, electrical conductivity, and resistance to the action of frost. Various building stones submitted by other Government departments and State governments have been investigated to determine their suitability for particular purposes. A collection is being made of samples of all the important building stones for the establishment of a permanent file.

Stucco and Plaster Investigation

A series of tests, primarily to determine the comparative durability of various types of plastered metal lath on exterior walls, was undertaken in 1911. The results of these tests, obtained from the exposure of small panels, indicated the necessity of carrying out an investigation on a much larger scale.

Properties of Hydrated Limes

In 1915 the American Society for Testing Materials adopted the standard specifications for hydrated lime. It was desired to learn just how the material made by different manufacturers compared with the requirements of these specifications. This will serve the double purpose of giving information as to the qualities of different brands of hydrated lime, and also enable one to form an opinion as to the justice of certain limiting values placed in the specifications. At the present time samples have been examined from about one-fourth of all the factories in the United States.

Wearing Quality of Sole Leather

The testing of sole leather to determine its wearing quality is a problem that has been brought to the Bureau's attention a number of times by Government departments and by manufacturers. The Bureau has given the subject careful consideration, with the result that a testing machine has been designed, with which it is proposed to conduct a series of experiments, with the view of establishing a standard method of testing sole leather.

Identification of Textile Fibers

An important phase of the textile work of the Bureau is the microscopical examination of fibers for the purpose of determining their identity. A great deal of information may be obtained about the probable service of a material if the fiber from which it is made is known. Adequate methods of microscopical analysis will also greatly assist in preventing misstatements of fiber content intended to deceive the purchaser as to the quality of a material.

Standardization of Tensile-Strength Testing Methods

There has been a considerable variation in the practice of making tests for tensile strength upon fabrics. Differences have existed in regard to the methods of sampling, the dimensions of the test specimen, and the method and rate of application of load. Investigations are now being made to determine the best procedure from the point of view of accuracy and reliability as well as convenience. This will enable the adoption of a single method, making possible a direct comparison of the results obtained in different laboratories.

Utilization of Waste Paper for Remanufacture into Paper

This country has recently seen an unprecedented rise in the cost of all grades of paper, caused by unusual demands for paper and

a shortage of many materials entering into the finished paper. This demand for paper and the lack of an adequate supply of raw material has forced many manufacturers to look to the use of waste paper for an additional supply. The processes now in use for the recovery of waste paper are very wasteful; therefore, for this reason and because of the possibilities involved, it is hoped to be able to make a study during the coming year of methods of cooking and treating old papers.

Investigation of Lubricating Oils

Considerable work has been done in developing the test for demulsibility, or resistance to emulsification. The investigation has been extended to include used as well as unused oils, and interesting results have been obtained in regard to the decrease of demulsibility with use. It is believed that power-house engineers, by the use of this apparatus and method of test, could obtain valuable information in regard to the rate of deterioration of oil in use in their plants.

New Investigations Proposed

Two exceedingly important cases have arisen for which estimates will be submitted. The first is that of optical glass. Notwithstanding the importance of this material in the construction of all sorts of optical instruments, it has not yet been successfully manufactured in this country in any considerable quantity. Every effort should be made to assist in the development of this industry. Estimates will be submitted for a special fund intended to enable the Bureau to undertake the important underlying scientific work needed in the production of optical glass.

The second case is that of electrodeposition of metals. Many industries are vitally concerned in the fundamental principles of the electrodeposition of metals, as, for example, the electrotyping and electroplating industries. Little attention has been paid to the underlying scientific principles involved.

THE UNITED STATES BUREAU OF MINES

Principal Divisions

Mining—

Principal Branches

Coal-Mining Methods
Metal-Mining Methods
Hydraulic Mining
Rescue and Safety

<i>Principal Divisions</i>	<i>Principal Branches</i>
Metallurgy—	Smelter Fumes Hydro-Metallurgy Lead and Zinc Complex Ores Blast Furnace Safety Steel Manufacturing Safety Corrosion of Metals
Mineral Technology—	Radium, Uranium, and Vanadium Platinum Metals Non-ferrous Alloys Metalloids (Arsenic, etc.) Building Stone, Cement, Lime Silicates, Ceramic Materials Quarry Technology Mineral Abrasives, Paints, etc. Minor Metals (Aluminum, Mercury, Man- ganese, etc.)
Fuels—	Testing Fuel Briquetting Boiler and Furnace Efficiency Gas Producer Peat
Chemical Research—	Origin of Coal Physical Tests of Coal Chemical Tests Volatile Products of Coal Clinkering and Fusing Tests Gases
Petroleum—	Production Transportation Storage Refining Testing

Purpose of the Bureau of Mines.—The Bureau of Mines was established by an act of Congress (36 Stat., 369), amended February 25, 1913 (37 Stat., 681), in recognition of the need of a Federal bureau that should seek to prevent accidents and bring about safer and more healthful conditions among workers in the mineral industries and to lessen waste and increase efficiency in the development and utilization of the Nation's mineral resources. In its efforts for these ends the bureau seeks the co-operation of all persons interested, and it welcomes the assistance of workmen's organizations, of technical societies, and of State officials and State governments.

Chief features of the work of the Bureau of Mines.—The Bureau of Mines is investigating the causes and prevention of accidents in mines, quarries, and metallurgical plants and endeavoring to safeguard the lives of those who work there; is testing and analyzing coals and other mineral fuels belonging to or for the use of the Government, with a view to increasing efficiency in their utilization; and is making investigations that look to the elimination of waste in the mining, metallurgical, and miscellaneous mineral industries. ' "

[SOURCE: Report of Secretary of the Interior, 1916, pp. 8-10, 51-56.]

Fuel investigations.—In its efforts to increase efficiency in the use of mineral fuels the bureau is studying the properties of these fuels and the methods of burning them in furnaces and gas producers. Also it is collecting, analyzing, and testing samples of coal purchased under specifications for Government use. In the fiscal year 1916 the aggregate cost of the coal represented by these samples was \$7,800,000. During the year the bureau continued to assist, in the capacity of a consulting fuel engineer, various departments and establishments of the Government in solving problems relating to the purchase of fuel and the efficient use of fuel for heating or power. The results of the bureau's investigations are being embodied in reports that are meeting a widespread demand for authoritative information on the utilization of fuel.

Problems of mineral technology.—The mineral technology investigations of the Bureau of Mines cover the minor metals, the rare and precious metals, the metalloids and the nonmetals, brass and other nonferrous alloys, abrasives, cement, mineral products used as building materials, and many different minerals used in the arts.

In the United States 75,000 persons annually die of cancer. Through the radium investigations of the bureau, in co-operation with the National Radium Institute, two great hospitals obtained during the year a goodly supply of radium for the treatment of that disease. Low-grade radium-bearing ore, heretofore wasted, was concentrated successfully in a mill especially designed for the purpose. This concentrate, as well as high-grade carnotite ore, is being treated at the Bureau of Mines plant at Denver, which is now producing radium at the rate of 5 grams a year. The cost of production since operations began in June, 1914, has been less than \$40,000 a gram, as compared with a market price of \$100,000 to \$120,000 a gram. This radium is not sold but is to be used in the treatment of cancer. ' "

Incidental to the production of radium at the Denver plant many

tons of iron vanadate that can be used in the manufacture of high-grade vanadium steel, and many tons of uranium oxide, used in coloring glass and making tool steel, have been produced. For an expenditure of less than \$35,000 the Bureau of Mines will receive as its share of the results of the co-operative agreement at least \$100,000 worth of radium.

In normal times the metal losses in brass melting in the United States annually amount to \$3,000,000, and during the past year of high prices and large production have probably been nearer \$10,000,000. As a result of its investigations of these losses the Bureau of Mines has devised an improved electric melting furnace which will be thoroughly tested on a commercial scale during the coming year. Also, because of the excessive loss of metal, sometimes running as high as 40 per cent, in melting scrap aluminum, the bureau has investigated methods of melting aluminum chips and is publishing the results.

In its clay-industry investigations the bureau has studied methods of so treating the secondary kaolins found in almost unlimited quantities in the Coastal Plain region of Georgia and the Carolinas as to render them applicable to the production of white wares. The results have demonstrated that these kaolins can be cheaply purified and that the purified material is superior to the best English china clay for making china, white crockery ware, and white tile.

Increasing efficiency and lessening waste in the petroleum and natural-gas industries.—Through its petroleum division the Bureau of Mines is investigating problems of technology, engineering, and chemistry in the production and utilization of oil and gas. The petroleum-technology investigations deal chiefly with practicable methods of eliminating waste in drilling wells and of recovering a larger proportion of the oil or gas stored in the productive sands; the engineering-technology investigations deal with storage, the prevention of losses from fires, and the manufacture of gasoline from natural gas; and the chemical-technology investigations deal with the mechanical development of the Rittman process for manufacturing gasoline, toluene, and benzene, and the improvement of methods for analyzing and testing petroleum and petroleum products.

Operators in different fields have been shown the need of properly protecting oil and gas sands from infiltrating water and of sealing wells so as to confine the natural gas securely until such time as it is utilized. Also, the bureau demonstrated the advantages of using mud fluid in drilling wells. Operators in Kansas

and in the Blackwell field of Oklahoma are successfully using methods the bureau advocates. In the Blackwell field the operators should recover at least 80 per cent of the gas in the gas sands, whereas in older fields the recovery has been less than 10 per cent. A conservative estimate of the value of the gas that will be saved through the use of approved methods in the Blackwell field is \$20,000,000.

As a result of the chemical-technology work of the petroleum division, the Rittman cracking process for the manufacture of gasoline, toluene, and benzene from kerosene or any other available fractions of petroleum is now a commercial success, and the Bureau of Mines is able to give to the public a commercial cracking process, free of royalty, which will make available for internal-combustion engines large quantities of otherwise unavailable fractions of petroleum. Investigations have also been made relating to the analytical distillation of petroleum, the properties of gasoline, and the various methods of analyzing petroleum and its products in general use in this country.

Other Scientific Work

Developed methods for treating low-grade complex gold, lead, silver, and zinc ores that may rejuvenate mining in certain parts of the country and render available millions of tons of ore that can not now be treated profitably, the principal results of this work being as follows:

The development of a brine leaching process for extracting lead from low-grade and complex ores.

The development of a process for the separation of lead and zinc contained in lead-zinc sulphides, and the recovery of both metals.

The application of the flotation process to the concentration and recovery of the valuable minerals in lead carbonate ores.

The development of a volatilization process for the recovery of zinc from oxidized ores.

The development of a process for the production of zinc dust from solutions of zinc.

Collected much valuable information on the corrosion of hoisting and pumping equipment by acid waters in mines, and the resistive qualities of different metals and coverings, with a view to finding methods of preventing or greatly lessening the damage to such equipment.

Investigated marble quarries, and published a bulletin describ-

ing quarrying methods used, and precautions that should be taken to reduce waste and avoid accidents.

Devised improved methods for concentrating the radium ores of Colorado and Utah. Nearly 2,000 tons of such ore has been concentrated in co-operation with the National Radium Institute, and radium has been produced at a cost equal to about one-third the current market price.

Investigated the ores of molybdenum in the United States and prepared a bulletin on their occurrence, the method of concentrating, the market for the ores and the metal, and the use of molybdenum in making tool steel and other products.

Demonstrated that great deposits of secondary kaolin (china clay) in Georgia and South Carolina, heretofore considered unavailable for white ware, can be cheaply treated so as to render them available for making the highest quality of white tile and china.

Began an investigation of manganese ores in the United States with reference to methods of mining and treatment, the purpose being to increase the domestic supply of this metal needed in the manufacture of steel.

Developed an improved electric furnace for melting brass.

Prepared for publication a report on gold dredging which presents detailed figures of operating costs and other data that have been carefully guarded by dredge operators.

Inspected several Government power plants by request of the departments concerned and recommended changes in practice that are resulting in a considerable decrease in the cost of fuel.

Completed for publication a report showing the merits of coke as domestic fuel.

Obtained important data on the oil shales in the West and their value as future sources of petroleum.

Demonstrated the practicability of the Rittman cracking process for making gasoline, benzene, and toluene. Several commercial plants using the process are in operation or process of erection, 19 companies having received licenses to manufacture gasoline and 5 to manufacture benzene-toluene by the Rittman process.

Showed well drillers the advantages of using improved methods of protecting oil and gas sands and called attention to underground wastes; as a result millions of dollars' worth of oil and natural gas will be saved that otherwise would have been lost. The value of using mud-laden fluid in drilling and closing oil and gas wells was demonstrated by operations, and methods of flushing oil sands in

order to recover a large proportion of the contained oil were investigated.

Investigated the quality of different grades of gasoline marketed in the United States and their relative merits as motor fuel.

Investigated a process for producing gasoline from natural gas, by which the utilization of gas will be made more efficient and the output of gasoline will be increased.

Made further progress in its study of methods of removing from smelter smoke the constituents injurious to vegetation; demonstrated the possibilities and limitations of the wet Thiogen process for reducing sulphur dioxide in smelter smoke to elemental sulphur.

Studied means for increasing the efficiency of the cyanide process for the treatment of gold and silver ores.

CHAPTER XXVI

STATE AID TO COMMERCE

THE present chapter has necessarily been entitled "STATE AID TO COMMERCE" rather than "STATE SOCIALISM AND COMMERCE" because the stage of State Socialism has not yet been reached, unless in very exceptional cases. However, we find that the Russian Government has successfully established governmental stores throughout Siberia, as mentioned in the *Russian Year Book*, 1913, p. 349:

"The Russian Government has a number of general stores throughout Siberia, which sell to the community machinery, tools, grain, and timber, and during the five years 1906-10 the number of these concerns increased from 48 to 118, and their turnover exceeded £2,300,000, of which over £1,000,000 of goods were sold on easy-credit terms. The net profits from these stores during the five years mentioned amounted to £175,000."

It should also be pointed out that the most important of the widely discussed collectivist activities of the United States Government in the Panama Canal Zone were commercial. [See Chapter on "INTERNATIONAL WATERWAYS."] In discussing existing State aid to commerce—which may or may not be considered as a half-way step to collectivism—we have confined ourselves to Germany, where such aid is most advanced, and to the United States, where aid of this character on a large and effective scale has been developed chiefly since the European war. The selections referring to Germany are exceedingly important. They show that the government has handed over the control of commerce in considerable part to certain commercial bodies.

This might be regarded as a surrender of governmental functions to private interests rather than a control of private interests by government. Nevertheless, as soon as these commercial bodies acquire an official status and official functions the government acquires and exercises a right of control over them. Un-

doubtedly this system is the very reverse of democratic and somewhat resembles the guild system of the Middle Ages—from which, indeed, it is directly descended without any break. On the other hand, it may mark the beginning of an industrial parliament. [See our comments in the Chapters on “STATE AID TO AGRICULTURE” and “INDUSTRIAL SCIENCE.”]

The present efforts of the United States may be considered collectivist in the sense that the government is practically paying for selling and advertising agencies for American producers abroad. It is quite clear also that this act of governmental aid gives the government a certain measure of power over all the industries which become dependent on such aid. The same is true, of course, of the governmental aid to branches of American banks established abroad and governmental aid to shipping. [See our Chapters on “CENTRAL BANKS” and on “SHIPPING.”]

We have not sought to discuss minor forms of government aid to commerce, such as those involved in the widely ramified statistical investigations of all governments, and especially of the government of the United States. There can be no question that in the case of commerce in raw materials, such as grain, wheat, cotton, etc., government statistics are a leading, if not the chief, element in the making of prices. Nevertheless such statistical functions usually have been and will continue to be developed chiefly by governments, and therefore should not be considered as examples of collectivism in the common use of the term (unless the word collectivism is stretched to cover all economic functions of government, which stretching—as we have pointed out in our INTRODUCTION—seems unjustifiable).

STATE AID TO COMMERCE IN GERMANY

[SOURCE: U. S. Special Commercial Agent Report on “Commercial Organizations in Germany,” pp. 161, 162, 166, 167, 168, 96, 97, 99, 100, 101, 102, 158, 159, 160.]

There does not exist in Germany an imperial regulation of commercial organizations or an imperial department of commerce, but every German State, on the basis of special legislation, provides for proper organs (chambers of commerce) to represent the interests of commerce and to serve as a means of communication between local commercial interests and the authorities. Individual German

States, however, have either ministries of commerce or special divisions of other ministries, charged with the promotion of commerce. In addition to mediating between the authorities and the commercial interests the German chambers of commerce also manage the public and semipublic institutions, as stock exchanges, produce exchanges, and certain classes of schools, furnish certificates of origin and other commercial certificates, and appoint and administer the oath to officers charged with the examination, testing, and inspection of various classes of products.

At present State aid to commerce in Germany, from the imperial point of view, is limited to the activities of German consular officers and commercial experts attached to certain German consulates and to the services and publications of certain sections of the Imperial Ministry of Foreign Affairs and the Ministry of the Interior.

The second division of the German Foreign Office is charged, in addition to other duties, with the promotion of commerce abroad. The imperial budget provides no special sum for the promotion of foreign trade or for the maintenance of institutions fostering it.

Commercial Attachés

The German Empire maintains in foreign countries, attached to the consulates general and consulates, commercial attachés, called commercial experts and agricultural experts. There are commercial attachés at the consulates general in St. Petersburg, Bucharest, Calcutta, Shanghai, Yokohama, Singapore, Buenos Aires, Rio de Janeiro, Bogota, New York, Johannesburg, and Sydney; also, agricultural experts at Rome, St. Petersburg; Stockholm, Buenos Aires, Chicago, and Cape Town.

The commercial attachés of the German Empire are charged with furthering German export to foreign countries by giving practical advice on marketing goods and further information that may lead to the increase of trade and to the better exploitation of the market. The commercial attachés must also point out any defects in marketing conditions due to unfavorable tariffs, to German negligence, or to the progress of foreign competition. They are likewise bound to bring to the notice of the German industries any new raw products, inventions, improved manufacturing methods, or any important economic events in their district. They are to report on all events in their territory that may affect German industry; they also have to call the attention of foreign buyers to the progress of German industries.

Before German commercial experts proceed to their posts it is customary for them to make a trip through Germany to get in closer touch with chambers of commerce and individual business firms in each district. The arrival of the commercial expert is brought to the notice of the business world and special office hours are arranged for him at the chamber of commerce. In 1909, when the service of German commercial experts had just been organized, a considerable amount of adverse criticism was directed against the system. Commercial experts were described as superfluous and their activity as directly injurious, as no expert could be a specialist in all classes of products, and also for the reason that small manufacturers might regard the commercial attaché in the light of an *un-salaried traveling salesman*. For this reason, in 1910 the sum voted for the service was reduced from 300,000 marks to 200,000 marks. In the following year, however, the larger sum was voted again and the service continued and expanded.

The agricultural experts attached to the German consulates general are instructed to study all problems relating to agriculture, particularly if of interest in the preparation of commercial treaties; the condition of agricultural employees, working methods, etc., opportunities to sell German agricultural products, and the breeding of cattle are also among the subjects engaging the attention of these officials. The German agricultural expert stationed in the United States reports regularly on American dairy and farm products, beet raising, meat exports, conditions in the packing industry, timber resources, forestry, forest fires, fruit raising, and corn production, as well as irrigation and drainage. Among the important reports published by the German agricultural experts, that of the agricultural attaché at Copenhagen on the agricultural conditions in Denmark, stands out as a model. Occasionally German agricultural experts have been sent to foreign countries on a special mission, as, for instance, to report on the breeding of horses in France, the breeding of sheep and hogs in the United Kingdom, and agricultural machinery in the United States.

Chambers of Commerce

In most chambers of commerce the electors enjoy equal and direct suffrage. Members of 53 Prussian chambers of commerce and of all chambers of commerce in Bavaria, Württemberg, Baden, Hesse, Brunswick, Saxe-Meiningen, Saxe-Altenburg, Saxe-Coburg, Gotha, Hamburg, Bremen, Lübeck, Alsace-Lorraine, and a few minor principalities are thus elected. In a number of Prussian

and other chambers of commerce the electors vote in two or three classes.

In 1870 the Prussian Government issued a new law regulating all chambers of commerce in its territory, including 83 chambers of commerce proper and 7 corporations having the character of chambers of commerce. This law, in its main provisions, is still in force. The present chambers of commerce are no longer auxiliary organs of the provincial and State institutions, but are actual representatives of the interests of the entire commercial community within their districts. They have the oversight of exchanges and of the appointment of brokers. The establishment of new chambers of commerce, formerly the prerogative of the Sovereign, was transferred to the Minister of Commerce. The right of suffrage in the election of members and the duty of annual contributions are regulated by the German commercial code and depend upon the entry of a firm in the commercial register. The budget of the chamber of commerce is now submitted to the Government merely for the purpose of notification and not for approval, and otherwise chambers act quite independently. They are still required to furnish annual reports, and a uniform seal was provided for all Prussian chambers of commerce. A large number of the Prussian chambers were formed in the period from 1870 to 1896.

In 1897 additional functions were assigned to the Prussian chambers of commerce, including the right to issue certificates of origin, as well as certificates relating to the merit and quality of goods.

Under the present Prussian law chambers of commerce are institutions representing the interests of commerce and of trade. They have a twofold duty to perform: First, they are expert consultative organs charged with aiding the authorities in the furtherance of commerce and of trade; second, *they are administrative organs with special functions either assigned to them directly by law or voluntarily assumed by them in the promotion of the interests of commerce and of trade.*

A new chamber of commerce may be established in Prussia when the business interests in any district demand it and the Minister of Commerce approves, but one can not be established over the protest of the business community concerned. *The chambers of commerce are, then, compulsory organizations for the districts for which they have been formed, and no registered business man or firm can withhold his support.*

Merchants and business firms of all classes under the German

company laws find representation in the chambers of commerce, provided they are entered in the register and are subject to taxation.

Specific Meaning of "Chamber of Commerce"

In this connection may be emphasized again the difference in "membership" as applied to the right to vote and "membership" in the chamber of commerce proper. All persons and firms capable of exercising the right of suffrage in the election of the chamber of commerce members are members of the chamber of commerce organization. They have also the right to call upon the chamber of commerce for all of its benefits. Only the elected members, a council consisting of a limited number, are called in Germany the "chamber of commerce." Thus, while the "chamber of commerce" as an organization includes all the registered business men who pay a certain tax and have the right to vote, the expression "chamber of commerce" in a stricter sense applies to what would be called in the United States the board of directors. The chamber of commerce is not a club in which membership may be obtained by paying a stated annual fee, and is not accessible to the larger membership except in the course of business.

The right to vote for members of the chamber of commerce may be exercised by either natural or artificial persons, that is, corporations and companies. Companies can exercise the right of suffrage only through authorized representatives.

The tax paid by the business men in Prussia to support chambers of commerce is based upon the amount of the trade tax, which is fixed by the State. Certain municipalities have a special municipal trade tax, and in such case, with the approval of the Minister of Commerce, the municipal trade tax may be made the basis of a surtax collected for the support of the chambers of commerce.

Eligible as members of the chamber of commerce (the council) are all German subjects who are at least 25 years of age and qualified as electors. Not more than one-fourth of the entire membership may consist of certified and authorized representatives of firms other than the owners (holders of proxies or powers of attorney).

The chambers of commerce may choose for themselves which of the systems of election shall be adopted in the district: Direct and equal suffrage; division of electors into classes in accordance with the amount of annual tax paid by them; or plural suffrage. If the chamber of commerce has made no decision on the subject, the voters are divided into three classes according to the grade of the trade tax, and each class elects separately one-third of the membership.

In its budget the chamber of commerce is entirely untrammelled, excepting that it must obtain the approval and sanction of the Prussian Minister of Commerce, if at any time it provides for an expenditure exceeding 10 per cent of the amount of trade tax collected in the district. The treasury of the chamber of commerce is not subject to any supervision by the State. The collection of the surtax levied for the needs of the chambers of commerce may be undertaken at their request by municipal and district authorities, for which a charge of not more than 3 per cent of the amount collected may be made.

Prussian chambers of commerce have the right to appoint and administer the oath of office to certain officials, among others gross-average inspectors for damages to ship or cargo, official surveyors, certified accountants, weighers, and samplers for sugar and molasses, and chemical and other experts.

They likewise have the right to nominate candidates for the position of commercial judge. A commercial judge is not a salaried official; he holds an honorary office and sits as an associate judge in commercial litigation. Any German, 30 years of age or over, who is a registered merchant, director of a stock company, or manager of a business house, may be appointed a commercial judge. He must reside within the district of the chamber of commerce that proposes his name, or at least have his place of business there. The number of commercial judges to be proposed by each chamber of commerce is decided by the Minister of Justice. The election of candidates whose names are submitted to the Minister of Justice is effected by members of the chamber. The president of the Landgericht selects the judges from the list submitted.

Unlike commerce and industry, for which there is no uniform legislation in the Empire, all interests of the arts and crafts (artisans, independent mechanics, and handworkers) are the subject of imperial regulations. In 1897 a law was passed standardizing the creation of chambers of trades throughout the Empire. Such chambers already existed in Hamburg, Bremen, and Lübeck, and in Bavaria, Saxony, and Württemberg. In other States chambers of trades were a part of chambers of commerce. The law in 1897 created special chambers of trades for the entire Empire, and strictly limited the scope of their activity. Members of chambers of trades must be independent mechanics or artisans who are qualified to employ apprentices. The members of the chambers of trades serve three years and elect special committees to manage the chamber. They can select additional members with a consultative voice,

not exceeding in number 20 per cent of the original membership.

The chambers of trades co-operate with committees representing the employees working for the independent artisans who have the right to elect members of the chambers of trades. The local authorities determine the number of members in these employees' committees and their distribution among the various trades in the district. These committees must be heard by the chamber of trades with regard to the regulation of the apprenticeship system and the relations between employees and employers. The chambers of trades are charged with regulating the apprenticeship system and with enforcing legislation relating thereto. They must assist the State and the municipalities by furnishing expert opinions on matters relating to various crafts, and must prepare annual reports. They appoint committees to examine graduating apprentices and additional committees to hear complaints against decisions of the examining committees.

Chambers of trades have the right to found and manage establishments for the welfare of apprentices and employees, schools, lecture courses for master mechanics and employees, etc. Laws affecting the interests of mechanics and apprentices are submitted to the chambers of trades for an expression of opinion. The chambers of trades have the right to fine masters, employees, and apprentices not complying with their regulations. The expense of operating the chambers of trades is borne by the municipalities within their sphere of activity.

A central organization similar to the *Handelstag* includes in its membership a large number of the German chambers of trades and meets from year to year. The cost of the convention is distributed among the participating chambers.

Upon motion of a majority of tradesmen carrying on a similar trade in any one district, the authorities may order the formation of a guild *with compulsory membership* (*zwangsinnung*), in which all who wish to carry on a certain trade shall be members, provided the delimitation of the district does not work hardship upon the tradesmen in the vicinity, and, further, that there is a sufficient number of tradesmen to found an active guild. Any independent tradesman carrying on a trade for which the guild was formed may be a member thereof, provided he is not a factory owner and provided he employs assistants or apprentices.

The guilds must not influence their members in the fixing of prices or in seeking customers. A number of guilds in any district

may select a guilds' committee, to facilitate intercourse with the authorities and to advance common interests. Guilds may associate themselves in federations and unions.

The official representation of the interests of manual trades (handwork carried on by independent tradesmen in shops as distinct from factories, employing assistants and apprentices) is in the hands of chambers of trades (Handwerkskammern), one for each district of the German Empire. Sectional chambers may be formed in subdivisions of districts.

The number of members in each chamber is determined by the statutes. The members are elected by (1) artisans' guilds having their headquarters in the district; (2) by tradesmen's associations and similar organizations, provided one-half the members thereof are actually independent tradesmen carrying on a manual trade in shops. The mode of election is regulated by local provisions.

Persons qualified to act as jurymen, over 30 years of age, who have carried on an independent trade for three years in the district, and who are competent to train apprentices, may be elected members of the chambers of trades. The chambers of trades may select additional members, with a consultative voice, not to exceed one-fifth of the entire membership.

The chambers of trades are particularly charged with (1) regulation of the apprenticeship system; (2) control of compliance with laws affecting apprentices; (3) assisting the State and district authorities in all matters relating to the interests of the manual trades; (4) examinations of tradesmen's assistants; (5) complaints against the decisions of the examining committees; (6) bringing to the notice of the authorities the needs and wishes of tradesmen.

The guilds and guilds' committees are obliged to follow the instructions issued by the chambers of trades.

Each chamber of trades is assigned a Government commissioner, who must be invited to all meetings and who may temporarily veto all motions, pending final decision by the authorities.

The expenses of the chambers of trade are borne by the communities in the district for which they are formed, the details being regulated by local laws. [*Italics in the above extract are ours.*]

Government Aid to Commerce in the United States

[SOURCE: Report of the United States Secretary of Commerce, 1915, pp. 46-63.]

The work of the Bureau of Foreign and Domestic Commerce is necessarily of a missionary character. It partakes of the nature

of a commercial reconnoissance. It often precedes the efforts of the regular salesman. Nevertheless, it must be tested by its practical value and can not be called promoting commerce unless actual orders result.

Within a few days of the end of the past fiscal year a representative of a Russian house applied to the Bureau of Foreign and Domestic Commerce to assist him in getting in touch with concerns interested in exporting cotton. Through a confidential circular his presence in New York City was made known, and during a short stay in New York the visitor made his headquarters at the office of our service there and formed connections with American exporters. One of these latter tells us that he has just closed with the party named a five-year contract for 40,000 bales of cotton annually.

We are also informed of several specific instances of large orders, some for a million dollars or more, the information of which was first published in our "Foreign trade opportunities" service. Among these are a railway for the island of Formosa, a capitol at Taihoku, Formosa, and arsenal machinery for Hanyang, China. We were recently informed by a large milling concern in the West that about two years ago it formed a business connection with a concern in Turkey through the Bureau and that during the past two years the amount of business done by the American house with this one concern has exceeded \$800,000.

Information published as a "Foreign trade opportunity" resulted in a contract for a new telephone system for a city in northern Europe, a contract for a petroleum pipe line in southeastern Europe, and a contract for a public building in the Far East.

One single result of the work of a commercial attaché in Europe would many times pay the cost of the entire attaché service for years through the opening of a market for several million tons of American coal annually. Within three hours after we learned from abroad that through the agency of our attaché the door for exporting coal to Spain was open telegrams giving this information were sent by the Bureau to the most important coal producers in the United States, and within three days a letter was received from a prominent American coal producer saying they had already gotten into cable communication with their representatives in Madrid and had a cable order for a considerable quantity of coal.

The Bureau of Foreign and Domestic Commerce maintains branch offices in the cities of New York, Boston, Chicago, St. Louis, Atlanta, New Orleans, San Francisco, and Seattle.

These eight offices distribute information collected by the Bureau from all over the world, and conduct special investigations for the Bureau. They arrange conferences between American consular officers and the special agents of our own service who have returned from abroad and the business men interested in foreign trade in the fields from which these officers come. They aid foreign purchasers in forming desirable connections with American manufacturers and exporters; they confer with commercial organizations and business men in regard to trade conditions at home and abroad.

Reorganization of Statistical Service

During the last fiscal year a comprehensive study of the statistical methods affecting the returns of exports and imports was made.

On the export side much inaccuracy has existed up to the present time. No method has been employed to insure statistical returns in the case of every shipment that leaves the country, and it is therefore impossible to estimate the degree of incompleteness of our published exports. It is known, however, that the total value of our exports has been understated. An agreement has been reached between the two Departments to modify the present practice in respect to export declarations; this change will undoubtedly go a long way, just as far as it is possible to go under existing legislation, to obtain complete returns.

"Commerce Reports"

Through the co-operation of the State Department and the Government Printing Office, it was possible at the beginning of January, 1915, to expedite the issue of the daily publication of the Bureau of Foreign and Domestic Commerce so that a dispatch or cablegram from a consul or a field agent of this Department is printed and mailed to subscribers within 12 hours after the report is received at Washington. Within this period the dispatch, if received from a consul, is examined at the State Department, edited in the Bureau of Foreign and Domestic Commerce, printed, and put in the mail. To emphasize this change, and to identify our daily publication more completely with the whole work of the Department, the title was changed from *Daily Consular and Trade Reports* to *Commerce Reports*. The business public has shown its appreciation of the increased value of the publication by a greatly increased number of subscriptions, with the result that the total amount of subscriptions

paid exceeds the amount for any other publication of this Government.

Cost of Production

The first full investigation conducted under the "cost of production" appropriation—that on the pottery industry—was completed and published during the last fiscal year. The report contained a careful analysis of all aspects of the industry in the United States, with a comparison of conditions in England, Germany, and Austria.

Similar studies were undertaken dealing with the general subject of clothing. Three of these reports—on women's muslin underwear, on hosiery, and on knit goods—were well advanced by the end of the fiscal year, and have since been completed. The field work was finished on the investigations of the cost of production of men's shirts and collars, and men's clothing, and reports on these subjects are now in course of preparation.

It is unfortunate that the wording of the appropriation confines this line of work to the cost of production. This is but one factor in determining our competitive ability as compared with foreign countries. The question of prices, proximity to the market and capacity of the market, the technical equipment of factories, and the cost of distributing the product when completed are all questions that merit careful investigation.

Commercial Attachés

The work of the commercial attaché has so fully justified itself that there is urgent demand for its considerable extension. If there ever is a time at which that extension is urgently necessary, that time is to-day. A large portion of our possible foreign markets are entirely untouched by the commercial attaché service, while other important markets are so combined as to receive inadequate service. There are no commercial attachés in Central America, India, the Near East, South Africa, or Canada. These are among the best possible markets for the goods of the United States. Spain, Portugal, and Italy receive but partial care through the commercial attaché stationed in Paris. Spain and Italy should each have a commercial attaché.

Commercial Agents

A number of investigations into special subjects have been conducted by the 12 commercial agents of the Bureau of Foreign and Domestic Commerce during the last fiscal year.

In addition to the reports from our own officers a number of special investigations have been made by consuls at the request of the Bureau of Foreign and Domestic Commerce.

During the last fiscal year a comprehensive report was published on the paper and stationery trade of the world. Shorter reports treated of the markets for soap and cooking fats in South America, the iron and steel industry in Europe, tobacco trade of the world, foreign markets for coal, and the South American market for jewelry and silverware. An exhaustive handbook on India was compiled in the Bureau from various consular reports supplemented by much information collected from all available sources.

In the past, investigations by commercial agents were confined chiefly to foreign countries. Last year it was determined to broaden the scope of this work by authorizing similar investigations in the United States. A comprehensive study has been made of the water terminals and facilities at the various ports. An investigation which has aroused wide popular interest is that of the dyestuff situation in the United States. One of the first serious effects of the war was the cutting off of our supply of artificial colors previously imported from Germany, on which our textile industry and other industries were vitally dependent. By direction of Senate resolution of January 26, 1915, the situation was thoroughly investigated and made clear to the public. A number of manufacturers have entered the field and the Bureau has done much to guide lines of manufacturing so as to answer the most pressing needs of the consumer. Aside from its published reports, it has conducted a large correspondence giving advice both to prospective manufacturers and to users of dyestuffs.

[SOURCE: Report of the Department of Commerce, July 1, 1915, pp. 246-250.]

Under the Federal reserve act of 1913, national banks are permitted to establish branches in foreign countries. This provision is of importance in building up our foreign trade equal to that of the acceptance privilege. Under this provision the National City Bank of New York has established branches in Buenos Aires, Rio de Janeiro, Sao Paulo, Santos, Montevideo, and Habana.

In thus establishing branch banks in foreign countries we are following the lead of England, Germany, and the other European countries which have used their banks as trade outposts. European exporters have been able, because they had their own banking institutions on the ground, to extend credits to their customers, when

such credits were deserved. Our exporters have been hampered by the lack of these facilities; but more important than this, the documents containing often the most confidential facts of our merchants and manufacturers have been open to the scrutiny of our competitors.

In the matter of financing our foreign trade we seem to be making headway, but we can never hope to realize the really big prizes in foreign trade until we are prepared to loan capital to foreign nations and to foreign enterprise. The big prizes in foreign trade are the public and private developments of large proportions, as, for example, the building of railroads, the construction of public-service plants, the improvement of harbors and docks, the digging of canals, and many others which demand capital in large amounts. New countries are generally poor. They look to older and richer countries to supply them with the capital to make their improvements and to develop their resources. The country which furnishes the capital usually sells the materials and does the work. In the last analysis it comes to this: The country that wants the business must finance the purchases, since the improvements will be made and the materials paid for out of the money loaned. The same thing is true, but less directly, in the case of Government loans. But there is no doubt that the loans of one nation to another form the strongest kind of economic bond between the two. It is commonly said that trade follows the flag. It is much more truly said that trade follows the investment or the loan.

Commercial Policy

The people of the United States, not alone the business community, are acquiring an international point of view. The great European war has forced the United States into a more active position in the arena of nations, it has forced a clarification of our popular ideas as to our position as a world power, it has forced a delineation and expansion of our international policies, and it has brought us to a full realization of the inadequacy of many of our theories as to our position with reference to the rest of the world. A foreign commercial policy for the United States is gradually taking shape under a wise and careful administration. American investments abroad are being encouraged. The fact that investment must precede trade and that investments abroad must be safeguarded is fully recognized.

Our international commercial policies should not be subject to the vagaries of political changes. Our foreign policy in regard to

commerce should be so thoroughly American that it would be consistent and constantly directed toward extending our commercial interests. The intelligent support of our National Government in the international trade is the sine qua non of foreign trade on a large scale.

Revision of Commercial Treaties

We have utterly failed to make use in our foreign trade promotion of the machinery of the conventional tariff system, which our competitors have employed with great success. We have been satisfied to get most-favored-nation treatment from foreign countries, or, in other words, tariff concessions adapted to the needs of other countries and not to our own. Other countries, by mutual tariff concessions, have gained valuable markets for the goods which they are peculiarly fitted to manufacture for export. Such concessions in the aggregate make up a conventional tariff. This is a matter which is entirely outside the discussion of a protective tariff, a tariff for revenue only, or free trade. A conventional tariff system may be based on a high or a low tariff and is to be regarded solely as a method of promoting foreign trade.

In this connection it would be well for us to take account of the fact that the commercial treaties of the most important countries will be largely recast as a result of the European war. Already we find ourselves in a very disadvantageous position in respect to our trade with some of the countries now at war, whose conventional tariffs have been greatly affected by the suspension of their treaties with Germany and Austria-Hungary. This is not a day too early for us to begin preparations for the negotiation of commercial treaties. In fact, such treaties can not be intelligently negotiated without adequate preparation and a definite commercial policy.

PART V

**COLLECTIVISM AND THE INDIVIDUAL
(AS CITIZEN, CONSUMER, PRO-
DUCER, AND TAXPAYER)**



CHAPTER XXVII

PUBLIC HEALTH AND SOCIAL INSURANCE

UNDOUBTEDLY the most important force making for the public care of public health to-day is health insurance, as it is automatically and inevitably pushing governments into the national organization of the major part of the medical profession, into a wholesale, systematic, and adequate provision of hospitals and sanatoria, and even—more slowly and doubtfully—into the provision of drugs and surgical supplies. Once engaged in health insurance, as nearly all governments are to-day, the scientific care of the public health is undertaken not alone from devotion to the public welfare, but for the purely business reason of protecting the public purse and reducing the amount of sickness, disability, and invalidity for which the government must pay.

Health insurance and other forms of social insurance are most developed outside the United States, and we rely for our summary of these developments (by special permission) on the authoritative works of I. M. Rubinow (*Social Insurance and Standards of Health Insurance*, both published by Henry Holt & Co.)

On the other hand, public health work has developed rapidly of recent years in the United States, and this country now rivals Germany in some branches. We, therefore, give a complete statement of public health work in the United States, prepared for us, exclusively from official sources, by Miss Evelyn Salzmänn.

SOCIAL INSURANCE

[Rubinow, *Social Insurance*, pp. 15-26.]

The famous message of the Emperor to the Reichstag reconvened on November 17, 1881, announced that accident and sickness insurance bills would be introduced, but that other problems such as that of old age and invalidity would also be considered later. It was for considerations of minor importance that the sickness bill

became a law first, in 1883, and the accident bill in the following year. The era of real state social insurance had come into existence.

The essential subdivision of social insurance has been mainly into the following branches: Insurance against:

1. Industrial accidents.
 2. Sickness.
 3. Old age
 - and
 4. Invalidity
- } combined.
5. Insurance of widows and orphans.
 6. Unemployment insurance.

Several newer forms of insurance are not mentioned in this briefer classification, because they are usually (though not always) combined with one of the standard branches. Thus, non-industrial accidents, which the workingman may suffer in the same degree as other classes of society, are usually handled by the organization of sickness insurance, though there is now at least one example of special provision for this emergency under the Swiss law of 1911. Industrial diseases, which bear an equally close relation to the problems of accidents and of diseases, are treated in most countries with the latter, but in some with the former, and the tendency to bring them into closer connection with accident insurance is quite pronounced at present. Invalidity and death, when due to industrial accidents, are taken care of in a different way than when resulting from ordinary disease. Maternity insurance is, for purposes of administrative convenience, usually treated as a part of the problem of sickness, though one country—Italy—presents an interesting exception. Funeral insurance is universally treated in all social insurance systems with either accident or sickness insurance, according to its causation.

The greatest results were achieved in the domain of accident provision. The principles of industrial accident insurance are somewhat different from other branches of social insurance. With very few minor exceptions, all countries agree that the entire cost of compensation for industrial accidents must fall upon the employer. The financial responsibility for losses occasioned by industrial accidents is, therefore, transferred from the wage-workers to the employers, and this transfer—known as the compensation principle—is the essential feature of accident insurance. The method of organization of insurance, therefore, becomes a matter of secondary importance as far as the workingmen are concerned. It is a problem

primarily for the employer. Compulsory accident insurance means compulsion of the employer and not of the employee. In a good many countries, therefore, so-called accident compensation laws instead of accident insurance laws were adopted. But in one of the two forms most industrial countries following the German example have within the 30 years adopted laws providing for wage-workers injured in the course of their employment, until early in 1910 the United States remained the only country of industrial importance without such legislation. The order in which the various countries have fallen in line is as follows:

First Decade (1880-1890): Germany, 1884; Austria, 1887.

Second Decade (1891-1900): Hungary, 1891; Norway, 1894; Finland, 1895; Great Britain, 1897; Denmark, 1898; Italy, 1898; France, 1898; Spain, 1900; New Zealand, 1900; South Australia, 1900.

Third Decade (1901-1910): Netherlands, 1901; Greece, 1901; Sweden, 1901; West Australia, 1902; Luxemburg, 1902; British Columbia, 1902; Russia, 1903; Belgium, 1903; Cape of Good Hope, 1905; Queensland, 1905; Nuevo Leon (Mexico), 1906; Transvaal, 1907; Alberta, 1908; Bulgaria, 1908; Newfoundland, 1908; United States (for Federal employees only), 1908; Quebec, 1909; Servia, 1910; Nova Scotia, 1910; Manitoba, 1910.

Fourth Decade (1911—): Switzerland, 1911; Peru, 1911; Roumania, 1912; about 25 states of the American Union, 1911-1913.

In many of these countries, perhaps in all even, the influence of the German experience was particularly strong, as Germany was the only country with a system in well-working order when the earlier of these laws were passed. And in later years, while one country after another was falling into line, Germany not only remained the country with the longest experience as the pioneer in the movement, but with characteristic German thoroughness, it soon was best equipped with the necessary statistical material for a scientific discussion of the problem. The effect of German example is also seen in the order in which the other countries followed.

And yet when summed up in just that way, quite an erroneous impression may be conveyed, as if it were nothing but the German influence that created the world movement. A close investigation of the history of these enactments does more justice to these countries. In France, for instance, the subject was agitated continually since 1880, and as early as 1888 an accident compensation law passed one house of the Parliament, but it took ten more years before the law was enacted. Similarly in Italy, where the law passed

in the same year as in France, it was preceded by 20 years of almost continuous agitation; the first bills having been introduced in the Chamber of Deputies in 1879. In Sweden, where the law was not enacted until 1901, a compensation bill to that effect was introduced as early as 1884. In Norway, where compulsory accident insurance was effected in 1894, obligations to furnish certain relief in case of accidents were placed upon the employer in 1881. In highly industrialized Belgium, which, because of a decidedly reactionary political atmosphere, was very late in joining the international movement (1905), bills were introduced as early as 1890. Even in Imperial Russia, the problem was discussed as early as 1881, and an official bill was presented to the higher authorities in 1893.

In the domain of sickness insurance the history of victories achieved is perhaps a somewhat more modest one. Not that the problem of sickness is any less acute than that of industrial accidents. But perhaps the very generality of the risk of sickness has created a great many relief institutions among the wage-earners, and, therefore, made a state interference seem to be less imperative. As yet the German example of a statewide, universal, and compulsory system of sickness insurance has been followed by few countries. Austria in 1888 and Hungary in 1891 were the earliest to fall into line. In the other countries the force of the movement for social legislation centralized itself upon the accident problem. Sickness was not entirely neglected, but there was stronger objection to any compulsory system, as compulsion in this case would include the workmen. The hope for the possibility of voluntary insurance was given, and is still being given, a much longer trial in this field of sickness relief. Of course, here too the modern progressive state did not remain altogether inert. From an attitude of utter neglect and even antagonism towards workmen's sick-benefit associations, most of the states gradually went over to that of encouragement and control, and then took the next step to financial assistance of these voluntary organizations from the state treasury, as do now France, Denmark, Sweden, Belgium, Switzerland, and others. But it is quite significant that another 20 years' experimentation with regulation, encouragement, and subsidy has convinced even the most obstinate opponents of compulsion that without it the problem of sickness in a workman's family cannot be solved. Norway in 1909 introduced a compulsory sick-insurance system, as did little Serbia in 1910; and Lloyd George's great English National Insurance System of 1911 presents the latest important achievement of the compulsory principle. In Italy the in-

roduction of a similar scheme has been considered for a long time and its final success is assured by the fact that in 1911 Italy—the first of all European countries—introduced a centralized national compulsory system of insurance of wage-earning women in case of maternity. Even in Russia a governmental proposal of a complete sick-insurance system has passed the Duma during the past year and become law. In other words, having more or less satisfactorily settled the problems of accidents, Europe is now devoting its energy and attention to the kindred subject of sick-insurance.

In a similar status the equally important problem of old-age provision may be said to be at present. When the first proposals for social insurance were carried through the German Parliament in the early eighties, it was announced that the question of old-age provision constitutes an essential part of the new social policy. But even in Germany another five years elapsed before the old-age pension law passed. The technical aspects of any old-age insurance are so complex that time was needed for the preparation of the necessary data. Besides, each one of the three systems imposed new burdens upon the employers and naturally the latter resisted it violently and had to be broken in gradually, as it were.

France and Belgium since the early fifties experimented with national institutions for voluntary old-age insurance, and so long as the assistance was limited to providing a safe place and assuming the administrative costs, the undertaking was a perfect failure. More direct and substantial subsidies were next tried. In 1895 France first began to grant such subsidies. When Italy, in 1898, organized its National Voluntary Old-Age Insurance Institution, substantial subsidies were from the first made a part of the system, and in that country such subsidies were advocated for about 20 years previous to the final adoption of the law. In Belgium after 40 years of unsubsidized insurance, subsidies were granted in a small way from 1891, and later the policy of subsidies was broadened out by the special act of 1900. Spain, trailing behind the more progressive countries, has within recent years (1908) started its new National Old-Age Insurance with a similar subsidy plan.

Simultaneously, however, with this movement for subsidized old-age insurance, a movement of a somewhat different nature grew up, which had its most important manifestation in the British old-age pension act of 1908. The truth is, that the movement for old-age insurance proceeded from several different directions. One moving force was the necessity of meeting the problem of superannuation in modern industry—and that led up to private pension

funds, and old-age insurance with compulsory contributions from employers. But there was another tremendous moving force in the desire to improve the conditions of poor relief in these countries, where such relief for the aged was admitted as a right. Denmark was the pioneer in this development of national old-age pensions with its laws of 1891, "providing old-age support for the worthy poor aside from poor relief," and there were many good reasons why Great Britain selected this path rather than that of compulsory old-age insurance, when it finally passed a measure in 1908. Quite naturally the same preference for straight old-age pensions is found in the Australasian Colonies, which, in point of accomplishment, actually got ahead of Great Britain by some eight years. But a very curious combination of both forms of old-age provision may be found in France, where in 1905, or three years earlier than in England, an old-age pension law for worthy poor was passed, and nevertheless was five years later followed by a compulsory old-age insurance system, which exists side by side with the older one.

In 1900, in a very small way, the Belgian city of Ghent began the experiment of subsidizing labor unions in this work [of unemployment insurance]. The experiment was watched very carefully, and very soon was admitted to be a very effective way of meeting the problem, if the problem is ever to be met. The experiment was, therefore, soon tried in other countries; in Italy by the large Milan foundation for social welfare in 1905. In Germany a number of cities in 1907, and many more since 1909, have developed this plan. In France, Norway, and Denmark, the very interesting, and from the ordinary American point of view almost incredible, situation is found of the Central Government subsidizing labor unions or other organizations of wage-workers in their function of paying unemployment benefits and a similar measure is earnestly agitated for in Italy. And finally, Great Britain, towards the close of 1911, passed its compulsory unemployment insurance system, the first national system in this field, covering nearly two and a half million workmen. It may finally be said that a theoretical answer to the question "Is unemployment insurance possible?" has been given, and the answer is in the affirmative.

With accident, sickness, old age, and unemployment, the list of the existing social insurance institutions practically closes. But in the future another branch, as yet very little spoken of, is bound to achieve a good deal of prominence. This is the insurance of widows and orphans, or ordinary life insurance.

What was true of old-age and invalidity insurance is also true

of widows' and orphans' insurance. The more compact and better paid groups of wage-earners in navigation, mining, and railroads, are already provided with such form of insurance in many countries. We already find such pension systems in the mining industry of Austria, Belgium, France, Germany, and Great Britain; in the railroad industry of Belgium, France, Germany, Russia, and Spain; in the navigation industry of France, Germany, and others.

Outside of these definite wage groups several states have made an effort to meet the need by providing cheap voluntary insurance. Such efforts either in connection with the Postal Savings Bank System, or old-age insurance institutions, have been made in England, in France, in Italy, and even in Russia. But needless to say they have been invariably complete failures. France was the pioneer in this problem, by providing for a small death benefit continuing only for six months, as a part of its new old-age insurance system. But Germany was again the first to provide a comprehensive widows' and orphans' pension system for its entire wage-earning population, through the new insurance act of 1911, revising all its existing social insurance legislation. Thus a new path has been opened for other civilized countries to follow. Finally, the United States, within the last two or three years, by the somewhat sudden development of the mothers' pension movement, has indicated at least the possibility of a different solution of the same problem.

OLD AGE INSURANCE

(a) *Compulsory, but Not Financed Exclusively by Governments*

[Rubinow, *Social Insurance*, pp. 350-356.]

The German system applies to all wage-workers in industry, transportation, commerce, agriculture, and domestic service; and to salaried employees earning less than 2,000 marks (\$476) per annum.

The French system is equally comprehensive, except that even for wage-earners there is a limit of 3,000 francs (\$579).

In Germany, in 1910, out of a population of 63,000,000 over 16,000,000 were insured, or nearly 25 per cent. Considering that persons under 16 were not insurable, and that married women do not often carry the insurance, the proportion is very high, probably much more than one-half of the adult population. It was by 2,000,000 greater than the number insured against sickness, as in the latter system several large wage-earning groups were left out. On the other hand, there were over 27,000,000 persons insured against accidents, or 12,000,000 more than against old age. The difference

is mainly explained by the large number of independent farmers insured against accidents but not against old age.

In France, with a population of 40,000,000, the number of persons subject to compulsory insurance was estimated at 10,500,000, or 26 per cent, and voluntary insurance is available to 6,000,000 more. In Germany, experience has shown that of the voluntary insurance very little use has been made, but it is not unlikely that the optional feature of the law would be somewhat more successful in France. However, it must not be forgotten that in addition to these 10,500,000, over half a million are insured under the industrial systems in mining, navigation, and railroading.

The German influence was strong in the system of state contributions. The share of the state, besides bearing all the cost of central administration, furnishing postoffices as financial agencies free, is a direct contribution to the pension, not during the insurance period, but after it has matured.

In Germany the amount is 50 marks per annum (\$11.90). In France the subsidy provided in the original act was 60 francs (\$11.58), but to overcome the opposition among radical labor organizations it was increased to 100 francs (\$19.30) by the act of February 27, 1912.

The French system is in fact extremely simple. Under the compulsory system adult males pay 9 francs per annum, or 3 centimes per day; adult females pay 6 francs per annum, or 2 centimes per day, and minors $4\frac{1}{2}$ francs per annum, or $1\frac{1}{2}$ centimes per days, and the employer contributes an equal amount, so that the actual premium is double the amounts quoted. For voluntary insurance a certain range is permitted between 5 and 18 francs.

In Germany the system of contributions is complicated. An actual adjustment to the true wages which was contemplated originally would have created enormous complications. The existing system is a compromise between the two principles, in that it provides a classification of all degrees of wages into five groups. Until the radical overhauling of the entire system of social insurance in Germany in 1911, the classification of the wage-groups, and the respective rate of contributions, was as follows:

Wage group.	Annual earnings.		Weekly contributions.	
1	350 M. or under	\$83.80 or under	14 Pf.	13.3c.
2	350 M. to 550 M.	83.80 to \$130.90	20 "	14.8c.
3	550 " 850 "	130.90 " 202.30	24 "	15.7c.
4	850 " 1150 "	202.30 " 273.70	30 "	17.1c.
5	1150 M. or over	273.70 or over	36 "	18.6c.

Of these amounts the employer and the employee contribute one-half. On a basis of fifty weeks of employment these contributions would amount to: 7, 10, 12, 15, and 18 marks (\$1.66, \$2.86, \$3.57, \$4.28, and \$5.15). The rate of contributions was slightly increased by the comprehensive revision of the whole insurance code in July, 1911, but as the increase of contributions was made only for the purpose of providing an independent and new form of social insurance, namely, widows' and orphans' pensions, perhaps it is not necessary to go into these changes at this place.

Still more complicated is the system of benefits. Both systems combine old-age insurance with invalidity insurance, though the invalidity feature in the German system is very much more important than in the French system. In addition, the French system carries a small life insurance feature with it, and the German new act has tacked on a widow and orphan insurance system. Finally, for administrative purposes also, the German system includes provision for delayed cases of sickness; and from the standpoint of national health, this side of the old-age insurance system is extremely important. It is, of course, difficult to grasp the entire picture at once. The various features must be studied separately, the old-age pensions, as the basic feature of the system, being best taken up first.

Here, again, there is a considerable difference between the German and the French systems. The German system provides definite old-age pensions, while the French holds on to the system of individual accounts and pension accumulations, developed in the practice of voluntary insurance.

As already mentioned, in Germany the old-age pensions begin at 70. The original French act of 1910 placed the age of the normal pension at 65, but for the purposes of overcoming the opposition of the radical labor organizations, it was subsequently reduced (by the act of February 27, 1912) to 60; and this difference naturally puts the French system far ahead of the German one from the point of view of social welfare, though the higher German age limit, as will be explained presently, is largely mitigated by the invalidity considerations. The German old-age pension consists of two portions: (1) the one of 50 marks contributed directly by the government treasury, and (2) the amount contributed by the Insurance Institution out of its funds in accordance with the wage-class.

Class.	Insurance pension.		State subsidy.		Total.	
	Marks.	Dollars.	Marks.	Dollars.	Marks.	Dollars.
1	60	14.28	50	11.90	110	26.18
2	90	21.42	50	11.90	140	33.32
3	120	28.56	50	11.90	170	40.46
4	150	35.70	50	11.90	200	47.60
5	180	42.84	50	11.90	230	54.64

In actual practice the pension seldom equals exactly one of these amounts, for a worker rarely, if ever, remains his whole life in the same wage-class and in the computation of the actual pensions the respective length of service in the various classes is taken into consideration, so that the old-age pensions will be of all possible amounts between 110 and 230 marks (\$26.18 and \$54.64).

On the other hand, the French method of computing the pension is technically different though the final results are approximately the same. No definite pension is promised, but each premium payment carries a certain pension value with it, depending upon the age of the insured. Instead of a table of definite payments, such as the German law contains, the French government has published an estimate of probable pensions, on the supposition of continuous payments, beginning at a certain age.

The pension obtainable is entirely a result of the number of contributions, i. e., of the age when the insurance starts. If it be begun at the tender age of 12 (when employment is permitted by the French law), and kept up continuously till 65, which, after all, is an unusual condition, pensions of 400.19 francs (\$78.78) might be earned by the male employees (only \$62.73 by the females). If, however, the insurance begins at 40, the possible maximum is only 160.59 francs, or \$30.99, and 127.05 francs, or \$24.52. The law being compulsory, and most wage-workers beginning their employment at or near the minimum age limit permitted by the law, it is reasonable to expect that the pensions maturing in 1960 will be near the maximum amounts. On the other hand, for all the 50 years up to that time, the pensions will be very much smaller.

(b) *Old-Age Pensions—Exclusively Financed by Governments*

[Rubinow, *Social Insurance*, pp. 374-380.]

Of the restrictions, the more important is that concerning the amount of income permitted; less so is the limitation of the ownership of property. These limitations naturally vary much in proportion to the local conception of a minimum standard. The high-

est standard is found in Australian countries. No one may receive a pension who enjoys an income of £52 in Australia (£1 a week or \$5), and £60 (\$300) in New Zealand. In Great Britain the permitted revenue must not exceed £31 10s., or about \$157.50 per annum, or, roughly, \$3 per week. In France, the permitted amount is much less—480 francs, or \$92.64, while in Denmark, only 100 kroner, or \$26.80, may be disregarded. Under the temporary scheme in Belgium, a revenue of 360 francs for single persons, and 600 francs for married persons, was permitted.

Important as are all these requirements, theoretically, the one which definitely determines the sphere of activity of a pension act is the economic qualification contained in the maximum income. The other qualification is that of age. Here, too, a wide variation is observable. The British and French pension systems (until 1910) have a very high age limit of 70; New Zealand and Australia, as well as the Australian colonies, before the act for the entire Commonwealth was adopted, began their pensions at 65 (as did Belgium under its temporary provision), and Denmark begins its old-age relief at the earliest age of 60. It is necessary to add that at least in two countries, Australia and France, the pension provisions are extended to invalids, irrespective of age, provided incapacity may be definitely established.

In Australia, as in Denmark, an adjustment to the individual case is permitted. The amount of pension must be "at such a rate as, having regard to all the circumstances of the case, the commissioner who determines the pension claim deems reasonable and sufficient." A maximum amount of £26 per annum, or about \$2.50 per week, is provided, with a further condition that the pensioner's total income, including the pension, must not exceed £52 per annum, or \$5.00 per week. The same comparatively high level of pensions obtains in New Zealand, and did obtain in those Australian colonies which preceded the Commonwealth's Act.

Finally, the British system, in amount of pension, stands between those of Australia and the Continental systems. The amount of pension fluctuates between 1 and 5 shillings per week, 24 cents to \$1.22, according to the amount of the other income as per the following schedule:

When income does not exceed £21,	the pension is	5 shillings
" " is over £21 but not over £23,	2½ s	4 "
" " " £23 2½ s. but not over £26	5 s. . . .	3 "
" " " £26 5 s. " " " £28	17½ s. . . .	2 "
" " " £28 17½ s. " " " £31	10 s. . . .	1 "
" " " £31 10 s.	there is no pension.	

Roughly, the combined value of the pension and the income enjoyed will fluctuate between \$1.25 a week for those who have no income of their own at all, and about \$3.00 for those who are on the boundary line.

It was estimated in advance that the number of persons of 70 years of age and over in Great Britain was 1,254,000, of whom 393,000 probably had an income exceeding £26 per annum (which was the level proposed and subsequently changed to £31 10s. per annum), that 414,000 were paupers and about 60,000 not qualified to receive pensions for various reasons, and that the number of pensioners would be 386,000. It was further assumed that the pension would prove a strong stimulus for reducing the number of paupers and thus increasing the number of pensioners to about 480,000 in 1911, and 626,000 in 1912. Appalling as these figures were, the actual experience showed that they materially underestimated the existing demand for old-age relief, as in 1909 the total number of pensioners already reached 667,000, or nearly twice as many as were expected, constituting over one-half of the population over 70 years of age, although about 25 per cent or 30 per cent were receiving aid as paupers. Since then the number of pensioners has grown with remarkable rapidity, reaching 700,000 in 1910, 907,000 in 1911, and 942,000 in 1912. The sudden increase in 1911 is clearly due to the expiration of the poor-relief disqualifications. Thus some 75 per cent of the population over 70 years of age are receiving old-age pensions at present.

It is still more amazing that the degree of old-age need was almost as urgent in the prosperous Australian colonies. Who has not heard of the economic prosperity of New Zealand? Nevertheless, in a population of a little over 1,000,000, the number of pensioners in 1909 was 14,396, or nearly $1\frac{1}{2}$ per cent. As the number of persons over 65 years of age constitutes about 4 per cent of the total population, it follows that some 35 per cent of that age-group were able to qualify for the old-age pensions.

Finally, for the whole of Australia, the number of pensioners in December, 1909, was 60,000 in a population of 3,832,760, or nearly 1.5 per cent or over 40 per cent of the aged population.

Can any evidence be more convincing than these dry figures of the urgent need of some form of old-age provision?

With such large and rapidly growing numbers of pensioners throughout the civilized world, the cost of old-age pensions must be perceptible. Even in such a small country as Denmark the cost has increased from \$685,000 in 1892 to \$2,175,000 in 1907. In New

Zealand the cost reached nearly \$1,750,000 in 1909; in New South Wales over \$2,134,000, and in Victoria over \$1,325,000. The greatest expenditures are naturally called forth in France and Great Britain. In France the cost during the first year of its application was about 45,000,000 francs (about \$9,000,000), and has since increased to some 100,000,000 francs, or about \$20,000,000. In Great Britain, where both the number of pensioners and the amount of pension is greater, the cost for 1909 was £8,500,000, or \$42,000,000, and increased to £9,800,000 (\$48,000,000) in 1910-11, and £11,700,000 (\$57,000,000) in 1911-12. In other words, the pension system called for large appropriations which must rapidly increase, while under a compulsory insurance system, on the contrary, a gradual decrease of contributions from the national treasury is expected.

The financial arrangements of the different systems are, therefore, of considerable importance. In this, two different types may be distinguished: Under one there is a concentration of all expenditures within the national financial system, and under the other there is an effort to shift at least part of the expenditures upon the local authorities and means.

In Great Britain and its colonies the first plan prevails, and it is understood in Great Britain that the income tax is to be called upon to furnish the necessary means for meeting this additional expense. In Denmark and France, where the local authorities are given considerable discretion in determining the amount of pension, they share in its cost. In Denmark the rule is simple: the commune grants the relief out of its own funds and is reimbursed, out of the treasury, for one-half of the expenditures. In France the financial arrangements are more complicated. The communes which grant the pensions receive subsidies from the department, according to a complicated sliding rule of taxable property which works out in such a way that the larger the proceeds from local taxation, the larger is the share of the commune and the smaller the subsidy of the department. The latter may vary from 90 per cent to 30 per cent of the total cost. In addition, the state contributes from 10 per cent to 20 per cent, according to the number of persons per thousand assisted, if it is over 10,000. Furthermore, the department itself receives a subsidy from the state varying from 50 per cent to 95 per cent, according to the local level of taxation.

HEALTH INSURANCE

[Rubinow, *Standards of Health Insurance*, pp. 156, 157, 271, 272.]

In Germany the employer contributes a sum equal to one-half of the employee's contribution, or one-third of the total. The same is true of Austria, Russia, and some other countries. In the insurance systems of Hungary and Servia, employer and employee contribute equal amounts.

One of the important deviations of the British system from the German is the compulsory contribution from the public treasury, in addition to that of the employer.

The respective shares in the British law are so well known that it seems scarcely necessary to quote them: the insured pays 4d. (females, 3d.) per week, the employer 3d., and the state, in a somewhat indirect way, 2d. In proportion to one another, the respective shares, in case of the male insured, are: employee, 44.5 per cent; employer, 33.3 per cent; the state, 22.2 per cent; in case of the female insured the proportions are 37.5 per cent, 37.5 per cent, and 25 per cent. There are numerous modifying conditions, some of which will be referred to presently. . . .

Assuming that most wages [in America] fall between \$500 and \$1,000 a year, 4 per cent of that will amount to from \$20 to \$40 per annum. The sum is not inconsiderable. For the twenty-odd million wage-workers of the United States, it will represent the staggering amount of perhaps \$600,000,000 per annum. But it is not all an additional charge. No one knows how much the American working class pays at present for sickness benefits, medical aid, and for funeral insurance together. We do know, however, that for the last and least important aspect of the entire problem, funeral insurance, over \$200,000,000 annually is paid to industrial insurance companies. In the investigation made some 12 years ago by the United States Bureau of Labor, it was ascertained that the expenses for sickness and death (exclusive of sickness benefits) amounted to \$26.78 per family.

[SOURCE: Article by Prof. Irving Fisher in *The American Labor Legislation Review*, March, 1917.]

We may, I think, accept as conservative the calculations of the National Conservation Commission that at least 42 per cent of the deaths now occurring in the United^e States are unnecessary, or that over 630,000 lives could be saved annually by applying existing and known methods of life saving, which would add at least fifteen years to the average duration of human life. These estimates are

doubtless over-conservative, as may be judged from the data of the Commission on Industrial Relations, from the recent health surveys of the Metropolitan Life Insurance Company, and from other evidence.

There are special reasons to hope that health insurance may win favor rapidly. The war has made labor scarce and therefore dear. This fact will make not only for high wages, but also for the conservation of labor. Students of the history of slavery find that when slaves were abundant and cheap, masters worked them to death and replaced them when worn out. Consequently, cruelty was condoned and fashionable. On the other hand, when slaves were scarce and dear, the masters took good care of them and a humanitarian sentiment developed to correspond. I believe it to be a correct economic portent that the world is about to enter upon a period of life conservation. The war has for a time withdrawn much of the world's labor supply and destroyed and maimed a large part of that which it has withdrawn. The world will seek the greatest possible salvage out of the wreck.

MATERNITY INSURANCE

[Rubinow, *Standards of Health Insurance*, pp. 123-129.]

Altogether 14 systems of maternity insurance may at present be recognized, and 10 of them are in connection with compulsory health-insurance systems (Germany, Austria, Hungary, Great Britain, Russia, Norway, Bosnia-Herzegovina, Servia, Roumania, Luxemburg). Italy has an independent system of compulsory maternity insurance, in Switzerland maternity insurance is a feature of the comprehensive but voluntary sickness-insurance system, and finally France and Australia have recently taken a new step in "social insurance" by providing non-contributing state pensions to lying-in women.

In Germany a substantial lying-in benefit, amounting to a sickness benefit for eight weeks, is required by law for all insured women, no distinction being made between married and unmarried mothers. With the consent of the lying-in woman, medical attendance, services of midwife, or nurse, or hospital care, may be substituted for the entire maternity benefit, or parts of it. Special pregnancy benefits, in case of incapacity up to six weeks, are among the optional benefits allowed by the sick fund, as also the extension of benefits to the wives of insured persons.

The maternity benefits of the British law have occasionally been referred to as the most liberal in Europe, but that is hardly correct.

The basic maternity benefit is a flat amount of 30 shillings, but this is payable both to the insured women and to the wives of insured men. However, in Hungary, Servia, Roumania, and Norway as well, maternity benefits to wives of insured persons are compulsory. In addition to the 30 shillings, insured women are entitled also to the regular sickness benefit during confinement. The 30-shilling provision is entirely free from any moral strings; all wives (or widows in case of posthumous children) of insured persons, and all insured women are entitled to it. Curiously enough, however, the additional sickness benefit just referred to is payable only if the "insured woman" is married. Some discrimination against the unmarried mother was after all dragged in to satisfy Anglo-Saxon moral standards.

Nothing can be more readily estimated than the approximate number of births, and nothing can, therefore, be more easily provided for in advance. In Austria, in Hungary, in Russia, in fact in almost all the compulsory systems enumerated above, such medical aid is required.

As to the duration of these benefits laws again differ. The Italian law of 1911 establishing compulsory maternity benefit resulted from a labor law prohibiting employment of women within four weeks after childbirth. Of 12 countries granting maternity benefits the required period is four weeks in six, six weeks in five, eight weeks in two (Germany and France). Somewhere between four and eight weeks must, therefore, be the minimum period of enforced rest after childbirth.

The German law permits at least two weeks' benefit before childbirth, the Russian act two, and the French four weeks. These periods are included in the total period indicated above, but in several countries the law permits optional extension of benefits to pregnant women for longer periods.

Finally, the interests of the child would require at least some extension of time after the necessary period of recuperation for the mother. During this period breast feeding may be kept up, and some care given at the time when it is most important. In Germany, such extension up to six weeks is permitted. Altogether, the liberal and prosperous fund may grant aid for 14 weeks to the wage-working mother.

Germany, by a decree of December 3, 1914, has voted 2,000,000 marks a month for the purpose of providing for the wives of men at the front the following benefits at childbirth: (1) 25 marks to meet the cost of childbirth; (2) 1 mark per diem (including Sun-

days and holidays) for 8 weeks, of which at least 6 must be after childbirth; (3) 10 marks for additional nursing and medical aid, if necessary; (4) in case of a breast-feeding mother, $\frac{1}{2}$ mark per diem for 12 weeks, making a total benefit period of 20 weeks, and a total maximum cost of 133 marks, or \$31.65.

In explanation of these measures the decree states that "the enormous sacrifice of human life which war demands makes it the imperative duty of the state to take proper care for the preservation and strengthening of the coming generation at the very moment of entrance into this world."

ORGANIZATION OF MEDICAL AID

[Rubinow, *Standards of Health Insurance*, pp. 237-247.]

Complete organization would presuppose a state of affairs in which all the medical work to be done for the members of a health-insurance fund would be done by physicians and surgeons (one or many, as the case may be) who are specially employed for the purpose and devote their entire time to it, as is the case with the internes in hospitals and in other institutions. That is not at all a revolutionary proposal. It exists in many industrial corporations, it is found on a national scale in the famous system of Russian village medicine, and often gives excellent results. It is in use in some German health-insurance funds and is advocated by many experts on health insurance and by a goodly proportion of administrative officers of health funds.

It is sometimes advocated even in this country by persons familiar with the advantages of organized medical service in the army or navy, for instance. It finds its support occasionally in the brilliant results achieved by thorough organization of medical service in the building of the Panama Canal.

But this entire elimination of private practice among members of a health-insurance system has raised very strong objections from two sources—the medical profession and the insured themselves. The physicians are opposed to such complete organization because they fear that in its place will be found for only a limited portion of the profession—which seems to be based upon an assumption that the medical profession is already overcrowded. It is true that the census indicates some 150,000 physicians in the United States, or 1 physician to a population of some 600. Yet it is difficult to say whether this proportion is excessive. There are many idle physicians, but there are also many overworked ones, and many ill persons who do not receive adequate medical aid.

One of the most significant results of the *Community Sickness Survey* of a middle-sized city undertaken by the Metropolitan Life Insurance Company* was the statement that only "61 per cent of the cases of sickness had a physician in attendance," and that "only 45.3 per cent of those sick but able to work had physicians in attendance," while, "of those both sick and incapacitated for work, 63.8 per cent employed physicians or were being treated in institutions." If, therefore, nearly two-fifths of the sick poor receive no medical aid, it becomes obvious that through a system of health insurance the amount of medical aid to be furnished would at once increase very materially. Perhaps a very rough computation may be made here for the purpose of illustration only. If the average annual number of sick days per adult person is about 10, a population of 600 will give some 6,000 days of illness, or some 20 patients per every working day for each physician, perhaps as many as one should be required to care for. But in every civilized community the number of physicians required for the work of control, of investigation, of public health and hygiene is growing fast, so that the foregoing proportion of physicians to population is probably higher than will be found in actual practice. Moreover, no system of health insurance contemplates the inclusion of the entire population, and among the higher social strata private practice, with its higher fees and greater income and leisure for the medical practitioner, may still persist.

Another serious objection which is advanced by the medical profession is that complete organization of medical practice would lower the standard of medical income and would close the avenues for advance to the ambitious members of the class. This argument can be very readily disposed of. High medical incomes are very few and far between. They are found almost exclusively among the fortunate few who are ministering to the ills of the wealthy. In practice among the poor, large incomes can be achieved only through exhaustive overwork or by gross neglect of the interest of the patients. The difficulty is that the psychology of the medical man has been adjusted to a speculative hope of exceptional success, a factor wholly absent in most other liberal and scientific professions, and one which frequently has an injurious effect upon the entire psychology of the profession and its attitude of the average physician to social problems.

* *Community Sickness Survey*, Rochester, New York, Sept., 1915, by Dr. L. K. Frankel and Dr. L. I. Dublin. *United States Public Health Reports*, Feb. 25, 1916.

In Germany, the recent law of 1911 demands the freedom of choice between at least two physicians "if it does not add excessively to the cost," with the important limitation that all medical aid must be furnished by physicians under contract. Here, also, practice has created both types, while the question of comparative advantages of the physician employed outright and selection from a large list of physicians still remains one of the mooted questions in the practice of German social insurance.

While exact information as to the economic status of the medical profession in this country is lacking, the very fact that statements as to the average income of physicians, varying from \$600 to \$1,200, are frequently mentioned and accepted with credulity seems to indicate an unsatisfactory condition for many.* Evidently satisfactory progress of medical science and the art of medical practice cannot be built upon such an economic basis. A prosperous, rich people is entitled to a medical profession sufficiently relieved of the struggle for existence, to be able to command some leisure from work, and to devote part of that leisure to its own development. For medical science is at present perhaps on the height of its development, and no amount of school education alone can long keep the practising physician abreast of the times unless supplemented by continuous study of the results of scientific advance.

The proper organization of medical aid is, therefore, closely connected with the complicated problem of remuneration for medical work. It is charged by many, for instance, that the shortcomings of the British system, repeatedly referred to above, depend largely upon the unsatisfactory provisions for payment to doctors. It is true that the question of rate of payments to physicians was the cause of serious contention between the central authorities of the national health-insurance system and the organized medical profession in Great Britain,† and that in various German cities it has led to serious conflict between the insurance funds and the physicians, often accompanied by the so-called "doctors' strikes," ‡ of which as many as 1,022 were recorded up to 1911, with 921 decided in favor of the doctors. This result alone would indicate that usually the medical profession had real grievances to contend with.

* The Social Insurance Bureau recently established by the American Medical Association, the work of which is in charge of the writer, contemplates collection of accurate data on this subject.

† See "Report for 1912-13 on the Administration of the National Insurance Act," Part I (*Health Insurance*), pp. 124-158.

‡ See I. G. Gibbon's *Medical Benefit*, especially pp. 227-246.

INSTITUTIONAL TREATMENT

[Rubinow, *Health Insurance*, pp. 85-86.]

In Germany, the development of special sanatoria and convalescent homes, largely owned by the sickness funds themselves, has been very rapid. Thus, e. g., the Leipzig fund has three convalescent homes and a special Zander institute for treatment of functional disorders by special exercises, Munich has two sanatoria, Hamburg two convalescent homes, etc. This is entirely independent of the special institutions established by the invalidity insurance institutes operating under the old-age and invalidity insurance laws, which furnish a good deal of medical aid to those insured. It is the invalidity institutes which have provided some 65 sanatoria for special treatment of tuberculosis, with very important results.

The whole problem of institutional treatment in Great Britain is still in a very unsatisfactory condition. The so-called sanatorium benefit is limited to tuberculosis and such other diseases as the Local Government Board may designate, but as yet no others seem to have been so designated. The sanatorium benefit is therefore comparable to the tuberculosis treatment of the German invalidity insurance, or would be, if in reality it were not so much inferior to the standards of the law. The sanatorium benefit may be given in form of dispensary or even home treatment, and in actual practice often resolves itself only into supplementary allowances to the physician for medication in cases of tuberculosis, which should be a constituent part of the ordinary medical aid. The serious obstacle to the proper development of this benefit is the appalling insufficiency of hospital facilities in Great Britain; but this, it was hoped, would be gradually overcome through special appropriations for construction of tuberculosis sanatoria. How far this program may be continued in face of the financial problems created by the war remains to be seen. Nevertheless, even if the reality is very much below the standards established by the law, it has accomplished some good by attracting public attention to the lack of hospital facilities, and creating a constant, urgent demand from the insured for correction of this evil.

Modern sanitary science demands 5 beds for every 1,000 of population. According to the researches of the Fabian Committee, London and the adjacent counties have about 2 beds per 1,000, some 15 counties have from 1 to 2 beds, and most counties have even less than 1 per 1,000.

GOVERNMENT HEALTH WORK IN THE UNITED STATES *

Historical

Our government health activities have grown from a few scattered measures in colonial times in regard to quarantine. Along with the development of a full realization of the economic and social importance of health protection has grown up in the United States an intricately divided and subdivided system of government health service. The first attempt at public health legislation in the United States was made in Virginia in 1639; its object, to regulate the practice of medicine. Sporadic measures, especially in regard to quarantine, were adopted in almost all colonies during the latter part of the seventeenth century, but it was only after the formation of the Union that any serious attempts toward establishing any distinct health organization were made. Local organizations usually preceded state. It was usually the outbreak of some serious epidemic that inspired a city to create a health board. The Board of Health of Philadelphia was created in 1794 because of a yellow fever epidemic; the same reason occasioned the formation of the Baltimore and Boston boards in 1799. Other cities followed shortly, in most cases because of the outbreak of the same epidemic. But the first definite step taken for providing health *organization* was the Massachusetts law of 1797, establishing boards of health for the different towns of that state. To-day, in the United States, there is Federal, State and City health work; the list of health boards embraces every state in the Union, and practically every city of importance.

Federal Health Work

Our Federal health service dates from July 16, 1798, when Congress passed an act for the relief of sick and disabled seamen and established the United States Marine Hospital Service. It was not until 1832 that quarantine duties were added. In 1871 the service was reorganized and made more active; the operations of the service were extended, hospitals were placed under the charge of a surgeon general, who was commissioned by the President; various quarantine and public health functions were added. In 1893 the service was given the authority to establish quarantine regulations between states. In 1902 a bill was passed "to increase the efficiency and change the name of the United States Marine Hospital Service."

* The rest of this chapter was prepared from official documents by Miss Evelyn Salzmänn.

This bill changed the name to "*Public Health and Marine Hospital Service.*" The bill also provided for the organization of the service into seven divisions, provided for a hygiene laboratory which was to do research work in various diseases, make investigations on polluted water supplies, examination of chemical disinfectants, etc. In 1908 the scope of the Federal Health Service was further broadened—it had become a general public health guard instead of a marine hospital. It was authorized to co-operate with health authorities of states and territories; it was to publish the results of its investigations in regard to the spread and prevention of contagious diseases, and to conduct exhibits in order to disseminate practical information concerning the prevention of disease. By 1912, so general had become the duties of the Federal health service that it was no longer considered appropriate to call it "Public Health and Marine Hospital Service"; it was thereafter called the "United States Public Health Service." Under that name it is now conducted as a division of the Treasury Department of the United States. This, briefly, is the history of our Federal health service from its beginnings, as a medical service for our sailors to its present status as a protector of public health and supervising co-operative agent of all local health authorities.

The health work of the Federal Government to-day is, however, by no means restricted to the activities of this one division of the Treasury Department. There are health agencies scattered through the different departments of the government, including State, War, Navy, Treasury, Agriculture, Commerce, Labor, and the Interior. I propose to touch upon some of the more important health problems that the Federal Government handles through its various departments.

Quarantine and Care of Contagious Diseases

There are medical officers of the United States Health Service attached to the consulates at various points, who keep themselves informed of the prevalence of contagious diseases in those cities. It is the duty of these doctors to sign a bill of health for each vessel leaving for the United States, certifying that all regulations have been complied with in regard to disinfection of vessels and baggage, inspection of vessel and passengers, etc.* We have such officers stationed at most of the important ports. We also have stationed at various points of our insular possessions medical officers under appointment from the Treasury Department, engaged in incoming

*.Reprint, Public Health Report 49, 1910.

and outgoing quarantine. Supplementary to these commissioned health officers are the United States consuls. Every United States consul is a health scout, and it is his duty to maintain a constant vigil for the presence of contagious diseases. Every week each of these officers makes a written report to the Public Health Service—a clinical chart of the world is compiled at Washington from each week's accumulation of health reports and is distributed to all the health and consular representatives.* In this way the United States attempts to keep her country protected from the contagious diseases of foreign countries.

Research and Educational Work of the Federal Government

One division of the United States Health Service is devoted entirely to scientific research and sanitation. For this purpose the service maintains several large research laboratories, besides conducting public health investigations at certain of the marine hospitals and quarantine stations. The largest and most important laboratory is the Hygienic Laboratory at Washington. It is since the quarantine act of 1893, which gave the service the duty of preventing the introduction of infectious and contagious diseases, that this increasing attention has been paid to the science of bacteriology and preventive medicine. Men are sent abroad to acquaint themselves with the methods employed in foreign laboratories. The making of diphtheria antitoxin for the first time, in the United States Hygienic Laboratory, in November, 1894, was a direct result of such careful comparative study.† Studies of disinfectants are constantly being carried on and the laboratory has many discoveries to its credit in that branch of work. Up to 1902 the Hygienic Laboratory had been devoted almost entirely to research in pathology and bacteriology. The law of 1912 enlarged its scope and divided the laboratory into four divisions: pathology and bacteriology, medical zoology, pharmacology, and chemistry. The United States appropriated in 1916 for the maintenance of the Hygienic Laboratory at Washington \$20,000. Through its four divisions the laboratory conducts studies concerning parasitic diseases in man; studies of milk, water, and their relation to public health; investigations of the dissemination of tuberculosis, typhoid, pellagra, poliomyelitis, and other diseases; and various pharmacologic research studies that have led to the making of many new preparations. The laboratory publishes the results of its investi-

* *Review of Reviews*, March, 1914, W. A. DuPuy.

† "Annals of American Academy," March, 1911, J. U. Kerr.

gations as *Hygienic Laboratory Bulletins* and *Public Health Reports*.

Foods and Drugs

The Foods and Drugs Act, "an act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein," was passed on June 30, 1904. The purpose of this act is to enforce honest labeling of the foods and drugs which are produced and sold for interstate traffic, and to conserve health in so far as it is affected by these articles. The law states that it is a criminal offense to manufacture adulterated or misbranded foods or drugs within the District of Columbia or the territories or to ship any such article from or to any state or territory or the District of Columbia, or to receive and deliver any such article brought from another state. The terms adulterated and misbranded are specifically defined. The Department of Agriculture administers the act through the Bureau of Chemistry; it collects samples and conducts investigations and hearings. The law provides not only for inspection of domestic products, but also for inspection, before entry in this country, of foods and drugs produced in foreign countries. These foreign products must conform to the laws of this country and also to those of the country in which produced. The work of inspection is very closely identified with the work of the Customs Division of the Treasury Department—while the invoice of the shipment and the merchandise are in the possession of the appraiser, the food and drug products are being inspected by a representative of the Department of Agriculture. The inspecting officer of the laboratory (of which branches are established at the most important ports) examines the invoice and may demand samples of products if he sees fit. The analysis of all necessary samples is made at the laboratory branches with the least possible delay. Such products as are found to be in violation of the law are refused admission and required to be reshipped; if not reshipped within three months they are destroyed by the collector of customs.

There is no doubt that our Pure Foods and Drugs Law has had a very marked effect upon the sale of false remedies of all kinds and has been successful in checking traffic in harmful, falsely labeled, and adulterated foods from one state to another. Preservatives and artificial coloring have in many cases been voluntarily abandoned; successful prosecution has made such materials

too expense and troublesome. The most important effect of the Federal act, perhaps, has been its good influence on the legislation of the states. Most of the states have either enacted new laws or modified their old ones to conform with the Federal statute. The general uniformity of the recently enacted pure food and drug laws demonstrates the fact that uniformity in state legislation is not an impossibility. In the main the decisions of the courts have upheld the fundamental principles of the law. The propaganda for protecting the public against quackery recently received a powerful impetus by the Supreme Court decision of January, 1916. This decision upheld the amendment of the pure food law which says that the law applies to false claims of therapeutic virtues in medicines, and it negatived the claim of patent medicine men that Congress had no power to judge the virtue of a remedy—patent medicine people now have to tell the truth about their wares; that, according to Dr. Harvey Wiley, will prove rather fatal to a good many of them.*

But the Foods and Drugs Law has by no means brought the results that had been hopefully expected of it. Only too often have its enemies proved too much for it—our patent medicine trusts, manufacturers of chemical preservatives and sweeteners, and the caffeine interests have not been peacefully asleep since the enactment of that law; nor has our Government been as wide awake as would be necessary in the face of such enemies. The trouble starts with the law itself. It is not really a pure food or health law; it is in fact only a labeling law—as long as the producer warns the public when his food is unwholesome, he is innocent before the law. The law does forbid the use of certain products, and these are for the most part not employed in manufacture, but it leaves to the producers a large enough number of unwholesome and often harmful products so as to make many of our foods and drugs either altogether useless or, in many cases, actually injurious. The law, as it stands now, permits the introduction of minute quantities of poisonous material in prepared foods and so allows the general use of all the coal-tar dyes, which often contain arsenic, lead, iron, and tin.† Ethers supply the flavorings of a great many of the foods which we use in perfectly good faith, and saccharin as a substitute for sugar is only too common. The ice cream which we consume in such large quantities, and which we tell ourselves is

* *Good Housekeeping*, February, 1916, Dr. Wiley's Department.

† *McClure's*, March, 1915, "Eight Years of the Pure Food Law," B. J. Henrick.

nourishing food, is in many cases only a mixture of artificial colors, imitation flavors, gelatin, starch, egg powders, thickeners, and skimmed milk.* The law also permits the use of benzoate of soda, which, quoting the words of Dr. Wiley, is "contrary to law, justice, and ethics of human rights."

Federal Care of Women and Children

The Federal organ for the care of children is the United States Children's Bureau, a division of the Department of Labor. This bureau has no power to do administrative work; it can make no regulations concerning children nor create any institution for them—its duty is solely to study and report upon conditions affecting the welfare of children. The bureau collects important facts and statistics and presents them for popular distribution. Miss Lillian D. Wald, head of the Nurses' Settlement of New York, first made the suggestion for the bureau. The bill was introduced in Congress in 1905 through the efforts of the National Child Labor Committee, but it did not reach a vote till April, 1912. The field of the Children's Bureau is now defined as "all matters pertaining to the welfare of children and child life; to ascertain and popularize just standards for their life and development." † The bureau cares especially for the needs of unfortunate and handicapped children, and its work centers around problems of infant mortality, orphanage, juvenile courts, desertion, etc. During the first year of its existence the bureau conducted investigations along the lines of infant mortality and child labor. It succeeded in completing 1,551 schedules giving a picture of the social, civic, and industrial conditions surrounding infants in Johnstown, Pa., together with a careful history of the growth of the baby during the first year. The importance of such systematic, thorough study of infant mortality, when officially authorized by the Government, needs scarcely to be emphasized. The Children's Bureau also prepared, during the first year, a review of child labor legislation in the 52 political divisions of the United States. It made a statistical study in respect to child labor which showed the hygienic conditions surrounding such work, hours of labor, physical, mental, and moral strain of various occupations, etc. The three publications which the bureau got out in 1913 were of extreme interest and importance—there was one on the "importance of birth registration as an aid in protecting the lives and rights of children," one on "Baby

* *Good Housekeeping*, Dr. Wiley's Department, January, 1916.

† Annual Report of U. S. Children's Bureau.

Saving Campaigns," and one pamphlet on prenatal care. The bureau also started during its first year a library which "should serve as a reservoir of current information on the science of child welfare." *

The second year of its work was taken up with further investigations of infant mortality, birth registration, child labor, mothers' pensions, juvenile courts and treatment of delinquent children, study of feeble-mindedness, recreation, and exhibits. It sent out new pamphlets and did all in its power toward co-operating with local agencies working for the welfare of the child. The third annual report of the Children's Bureau (1915) opens with most encouraging statements. It reports that the bureau began its third year with a staff increased from 15 to 76 and an appropriation increased from \$25,640 to \$164,640. This increase in appropriations permitted the organization of the bureau into five divisions: statistics, library, industry, hygiene, and social service.

Women in Industry

In 1911 there was established a Women's Division of the Bureau of Labor Statistics. That, as far as I can find, was the only organized officially authorized body dealing exclusively with the problem of the health of women in industry. It was the business of this Women's Division to supply data for investigations in regard to labor reform. It is reported to have produced fully 10 per cent of the bureau's work on about 4 per cent of the bureau's appropriation.† Its able and energetic work was met with curtailment and discouragement. The division no longer exists—no one, it is said, can be induced to accept appointment. We need only glance through the last report of the United States Industrial Relations Committee (1915) to see how absolutely necessary for the welfare of the country is a well-supported bureau whose sole work should be the study of the health conditions under which women work. That report points out again the facts we are all familiar with, i. e., the alarming extent to which women are exploited in industry, the danger to their health and the welfare of future generations. It states, furthermore, that there is a strong and increasing demand on the part of manufacturers that regulation of factory conditions be undertaken by the Federal Government, and that there is an ever-increasing demand on the part of labor representatives for Federal action.

* Annual Report of the Bureau, 1913.

† *New Republic*, July 29, 1916.

Need for Organization of Federal Health Work—Owen Bill for Establishment of a Federal Health Department

It has been frequently pointed out and demonstrated that, within certain natural limits, human life is long or short precisely according to the hygienic conditions under which it is lived. The United States is not as yet doing its utmost to prolong human life. That the country suffers a loss of more than \$1,500,000,000 a year through avoidable sickness has become quite a familiar fact to many of us. Four hundred and fifty million has been placed as a conservative figure for the loss the United States suffers through tuberculosis; and the cost of typhoid to the American people is estimated at \$212,000,000.* It has been found by experts that 15 years at least could be at once added to the average human lifetime by applying the science of preventative medicine.† Purer air, water, and milk could add more than half of this additional life. The United States Federal Government needs a better system of collecting vital statistics, a better control of rural and industrial hygiene, better paid health officers; but above all it needs a concentration of the several bureaus now exercising health functions under one well-organized health department which shall be a credit to the nation. It is the opinion of men most prominent in public health work that the establishing of an independent Department of Health under the supervision of a head occupying an authoritative position as a member of the Cabinet will go far toward insuring a definite health program and the efficiency and organization essential to good health work; and would furthermore relieve existing departments of duties not closely connected with their logical functions. The Owen Bill for the establishment of such a Federal Health Department was first proposed in 1910—as yet it has not reached a vote, though it has been endorsed by many prominent health workers, among whom are General George M. Sternberg, General Walter Wyman, Dr. Harvey W. Wiley, Professor Irving Fisher (president of the Committee of 100 on National Health), and by the various conferences of state and territorial Boards of Health. The bill proposes “That it shall be the duty and province of such a department of public health to supervise all matters within the control of the Federal Government relating to public health and diseases of animal life.”‡ The bill makes provision

* Earl Mayo, *Outlook*, Dec. 7, 1912.

† Professor Irving Fisher, Report on National Vitality.

‡ Section 7 of the Owen Bill,

for the unification, under a Secretary of Public Health, of the various agencies now existing for caring for the public health.* The proposed department of health would be divided into eight divisions concerned with sanitary research, child hygiene, vital statistics, foods and drugs, quarantine, sanitary engineering, government hospitals, and executive administration.

Note: Departments of our government now engaged, whether directly or indirectly, in some health work—as listed in the statement of appropriations:

- I. Treasury Department.
 - A. Public Health Service.
 - B. Internal Revenue Service.
- II. Department of the Interior.
 - A. Bureau of Mines.
 - B. “ “ Indian Affairs.
- III. Department of Agriculture.
 - A. Bureau of Animal Industry.
 - B. “ “ Chemistry.
- IV. Department of Commerce.
 - Bureau of the Census.
- V. Department of Labor.
 - Children’s Bureau.
- VI. Army and Navy Department.

State Health Activities

The establishment of state health boards came with the gradual development of the country; as the population and wealth of the country increased, the need of state organization of health work began to be felt. It was in 1855 that the first health board with powers extending over a whole state was established in Louisiana. In 1869 the first board charged with such functions as are now ordinarily preformed by sanitary bodies was created with the organization of the Massachusetts Board of Health. Since then at various periods within the last 46 years every state and territory in the Union has founded a state board of health.

Some state health boards are made up merely of a number of committees charged with various specific duties. Most boards, however, are at the head of a regular department which is divided into a number of divisions. The New York State Department of Health, for example, is divided into six divisions charged with administrative work, sanitary engineering, laboratory, vital statistics, communicable diseases, and publicity and education. The

* Section 2 of the Owen Bill.

Virginia board has six divisions, the Pennsylvania has eight such divisions, etc.

The state health law usually reads that it is the duty of the State Department of Health "to take cognizance of the interests of health and life among the citizens," or "to have supervision of all matters relating to the preservation of the life and health of the people." The tendency in recent years has been to increase state powers at the expense of local boards. They are sometimes called the "superior health board of the state." The country and municipal boards are placed under the supervision, control, and direction of the state authorities from whom they receive their legal power to perform health functions. Though the state board does not interfere with local authorities (unless such authorities are unable to cope with their problems), it does assume an advisory and controlling role, just as the Federal health authorities exert an advisory and directing influence over the whole country. It is the duty of all local boards to keep state boards posted on the sanitary condition of their localities by means of periodical reports. Also, there are provisions in most state health laws for attendance at national conferences, state conferences, and joint conferences of state and territorial authorities with the United States Health Service. The whole scheme of health work in the United States is based on a plan of close co-operation between Federal and state officials, on the one hand, and between state and local authorities, on the other hand.

The duties of state boards may in general be classified under the following three heads:*

1. Investigative duties:

All state laws provide that the state health authorities "shall investigate the causes, modes of propagation, and means of prevention of endemic, epidemic, infectious, and contagious diseases" (Sect. 702, Ala. Code). They further empower the state board to make investigations as to effects of different localities, employments, etc., on the public health. It is also the duty of state health authorities to make routine examination of water, milk, foods and drugs, and to conduct laboratories for research work in those fields.

2. Executive or administrative functions:

It is the business of the state boards to put the sanitary code into execution. It sees to the collection of vital statistics, controls

* Division adopted in Public Health Bulletin 54.

communicable diseases, helps support hospitals of a semi-public nature, supervises industrial and school hygiene, protects water supplies, abates nuisances, cares for the sanitation of public buildings, etc. Vast powers are, in many cases, conferred upon state boards to make the administration of the law effective. Especially is this true in cases of communicable diseases where there is danger of the spreading of the disease throughout a state—the state board has power to issue rules to be enforced by local authorities, to conduct investigations, establish quarantine, and attend to all problems affecting the public health.

3. *Educational duties:*

All states are engaged in publishing, in some form or another, bulletins which are distributed among the public free of charge. In addition to the regular bulletins, most states publish special pamphlets on specific subjects, such as tuberculosis, typhoid, the house fly, etc. Popular campaigns for the education of the public in the causation and prevention of preventable diseases and in the methods of securing pure milk and water are being constantly carried on. The state of Indiana, for example, sends out, for the purpose of instructing the people in regard to prevention of disease, various lectures and exhibits which are conducted with the help of the public schools, speeches in public mass-meetings, and often the big daily newspapers. Some health boards, notably California and Louisiana, have health cars equipped with an exhibition on sanitation; these they send all through the state, stopping for a time at the different towns and cities.* Such educational campaigns have done a great deal toward teaching people how to have a sanitary water supply, to safeguard the purity of the milk, and to care for their children. Often state boards join with universities in delivering series of lectures to students on public health problems. Most of the boards in the southern states are very closely affiliated with the Rockefeller Sanitary Commission, and almost all the state health boards are in more or less close co-operation with the Boards of Education. All states are agreed in this one point—that the educational branch of their work is one of the most important, if not *the* most important, phase of state health work.

There are two branches of health work subject to state supervision, which are of especial importance and interest and warrant more detailed consideration—school and industrial hygiene.

* Commissioner of Education, Annual Report, 1913.

School Hygiene

The scope and aim of medical inspection of schools, says Dr. J. W. Schereschensky, a prominent surgeon of the Public Health Service, is "to maintain at all times a careful, scientific watch over the health and development, mental and physical, of each individual child; preventing and correcting faulty habits, defective physical state, etc., so that the child, passing through its years of school life, arrives upon the threshold of citizenship with a future unhandicapped by disease, ready at once to become an efficient social unit." * This states in full what has been the goal of school hygiene, one of the latest branches of public health activities. At the time of the publication of Gulick and Ayres' most comprehensive work on *Medical Inspection in Schools*, 1908, only two states, Massachusetts and Connecticut, had statutes relative to medical inspection of school children. Since 1902, 21 states have secured some form of legislation. Between 1908 and 1911, 16 states provided for medical inspection of some kind.† Since then occasional new legislation and frequent strengthening amendments have been added. At the time of the meeting of the legislatures of 1915, the medical inspection of public school pupils was required in nine states; it was specifically admitted in 18 states and had general authorization of the law in several others. According to Ernest Hoag, an authority on the subject, the United States is behind most of the nations of Europe in its school hygiene, but is making rapid progress.‡

Medical inspection in schools was at first understood to mean only the detection of contagious disease. It was later extended to include examination for non-contagious physical defects. In 1914 over 200 cities had undertaken to give their children *complete* examinations. At present school hygiene is a distinct field of preventive medicine and undertakes the health supervision of all school activities. The most developed systems of school inspection today—of which Massachusetts and New York are good examples—provide for detection of contagious diseases, routine examination of children by the physician for serious diseases, and by teachers for defects of eyesight and hearing. Open-air schools, school feeding, school clinics, and school nurses all help to make school hygiene a real health force.

* Reprint from Public Health Reports, 142, 1913.

† U. S. Education Bureau, Report of Commissioner, 1915.

‡ Ernest Hoag, *Health Work in Schools*, 1914, Ch. I.

Summary of Returns from Questionnaire on Medical Inspection in Schools, 1914 *

Total number of schools reporting	1,466
Number of cities having some form of medical inspection....	750
Cities where inspection is chiefly for contagious diseases	242
" having " of eyes, ears, teeth	570
" " school nurse	268
Total number of nurses reported	923
Cities having dental clinics for school children	130
" treating teeth of school children	195
" having psychological clinics	33
" " a central or general clinic	74

School Feeding

The problem of school feeding has of recent years become a more and more important element of school hygiene. As late as 1908 there were only four cities with lunch experiments in operation.† By 1913 there were more than 70 cities conducting school lunches in the elementary schools. It is only gradually that states come to regard the feeding of their school children as being not merely a problem of private philanthropy, but a legitimate extension of the principle of compulsory education. There are as yet no legislative enactments in the United States providing for school lunches, except a bill in Massachusetts which states that local school boards shall be empowered to expend school funds for the support of lunches in elementary schools.

The New York City school feeding experiment is a very interesting example of this modern phase of public hygiene. In 1907, as a result of an investigation in regard to the prevalence of malnutrition among school children, there was organized the New York School Lunch Committee. Its purposes were the provision of nourishing lunches on a self-supporting basis, special observation of children showing lack of nourishment, and the formation of special classes of mothers for instruction in proper care of children.‡ In 1915 there were 20 schools, registering 32,000 children, with the penny-a-portion service. During the last school term 1,249,489 such portions were sold in New York City. The working force of the committee is headed by a dietist and all food is care-

* U. S. Bureau of Education, Report of Commissioner, 1915.

† U. S. Bureau of Education, Bulletin 48, 1913, "History of School Feeding," L. Bryant.

‡ New York City Health Department, Reprint 26, 1915, "Health Aspects of School Lunches," Brown.

fully tested. Co-operation with the Health Department brought very good results, since opportunity was afforded for analysis of food by the department and university laboratories. The committee has been very careful in arranging the dietary with special reference to differences of race and locality—different foods were offered to the Italian, Jewish, and American elements among the children.

In working out this problem of school feeding in England, France, Germany, and United States, it was found possible to provide thousands of children with nourishing meals costing from one to five cents. Along with this work of merely providing food, investigations are made as to conditions in the home and mothers are instructed in dietetics.* We need go no further than the evidence collected in 1915 by the New York City Health Department to realize how absolutely essential is some system of school feeding and how necessary it is that our state authorities make legal provision for it. In 1915, says the New York City Health Board, 40,000 children in the public schools of that city were suffering from malnutrition. But besides providing the nourishment, for which there is so crying a need in most of our cities, it is shown that where school feeding has been carried on long enough marked improvement in scholarship has resulted. School feeding, indeed, finds its justification in the fact that we cannot separate bodily and mental welfare; that a well-nourished mind is impossible in a poorly nourished body.

School Clinics

School clinics are another outcome of the recent development of school hygiene. It was found that the percentage of school children suffering from nose, throat, teeth, and eye defects was almost unbelievable, and that in only a comparatively few cases was the defect attended to. Prior to the establishment of school children's clinics, all cases among the poor class were sent to public dispensaries. The overcrowding that resulted became so objectionable that both parents and children were soon discouraged. At present school clinics are being tried all over the country. They are clinics controlled by the educational authorities and supported at public expense for the purpose of permitting a more thorough examination, and sometimes also treatment, of defects revealed by the routine inspection of schools. In most large cities clinics are beginning to be looked upon as a standard requirement of any system of school medical service. In New York City, for example,

* *Educational Review*, 1913, L. S. Bryant, "School Feeding."

the Department of Health maintains dental, nose and throat, and contagious eye diseases clinics for all children who cannot afford the attention of a private physician. The first school clinic in New York was established in 1912 for the free operation and treatment of needy cases. Within three years there were five such clinics in New York City. The dental clinics are the most recent development of the movement. The dental clinic of Boston, a semi-public institution, is perhaps the best establishment of its kind. It is a magnificent building beautifully maintained, where practical instruction in mouth hygiene is given, a dental museum supported, and public lectures conducted; it also has a research fellowship for the investigation of dental diseases.

The School Nurse

It is now being recognized that without the school nurse authorities need have little hope of establishing a modern scientific system of school hygiene. School nursing had its beginning in London in 1894, but it was not till 1903 that the movement gained recognition in the United States, with the appropriation in New York of \$30,000 for the appointment of 27 nurses to assist the Board of Health in the medical inspection of schools.* In 1907, eight cities had school nurses; in 1915, according to the Report of the Commissioner of Education, school nurses were reported as employed in one or more places in all but nine states. The importance of the school nurse lies not so much in the care she can give the child in school, but more especially in the personal follow-up work with which she is entrusted. The school nurse has done a great deal toward reducing absence from school by treating the many petty ills which keep the children away. She acts as a sanitary inspector of schools and, very often, of homes; she assists in the teaching of hygiene and, most important of all, she acts as a social worker in the home.

Open-Air Schools

One other very recent step in the development of preventative medicine in school health work is the open-air school experiment, which has, in the last few years, attracted great attention both because of its novelty and the results it is bringing. The number of open-air schools in the United States is constantly increasing in spite of the fact that they are considered by some to be too impractical for general use.† The Boston school department is at

* Hoag, *Health Work in Schools*, Ch. IV.

† National Education Association, *Journal of Proceedings*, 1915, Wm. Watt.

present building one or more open class rooms in each new school building, and in California some of the cities are building the majority of their school buildings on a plan which permits all the rooms to be converted into open-air rooms.* Studies of tubercular children have shown that immediate and rapid improvement in weight, appetite, and mental ability always results from attendance in open-air classes.

Rural School Hygiene

It is a most deplorable fact that though most of our states have been making rapid strides along the lines of school hygiene in our city schools the rural school has been an object of most shameful neglect. The city child has, for some years now, enjoyed the benefits of sanitary and attractive school buildings; the needy city child has been given cheap nourishing meals; clinics have been provided and open-air schools have been built, but all for the child who lives in the city. For some reason, the rural school population—which makes up about 42 per cent of the school children of the United States—has not been thought to need such benefits of modern civilization. The fact is, that the country school house and school child are in greater need of improvement than those within city limits. The low architectural and sanitary standards in rural regions throughout the country, the ignorance regarding the physical and moral effects of unattractive and unsanitary school buildings, the false economy of school boards, and the imperfect supervision exercised by state authorities all contribute toward bringing about the present wretched condition of the country schoolhouse.† It is now a recognized fact that the country child needs a healthy school environment quite as much as the children of the city, that many diseases and defects are just as prevalent in the country as in the city.‡

Yet investigation shows that many of our country schools violate every principle of sanitation and are a disgrace to the communities that tolerate them. We need a thorough investigation of the sanitary condition of rural schools, an educational campaign among parents, teachers, and pupils; but above all, we need a systematic routine medical inspection under the uniform law and strict supervision of the State Departments. The interesting work

* Hoag, *Health Work in Schools*, Ch. XII.*

† Report of the Committee on Health Problems, National Education Association.

‡ National Education Association, *Proceedings*, 1914, "Health Problems in American Public Schools," Thomas D. Wood, M. D.

undertaken by Indiana may well be taken as an example of what can and must be done for our rural schools. In 1911 the Indiana Legislature enacted the Sanitary School House Law, the first law enacted in the United States which established a standard of sanitation for school children, which must be kept by every community in the state. In the first three years after the passing of the law 570 new buildings were erected in the state at a total cost of \$7,195,008, and 199 buildings were remodeled at a cost of \$1,276,440. In 1915 there were in Indiana 132 new buildings under construction. The district schools are being abandoned at an average rate of 200 per year, and the modern buildings now found in most school districts in Indiana are the last word in scientific school-house construction. The modern school has become the sanitary leader and guide of the community and very often the civic and social center. The State Board of Health in Indiana might very truthfully say that "the modern rural school has become in fact as well as in name the bulwark of the state." *

Industrial Hygiene

Industrial hygiene is one of the most gigantic problems of government health work, but it is only in very recent years that it has been a subject of any consideration, and has as yet not received the attention its importance would warrant. The work that is now being done is for the most part in the hands of state boards, though the Federal Government does have various agencies, part of whose duties is the care of the laborers' safety and health. The United States Department of Labor, the Children's Bureau, the Industrial Relations Committee all do something in the line of industrial sanitation. The United States Health Service was given legislative authority in 1912 to investigate diseases of men, and so it also entered the field of industrial hygiene. The rather extensive investigation now being carried on by the service, in regard to the effects of various industries upon the health of the individual, is a direct outcome of this legislation of 1912.

The separate states have in recent years made some progress in promoting safety and sanitation in manufacturing, mining, and transportation. The movement has been largely promoted by the enactment of workmen's compensation laws, by continued agitation and education, and by the formation of safety committees made up of officials and workmen, and joint conferences of employers and employees to assist and advise state officials in the administration

* National Education Association, *Journal*, 1915.

of the law.* The labor legislation now in force deals mainly with women and children in industry, and affects the hours, wages, and safety of the working people.

Labor Legislation as It Stood in 1915

Women.		Children.	
Hours.	States.	Hours.	State.
8	5	8	23
10	12	9	13
10 or more	25	no regulation	13
no regulation	7		

Note: Regulations in regard to men are confined mainly to public enterprises. In private industries, there is some regulation in transportation companies and in dangerous industries.

The legislation that exists in regard to safety and health deals with the reporting of accidents and occupational diseases, prohibition of certain substances and instruments, provision of medicine guards, protection against fire, regulation as to lighting, heating and ventilating, general factory sanitation, protection from infectious diseases, tenement-house manufacture, etc. We need not go far to find evidence for the fact that the United States campaign for industrial safety is still in its rudimentary stages. The annual list of accidents in this country is about 35,000 fatalities and 7,000,000 injuries. From one-third to one-half of these accidents have been estimated as preventable by proper safeguards, inspection, and control.† The results of an investigation of the Federal Bureau of Labor in regard to conditions in mill towns of New England show, to quote the words of Constance Leuppe, "that a cotton mill for nine or ten hours a day is rather more dangerous than war."‡

The occupations census for 1910 shows a total of 1,990,225 children under 16 years at work. These figures give no idea of the number of children employed in canneries (since the census was taken at a time when the canneries were not in full operation); neither do they attempt to show the extent of the work done outside school hours, such as street trading and tenement home work. Cases of 14-year-old children working 10 hours through the night, of still younger children employed in the most harmful and unsanitary trades, of mine accidents due to the fatigue of the young children employed all have been quoted so often that it seems almost unnecessary to mention them again.

* U. S. Industrial Relations Committee, Final Report, 1915.

† U. S. Industrial Relations Committee, Final Report, 1915.

‡ "A Substitute for Charity," Constance Leuppe, *Pearson's*, 1915.

Conditions of almost unbelievable wretchedness have been disclosed, yet employers come before the state legislatures and fight the restrictive laws that are proposed. A uniform Child Labor Law has been drafted by the National Child Labor Committee from the best provisions now in force in any state. As yet no state in the Union comes up to the standard of the uniform law in every point.* In two-thirds of our states there is no effective enforcement of child labor laws. The work is always hampered by small appropriations, small salaries, lack of public support, big commercial interests, and corrupt politics. As late as January, 1915, the following conditions in child labor still existed: †

States having no 14 yr. limit in factories	6
“ “ a “ “ “ with exceptions	15
“ “ no 16 “ “ for night work in factories	13
“ “ “ 8 hr. day for children under 16	28
Important mining or quarrying states with no 16 yr. limit	20
States having no 21 or 18 yr. limit for night messengers	26
“ “ “ compulsory education law	6
“ “ “ educational requirement for work permits	16
“ “ all the standard “ “ “ “	5
“ “ a 14 yr. limit for boys in all street trades	1

Municipal Hygiene

Municipal hygiene, or municipal housekeeping as it has been called, is the science of making the city clean, healthy, comfortable, and attractive. This science, in its most highly developed form, is of recent date. To-day city departments which a few years ago had for their chief work the abating of nuisances and the granting of burial permits consist of a carefully organized staff of experts, whose duty it is to prevent as well as control disease and to care for every phase of public health work. The following list of duties gives an idea of the magnitude of the problem set before our modern city health departments: management and control of infectious diseases, inspection and abatement of nuisances, sanitary inspection of the food supply, inspection of bakeries and restaurants, inspection of schools, supervision of foundling and infant asylums, collection and disposal of ashes, garbage, and refuse; inspection of plumbing, tenement house inspection, registration of vital statistics, regulation of hospitals, and educational work on health topics.

A description of the New York City Department of Health, the

* National Child Labor Committee, Pamphlet 185.

† National Child Labor Committee, Pamphlet 239, January, 1915.

largest and most efficient health department in the country, will serve as an interesting example of city health activities.

New York City Health Work

The New York City Health Department began, as did all other boards, as a body chiefly concerned with general sanitary problems, such as street cleaning, supervision over the water supply, etc. It has since developed into a most effective agency for the control of contagious diseases, for real preventative medicine, and, most recently, for social analysis of disease and personal hygiene.* Each borough of Greater New York has its own Health Department branch, all working under the general supervision of the Chief Commissioner of Health of New York City (at present Haven Emerson, M. D.). The Manhattan branch, the headquarters of the department, is an immense seven-story building made up of countless division offices, laboratories, and store rooms.

The New York City Health Board is empowered by law to enforce all laws of the state applicable in that city to the preservation of human life and the protection of health. The board may, furthermore, from time to time add to, alter, or annul any part of the sanitary code without further authorization. In order to do all that the law requires of it, the board—consisting of the Commissioner of Health, the Health Officer of the Port, and the Police Commissioner—details its work among nine bureaus, concerned with general administration, records, sanitation, infectious diseases, laboratories, child hygiene, food inspection, public health, education, and hospitals. The department employed in January, 1915, a total of 3,421 men and women,† and the total department appropriation for 1915 ‡ was \$3,443,492.22.

Sanitary Bureau

The Sanitary Bureau, with an employment list of 187, deals with matters pertaining to general sanitation. Up to last year the work of the bureau was confined mainly to action upon citizens' complaints and the necessary supervision of premises and processes which are ordinarily subject to the regulation of a health board. This system has been found inefficient and wasteful. To-day the New York City Health Department conducts a systematic sanitary survey of the entire city, so that action⁸ taken by the department

* *Over a Century of Health Administration*, Charles Boldman, 1916.

† Annual Report of Commissioner, 1914.

‡ Budget, 1915.

is now based on its own knowledge and initiative rather than upon occasional demands of citizens whose personal interest or lack of technical knowledge may cause unwarranted conclusions. In 1914 a house and block survey of the whole city was begun which was to take about 18 months to complete. The bureau, in the course of its work in 1914, acted upon 51,434 complaints; made a survey of all lodging houses, involving 5,800 inspections; inspected 5,000 barber shops; made a survey of theaters, department stores, public institutions, ferry houses, public wash rooms, all comfort stations maintained by the city departments and transit companies; made investigations in the methods used in cleaning various public conveyances; supervised bathing establishments, pools, etc.; abated smoke nuisances, and attended to many more duties which it would take too long to enumerate here. This bureau expended in 1915 for salaries of regular employees \$239,620. The work of tenement house inspection, inspection of water supplies, and street cleaning is done by separate departments in New York City.

Bureau of Infectious Diseases

One of the most important bureaus of the New York City Health Department is the Bureau of Infectious Diseases, which exercises supervision and control over all cases of infectious communicable diseases, establishes and maintains quarantine, administers vaccines, maintains tuberculosis clinics and day camps, attends to the admission of tuberculosis patients to sanatoriums and hospitals, and disinfects infected premises. This bureau alone employs 686 persons, including physicians, medical inspectors, dentists, nurses, bacteriologists, etc. The work is detailed among several divisions, including a Division of Contagious Diseases, of Institution Inspection, of Tuberculosis, Typhoid Fever, of Venereal and Veterinary Diseases, and since 1915, the Division of Industrial Hygiene. In general, the work of this bureau needs no special comment—it is the usual quarantine work that has been done for years.

The Division of Industrial Hygiene is, however, of special interest. This division, established in March, 1915, is a direct result of the recently increased interest in industrial hygiene. It is concerned with the registration, investigation and supervision of occupational diseases, the investigation and correction of matters and complaints pertaining to industrial hygiene and the administration of the Occupational Clinic for examination of all licensed food handlers. Its work includes factory surveys and examinations of

all conditions found in the shops and factories as they may bear upon the health of the workers. Special studies are conducted by the division in department store conditions and in conditions found in many dangerous occupations, such as the manufacture of cigars, fur drying, paint and chemical manufactures, etc. The division co-operates with such outside agencies as the American Museum of Safety, Labor Unions, etc. Not the least interesting part of the division's work is carried on at the Occupational Clinics, where it examines all applicants for peddlers' licenses (who now are required by law to have a certificate showing freedom from communicable disease), all bakers, waiters, cooks, and other food handlers.

The work of the Bureau of Infectious Diseases is organized with special reference to boroughs and district units. Branch offices and clinics are maintained in the different districts of each borough under the supervision of a physician and a staff of nurses. The appropriation in 1915 for salaries only was \$479,060.

Bureau of Laboratories

The Bureau of Laboratories is subdivided into six divisions, each maintaining a large number of chemists, bacteriologists, and laboratory assistants. There are in all 170 persons engaged in carrying on the great laboratory work of the city. This bureau manufactures laboratory products for the diagnosis, prevention, and treatment of disease. All sera and vaccines are made at the department's laboratories and distributed free of charge to indigent citizens. It is the work of the bureau to conduct chemical and bacteriological examination of water, milk, and foodstuffs, and to do experimental work on infectious and other diseases. The results of the bureau's experimentation are published annually in the form of *Collected Studies* and is distributed among those known to be interested. The following six divisions cover the work of the Bureau of Laboratories: Division of Production of Sera and Vaccines, of Applied Therapy, of Diagnosis, of Microbiology of Foods, Water and Disinfection, Division of Chemistry, and the Division of Special Investigation (research for the purpose of obtaining data for the revision of the sanitary code, of determining the epidemiology of certain diseases, etc.).

Bureau of Hospitals

Three hospitals for the treatment of cases of contagious diseases are maintained by the Department of Health through the Bureau

of Hospitals, besides a sanatorium at Otisville, Orange County, N. Y., for the treatment of tubercular patients. The bureau maintains a hospital staff of 1,074 at an annual salary expenditure, for the three contagious disease hospitals, of \$419,795. During 1914, 10,446 cases were treated in the three city hospitals—the Willard Parker, the Kingston Avenue, and the Riverside—and there was at the Otisville Sanatorium an average daily census of 550 patients. Besides maintaining these four institutions the city helps to support many hospitals partially supported by private interests or charitable organizations. The Department of Public Charities in New York City received in 1915 an appropriation of almost \$2,000,000 for the partial maintenance of all hospitals under city supervision and regulation.

Bureau of Child Hygiene

The Bureau of Child Hygiene is perhaps the most interesting division of the New York City Health Department, both because of its extreme recency and the very nature of its work. It is the first organization established under municipal control to deal with the health of children from birth to legal working age.* Prior to 1908 the work now performed by the Bureau of Child Hygiene was divided among several independent divisions of the department. The scope and importance of the work soon warranted its organization under one separate division. Until 1913 it continued to be a part of the Sanitary Bureau. Then the work had grown to such proportions that it was made an independent bureau with a director responsible to the Commissioner of Health. This bureau now has for its functions: the control and supervision of all midwives, the reduction of infant mortality, the supervision of foundling babies boarded out in private homes, the inspection of all institutions harboring dependent children, the medical examination and inspection of school children, and the enforcement of that part of the Child Labor Law which relates to the issuing of employment certificates. The bureau staff consists of 722 persons, including medical inspectors, nurses, dentists, surgeons, nurses' assistants, and hospital clerks. The budget appropriation for 1915 was \$684,636, an increase of \$349,266 over the appropriation for 1909.

The bureau, which has branches in each of the boroughs, is divided into seven divisions. The Division of Midwives and Foundlings has under its charge the enforcement of the laws and regula-

* New York City Department of Health, Bureau of Child Hygiene, Monograph Series No. 4, January, 1915.

tions of midwifery and the boarding and care of foundlings. Regulations and rules are drawn up by the division which must be closely followed by all registered midwives, and provision is made for general educational meetings and special lecture courses. The Division of Infants' Milk Stations operates milk stations and advises mothers in the care, feeding, and hygiene of infants. One hundred and eighty-five people are employed in this division alone. There are in New York City 59 milk stations maintained by the Bureau of Child Hygiene. These are located with reference to non-duplication of facilities in districts already supplied with stations by private agencies. Each baby brought to the station is registered by a nurse, who obtains the history of the baby and mother and records it, with the baby's weight, on an individual history card. The baby is then fed according to its special needs. The mother is required to bring the baby once a week for examination, and the nurses spend their afternoons visiting homes and giving instructions in all matters of infant hygiene. The milk stations are also used as a meeting station for the Little Mothers' League and as offices for vaccination and physical examination of children of the pre-school age. The true value of all the milk stations lies not so much in the milk distributed, but in the educational propaganda that is conducted. It was probably the educational campaign and the follow-up work done by the milk station nurses that were so instrumental in lowering the infant mortality rate in New York City. The death rate of children under 5 years in 1909 was 49.5 per 1,000. In 1913 that death rate had been reduced to 36.4 per 1,000, and in 1914 the Board of Health reported no real rise in infant mortality (though a slight increase in the number of deaths reported, due to the more thorough system of registration). The bureau states, furthermore, that since it has adopted its method of preventative work, infant morbidity has decreased in even greater proportion than can be shown in the decrease in infant mortality.*

Another division of the Bureau of Child Hygiene, the Division of Institutions and day nurseries, has under its care the supervision of all institutions for dependent children. Such institutions are regularly inspected by the division officers and the children given medical examination. The work of medical inspection of children in all free schools in New York City is in the hands of another division of this bureau. A complete system of medical

* New York City Health Department, Bureau of Child Hygiene, Monograph Series No. 4, January, 1915.

inspection is carried on in 771 public and other free schools, with a registered attendance of 923,486 pupils. Ninety-nine medical inspectors and 200 nurses are detailed to the school medical inspection in New York City. Each inspector is assigned to duty in a group of schools with an average registration of 9,200 pupils and each nurse has under her care about 4,600 pupils. The children found by the physician or nurse to need medical treatment or more careful examination are sent to the various Children's Clinics, which are maintained by another division of the Bureau of Child Hygiene. The department was given in 1912 a permanent fund for the establishment of clinics exclusively for the treatment of school children. There are 10 such clinics in New York. Only those children whose parents are unable to pay for private physicians are accepted for treatment. Beginning with 1913, an additional appropriation was allowed the Bureau of Child Hygiene to establish a number of school dental clinics. There was only one such clinic in New York in 1914, with nine operating dentists. The dental service of the bureau is totally inadequate to care for more than a tiny fraction of those children needing dental care.

One other important function of the Bureau of Child Hygiene is the issuance of employment certificates to applicants between the ages of 14 and 16. Such certificates may be obtained at the different borough offices after the necessary examination. It is most encouraging that these examinations are more strict than they have been in the past, and that more and more children are being refused certificates for insufficient education and tuition, insufficient evidence of age and physical incapacity. The most important provision of the whole law is that which provides that no employment certificates shall be issued unless the applicant has reached the normal development of a child of its age "and is in sound health and physically able to perform the work it intends to do." A minimum standard of 4 feet 8 inches and 80 pounds in weight for children of 14 years of age has been set by the department.

The one remaining division of the Bureau of Child Hygiene, the Division of Research and Efficiency, is concerned with special investigations and preparations of statistics. This division was organized in 1913 for the purpose of enabling the chiefs of other divisions of the bureau to devote most of their time to executive matters, and to aid the director in determining the value of methods in operation, both from the standpoint of economy and results. Its work, in short, is "the improvement of the efficiency of the bureau."

Bureau of Food Inspection

This bureau is charged with the inspection and supervision of the production, manufacture, and sale of all foods. The bureau has on its staff 152 employees and expended in 1915 \$199,970. The division of the work between local and state authorities depends wholly upon the extent to which the state chooses to exercise its functions in a city which has its own machinery for food inspection. In the case of New York City the inspection of food, locally produced and sold, is almost entirely in the hands of the city Health Department, which has a very well-organized bureau of food and milk inspection. The city board has the power to control food industries by granting permits to operate such industries. The following operate under permits issued by the city board: milk stores and all places where milk is sold; slaughter houses, including poultry abattoirs and sausage factories; bakeries; establishments for testing out eggs, and bottling establishments for soft drinks.

More attention is paid to the supervision of milk in New York City than to any other branch of food control, and there is no other city that has developed so extensive a system of inspection of dairies and creameries as is practised by that city. It is on the authorization of state legislation that a city board enacts the milk ordinance which is incorporated in a general sanitary code. The recency of such city ordinances is really quite remarkable. Of about 50, 19 were passed as late as 1907, 10 in 1908, and 11 in 1909.* New York City milk inspection includes a supervision over the health of all persons handling milk on farms and over the sanitary conditions all along the line from farm to consumer. Ernst Lederle, Commissioner of Health in New York City, 1913, gives a very interesting picture of the gigantic milk problem with which New York City has to cope: "The city draws its milk supply of 2,500,000 quarts from 44,000 farms located in 6 different states. . . . The milk shed covers an area of 50,000 square miles. The milk is produced from about 350,000 cows and shipped from 1,100 creameries over 11 different railroads. It is received at 15 terminals and delivered in 55,000 wagons, and dispensed at 14,000 stores." The city, in order to deal with the tremendous task of supervising this vast supply, in 1912 ordered the pasteurization of the entire city milk supply, except certain special grades. It also divided

* Statistics of cities having a population over 30,000, 1907, Census special reports.

the milk into three grades, each to be sold under its proper classification. In February, 1914, the Board of Health decided, in order to avoid future epidemics of typhoid and bovine tuberculosis, to demand the pasteurization of practically the whole supply of milk sold in the city. Very careful attention is given by the bureau to the bacterial content of all milk both before and after its pasteurization.

Meat inspection is perhaps a graver municipal problem than is the question of the milk supply. The Bureau of Statistics estimated that during 1907 there were 26,000,000 food-producing animals consumed in the United States without any known inspection. Since Federal inspection is limited to establishments that are engaged in interstate and foreign trade, it is left to the state or city to inspect the meat sold locally. The condition of most slaughter houses not under Federal inspection is almost indescribably bad. Small local establishments, and in many cases even large city abattoirs, are often very filthy, surrounded by stables, and unprotected from rats and flies.* It is a matter of statistics that the percentage of disease is much higher among animals slaughtered in small local places than among those slaughtered under Federal inspection, yet it is often the case that there is local meat inspection, as it is offered for sale in the market, with no veterinary inspection of the carcass at the time of slaughter. It is, however, true that New York City and many other large cities have succeeded in establishing a system of meat inspection that copes, more or less, with the situation. New York City has seven abattoirs wholly under the control of the Health Department Bureau of Food Inspection, and it has placed in the squad detailed to inspection of cattle and meat, seven veterinarians, besides a supervising inspector. The bureau has ordered drastic structural changes in the abattoirs of the city, so that these establishments can be said to-day to be in an acceptable sanitary condition.* The New York City Bureau of Food Inspection uses the same system of meat inspection that is used by the United States Bureau of Animal Industry. The Bureau condemned in 1914 48,178 pounds of meat from stock yards and 969,687 pounds from slaughter houses.

Besides supervising the milk and meat supply of the city the Bureau of Food Inspection sees to the supervision of all bakeries, markets, restaurants, and the general food supply of the city. The bureau enforces the various regulations in regard to adulterations and false labeling.

* Board of Health, Annual Report, 1914.

Bureau of Public Health Education

The most recent branch of the New York City Health Department is the Bureau of Public Health Education, established July, 1914. This bureau conducts lectures, holds health exhibits, sends out publications, gives free moving picture shows on public health problems, and sends out, from time to time, various circulars and leaflets besides the regular weekly and monthly bulletins. Through co-operation with other bureaus, the Bureau of Public Health Education conducted in 1914 five courses of lectures for the department employees, and various lectures before labor organizations, clubs, churches, and popular mass-meetings. The bureau issues weekly bulletins, special bulletins on pure food matters, descriptions of the department activities, etc., besides continuing its reprint series and monograph series, and printing circulars for such activities as "Clean-Up" Week and "Baby-Week." It gave in 1914, in co-operation with various societies, 23 moving picture shows on health topics in the parks and recreation piers of the city. The staff of the bureau includes eight people, and appropriation made by the city in 1915 for public health education was \$14,660.

Bureau of Records

The work of the Bureau of Records consists in recording and indexing all certificates of births, deaths, and marriages, and in preparing statistical analyses and tables based upon the certificates filed. The latest step taken by the New York City Health Department is the new plan of collecting mortality and morbidity statistics according to district subdivision rather than for the city as a whole. The new system, as described in a very recent report, provides for the division of New York into small areas selected with special reference to the nationality and economic status of the people. Such a division, the authorities think, will give a true picture of conditions and serve as an effective watch over public welfare.

The above account gives, in a rather vague and unsatisfactory way perhaps, a picture of the health work of the largest city in the United States. It is hardly to be expected, of course, that any but a comparatively small number of cities come up to the standard set by the health work of New York City. In most of our small cities and in the larger part of our rural districts health work is still in its infancy. In 1913 only 21 states were included in the so-called registration area where vital statistics are reported and recorded

with some degree of accuracy.* In every small city greater emphasis is still being placed on sanitary inspection and abatement of nuisances than on the preventative measures and personal health work which now constitute the greater part of the work in the more modern health departments. Vaccination, medical inspection of school children, quarantine regulations, bacteriological analysis of milk are things unheard of in only too many communities in this country. There can be little doubt that constant progress and improvement in the health activities of local boards is actually taking place,† but conditions as they are now in many parts of the United States are not such as should be tolerated by any civilized body of people. We have still to convince people that health work is certainly as important, if not much more important, than the many museums, art galleries, libraries, schools, police, and fire guards upon which a so much greater sum of money is expended.

* *New City Government*, H. Bruere, p. 401.

† *Survey*, May 28, 1915, "Tri-City Department of Health."

CHAPTER XXVIII

NATIONAL AID TO RECREATION

THE Governments of Switzerland, Austria, New Zealand, and several other countries have established departments for the encouragement of foreigners visiting these countries for the purpose of recreation. But the sums expended by the government on recreation in these and other countries have been expended chiefly by municipalities and for the purely commercial object of securing the foreign visitors. These expenditures, then, are clearly competitive as well as collectivist; that is, they have a characteristic of the pre-collectivist or competitive era.

On the other hand, the vast expenditures of the United States Government for national parks, and still more, the vast sums of money represented by leaving these large areas to be devoted exclusively to recreation, have been chiefly for a non-commercial purpose—furnishing recreation to American people. Similar expenditures have been undertaken by foreign nations and foreign cities, but certainly none on anything like so grandiose a scale.

GOVERNMENT TOURIST BUREAUS, BATHS, ETC.

[Davies, *op. cit.*, pp. 76-78.]

Several States run their own tourist bureau, usually in connection with the State railways.

New Zealand, for example, has a "Government Division of Tourist and Health Resorts," the scope and activities of which are best described in the Government's own words, the following extract being taken from an official publication entitled *New Zealand in a Nutshell*:

"New Zealand's Government Division of Tourist and Health Resorts controls the town of Rotorua, with its sanatorium and bath buildings and beautiful public parks and gardens.

"New Zealand's Government Division of Tourist and Health Resorts controls the public parks and bathing establishments at Te

Aroha Hot Springs, Hammer Hot Springs, Morere Hot Springs, Te Puia Hot Springs, etc.

“New Zealand’s Government Division of Tourist and Health Resorts controls ten houses for accommodation of tourists in the principal scenic and health resorts of the Dominion.

“New Zealand’s Government Division of Tourist and Health Resorts controls trout fishing and game shooting in the Rotorua Acclimatization District, which embraces the counties of Rotorua, Whakatane, East Taupo and parts of Wairoa, West Taupo, and Matamata counties in the North Islands.”

Seated one day in the consulting room of a London physician, I turned over the leaves of a beautifully illustrated album, giving pictures and descriptions in perfect English of many of the well-known German spas, such as Ems, Kissingen, and the like. To my surprise I found that this book was issued and presented free to the leading physicians by the Prussian State Domains Department, and then I discovered that these famous spas are actually run by the Prussian Government, and at a good profit. I wonder if the thousands of English people who frequent these world-famed spas are aware that they are recuperating from the cares of private business and finding health in a business undertaking carried on by a Government. State mineral springs are a familiar feature and their products are consumed all over the world. Most people are familiar with Vichy Etat, and are presumably aware that the latter word denotes that it comes from State springs.

The New Zealand Government exploits the famous springs and mineral waters of the country with great success, and so do various towns in the United Kingdom, e. g., Harrogate. Travelers between London and the north, on passing Stafford, will have noticed the large advertisements along the railway of the Stafford Corporation Brine Baths.

Ordinary baths and washhouses, owned and managed by municipalities, are so general that it is unnecessary to do more than mention them. Some towns, e. g., Dover, run Turkish and other special baths.

THE NATIONAL PARKS OF AMERICA

[SOURCE: National Parks Portfolio, U. S. Department of the Interior.]

To build a railroad, reclaim lands, give new impulse to enterprise, and offer new doors to ambitious capital—these are phases of the ever-widening life and activity of this Nation. The United States, however, does more; it furnishes playgrounds to the people

which are, we may modestly state, without any rivals in the world. Just as the cities are seeing the wisdom and necessity of open spaces for the children, so with a very large view the Nation has been saving from its domain the rarest places of grandeur and beauty for the enjoyment of the world.

And this fact has been discovered by many only this year. Having an incentive in the expositions on the Pacific coast, and Europe being closed, thousands have for the first time crossed the continent and seen one or more of the national parks. That such mountains and glaciers, lakes and canyons, forests and waterfalls were to be found in this country was a revelation to many who had heard but had not believed. It would appear from the experience of the past year that the real awakening as to the value of these parks has at last been realized, and that those who have hitherto found themselves enticed by the beauty of the Alps and the Rhine and the soft loveliness of the valleys of France may find equal if not more stimulating satisfaction in the mountains, rivers, and valleys which this Government has set apart for them and for all others.

It may reconcile those who think that money expended upon such luxuries is wasted—if any such there are—to be told that the sober-minded traffic men of the railroads estimate that last year more than a hundred million dollars usually spent in European travel was divided among the railroads, hotels, and their supporting enterprises in this country.

There is no reason why this nation should not make its public health and scenic domain as available to all its citizens as Switzerland and Italy make theirs. The aim is to open them thoroughly by road and trail and give access and accommodation to every degree of income. In this belief an effort is making this year as never before to outfit the parks with new hotels which should make the visitor desire to linger rather than hasten on his journey. One hotel was built last year on Lake McDermott, in Glacier Park, one is now building on the shoulder of Mount Rainier, in Paradise Valley, another in the Valley of the Yosemite with an annex high overhead on Glacier Point, while more modest lodges are to be dotted about in the obscurer spots to make accessible the rarer beauties of the inner Yosemite. For, with the new Tioga Road, which, through the generosity of Mr. Stephen T. Mather and a few others, the Government has acquired, there is to be revealed a new Yosemite which only John Muir and others of similar bent have seen. This is a Yosemite far different from the quiet, incomparable valley. It is a land of forests, snow, and glaciers. From

Mount Lyell one looks, as from an island, upon a tumbled sea of snowy peaks. Its lakes, many of which have never been fished, are alive with trout. And through it foams the Tuolumne River, a water spectacle destined to world celebrity. Meeting obstructions in its slanting rush, the water now and again rises perpendicularly, forming upright foaming arcs sometimes 50 feet in height. These "water-wheels," a dozen or more in number, soon will be made accessible by trail.

While as the years have passed we have been modestly developing the superb scenic possibilities of the Yellowstone, nature has made of it the largest and most populous game preserve in the Western Hemisphere. Its great size, its altitude, its vast wildernesses, its plentiful waters, its favorable conformation of rugged mountain and sheltered valley, and the nearly perfect protection afforded by the policy and the scientific care of the Government have made this park, since its inauguration in 1872, the natural and inevitable center of game conservation for this nation. There is something of significance in this. It is the destiny of the national parks, if wisely controlled, to become the public laboratories of nature study for the nation. And from them specimens may be distributed to the city and State preserves, as is now being done with the elk of the Yellowstone, which are too abundant, and may be done later with the antelope.

If Congress will but make the funds available for the construction of roads over which automobiles may travel with safety (for all the parks are now open to motors) and for trails to hunt out the hidden places of beauty and dignity, we may expect that year by year these parks will become a more precious possession of the people, holding them to the further discovery of America and making them still prouder of its resources, esthetic as well as material.

FRANKLIN K. LANE,

Secretary of the Interior.

[SOURCE: Report of Secretary of the Interior, 1916.]

The act to establish a National Park Service was passed by Congress and became a law on August 25, 1916.

This act provides for the appointment by the Secretary of the Interior of a director, assistant director, chief clerk, and other employees of the National Park Service, and puts under the director, subject to the supervision of the Secretary, the supervision, management, and control of the national parks and monuments and of the Hot Springs Reservation in Arkansas, which have heretofore been

administered by the Interior Department. The act also provides that the Secretary may make rules and regulations for the use and management of the reservations and prescribes punishment for the infraction of such rules and regulations; it also gives power to the Secretary to grant privileges, leases, and permits for the use of the lands for the accommodation of visitors in the reservations, for periods not to exceed 20 years and for areas not to exceed 20 acres in any one place, and to grant grazing privileges in any of the reservations except the Yellowstone National Park when such use of the lands does not interfere with the primary purpose for which the park was created.

Area of National Parks.—Congress inaugurated the policy of setting aside tracts of land in various sections of the country as pleasure grounds for the people in the establishment by the act of March 1, 1872 (17 Stat. L., 32), of the Yellowstone National Park in Wyoming, Montana, and Idaho. Since that time 15 additional national parks have been created, the latest being the Hawaiian National Park in the Territory of Hawaii and the Lassen Volcanic National Park in northern California. The total land embraced in these reservations is 4,821,302.83 acres. The areas of these national parks, with the dates of the establishment of each, are as given in the table on the following page.

Visitors.—During the season just closed the number of tourists visiting these national playgrounds aggregated 358,006, as against 335,299 for the season of 1915, an increase of approximately 7 per cent. The general public has continued to manifest interest in the parks, as is evidenced by the large number of communications received, coupled with requests for literature regarding them.

Through the co-operation of a number of railroads it has been possible to publish a collection of illustrated booklets known as the National Parks Portfolio, which became so well advertised and known all over the country that, although an edition of 275,000 was printed, it was not possible to supply the demand. It is planned, however, to issue a sale edition, which may be purchased from the Superintendent of Documents, Government Printing Office, and is expected to be available this winter.

Economic value of national parks.—Leaving out of consideration the cost to visitors of transportation from their homes to the parks, a fair idea of the economic value of tourist travel in five of the larger parks may be obtained by consideration of the financial reports of concessionaires, which show gross receipts for past seasons in the following approximate estimates: Yellowstone National Park

Area of national parks

Park.	Date of establishment.	Acreage.
Hot Springs Reservation, in Arkansas	Apr. 20, 1832	911
Yellowstone, in Wyoming, Montana, and Idaho	Mar. 1, 1872	2,142,720
Casa Grande Ruin, in Arizona	Mar. 2, 1889	480
Sequoia, in California	Sept. 25, 1890	161,597
Yosemite, in California	Oct. 1, 1890	719,622
General Grant, in California	Oct. 1, 1890	2,536
Mount Rainier, in Washington	Mar. 2, 1899	207,360
Crater Lake, in Oregon	May 22, 1902	159,360
Wind Cave, in South Dakota	Jan. 9, 1903	10,522
Platt, in Oklahoma	{ July 1, 1902 }	848
	{ Apr. 21, 1904 }	
Sullys Hill, in North Dakota	Apr. 27, 1904	780
Mesa Verde, in Colorado	{ June 29, 1906 }	48,966
	{ June 30, 1913 }	
Glacier, in Montana	May 11, 1910	981,681
Rocky Mountain, in Colorado	Jan. 26, 1915	229,062
Hawaii, in Territory of Hawaii	Aug. 1, 1916	75,295
Lassen Volcanic, in California	Aug. 9, 1916	79,561
Total .....	.....	4,821,301

in 1913, \$1,186,811.36; in 1914, \$848,688.44; and in 1915, \$2,003,072.35. Yosemite National Park in 1913, \$359,481.45; in 1914, \$334,914.32; and in 1915, \$630,033.60. Mount Rainier National Park in 1913, \$66,942.76; in 1914, \$61,078.08; and in 1915, \$138,120.23. Glacier National Park in 1913, \$161,510.87; in 1914, \$155,716.14; and in 1915, \$277,086.54. Hot Springs Reservation in 1913, \$253,526.98; in 1914, \$233,946.85; and in 1915, \$200,629.21. The financial reports of concessionaires in the parks for the season of 1916 have not yet been received in the department.

Appropriations and revenues.—The total of appropriations made by Congress for protection and improvement of these parks during the year, expendable under this department, was \$252,550, and the amount thereof expended during that period was \$250,940.89. The total of revenues received from concessions in all the parks was \$177,470.69, and the total amount thereof expended was \$141,692.42. The appropriations for the fiscal year ending June 30, 1917, total \$529,800.

Automobiles in the parks.—Automobiles are now admitted under regulations governing travel over the generally traveled roads in all of the national parks and over the West Mountain roads in Hot Springs Reservation; the other roads in the Hot Springs Reservation, however, are not in such condition, considering the safety of individuals and animals, as to permit of their joint use by motor-driven vehicles and vehicles drawn by horses. On special occasions, however, and under special restrictions motor-driven vehicles are permitted over all the roads in the reservation. The total number of automobiles admitted to all the parks was 14,976; the total number of motorcycles, 179; the total revenues derived therefrom being \$64,310.23, as against \$42,589.73 received from this source in 1915.

As stated in a prior annual report, the wild animals in the Yellowstone Park have increased to such an extent, owing to the protection afforded them, as to warrant the department in distributing them for propagation purposes to various parts of the country. This distribution of animals is limited to Federal, State, county, and municipal authorities, and no allotments are made unless evidence is furnished that the laws of the State to which they are intended to be transported afford them ample protection at all times. During the past year permission has been granted for the securing from this park, under proper restriction, of the following animals: Six hundred and sixty-eight elk, 12 buffaloes, 8 grizzly bears, 4 brown bears, 2 mountain lions, 2 wolves, and 2 families of beaver.

Increasing park areas and new national parks.—As stated in the last annual report, Congress has to carefully cut the boundaries of the national parks to the express purpose for which each was created that, in some instances, scenic features of the very first order were excluded. In the careful study which the department has since made of each such territory it has become apparent that, in several instances, outlying territory should be added to these reservations. The most distinguished of these instances is Sequoia National Park, the boundaries of which should be extended to include the superb Kings Canyon on the north and on the east the Kern Canyon and the west slope and summit of Mount Whitney, the highest point with exception of Mount McKinley in the United States. Other instances are the lands east of the Rocky Mountain National Park having features of extraordinary beauty.

The Grand Canyon of the Colorado is one of the greatest natural wonders of America, the gorge itself being one of the largest and

most magnificent in the world, and from its rim the traveler overlooks a thousand square miles of pyramids and minarets rising from the floor of the canyon and ever changing in color. It is at present a national monument, administered by the Department of Agriculture. The officials of that department have reached the conclusion that it should be made into a national park, as in this way it would be more practicable to develop the reservation through the construction of roads, trails, and such other improvements as would afford increased attractions for tourists. It is hoped that the Grand Canyon may be established as a national park during the coming session of Congress.

A bill is pending in Congress for the establishment of the Mount McKinley National Park, in the Territory of Alaska. Mount McKinley is the loftiest mountain in North America, having an altitude of 20,300 feet, and the highest peak in the world above the line of perpetual snow; it is one of the noblest spectacles of its kind. The Government railroad, which is now being built in Alaska, runs within about 45 miles of Mount McKinley, and the creation of this national park would, no doubt, result in additional traffic for this road and a greater number of visitors to Alaska, and give an impetus to the settling of the country. Also the reservation of this land by the creation of the park would mean the establishment of what would probably be our greatest big-game preserve, with moose, caribou, and bighorn sheep. This bill passed the Senate at its last session and it is hoped that it will shortly be enacted into law.

New parks.—By act of Congress approved August 9, 1916, the Lassen Volcanic National Park in the Sierra Nevadas, in the State of California, was established. This park has an area of 79,561.58 acres and embraces the only region in the United States proper exhibiting recent volcanic action. In addition to its volcano it contains hot springs and mud geysers, ice caves, and lakes of volcanic glass, as well as beautiful canyons, lakes, and trout streams. No appropriation has as yet been made for this park, but an estimate in the sum of \$5,000 has been included in the estimates for the next fiscal year, with recommendation that it be made immediately available. The Secretary of Agriculture has permitted the Forest Service to continue the patrol of the lands, as before the creation of the park they were within a national forest, until such time as appropriation is made and it is practicable for this department to administer the reservation.

By act of Congress approved August 1, 1916, the Hawaii Na-

tional Park, in the Territory of Hawaii, was created. This park has an area of 75,295 acres and includes two of the most famous active volcanoes in the world, and another which erupted less than 200 years ago, in addition to the wonderful lava lake which is a mass of fire 1,000 feet in diameter. The act provides that no appropriation for the park shall be authorized until conveyances shall have been made to the United States of such perpetual rights of way over private lands within the exterior boundaries of the park as the Secretary of the Interior shall find necessary to make it reasonably accessible in all its parts, and when such rights of way have been so conveyed report thereof shall be made to Congress. Measures are now being taken through the governor of Hawaii to obtain definite information as to the conveyances of such rights of way.

Congress, on the recommendation of the department, passed a bill creating the National Park Service.

By act of Congress two new parks, the Hawaii National Park, consisting of three separate tracts of land, two on the island of Hawaii and one on the island of Maui, Territory of Hawaii, and the Lassen Volcanic National Park, in northern California on the summit of the Sierras, were established.

The General Land Office made a survey of the privately owned lands containing sequoia trees in the Sequoia National Park that are to be purchased under authority of Congress, and plans were perfected for obtaining these holdings.

Made final surveys and commenced construction of hydroelectric power plant in the Yosemite National Park which, when completed, will furnish sufficient power for lighting all camps, the new hotel, and all of the main roads and foot trails in the park, and for heating and cooking at the hotel and permanent camps.

Issued automobile guide maps of the Yosemite and Yellowstone National Parks.

Under a long-term contract for the development of the Yosemite two new hotels are under construction, one in Yosemite Valley and one at Glacier Point, and two permanent camps are being constructed in the valley and three in the upper country.

Executed long-term contract for development of Mount Rainier National Park on a profit-sharing basis with the Government, the concessionaires to erect immediately a hotel and thereafter, as rapidly as possible, camps and chalets in the park.

Established a free clinic at the Government free bathhouse at Hot Springs Reservation.

At the request of the Secretary of War arranged for the trans-

fer of the guardianship of the Yellowstone National Park from military control under the War Department to civilian control under the Department of the Interior.

Made a survey of the sanitary conditions of hotels and camps in the various parks.

Continued furnishing public information on wide scale about the beauty and accessibility of national parks with purpose of directing travel thereto, publishing "National Parks Portfolio" and "Glimpses of our National Parks."

CHAPTER XXIX

MUNICIPAL OWNERSHIP

By EVANS CLARK

1. INTRODUCTION

THE public ownership and operation of trade undertakings of every conceivable kind from street railways to daffodil culture, from gas works to cattle-dipping tanks, is one of the most interesting developments of cities in almost every part of the civilized world. From South Africa to Sweden, from Saskatchewan to Japan, city governments have, to a greater or less degree, invaded the field of what our business men are pleased to call "private" enterprise. And the extent to which this has occurred is perhaps the most satisfactory practical measure of the success of State Socialism in municipalities.

Public ownership is popular under every conceivable type of government and in countries of every stage of economic and social development. In autocratic Russia and democratic United States, in the ancient civilization of Great Britain and in the youthful stage of South Africa's growth we find municipal trading firmly established. In Germany, where the will of the people has a minimum of effect, municipal ownership has flourished. Germany, in fact, leads the world in this particular. But it flourishes also in Switzerland, the most complete democracy in existence. Conversely, in the nations of South America, almost invariably representative republics, there is little or none. In France, one of the most highly developed nations from the economic and social point of view, there is a relatively small amount of municipal trading, while it is the general rule in New Zealand, whose civilization is, so to speak, on the make.

In fact, this is perhaps the most interesting phase of the development of municipal ownership. It is impossible to correlate its development with either the form of government in any given country or with the character of its civilization.

The only generalization, it seems, that can be made from the facts at hand is this: the amount of municipal ownership varies directly with the influence of cities on national life, and inversely with the domination of the rural sections. Germany and England, both of them dominated by their urban life, lead the world. Russia and South America, still largely agricultural, lag behind. A proof of this generalization would, however, demand fairly complete data in at least four departments of the world's national life: (1) extent of municipal ownership, (2) extent of private ownership, (3) population and economic development of cities, and (4) the same of the rural districts. As this study attempts to cover only the first of these four it is obvious that it must remain herein merely as a hypothesis. But perhaps it will prove of use and ultimately a valid conclusion.

It is well to note, however, that New Zealand and South Africa, whose urban growth is far from being as yet their dominating characteristic, disclose an exceptionally high degree of municipal ownership. This fact would seem to refute even this hypothesis. It can stand still, however, if we add this corollary: colonies inherit the characteristics of their mother countries. The urban development of Great Britain, with its corresponding growth in municipal trading, has transmitted this trait to England's overseas possessions. And this is but natural. The men of influence in the colonies have usually received their training and education in the mother country. Colonies are, moreover, largely dependent on their mother country for their governing precedents and often for actual authority in the conduct of their affairs.

It would seem, then, that it is the logic of social development that is driving towards public ownership. Where cities grow, flourish, and spread their influence abroad in the land, there we find municipal trading. And, roughly speaking, the greater the growth the greater the trading. That this drive is irresistible is attested by the fact that it has made headway against every form of government, every governing policy, and in countries of every age of civilization.

The following survey of the extent and distribution of municipal ownership in the leading countries of the world will go far to support these assertions. If arranged in order of their

relative city-trading development they would perhaps have better illustrated the influence of urban domination and colonial inheritance. They are, however, arranged more or less in the order of the importance of their municipal enterprises.*

2. GERMANY †

1. General

“Allowing for local circumstances, the advantages, like the disadvantages, of public as compared with private enterprise are the same in all countries, and any theoretical consideration of that aspect of the question is superfluous. In general, however, it may be said that municipal enterprise [in Germany] is favored where one or other of the following considerations carries special weight: (a) where the enterprise is concerned with the health, convenience, and safety of the community, as in the case of water-works, sewage works, scavenging, etc.; (b) where the community is the largest consumer, as often in the case of light and power; (c) where the enterprise involves the use of public property, as the tramways in relation to the streets; (d) where important monopolies are at stake, as in the case of water and several of the utilities already named; (e) where private capital is not attracted, as in the case of abattoirs and stock-yards; (f) where the community can distribute more efficiently than private individuals, as in the case of gas and electricity; and (g) where uniformity of action is desirable, and conflict of authority should be prevented, a consideration which applies to most public enterprises. Behind nearly all these enterprises, however, there is an equally powerful motive—the desire to raise revenue freely in other ways than by direct taxation, and this motive, as we shall see, is strongly emphasized by the German Governments.

“The laws relating to municipal government and taxation do not attempt to define the directions in which local authorities may engage in trading undertakings, but give them a perfectly free hand, subject to some extent to control by the State supervisory authority. How wide is the scope of public enterprise in Germany at the present day may be shown by a return relating to 1,279 Prussian

* It is a pleasure to acknowledge the assistance of Alice K. Boehme, Freda Kirchwey, and James W. Alexander in the preparation of this chapter. Their help in digesting the immense amount of material at hand was invaluable.

† The following extracts are taken from Dawson, *Municipal Life and Government in Germany*, London, 1914, pp. 124-329.

towns of all sizes, prepared in 1906. It was found that the following undertakings were in public hands in these towns:

561 waterworks.	104 inns and restaurants.
440 gasworks.	15 hydropathic establishments.
201 electricity works.	2 fruit preserving factories.
54 tramways.	2 wine cellars.
426 abattoirs and stockyards (one for horses).	1 timber warehouse.
19 docks and quays.	2 refrigerating works.
38 market halls.	2 mines.
370 bathing establishments.	2 bakeries.
13 sea and therapeutic baths.	4 factories.
5 salt and mineral springs.	45 brickworks.
1 milk cure establishment.	23 mills.
10 warehouses and sale halls.	2 dairies.
1 wine business.	2 locksmitheries.
42 stone and lime quarries, turbaries, and sand and gravel pits.	2 ropeworks.
17 breweries.	17 dancing halls.
	16 ferries.
	1 livery station.
	2 fishery enterprises.

“Of these 1,279 towns only 310—nearly all small places with less than 5,000 inhabitants—were without trading enterprises.

“The variety of enterprises carried on by the communes would be further increased if the survey were to be extended to other States. While owning and working undertakings common to other places, some towns have enterprises peculiar to themselves. Munich, Frankfort-on-Main, Düsseldorf, and Magdeburg, for example, have wine business and restaurants. Dresden, Düsseldorf, and Neukölln (Rixdorf) have printing works. Nuremberg has an orchard, and also stone quarries, from which it paves the streets. Breslau, Hanover, Mayence, Worms, and a number of smaller towns own and in some cases carry on pharmacies. Cologne carries on a brewery and Leipzig a bakery to meet the needs of the assisted poor. The municipal newspaper, devoted to official reports and notices, has already been mentioned; in two towns, however, Dresden and Elberfeld, the municipal daily newspaper has all the characteristics of a public journal. A number of towns, again, own theaters and concert halls. Some towns own so large an area of forest that they find it necessary to have a special department to manage this section of their estates, to sell timber, re-afforest as may be necessary, etc.

“The wide range of enterprises carried on by individual towns may be illustrated by the case of Mannheim, whose larger under-

takings include gasworks, waterworks, tramways, abattoir and stock-yards, docks and quays, a land trading department, river and other bathing establishments, theater and concert hall, milk kiosks, and a large amount of house property. Some towns, in addition to having important commercial undertakings of their own, have large share interests in industrial, tramway, and power companies; the municipality of Düsseldorf places at the disposal of the mayor and executive a special fund for participating in industrial undertakings.

“An interesting illustration of the readiness of German municipalities to give hostages to the future where there is a prospect of ultimate benefit is afforded by their present enterprises in encouraging aeronautics and aviation. Enormous sums have been expended by the larger towns in particular in the provision of airship sheds, aerodromes, landing stages, etc. Brunswick, for example, has just agreed to provide a Frankfort Airship Company with a site for a landing place for its airships and also for an aerodrome, and to subsidize the company to the extent of from £1,250 to £1,600 a year, while the company undertakes to make Brunswick a place of call in journeys between Frankfort, Hamburg, Berlin, and Düsseldorf. In making grants and subsidies of this kind the towns act entirely on their own responsibility, and without seeking Government or other permission. They also invariably subsidize the local improvement and similar associations formed for the purpose of attracting and ministering to their convenience.

“The ‘public utility’ services are now largely owned and worked by the local authorities. A census taken in 1908 relating to 2,309 urban districts showed that these services were so owned to the following extent;

Towns with a population	Total No. of towns.	No. of these towns which owned				
		Water-works.	Gas-works.	Electricity works.	Tramways.	Abattoirs.
Under 2,000	615	206	19	22	..	56
2,000 to 5,000	873	404	180	154	..	223
5,000 to 20,000	602	426	333	112	17	352
20,000 to 50,000	134	123	112	62	27	101
50,000 to 100,000	44	41	32	30	17	43
Over 100,000	41	38	33	33	18	39
Totals	2,309	1,238	709	413	79	814

“Some of the undertakings here specified are obviously beyond the means of small places, but it will be seen that nearly all the towns with a population exceeding 50,000 owned waterworks and abattoirs, four out of five owned gasworks and electricity works, and two out of five owned tramways. Corresponding figures for 1911 published by the *Statistical Yearbook of German Towns* show that of 87 towns reported upon 77 then owned waterworks, 72 gasworks, 67 electrical works, 78 abattoirs, 47 tramways, and 69 bathing establishments. It has been estimated that a capital of two hundred and fifty million pounds is now invested in the trading enterprises of German towns. In most towns about one-half, and in some as much as three-quarters, of all the outstanding loans has been contracted on behalf of these enterprises, a fact to be remembered when the heavy indebtedness of German towns is considered.

2. Gas

“The first experiments in gas lighting in Germany were made in Freiburg in 1817, and the first gasworks were introduced in Berlin and Hanover by English companies, which still retain the right to supply part of the municipal areas. For a long time private enterprise kept the communes at bay, but the communalization of gas undertakings has made rapid progress during the last 30 or 40 years, and it is estimated that about two-thirds of all town gasworks are now in public hands, as compared with barely one-half of the electricity works, in regard to which public enterprise is losing rather than gaining ground. The proportions are more favorable to municipal enterprise in the large towns. In 1911, of 23 towns with over 200,000 inhabitants, 16 owned and worked the public gasworks; of 23 towns with from 100,000 to 200,000 inhabitants 14, and of 41 towns with from 50,000 to 100,000 inhabitants 29; the corresponding number of towns which owned and worked electricity works were 15, 15, and 28, while three towns had both a gas and an electricity supply.

3. Street Railways

“The first electric tramway to be constructed in Germany was that at Halle, dating from 1894: In that year the total length of electric line in Germany was 64 miles; in 1911 there were 2,700 miles. The number of municipal undertakings in 1912 was 132, 95 of these being in Prussia. The largest of the municipal tramway systems are now those of Dresden with a length of 72 miles,

Munich 58 miles, Frankfort-on-Main 53 miles, Cologne 50 miles, Düsseldorf 47 miles, Nuremberg 24 miles, and Chemnitz 23 miles.

4. Docks and Quays

“The German idea that towns should be managed like business concerns has caused municipal authorities to devote great attention and expenditure to the development of their water communications. Towns that do not lie upon a river are ambitious to connect themselves with one by means of a canal; if so situated, they seek communication with the sea. Hence such towns are prepared to spend enormous sums and to pledge their resources and credit for decades in the development of natural and artificial waterways and the construction and improvement of their dock facilities. Cologne, Düsseldorf, Duisburg-Ruhrort, Mannheim, Ludwigshafen, and Strassburg on the Rhine, Hamburg, Magdeburg, and Dresden on the Elbe, Bremen on the Weser, Breslau and Stettin on the Oder, with Berlin linked to that river by its tributary the Spree, are examples of towns which have shown a keen appreciation of the importance of water communications and have invested money freely in the provision of large and well-equipped docks, provided with all necessary warehouses. Emden, at the mouth of the Ems, owes its remarkable growth entirely to the far-sighted policy of the municipality, which saw in the completion of the Dortmund and Ems canal the opportunity for converting Emden into a great North Sea port.

“An inquiry made by the central office of the German Municipal Congress in 1911 relating to the measures adopted by 113 towns for the furtherance of trade and industry elicited the fact that 27 of these towns had constructed docks equipped with extensive quays, warehouses, railways, electric cranes, and all other necessary auxiliaries. The inland towns which had done most to develop their advantages and traffic were Mannheim, Breslau, Dortmund, Karlsruhe, Frankfort-on-Main, Offenbach, Bamberg, Würzburg and Worms.

“Often the construction of docks has been part of a great scheme of industrial development. Mannheim, Bremen, Frankfort-on-Main, Emden, and many other towns have purchased large areas of land adjacent to their docks and by selling it on easy terms have attracted new industries and trades. The inquiry made by the central office of the Municipal Congress showed that nearly half of the 113 municipal authorities questioned had acquired land for industrial purposes and had systematically offered it to capi-

talists on advantageous conditions, and that in many cases their land was in communication with the municipal docks. It appeared that in one case the town sold land at half the cost price solely with a view to attracting new industries, while in others mortgages on the land sold were accepted at a low rate of interest.

“Berlin itself, though situated so far inland, has of late years expended large sums in dock enterprise. Thanks to the development of the rivers and canals Berlin has long been in direct water communication with Hamburg by the Havel and the Elbe, with Magdeburg by the Plauen canal, with Breslau by the Spree and Oder, and with Stettin by the Finow canal and a deep-water canal now being completed. In order to make the fullest use of its water facilities the municipality has just constructed, at a cost of £870,000, on the right bank of the Spree, several miles from the center of the city, a large dock known as the East Dock, with a wharfage front of 1,500 yards and an area of over 20 acres, and it is about to construct a much larger West Dock on the Spandau canal at a cost of nearly two million pounds, one-third of which will be spent in the purchase of land. The Berlin Chamber of Commerce and the Corporation of the Merchant Elders have shown their faith in the first of these projects by guaranteeing a minimum annual revenue.

5. Baths

“Few if any towns of consequence are without public baths, and in most large towns the principal baths belong to the local authorities. Many German towns are encouraged to enterprises of this kind by the nearness of running water, and the towns on rivers like the Rhine and Elbe and their tributaries use this advantage to the utmost. In 1910 there were 335 separate bathing establishments in public hands in 51 towns with a population exceeding 50,000, while the number of establishments owned by companies and private individuals was still larger. Nearly all these towns owned swimming baths in number from one to six. Further, 72 of the 85 towns whose public bathing facilities are reported on by the *Statistical Yearbook of German Towns* for 1913 are shown as having equipped nearly 500 school buildings with baths. Many of the municipal baths have been planned and equipped with apparent disregard of expense, and of their kind are probably without rivals in any other country. One of the largest and most sumptuous of these establishments was a gift to Munich, though it

is under municipal management. It contains swimming basins for men and women measuring 450 and 225 square yards, respectively, a Turkish bath, and a number of tub and shower baths. Over 600,000 persons use the various baths in a year, and though the charges made are very moderate, 1½d. and 3d. for the working classes, the institution pays its way. Munich has also four open-air river baths at 30 of the elementary schools. Mannheim has just built a swimming bath at a cost of £91,000 towards which the town contributed £60,000, while the balance was a benefaction. It contains covered basins for both sexes, a series of special baths (steam, electricity, wave, etc.), and a wash-house. Not only are all appointments kept in perfect order and the water frequently renewed, but the rule of requiring the bathers to cleanse themselves with soap and water before entering the bath is rigidly enforced.

“Many towns have gone beyond the standpoint of cleanliness in the provision of public baths, and have introduced medical baths of various kinds for the special benefit of insured persons. Open air, light, and air baths on a large scale have been instituted for public use by the municipalities of Düsseldorf, Metz, and a dozen smaller towns. Almost invariably the public baths are carried on at a considerable money loss to the town, but this consideration does not count with authorities bent on promoting the public health by the adoption of every measure approved by science.

6. *Abattoirs*

“The duties of the municipal authorities in relation to the food supply do not, as a rule, include its control and inspection with a view to the prevention of adulteration and the protection of health, for this is a function of the police authority. The principal exception is meat. There are now few German towns of any importance which do not own abattoirs, often with stockyards attached. The local authorities are empowered, by the adoption of by-laws to that effect, to require butchers to use the public abattoirs and to prohibit the slaughtering in any other place of animals intended for human food. There are now in Germany about 1,000 public abattoirs, 100 connected with stockyards, and only about 50 are still in the hands of Butchers' Guilds or private persons. Before the meat is allowed to enter the market it must be passed by official inspectors. Although the public abattoirs are primarily established in the interest of the public health and convenience, they are managed on business principles.

7. *Markets*

“The regulation of the open weekly markets for the sale of country produce, which are still very common in German towns even of large size, is a police function, exercised by the mayor, however, where he is appointed the State commissary for police purposes. On the other hand, where a town provides closed market halls, their control remains in its own hands. These halls are found in most large towns, and are used principally for the sale of vegetables, fruit, farm produce, meat, and fish; in general, for all perishable foodstuffs of which daily supplies come to the town. Berlin has built 15 of such halls, in addition to a large central wholesale market, but several have been disused owing to movement of population from the inner districts to the periphery and the suburbs. At present the municipality is erecting a second large wholesale market hall for the exclusive use of the fruit and vegetable trade. Some towns have added to their market halls large ice works for the supply of ice for their own purposes and to the public.

8. *Banks*

“There are municipal banks in two German towns only, Breslau and Chemnitz; but few towns even of small size are without municipal savings banks, which exist in the main for the encouragement of thrift, but also for the purpose of increasing the credit facilities of the local authorities themselves. Many of these banks have a large check business. Although created originally as welfare institutions in the interest of small depositors, the savings banks have far outgrown their first purposes, and they are now largely used by the lower middle class, shopkeepers, artisans, small officials, and the like.

“Many banks have established mortgage and rent-charge banks or loan funds for the purpose of advancing money to land and house owners and contractors to enable them to build and to develop their property. This is a comparatively recent form of municipal enterprise and has been resorted to owing to the increasing difficulty with which private individuals who needed money for building purposes had to contend so long as they were dependent upon the ordinary credit facilities. No less than 38 towns—for the most part in Prussia—are known to have mortgage banks or funds which make advances for building, while 8 of these towns and 13 others have rent-charge banks and funds which advance money for improvements, such as drainage, water supply, and pavement works. The

towns which have assigned the largest funds to this purpose are Dresden with £4,310,000, Düsseldorf with £2,081,000, Neukölln with £3,050,000, and Aix-la-Chapelle with £1,000,000. Up to 1911 33 towns had spent money on mortgage to the amount of £7,875,000, while 11 towns had lent £800,000 for improvement works, the loans in this case being repayable, as a rule, in yearly instalments spread over a short period.

9. Pawnshops

“ Few of the larger towns are without public pawnshops, which transact a large amount of business on terms more favorable to borrowers than those offered by private establishments. The latter are stringently regulated by Imperial and State laws. Not only does the business of a pawnbroker require to be licensed, but a town may adopt a by-law making permits dependent upon proof of need. The effect is to protect the municipal pawnshop, where it exists, from competition and the working classes from a great deal of imposition. Germany borrowed the idea of public pawnshops from Italy, and Augsburg established the first at the end of the sixteenth century. There are now 49 such pawnshops in Prussia, 34 in Bavaria, and 15 in other parts of the country, and most of them are of old standing. The Munich pawnshops, dating from the middle of the eighteenth century, are among the best examples of municipal enterprise of this kind. There are four of these institutions, under the direct control of the municipality, which provides the buildings, appoints the officials, and finances the undertakings.

10. Theaters

“ In their support of the drama the German municipalities follow three methods. Either the town (a) owns a theater and works it, or (b) owns a theater and leases it, or (c) not owning a theater, subsidizes theaters in private hands, which are often entitled to describe themselves as municipal theaters. It is estimated that over 50 German towns own theaters outright, while four own two each; thus the municipality of Charlottenburg, after building a theater, has now built a costly opera house; both are leased to companies. Of these towns 32 have over 80,000 inhabitants and 15 between 50,000 and 80,000 inhabitants. The list includes important places like Frankfurt-on-Main, Leipzig, and Mannheim, which own two theaters each; Cologne, Aix-la-Chapelle, Charlottenburg, Nuremberg, Düsseldorf, Bremen, Erfurt, Breslau, Halle, Magde-

burg, and Strassburg, all of which have a population exceeding 150,000; but also minor towns such as Wurzburg, with a population of 80,000; Freiburg-im-Breisgau (83,000), Frankfort-on-Oder (64,000), and Leignitz (60,000), though several towns with a population not larger than 30,000 also own theatres: for example, Oppeln, Schweidnitz, and Neisse.

“Of the towns which both own and work theaters the most notable are Mannheim (since 1839), Freiburg-in-Baden (since 1868), Strassburg (since 1886), Mülhausen, Kiel, Leipzig, Cologne, Dortmund, Colmar, and Königshütte. The usual practice, however, is to lease the theater to an actor-manager; though invariably on the subsidy principle. This principle is applied in two ways: Either the theater is leased at a low or nominal rent and the lessee is left to make the most he can out of the enterprise, or a rent approximating to a commercial basis is fixed and the lessee is given an annual subsidy; but variations of these two methods are common. Naturally, the liberality of the terms offered is governed by the extent and character of the population to be served.

11. Land

“The extent of land owned by German towns will probably surprise those who are unacquainted with the large views of communal enterprise held in Germany, where large towns are as ready to spend a quarter of a million pounds in buying land as an average English town of the same size is to spend ten pounds upon a watering-cart. For example, the following are the percentages of their entire administrative areas that were owned by the towns named in 1910 (roads, streets, railways, water, and fortifications are all excluded, but the property of charitable foundations under public management is regarded as town property): Freiburg-in-Baden, 77.7 per cent; Fürth, 66.2 per cent; Stettin, 62.5 per cent; Heidelberg, 61.1 per cent; Coblenz, 59.5 per cent; Brandenburg, 52.8 per cent; Augsburg, 49.0 per cent; Mannheim, 48.6 per cent and Frankfort-on-Main, 47.7 per cent. Cologne, Munich, Saarbrücken, Wiesbaden, Hildesheim, Karlsruhe, and Darmstadt own from 30 to 40 per cent of their areas, 11 other towns about one-quarter, and 5 others about one-fifth.

“What the large and wealthy towns do on an imposing scale the small towns do with equal enterprise, if in a more modest way. Of towns with a population between 50,000 and 60,000, Offenbach owns 2,230 acres of land, Hildesheim 2,770 acres, and Kaiserslautern 5,785 acres. During the present year the little town of

Kalbe on the Saale expended just £14 a head of its 12,000 inhabitants in buying for £168,000 a large estate for the purpose of creating a number of small holdings and laborers' allotments, as well as for disposing of sites for industrial works. One reads with astonishment also of the Rhenish town of Wermelskirchen, with a population of 15,000, which has during the past 30 years increased its estate from two to 1,270 acres.

"The steady growth of municipal estate is shown further by the following table settling forth the proportions of the administrative area owned by some of the larger German towns (exclusive of roads, streets, water, and fortifications) in 1910 as compared with 1906 and 1901-2; where a decrease is shown, it is usually attributable to the incorporation of new suburbs:

Percentage of Municipal Area Owned by Towns at Different Periods

	1901-2.	1906.	1910.
Augsburg	53.7	54.6	49.0
Barmen	2.1	11.3	20.0
Charlottenburg	4.2	10.0	23.9
Cologne	17.8	28.3	31.9
Crefeld	4.3	17.2	13.6
Darmstadt .....	....	33.1	33.3
Frankfort-on-Main	57.8	59.8	47.7
Halle	18.2	....	22.1
Hanover	44.0	43.8	24.9
Karlsruhe	13.7	19.8	38.7
Königsberg .....	....	12.7	18.6
Liegnitz .....	....	17.6	23.9
Mannheim .....	....	39.6	48.6
Munich	20.6	26.6	30.8
Nuremberg	8.3	9.6	15.4
Posen	6.1	8.9	10.4
Spandau	50.8	48.3	42.3
Strassburg	47.5	....	41.5

12. Dwellings

"As long ago as 1901 (March 19) the Prussian Ministers of Trade and Commerce, for Education, and for Home Affairs issued a decree on the improvement of housing conditions, directing the Presidents of Government Districts to use their influence with communal authorities so as to persuade them to increase their real

estate as much as possible, with a view to counteracting private speculation in land, yet urging them not to sell but only to lease such town land for building purposes.

“These decrees powerfully stimulated the local authorities in many parts of the country, and a large number of towns have since provided dwellings for a portion of their employees, invariably upon town land on the outskirts. These houses are in general cheaper than similar houses in private ownership, for the municipalities are satisfied with the return of bare interest and sometimes do not press for that. Of 106 towns with over 50,000 inhabitants, 42 (including Mannheim, Frankfort-on-Main, Düsseldorf, Munich, Stuttgart, Cologne, Mülhausen, and Essen) had in 1909 built such houses. Some of the best of these municipal working-class dwellings are to be found at Mülhausen, for they combine, in a high degree, both comfort and elegance. They are built detached, each block surrounded by a considerable piece of land, and the style of architecture suggests rather a bijou suburban villa than a workingman’s abode. The dwellings consist of three rooms and a kitchen, with a portion of the attic, and the use of a common drying-ground.

“Many towns go further, however, and build small houses for people of limited means generally. Of 15 of the larger towns which have been specially active in house-building, one has built over 200 houses, five between 100 and 200 each, and the remaining nine 50 each. In Bavaria a number of small towns and even villages have built dwellings for the working classes.

“Two comparatively small towns, Freiburg-in-Baden and Ulm in Württemberg, have built houses on a specially large scale, and their experience deserves more detailed reference since it represents a serious practical attempt to alleviate the housing problem by public action on commercial lines, and as such has attracted great attention throughout Germany. Freiburg’s house-building enterprise dates from 1862. It began by building houses to sell at cost price, but when it was found that the owners were selling out at a profit it ceased to part with its houses and has since let them on a commercial basis to working people, small officials, and others.

“The town owns, or manages as custodian of charitable funds, over 500 dwellings, and these it lets at rents which, while moderate, yield a satisfactory profit, but if to this number are added the dwellings provided by building societies receiving public assistance the town directly or indirectly controls over 1,000 dwellings, or 6

per cent of the total number in Freiburg. The houses contain from one to three living or bed rooms, with kitchen and other accommodation, and a garden, and the rents range from 10s. to 33s. a month. The town council has explained its housing policy as follows: 'It is the purpose of the town to set a beneficent example in the domain of house-building and to attempt as far as possible to equalize the fluctuations in supply. When it is satisfied that private enterprise meets all justifiable demands it will move slowly, while, on the other hand, it will be more active when abuses threaten. We can affirm with satisfaction that no serious complaint has yet been made of private individuals having been injured by the action of the town.'

"The municipality of Ulm follows a different method in that it builds houses and sells them outright. It also sells land for building purposes, but subject to the right to buy it back with the buildings thereon during a period of a hundred years whenever the property changes hands or the owner fails to observe his obligations. The town further reserves a special right of re-purchase for a period of 200 years in regard to front garden ground in the event of its being needed for street improvements.

13. Insurance

"Many towns engage in insurance enterprises of various kinds. The principal undertaking of this kind is the municipal fire insurance society as carried on in Berlin and elsewhere. The usual method of operations is for the town to form a company for the purpose, providing all the necessary capital, carrying on the business as an ordinary public enterprise, taking all risks, and receiving all profits. Neukölln, the largest suburb of Berlin, encouraged by the latter's success, recently formed an insurance company on these principles, beginning with the insurance of new buildings. In 1910 the total value of property insured in public insurance enterprise was £3,781,000,000, of which £3,357,000,000 represented immovable property. The year's net profits were £670,000 and the accumulated funds stood at £12,664,000.

14. Labor Registries

"Germany set the world an example in the creation of public labor registries, and other countries have gone to it for instruction in the working of these institutions. While, however, Great Britain and, on a small scale, some of the United States have adopted a State organization of labor registries, this field of activity is still

left in Germany to the municipal authorities and welfare associations, the latter being almost invariably assisted by grants of public money or the loan of public buildings or both, and to trade and labor organizations. Of registries either conducted or assisted by the communes there were in Prussia only three in 1880 and 29 in 1890, but 266 in 1911; in the last-named year there were in Bavaria 67, in Saxony 43, in Württemberg 16, in Baden 18, in Hesse 27, and in the rest of the Empire 38, making a total of 475. The importance attached to the subject by the municipalities may be judged by the fact that of 123 Prussian towns with a population in excess of 25,000, 115 now either maintain or subsidize labor registries. According to the *Statistical Yearbook of German Towns*, 57 of the larger towns in 1911 expended on their own labor registries the sum of £27,870, an average of £490, independently of the cost of rent, light, and heating.

15. Miscellaneous

“Among other notable public properties are the pharmacies owned by six towns—the largest of them Breslau, Hanover, and Mayence. In the first two of these towns the pharmacies are carried on as municipal undertakings, while in the others they are leased to private individuals. In 1910 Breslau made profits of over £2,000 by selling drugs. A far larger number of towns have hospital pharmacies, which supply drugs and appliances for all municipal institutions. The municipality of Duisburg, in conjunction with the local Chamber of Commerce, both owns and carries on a hotel, and several Bavarian towns own hotels and restaurants. Until recently Aix-la-Chapelle carried on its famous bath as a municipal institution, and though, owing to the want of success, it has been transferred to a company, the town is interested to the extent of 70 per cent in the company’s capital.”

3. GREAT BRITAIN *

“Closely related to this aspect of the problem of municipal trading is the question as to how extensively these various enterprises are carried on by local authorities. Unfortunately it is impossible to obtain complete information on this subject and it is necessary to be satisfied with such details as can be pieced together from a variety of sources.

“The amount of the outstanding loans of local authorities for

* The following extracts are from Knoop, *Principles and Methods of Municipal Trading*, London, 1912, pp. 95-103.

'trading' and certain other 'reproductive' purposes in different years gives an indication not merely of the present extent but also of the growth of the various undertakings. This information is given for England and Wales in the table which follows: detailed figures were not published for any year before 1884-85, consequently that year and the years 1894-95, 1904-5, and 1907-8, this being the last year for which the figures are available, have been selected.

"At the end of 1907-8, English and Welsh local authorities had outstanding loans amounting to over two hundred and sixty-seven million pounds in respect of 'trading' enterprises.

TABLE SHOWING THE OUTSTANDING LOANS OF LOCAL AUTHORITIES IN ENGLAND, WALES FOR TRADING, AND CERTAIN OTHER REPRODUCTIVE PURPOSES AT THE END OF 1884-85, 1894-95, 1904-5, AND 1907-8

Purposes.	1884-85.	1894-95.	1904-5.	1907-8.
I. Trading debt:				
Water works	£30,327,000	£43,970,000	£114,699,000	£122,547,000
Gas works	13,769,000	16,932,000	23,831,000	23,358,000
Electricity supply		1,379,000	25,639,000	29,667,000
Tramways and light railways	1,168,000	1,467,000	25,315,000	33,300,000
Harbors, piers, docks, and quays.	28,538,000	32,778,000	43,555,000	46,874,000
Markets	5,004,000	5,771,000	7,736,000	7,590,000
Advances to Manchester Ship Canal Company		5,127,000	5,088,000	5,051,000
2. Reproductive debt:				
Bath, wash-houses, and open bathing places	562,000	1,470,000	2,940,000	3,131,000
Cemeteries	2,369,000	2,718,000	3,077,000	3,120,000
Housing of the working classes	3,532,000	4,352,000	8,962,000	10,510,000
Total	£85,269,000	£115,964,000	£260,842,000	£284,148,000

"Of this debt some forty-eight million pounds were in respect of the Metropolitan Water Board and twenty-five million pounds in respect of the Mersey Docks and Harbor Board.

"Water works account for some 46 per cent of the trading loans, gas works for some 9 per cent, electricity supply for 11 per cent, and tramways for 12 per cent. During the 23 years between March, 1885, and March, 1908, the outstanding debt in respect of water-works increased by some 300 per cent, in respect of gasworks by some 7,700 per cent, in respect of tramways and light railways by some 2,750 per cent, whilst the debt in respect of electricity works,

which was nothing at the beginning of the period, amounted to more than twenty-eight million pounds at the end of the period. This period saw the growth of practically two new types of municipal enterprise—electricity and tramway undertakings—yet the borrowing incurred in connection with these two together was only two-thirds of that incurred in connection with water undertakings. Even if the outstanding debt of the Metropolitan Water Board is excluded, the new loans incurred in respect of water undertakings considerably exceeded those incurred in respect of any other trading undertakings. In 1884-85 the total outstanding loans of English and Welsh local authorities were £173,208,000, and the 'trading' debt represented 46 per cent of the total debt, and the 'reproductive' debt 49 per cent of the total debt. In 1907-8 the total outstanding loans of English and Welsh local authorities were £503,646,000, and the trading debt represented 53 per cent and the reproductive debt 56 per cent of the total debt, or if the loans contracted by the Metropolitan Water Board were entirely excluded from the calculations, 48 per cent and 52 per cent, respectively. From these figures it will be seen that the 'trading' debt represented a somewhat larger proportion of the total debt in 1907-8 than in 1884-85. Speaking quite broadly, about half the outstanding loans of English and Welsh local authorities are for reproductive purposes and half for other purposes."

1. Gas Works

"In 1909 there were 293 gas undertakings belonging to companies. The outstanding capital of the former was £30,479,000 and of the latter £90,121,000."

2. Electric Light Plants

"In 1909 information was collected concerning 451 electrical supply works in the United Kingdom. In 241 cases local authorities were generating and distributing current; in 7 cases local authorities purchased current in bulk and distributed it; in one case a Joint Board of Local Authorities generated and distributed current, whilst in 202 cases the supply of current was in private hands. From another source we learn that, in 1910, 325 local authorities and one Joint Board of Local Authorities held between them 384 Electric Lighting Orders, whilst 151 companies or private individuals held 351 Electric Lighting Orders. In some cases, although an order has been granted, no current is supplied; this applies especially to local authorities. On the other hand, some companies hold orders

relating to areas which are scattered over fairly large districts, and it is not feasible to supply them all with current from one central power station. In view of these considerations, it seems certain that there are fewer than 326 public electricity supply undertakings and more than 151 private electricity supply undertakings in this country. No information is available concerning the total amount of capital invested in electrical undertakings."

3. Street Railways

"Of the 300 street and road tramways and light railway undertakings in existence in 1909 in the United Kingdom, 176 belonged to local authorities and 124 belonged to companies. The total expenditure on capital account was £49,569,000 in the case of the former and £23,373,000 in the case of the latter."

4. Water Works

"In 1904-5 there were 1,142 municipal and 231 private water undertakings in the United Kingdom. The former employed a capital of £128,819,000 and the latter of £18,718,000."

5. Docks, Quays, etc.

"The number of local authorities carrying on Harbor, Dock, Pier, Canal, and Quay undertakings in England and Wales during 1907-8 were as follows:

County Councils	1
County Boroughs	10
Other Boroughs	28
Urban District Councils	9
Other Harbor, Dock, etc., Authorities	55
Total	103

The outstanding loans of these authorities were £46,874,000, exclusive of the five million pounds advanced by the Manchester Corporation to the Manchester Ship Canal Company."

6. Summary

"From these various figures quoted it will be noticed that nearly five-sixths of the water undertakings in the United Kingdom belong to local authorities, whereas in the case of electricity undertakings and tramways a little more than half are municipal. In the case of gas works, on the other hand, nearly two-thirds belong to companies."

7. *Non-metropolitan Boroughs*

TABLE SHOWING THE NUMBER OF BOROUGHS IN ENGLAND AND WALES, OTHER THAN METROPOLITAN BOROUGHs, WHICH OWNED AND MANAGED WATER, GAS, ELECTRICITY, AND TRAMWAY UNDERTAKINGS DURING THE YEAR 1908-9

Service.	County Boroughs.			Non-County Boroughs.			All Boroughs.		
	With separate undertakings.	Participating in joint undertakings.	Both forms of management.	With separate undertakings.	Participating in joint undertakings.	Both forms of management.	With separate undertakings.	Participating in joint undertakings.	Both forms of management.
Water supply undertakings	48	5	53	159	20	179	207	25	232
Gas supply undertakings	33	0	33	71	2	73	104	2	106
Electricity supply undertakings	65	0	65	79	4	83	144	4	148
Tramway and light railway undertakings	50	0	50	20	4	24	70	4	74
Total number of Boroughs	74			253			327		

“In the tables given above there is shown the extent of municipal water, gas, electricity, and tramway undertakings amongst the 327 boroughs of England and Wales, other than the Metropolitan Boroughs. It will be observed that the 74 County Boroughs all engage in trading enterprises to a very marked degree. Amongst the non-County Boroughs the trading is considerably less, except in the case of water. In view of the fact that in these boroughs the population is nearly always below 50,000, and in numerous cases very much below, this result is hardly astonishing.

“In many of these towns where there is no municipal tramway or electricity department, there is probably no private undertaking of the kind either, the number of inhabitants not being sufficient to justify the establishment of such an undertaking.”

8. *Miscellaneous*

“The great bulk of the information available concerning municipal trading refers almost exclusively to water, gas, electricity, and tramway undertakings. For those local authorities, however, which were included in the Parliamentary Return for the years 1902-3 to 1905-6 a more complete survey can be given. This is done in the following table:

SERVICE.	Thirty Lon- don local authorities.	Forty-three large local authorities outside London.	Seventy- three large British local authorities.
Water Supply .....	..	33	33
Sea-water Supply .....	..	1	1
Gas Supply .....	..	23	23
Electricity Supply	16	41	57
Tramways—			
(1) Owned and worked by the Local Authority	1	34	35
(2) Owned but not worked by the Local Authority .....	..	4	4
Markets (and Slaughter-houses) ...	3	40	43
Baths (and Wash-houses).....	26	41	67
Working-class Dwellings	16	26	42
Model Lodging-houses .....	..	3	3
Cemeteries	8	6	14
Milk Depots	2	2	4
Harbors and Quays .....	..	8	8
Ferries .....	..	3	3
Steamboats	1	..	1
Conditioning house .....	..	1	1
Ice Manufactory .....	..	1	1
Flag-making .....	..	1	1
Telephones .....	..	4	4
Aquarium .....	..	1	1

“The London local authorities, to which the first column of figures relates, are the London County Council, the Corporation of the City of London, and the 28 Metropolitan Boroughs. All of these are within the supply area of the Metropolitan Water Board, and consequently were indirectly interested in the water supply undertaking. Again, the one tramway undertaking, owned and managed by a local authority in London, is that belonging to the London County Council. Their system serves the areas of practically all the other 29 authorities, so that municipal trading in London is really much more extensive than is suggested by the table. Amongst them, the 73 local authorities to which the information relates carried on 19 different kinds of ‘reproductive’ undertakings, but of these only nine—water works, gas works, electricity works, tramways, markets, baths, working-class dwellings, cemeteries, and harbors—were engaged in by more than 10 per cent of these local authorities, whereas in six only a single enterprise of the kind existed.”

4. FRANCE

Municipal ownership in France has made relatively little headway compared to most of the countries of Europe. There is, however, evidence to show that there are a considerable number of municipal trading undertakings.

(a) Light

“France is backward in this movement. In 1905, as a result of the restrictive legislation of the Conseil d’Etat, this branch of production had been taken hold of by only eight townships, some very small, like Rozoy-en-Brie (Seine-et-Marne, 1,300 inhabitants), and three more important cities, Turwing,¹ Valence,² and Grenoble. The municipalization of gas at Grenoble was established in 1866. From 1890 to 1907 the city of Paris ran the municipal electrical system of the Halles. It had also made preparations for an extensive project for municipalizing gas; a large loan of 120 millions was to make possible the liquidation of the old franchise and the installing of the new system. The Chamber of Deputies twice passed on this scheme, but the Senate, after having modified it the first time, caused it to collapse definitely in 1905.”³

(b) Street Railways

In France the Conseil d’Etat so interprets the law that the municipalization of street railways is still to be accomplished. In addition to this, they (the cities) run up against natural and economic obstacles. The cities may hesitate in face of the particular complications of an enterprise of this sort, either from its very nature or owing to circumstances. The technical progress in transportation has transformed traction by animal power into traction by steam or electricity, which has necessitated study, experiment, change of equipment, and often also considerable expense. Furthermore, the business of public transportation often interests several localities (at once).⁴

(c) Water

“In France the municipalization of water has been considerably extended. It is the public service which is the most often municipalized in our country, being thus administered in two-thirds of

¹ Given to private concern 1913.

² Failed.

³ Bouvier, *op. cit.*, p. 25.

⁴ *Ibid.*

the cities of more than 5,000 inhabitants. The city of Grenoble was one of the first to undertake it. The work of installment began in 1852; operation began in 1852 with 31 customers. According to a survey made in 1892, out of 438 cities of more than 5000 inhabitants provided with a water system, 284 administered theirs directly, and only 154, that is, 35 per cent, were served by companies or individuals. Since this time the number of cities which have municipal water systems has very greatly increased."¹

(d) *Miscellaneous*

Housing.—"In France the city of Lyons 'régie des immeubles de rapport' in one of the new sections (quarters) of town known as grôlée. The system of administration is that of 'régie intéressée.' It is not a question of workmen's houses, and the undertaking is not of a social character; it is a productive enterprise."²

Abattoirs.—"Of the 905 slaughter houses that exist in France, we read in the *Matin* of November 1, 1909, only four satisfy the strict but beneficial requirements of sanitary hygiene. These four slaughter houses have been built within less than three years by four small cities, Conderque, Oullins, Villefranche, and Saint Chamond. Soissons has just followed their example. The Soissons slaughter house is connected with a cold-storage plant."³ A municipal abattoir has also been established at Conderque Blanche.⁴

Employment Bureaus have been established under municipal ownership and operation in 107 cities of over 10,000 inhabitants.⁵

Baths are owned and operated by the city of Saint Claude; population, 10,980.⁶

5. ITALY

Municipally owned enterprises are of two sorts, according to the method of administration:

(1) Those run by *special administration* (en régie spéciale), which have a great deal of autonomy and a budget separate from that of the city;

(2) Those run *in economico*, which are budgetary enterprises and form a part of the general administration.⁷

¹ *Ibid.*, p. 19.

² *Ibid.*, p. 25.

³ *Annales de la Régie Directe*, 1909-10, p. 120.

⁴ *Ibid.*, p. 104.

⁵ *Ibid.*, p. 339.

⁶ *Ibid.*, p. 124.

⁷ Compiled from *Ibid.*, Shiavi, *Statistique des Régies Municipales en Italie*.

Freedom to undertake a large variety of enterprises under *special administration* was granted by the state to the municipalities under a law of 1903.¹ Previous to this, however, municipalities had already gone a long way without direct official sanction.

“The development of municipal enterprises under special administration is illustrated by the following figures:

	Number.
In 1904	26
Jan 30, 1906	53
Jan. 1, 1908	74
Jan 1, 1910	105

They are distributed as follows:

	Established		Total.
	Before 1904.	Since 1904.	
1 Gas works	17	8	25
2 Electric light or power plants	12	23	35
3 Telephone .....	..	1	1
4 Street railways .....	..	7	7
5 Steam transportation by water .....	..	1	1
6 Water works	5	3	8
7 Flour mills	1	1	2
8 Bakeries	3	4	7
9 “ with pastry establishments .....	..	1	1
10 Butcher shops	1	2	3
11 Cold storage plants	1	..	1
12 Cellar for storing wine .....	..	1	1
13 Drug stores	1	4	5
14 Cheap dwellings .....	..	6	6
15 “Vidange” .....	..	1	1
16 Acetylene plant	1	..	1
Total	42	63	105

“These enterprises have a separate administration, a personnel and budget distinct from that of the general administration, and may adopt methods more closely resembling those of private industrial enterprises.

“On the same date (1st Jan., 1910), there were 24 other services forming a part of the general administration and which were in the process of being transformed to special administrations”:

¹ The Giolitti law.

1	Electric light plants	7
2	" power plant	1
3	Cheap dwellings	3
4	Water works (eau potable)	4
5	Bakeries	2
6	Sea bath	1
7	Butcher shop	1
8	Cold storage and ice plant	1
9	Warm bath ("établissement d'eaux thermales")	1
10	Public bath	1
11	Telephone	1
12	Electric light and water works	1
	Total	24

The following municipal plans are being studied with a view to transformation to special administrations:

1	Water	6
2	Power plants (consortium of eleven townships)	1
3	Electric light plant	12
4	Gas works	5
5	Acetylene plant	1
6	Gas and electric plants	1
7	Electric plants and street railways	2
8	" " " water works	1
9	Hydro-electric power plant	1
10	Abattoir	1
11	Abattoir and butcher shop	1
12	Bakeries	2
13	Flour mill and bakery	1
14	Drug stores	4
15	Mineral water establishment	1
16	Street railways	2
17	Cheap dwellings	9
	Total	51

"Finally, here is the list of municipally owned enterprises not under special administration on January 1, 1913":

Cheap dwellings	5
Water works	427
Gas works	4
Electric light plants	31
Acetylene plants	28
Transportation service	5

Drug stores	26
Flour mills and bakeries	14
Butcher shops	225
Public markets	57
Baths and laboratories	29
Ice plants	29
Night lodgings	1
Power plants	8
Bill posting	45

The number of different kinds of municipal undertakings in January, 1910, under both systems of administration, as well as in the twilight zones of transfer from one to the other, is as follows (in order of extent of distribution) :

1 Water works	447
2 Butcher shops	229
3 Electric plants	100
4 Markets	57
5 Bill posting monopolies	45,
6 Drug stores	35
7 Gas works	34
8 Baths	32
9 Ice and cold storage plants	31
10 Acetylene plants	30
11 Bakeries and mills	27
12 Dwellings and lodgings	24
13 Street railways and transportation	14
14 Telephone systems	2

6. SWITZERLAND

The following figures indicate the relative extent of municipal and private ownership in Switzerland in the year 1910:¹

1. Water

Supply system in	38 towns
Municipally owned	34
Privately owned	3
Supply gotten from neighboring town	1

2. Gas

Works in	37 towns
Privately owned	2
Privately run	9
Leased to private concern in which city owns stock	1
Municipally owned	27

¹ Compiled from *Annales de la Régie Directe*.

3. *Electric light and power*

Service in	35 cities
Privately owned	4
Leased to private soc.	8
STATE owned	1
Municipally owned	22

4. *Street railways*

Service in	17 cities
Private companies	9
Municipally owned	7
Owned by Canton	1

5. *Dwellings, etc.*

Swiss municipalities have gone extensively into the problem of keeping down the rents, in some cases giving financial assistance to co-operative construction companies for the erection of dwellings, and in others undertaking themselves the building of houses. Among the cities that have built their own dwellings are Geneva, Berne, Zurich, Lausanne, Vevey, Neuchatel, Saint-Gall, and Lugano.¹

“A fact which clearly proves the very general success of experiments in municipal housing in Switzerland is that we can see a series of projects springing up for the construction of more houses by the municipalities: at Glarus, Soleure, Bâle, Berne, Geneva, Lausanne, and Zurich.”²

Comparing the relative merits of subsidizing private construction companies and actually undertaking the building, the following comment is made:

“From the data we have gathered, seven subsidized companies at Coire, Payerne, Vevey, La Chaux-de-Fonds, Lucerne, Bâle, and Berne are found to have built 324 dwellings, on an average of 46 apiece, whereas the six municipalities of Vevey, Neuchatel, Berne, Bâle, Lausanne, and Zurich, which put up dwelling houses for general use and also notified us of their number, constructed 1,027, making an average of 171 dwellings per city (as against 46 per company). Direct action by the city thus appears to be the most expeditious.

“The city of Berne, which tried out^o both systems, reports as

¹ See *Annales de la Régie Directe*, Feb., 1913: Milhaud, “Notre Enquête sur l'Action Publique et le longuement Populaire en Suisse.”

² *Ibid.*

follows concerning the two [building] co-operatives to which it lends assistance: 'It must be said that action by these two concerns has been rather slow. Much swifter is action by the municipality, which alone up to the present time can be said to have had a wholesome effect on rents paid by families of small means.'"¹

6. *Unemployment relief*

"Several cities have attacked the problem of unemployment. In 1895, St. Gall organized a scheme of compulsory insurance against unemployment. Berne subsidizes one for voluntary insurance. The Canton of Bâle-ville founded a public bank for insurance against unemployment in 1909. The city of Zurich was satisfied with the public organization of some of the city work for the relief of unemployment."²

7. *Lands other than parks*

"When the Swiss townships passed from collective to private ownership the transition was less complete than in other places. Not only the waste lands ('landes'), but nearly all the woods and some of the pasture lands, and even of the cultivated fields remained with the township. In the canton of Schaffhouse these public holdings extend over one-third the total area. In Obwald the townships command a wealth of nearly 3,500 francs per family of four people, and in Appenzell, Rh. Int., a wealth of more than 1,200 francs per family."³

"The ways of enjoyment (modes de jouissance) are varied. In many places the enjoyment of nature (jouissance de nature) is still in practice; here the inhabitant receives firewood (Soleure, Berne, Saint-Gall), there building wood to repair his house—nowhere is the peasant so well housed as in the Alpe d'Uri—in another place, the right to pasture his flocks; in still another, a garden of 10, 20, or 30 acres. The industrial worker of the canton of Glarus always has his garden, granted to him for 10, 20, or 30 years. Elsewhere, the public lands are rented and the net product is distributed in money or used for the public welfare."⁴

"The Swiss township differs from the American township in that it is not only a political and administrative unit, but an economic unit as well. It gives its members more than abstract rights; it gives them also, in part, the means of existence. As in

¹ *Ibid.*

² *Annales, op. cit.*

³ *Ibid.*, Ganel, *Le Rôle Economique des Communes en Suisse.*

⁴ *Ibid.*

other places, it provides for the expenses of the school, the church, the police, and the public highways, but in addition it assures them the enjoyment of property, the fundamental requisite of true liberty and independence.”¹

The village of Bassins illustrates these economic functions of the Swiss commune:

“It is a township of 417 inhabitants. It owns real estate of various sorts, which it rents. The township hotel, to begin with, is rented to a hotel manager at 1,520 francs (a year) with the obligation that he retail salt. The township oven is rented for 40 francs a year and the price of cooking is established by the township. Finally, nine chalets and pasture lands are rented at auction—for 17,650 francs. In addition to this, the township administers under direct ownership the water service, a weighing machine, a thresher, a crusher, a wine press, pasture lands, and woods. The pasture lands cover about 39 hectares and are rented (1909) for 1,350 francs. The woods cover 800 hectares; they include *all* the wooded lands situated within the township. Most have been owned by it from time immemorial, some were bought at the beginning of the nineteenth century, and have since taken on a surplus value of 300 per cent. They bring returns of 50,000 francs a year.

“The revenues from these various holdings are sufficient to balance the township budget. The citizens of Bassins are not taxed.”²

7. AUSTRIA

The following is a summary of the extent of municipal ownership in the cities and towns of Austria.* Water works are owned by 27 cities. There are 30 municipal electric light and power plants and 28 gas works. There are 16 cities which own and operate street railway systems, 22 having municipal theaters or opera houses, and 6 own their own pawnshops. There are 22 public baths in 12 different cities, and 23 swimming pools in 16 cities, some of which have also the hot and cold baths. Real estate is held for profit in 15 towns. There are also 1 public hotel, 2 breweries, 1 mill, and 1 sawmill. Municipal savings banks are found in no less than 43 cities and undertaking establishments run by the municipality in 6 other towns. Farming and gardening are engaged in by 16 towns, stone quarries by 4, and municipal kitchens by 2 more. There is but one garbage destruction plant—in Bruenn.

¹ *Ibid.*, quoted from de Lavelage.

² *Ibid.*

* Compiled from Statistische Central Kommission, Oesterreichisches Städtebuch, XLV Band, 1913.

The cities which show the highest degree of municipal socialism are Vienna, Wiener Neustadt, a suburb of Vienna, and Linz. Vienna owns and operates its street railways, its gas, electricity, oil and ligroin lighting systems, an undertaking establishment, and five savings banks. Wiener Neustadt owns a lighting system, theater, slaughter house, two swimming pools, and a farm. Linz operates its water works, a gas and electric plant, a farm, a slaughter house, three baths, two swimming pools, and some savings banks.

8. HUNGARY

The following are the municipally owned and operated plants in the kingdom of Hungary: *

Of 136 Hungarian towns 134 have municipally owned works of various kinds. Among these municipal undertakings we find 124 slaughter houses, 81 canalization works, 40 water works, 39 bathing pavilions, 32 tile factories, 23 restaurants, 18 electric works, 12 stone quarries, 12 ice factories, 11 hotels, 8 gas works, 7 amusement halls, 6 savings banks, 6 pawnshops, 6 meadow and forestry administrations, 4 sawmills, 3 coffee houses, 2 local railroads, 2 public markets, 2 mills, 2 sand pits, 2 theaters, 1 electric street railway, 1 printing press, 1 coal mine, 1 furnace, 1 provision exchange, 1 liquor business, 1 petroleum plant, 1 disinfecting station, 1 garbage crematory, 1 Fuhrpark or street cleaning undertaking in which all horses, carts, etc., are owned by the municipality.

In all there are 452 municipally owned undertakings outside of the town of Budapest. Of this number 300, or 66 per cent, serve the public health.

Budapest has its own water works, gas works, street car system, billboard department. Under the food department it owns a bread bakery, slaughter houses and cattle markets, public markets, a slaughter house for horses and preparation of horse meat, a wholesale clearing house for provisions, storehouses, and a peddler market. The health department has its canalization works, its street cleaning system which owns its own horses and carts for the removal of ashes and garbage, bathhouses and a disinfecting station. The housing department has its municipal tenements and its bachelor boarding house. The city also owns for city consumption stone quarries, printing press, newspapers, a gas fittings department and warehouse, coal and fuel yards. Under the heading of the town's real estate we find listed lots and houses, fruit orchards, forests, and amusement halls.

* Compiled from Basch, "Die Gemeindebetriebe in Ungarn," in *Schriften des Vereins für Socialpolitik*.

9. UNITED STATES

There are some thousands of cities, towns, and villages in the United States which practice some form of municipal ownership every day in the year.

Out of 195 cities with a population of 30,000 people, 150 own and operate their own water-supply business. There are no less than 1,562 publicly owned and operated electric light and power plants, 125 gas works, some 20 asphalt paving plants, not to mention hundreds of isolated examples of municipally owned and operated markets, docks, garages, heating plants, public halls, cemeteries, ferries, and street railways. There is even a case on record of a municipal organ, a liquor agency, and a newspaper.¹

1. *Water works*

By far the greatest advances have been made in the field of water supply. In 1800 there were 16 water works in the country. Of these 15 were in private hands—all but one of which (Morristown), it is interesting to note, have since been taken over by the public. In 1899 there were 3,326 water works, of which 63 per cent (1,787) were municipally owned and operated. Of the 38 cities with a population of over 100,000 there were in 1900 no less than 30 which owned and operated their water supply business. The eight privately owned plants were in San Francisco, New Orleans, Omaha, Indianapolis, St. Joseph, Scranton, Paterson, and New Haven. Of these eight, two (New Orleans and Omaha) have since been taken over by the public. In 1912 there were 56 cities with a population of 100,000 and over. Of these 48 owned and operated their water works. The eight still in private hands were at that time: Indianapolis, Oakland, New Haven, Scranton, Paterson, Bridgeport, and San Antonio. In the same year there were 195 cities showing more than a 30,000 population, and among them but 45 private plants. The latest figures available show (1915) 204 cities of over 30,000 population and but 49 private plants. Of these 7 are in cities of between 100,000 and 300,000 population, 16 in those of 50,000 to 100,000 population, and 26 in cities of 30,000 to 50,000. *No changes in ownership from public to private hands have been noted*, but an increasing number of plants have gone from

¹ This and the following extracts are taken from Evans Clark, *Municipal Ownership in the United States*, New York Intercollegiate Socialist Society, 1916, p. 30.

private to public ownership: in the years 1880 to 1889 there were 7 such transfers; 1890 to 1899, 14; 1900 to 1909, 16, and in the five years from 1910 to 1915 there were already 11.

These figures carry with them the most important implications. In the first place it is clear that the big water works are in the hands of the public. It is only in the small towns that the private water company has struck root at all. And this is of special significance. In every other public utility just the opposite is true—the number of private companies varies directly with the city's size. Water works statistics, at least, give the lie to the assertion that public ownership is only adapted to small undertakings, and also to the equally tiresome claim that public control lacks initiative. Witness, for instance, the great engineering triumph that New York has won in the Catskill Water Supply. Public ownership has undoubtedly conquered the field of water service.

2. Electric light and power

In the production of electric light and power cities have gone much further than is generally known. In 1902 there were 3,620 electric plants in the United States. Of these 22 per cent (815) were owned and operated by municipalities. In 1907 there were 4,714 plants, 27 per cent (1,252) of which were publicly owned. In 1912, 30 per cent (1,562) of the plants were city-owned out of a total of 5,221. In other words, municipal ownership increased between 1902 and 1907 54 per cent and between 1907 and 1912 24 per cent, while during the same periods private ownership increased only 23 per cent and 6 per cent, respectively.

But with these figures must go others if we are to see the situation four square. It is clear that municipal ownership has made far greater headway than private ownership in number of plants established, but in terms of total output the facts are astonishingly different. The output of municipal plants per kilowatt hour in 1912 was 10,436,276, that of private plants 537,526,730. That is: although the number of municipal plants was 30 per cent of the total, their output was only 5 per cent of the total output for the year. The rate of growth of plants put into terms of output shows a similar discrepancy. From 1902 to 1912 municipal plants have increased their output 136 per cent, while private plants have gained 238 per cent.

What has happened is this. While a far greater number of new plants have been built under public ownership, the private ones have been decidedly larger.

This looks as if the private promoter had captured the big prizes in the electrical field. Other figures bear this out. In 1902 no less than 82 per cent of the municipal electric light plants were in cities of less than 5,000 population, while only 73 per cent of private plants were so located. In 1904 there were but 4 municipal plants in the 39 cities of over 100,000 population. And in 1912 there were only 7 in the 56 cities of the same population. To quote the Civic Federation Report: "It is only in cities below 30,000 that municipal (electric) undertakings are found." The only cities of over 100,000 population to-day which own and operate their electric light systems are: Chicago, Cleveland, Cincinnati, Los Angeles, Seattle, Columbus, and Birmingham—and of these none has a monopoly of the field, while some do not supply private customers.

These figures characterize municipal ownership in the electric field—a fairly high degree of development, but one almost exclusively confined to the smaller cities—precisely the opposite, as we have seen, from that in the field of water supply.

3. Gas

A survey of the gas business reveals a somewhat similar situation. In 1899 there were in the United States 965 gas plants. Of these 14 (1.5 per cent) were municipally owned and operated. In 1914 there were 2,109, of which 125 (6 per cent) were socialized. The number of municipal plants increased in this period 11 per cent, while the private plants increased as much as 46 per cent. In 1912 of over 100 municipal plants only one (Richmond) was located in any city of over 100,000 population.

In the gas business, therefore, as in the electric, the private companies have captured the big plants. But in the case of gas, public ownership, even in the smaller towns, has not made anything like the headway that it has in the field of electricity and water.

4. Telephones

The telephone business, it is needless to say, is entirely in the hands of private capital, although its service in all its essentials is similar to these other utilities.* Not a single city in this country owns and operates a commercial telephone system. The closest approximation to public ownership we find in the police and intra-departmental systems which some cities maintain. But even these lines are often (as are the police and fire department telephones in

* The necessity for inter-city and inter-state connections makes the telephone, however, more of a national than a municipal utility.

New York) owned and operated by the Bell or some other corporation.

5. Markets

The public ownership of markets has gone far. Of 195 cities with a population of over 30,000 no less than 112 own and operate markets. Nearly three-fourths of all cities of 100,000 and over (41 out of 56) have one or more. They flourish in the larger cities.

6. Street railways and ferries

In the whole of the United States only three cities (San Francisco, Seattle, and Monroe, La.) own and operate portions of their street railway systems, only two (New York and Boston) own and operate ferries, and but two (New Orleans and San Francisco) any large per cent of their water front.

The publicly owned water front of New Orleans with its municipal terminal railway and the water front development of San Francisco are two exceptional and remarkable examples to show the public advantages to be gained from resistance to this trading on people's necessities—advantages, it might be added, which almost every German and many English cities have long since recognized and acted upon.

7. Docks and waterfront

Of the 63 principal sea and lake port cities of the United States there are but eight which do not own some portion of the waterfront within their limits. It is interesting to note that of these eight no less than six, including so large a city as Milwaukee, are on the Great Lakes. Galveston and Port San Luis, Cal., are the only ports in this class on the seaboard. Of the remaining 55 port cities there are 14 which own some frontage but do not own any wharves, and 41 which own both frontage property and docks, piers, or wharves. Portland, Me.; Charleston, S. C.; Buffalo, N. Y.; Duluth, Minn., and Erie, Pa., are the more important cities which do not own any docks.

There are only eight ports in which the public owns the major portion of the waterfront or is in a position to acquire the bulk of it: New Orleans, San Francisco, Los Angeles, San Diego, Oakland, Sacramento, Stockton (Cal.), and Washington (D. C.). In New Orleans and San Francisco the ownership is vested in the state, in Washington in the Federal Government, and in the others in the city. Although in the remaining ports the public ownership

is less than one-half the entire waterfront property there are several important cities whose frontage ownership is a substantial interest. Among these the more notable are: New York, Boston, Philadelphia, and Baltimore on the Atlantic, and Seattle and Tacoma on the Pacific Coast.

There are some 548 publicly owned (city or state) docks, wharves, and piers in the United States. Of these New York City owns almost one-half the total number with 258. The income from these in 1915 was \$4,912,202. Philadelphia owns 21 docks, Baltimore 12, New Orleans (state) 21, Oakland 17, San Francisco (state) 38, and Stockton 16.

It is probable that the total amount of waterfront and dock property owned by the public in the United States is somewhat less than 5 per cent of the total used for commercial purposes.*

8. *Miscellaneous*

There are a few more sporadic cases of municipal ownership which conclude this tale of increasing socialization. They may be conveniently tabled as follows:

Kind of activity.	No. of cities out of total of 56 with population over 100,000.	No. of cities out of 195 over 30,000.
Public Halls	10 (Philadelphia, Pittsburg, Buffalo, etc.)	21
Golf Links		18
Wire and Pipe		
Subways	1 (Baltimore)	7
Toll Bridges	1 (New York)	5
Newspaper	1 (San Francisco)	
Farms		(San Diego and Pasadena, Cal.)
Public Belt R. R.	1 (New Orleans)	
Lunch Rooms		9
Stores		1 (Schenectady, N. Y.)
Organ		1 (Portland, Me.)
Liquor Agency		1 (Portland, Me.)
Powder Magazine		1 (Charleston, S. C.)
Canal		1 (Augusta, Ga.)
Artesian Well		1 (Racine, Wis.)
Harbor Towing	1 (Portland, Ore.)	
Ice Plant		1 (Weatherford, Okla.)
Stone Quarry		1 (San Antonio, Tex.)

* Compiled from Jones, "Ports of the United States," U. S. Department of Commerce, Misc. Series No. 33, 1916.

CHAPTER XXX

THE FOOD SUPPLY

GOVERNMENTAL control of the food supply was not undertaken very seriously or on a wholesale scale until the present war. Examples of partial control were very common before the war, and in many instances the control was successful. However, this control was seldom on a national scale, being mostly limited to the municipalities—and especially during the food riots all over the continent of Europe in 1911. National governments have undertaken to enlarge the food supply, that is, to encourage agriculture and to facilitate economic marketing. But such encouragement may be taken rather as a subsidizing of agriculture than as an effort to cheapen food, since no serious or effective effort was made to control prices. In some instances, no doubt, the natural law of supply and demand might be expected to somewhat lower prices (or to prevent their continued rise) without any special governmental effort. It is possible, therefore, that such activities as those of the United States Government to increase meat production may be taken as an effort to lower the price of meat to the consumer.

By far the most important part of "War Socialism"—or, more accurately speaking, "War Collectivism"—is the governmental control of the food supply. For this there are two reasons: governmental control of railroads, shipping, and mines had advanced very far before the war, and there was no question that the rapid development of collectivism in these fields would have continued had there been no war—as our chapters on these subjects have indicated. On the other hand, as we show below, the Government control of the food supply, although distinctly in evidence in several directions, was at a very rudimentary stage of development before the war.

The second reason why the governmental control of the food

supply constitutes the larger part of the total program of "War Socialism" is that the steps in this field have been far more radical than in any other, with the possible exception of the governmental control of the production of munitions of war—a field in which war-time governments have always, of necessity, been very active.

The importance of "War Collectivism" in its organization of the food supply is, furthermore, greatly increased by the fact that it promises—at least in very large measure—to last for a period of years, and in some cases to leave permanent results. Thus the British Government, besides fixing a maximum price of wheat and commandeering the total supply of India, seems also to be buying at a minimum price the wheat produced in Great Britain for a period of five years—an action especially significant in view of the fact that it is being done at a time when no one expects the war to last more than two years at the very longest. Similarly, we find Dr. Michailis, the new food controller in Germany, saying in the *Volkszeitung* of Cologne, on January 9th: "We must expect for a considerable time, perhaps for many years, further moderation of consumption and rationing as regards the most important foodstuffs." In France, the new Minister of Public Works, Transport, and Food, Edouard Herriot, says: "The organization that we are now building up will certainly leave great traces after the war."

GOVERNMENT CONTROL OF FOOD SUPPLY IN GERMANY BEFORE THE WAR

[SOURCE: *Collectivism in the Making*, by Emil Davies, p. 54.]

Either by direct production or by contracts with existing co-operative societies or with societies specially formed for the purpose, many German cities have arranged for the supply of meat, vegetables, and other foodstuffs to their inhabitants at lower prices than those at which private traders were delivering. Thus, in 1912, no less than 149 German cities (19 of which had a population exceeding 100,000) sold potatoes—and in many cases other vegetables also—direct to their citizens. Four German towns, namely, Ulm, Lennep, Wermelskirchen and Reutlingen, produced milk from municipally owned herds and sold it direct to their inhabitants. Many other cities, including such large ones as Mannheim, Freiburg, Kreuznach, and Offenbach-on-Main, purchase milk and resell

it to their citizens either at cost or at a very small profit, and Freiburg has in addition taken up the sale of condensed milk.

[W. H. Dawson, *Municipal Life and Government in Germany*, 1914.]

“Until recent years the only important direction in which the communes directly engaged in food enterprises was in relation to milk and other farm produce. The supply of pure milk takes a foremost place amongst the measures by which the excessive mortality amongst infants is being combated in Germany, and many towns produce milk on their own farms and sell it in public depots. The whole of the milk supplied to the mothers who frequent the nine dispensaries of Berlin is produced at the dairies on the municipal irrigation farms, and after being sterilized is distributed from 70 centers (usually schools) scattered throughout the city, and the produce of the same farms is also supplied to the city’s sanatoria, orphanages, houses of correction, and to persons in receipt of outdoor relief. Dortmund has a municipal model dairy, with baths for the hinds and milkers, where milk is produced for the public hospitals. Bielfeld subsidizes a co-operative dairy company and provides it with five kiosks for the sale of milk. From the depot milk is supplied in carts to the working-class districts of the town. Some of the co-operative societies and labor organizations share with the town in the cost. Mannheim has a municipal central milk depot which obtains its supplies from co-operative dairies.

“Other towns, like Leipzig, Magdeburg, and Ulm, carry on dairy farming and stock-breeding on a commercial basis. Several years ago the town council of Stuttgart seriously debated the question whether the municipality should take up the retail sale of milk and cut out the middleman altogether, and it was only after the proposals made to this end had been examined by experts that it was decided to refrain from such action, and, instead, to encourage the formation of co-operative associations of consumers for the purchase of milk direct from the producers.

“Over 200 towns in all parts of the country concluded contracts for the supply of foreign meat, and either sold it direct to the public or arranged for its sale by butchers at agreed prices. The municipal authority of Berlin sold foreign meat in the latter way to the amount of £375,000. Although it was possible to sell the meat from 20 to 30 per cent cheaper than fresh meat, most towns worked with a profit and few made a loss. Some towns went further. The municipality of Offenbach-on-Main for the time being under Socialist influence went systematically into the meat busi-

ness, opened shops, and set up a sausage manufactory; other towns began pig fattening and rabbit breeding on a large scale, or, by grants or loans, assisted co-operative societies and private individuals to do so, binding them to supply for local consumption a given amount of produce annually. Other towns concluded with Chambers of Agriculture and other farmers' organizations contracts for the supply of definite quantities of meat at fixed times. In many towns the mere threat of such municipal competition induced the butchers to moderate their demands.

"A still larger number of town councils further relieved the shortness of the meat supply at that time by purchasing sea fish and selling it as nearly as possible at cost price. In most places the fish was sold direct to the public, and the popularity of fish as an article of diet was increased in many towns by classes for instruction in fish cookery arranged by the same authorities. Almost as common was the sale at public depots of potatoes and vegetables at cost price. The municipality of Barmen in 1913 began the cultivation of vegetables on a commercial basis on an area of six acres of town land.

"Although these municipal experiments in food purveying have continued since, sufficient experience has not yet been gained to prove the permanent utility of public action of the kind. It was established, however, that the towns were able to carry on undertakings of the kind described without loss and with undoubted advantage to large sections of the population. Inquiries made by the Berlin Statistical Office in 62 important towns showed that in 60 of these towns, with a combined population of over 15,000,000, the authorities had in 1911 and 1912 organized a meat supply in order to relieve the prevailing scarcity and counteract the high prices. Meat had been imported from Russia, Holland, Servia, Roumania, and Bulgaria, and the conclusion was drawn that while it was impossible to prove by figures that municipal competition in the meat trade had reduced prices, it had unquestionably had the effect of preventing the butchers from exploiting the needs of the moment as much as they might otherwise have done. Many of the arrangements devised to meet a temporary emergency have now been placed on a permanent basis, and it is probable that German towns will in no distant future add to their other enterprises practical measures for making certain branches of the food supply independent of the interest and convenience of private traders.

GOVERNMENT CONTROL OF FOOD SUPPLY IN EUROPE
SINCE THE WAR

[SOURCE: United States Experiment Station Record, November, 1916.]

The first efforts in the various countries in Europe in the realm of agriculture since the beginning of the war centered largely on providing the machinery for gathering in and saving the crops, and in this the assistance of the military was furnished to a limited degree. But as time went on the necessity became apparent of providing for the continuance of agriculture on the highest possible plane, of keeping up the fertility of the land, of preventing the depletion of live stock, of avoiding waste of all kinds, and often of discovering and utilizing new sources of supplies. Organized effort was therefore enlarged and increasing latitude extended in the temporary use of soldiers.

The attitude of co-operation between the military and civil authorities is well illustrated by the instructions of the French Minister of Agriculture in transferring to district commanders the assignment of soldiers to agricultural duties. He said: "The regular, prompt, and (as far as possible) complete execution of agricultural work constitutes one of the essential elements of national resistance and consequently one of the principal forces of success. The full use of the soil must be obtained at all costs, equally with the supply of men and material to the army, or the supply of labor to factories engaged in national defense." Soldiers were classified on the basis of farm experience, and opportunity given them to offer themselves for temporary work in the fields. In order to avoid unfavorable reflection upon such, the idea was widely disseminated that soldiers thus volunteering to assist in farm work were not to be regarded as "shirkers," but on the contrary as men doing a double patriotic duty, by fighting and by keeping their brother fighters alive.

In Great Britain the measures and appeals of the government have shown no less appreciation of the importance of agricultural work. Steps were early taken to organize the agricultural forces and to increase the food production. The situation called attention to certain conditions in that country which attempts were made to remedy by a readjustment of the systems of farming, and by organizing systematic means for providing labor and increasing the food returns from the land under cultivation. In directing public attention to the need of special efforts, the president of the Board of Agriculture expressed the conviction that "if agriculture had made

no more progress in Germany than it has in the United Kingdom during the period 1895-1915, the German Empire would have been at the end of its food resources long before the second year of the war"; and he explained further that the war was being fought by that country quite as much on an agricultural as on a military organization of the nation.

In an appeal to farmers for an increase in the food production of England Lord Selbourne said: "You have something more on your shoulders than your own business to-day. You are no longer individual farmers making your own fortunes or losing them. You are trustees on your own land to do your best for England. You have your duty quite as clear and as definite as the captain of a cruiser or the colonel of a battalion. England has a claim on you farmers, men and women of every class, as clear as she has on our sons and husbands to go and serve in the trenches."

The force of the situation in Great Britain is illustrated by the fact that of the total area of cultivated land, two-thirds is in permanent grass and only one-third in cultivated crops, whereas in Germany the proportion is exactly reversed; and, furthermore, by the fact that even in 1915, when the wheat crop was the largest for many years, three-fourths of the wheat supply of Great Britain had to be imported. In 1915 the United Kingdom imported agricultural products valued at £276,803,000, whereas in the year before the war France spent only £60,000,000 for imported food products.

Similarly, in Germany the need for the greatest possible production of food has been impressed upon the people. The thorough cultivation has been urged of every available piece of land on farms and in towns, and societies have been formed to take the work in hand. Efforts have been made, for example, by the Moor Culture Union to increase vegetable growing on moor land, the society announcing allowances to disabled soldiers settling on such lands.

The measures adopted by the various nations are of much interest. The French Government early applied organization to the resumption of farming in affected areas and its continuance on an efficient basis elsewhere. To save the crops the small holdings were "pooled," the inhabitants of the villages who remained being grouped together for that purpose and the assistance of the military given when circumstances allowed. The government also took measures to prevent the wholesale slaughter of live stock, first suppressing the customs duty on practically all foodstuffs, including

frozen meat, and then excluding from requisition for army purposes cows in milk or in calf, brood mares, premium sires, pedigree stock, heifers, and plow oxen. Similar measures were taken in Great Britain and Germany. In the districts of France that had been invaded, the peasants were in need of horses, implements, seeds, fertilizers, forage, etc. To provide these the government made advances to the peasants, and to prevent the credit banks from breaking down from demands upon them it loaned money to the *Caisses Régionales de Crédit Agricole*, which in turn advanced money to the co-operative societies. Steps were taken to increase the amount of gardening carried on, by putting the opportunity for cultivating gardens within reach of even the humblest. The services of schoolmasters were enlisted to instruct children in gardening and to carry on model gardens.

To direct these efforts a "committee of agricultural action" was formed in each commune. These committees have formed a part of the government's plan for mobilizing agricultural labor, and have also become responsible for the cultivation of farms or holdings which have fallen out of use, the supply of seeds, fertilizers, etc.

In Germany systematic provision has been made for the cultivation of the land—selecting the crops most needed, for providing fertilizers and feeds, and economy in the utilization of agricultural products. In addition to its previous agencies and its food bureau, an imperial office for vegetables and fruit, to further the production, sale, and preservation of fruit and vegetables, was established the past year, with power to provide for the growth of the necessary amount of these supplies and their preservation.

In Great Britain the organization for agriculture has been greatly extended and strengthened. War agricultural committees and borough war food societies have been organized extensively for the assistance of farmers and to secure further allotments of land for cultivation. Attention has been turned to the utilization of land not ordinarily employed in agriculture, such as private parks, golf links, pleasure grounds, etc., as well as bringing more land into cultivated crops, employment of waste woodland for raising pigs, etc.

The farmers have been urged to plow up the poorer of the permanent pastures, shorten the period of grass and clover in rotations, bringing the remaining grass into the highest stage of production to enable it to carry more stock, reduce the acreage of bare fallow, and to cultivate more extensively crops for food and for animals.

The labor problem has been a difficult one in all the countries.

In Great Britain persons employed in certain agricultural occupations have been exempted from military duty, but despite this, it is estimated that up to the middle of 1916, 320,000 men had been taken from the land. Special efforts have been made to secure labor at critical times, as during harvest, by a national volunteer movement, and women have been drawn into agricultural occupations as never before. In this they have shown marked adaptability and brought much favorable commendation on their services. Nearly every issue of the *Journal of the Board of Agriculture* gives accounts of the successful and satisfactory employment of volunteer women laborers, frequently drawn from classes not accustomed to outdoor work. Women's committees have been active in securing recruits, and to overcome prejudice in some sections and convince farmers of their fitness for farm work, agricultural demonstrations have been held by women in doing various kinds of operations, such as plowing, handling teams, shearing sheep, etc.

The employment of women is even more extensive in other countries at war, and in many places the temporary employment of soldiers has been of very great assistance. The Army Council in Great Britain issued instructions the past season that as far as possible farmers be loaned draft horses, mules, and drivers for help in harvesting in the neighborhood. In Germany special attention was given this year to the prompt and proper harvesting of crops. In many cases public work of all kinds was interrupted in order to set free labor for that purpose. The extensive granting of furloughs by the military authorities contributed considerable supplies of soldier labor. In some sections the help of school children was enlisted in gathering the potato crop. France, Germany, and England to some extent, have made use of prisoners of war in carrying on farm work, the custom being to require the employer to pay a small wage for the services and provide suitable conditions for living. The results have generally surpassed expectations.

The various measures in aid of agriculture have presented fine examples of co-operation between national, state, and local agencies. There has been co-operation between the civil and military branches, supported by a realization of the necessities of each, and between governmental and private organizations, often formed voluntarily for the purpose. The strength which this union of effort has given has enabled agriculture to maintain itself under most trying conditions.

But the measures for maintaining the food supply and other necessities have not stopped with the physical means of production.

They have extended to advice and direction on the side of better farming, the conservation of supplies, and the utilization of new sources. The effort has tested ingenuity and resourcefulness to an unusual degree, and in this direction has led to new demands upon the various classes of agricultural institutions.

Nearly every number of the *Journal of the Board of Agriculture* contains notes on feeding stuffs, with suggested rations, prices per food unit, and similar information, supplied by the Animal Nutrition Institute of Cambridge University; advice as to sources and values of commercial fertilizers occupies a prominent place, and there are reports of numerous simple practical trials of fertilizers and feeds for immediate application. In some countries rules for the practical farmer are being worked out, and elsewhere tests made of new materials to serve as substitutes in agriculture or to replace the necessities of life in time of scarcity and high prices.

The maintenance of the industry on an efficient basis, with many of the ordinary supplies of fertilizers, feed, spraying materials, etc., diminished or cut off, has taxed the fund of knowledge and the resources of agricultural science. The high price and scarcity of copper has led to experiments to secure substitutes for copper salts in fungicides. The hot-water method is being reverted to in treating seed for smut, and lime-sulphur is being given wider use. In France, unusually heavy losses were sustained from black rot in the vineyards because of the inability to spray as much as usual.

Everywhere special stress is laid on the control of diseases and other injuries of standard crops like cereals, potatoes, beets, and grapes, to protect the food supply. We read, also, of efforts to prevent losses other than those due to insects and plant diseases, such as the killing off of wild animals, birds, etc., which injure or feed upon farm and garden crops, and of restrictions placed on the feeding of wild game. Unusual stress is laid upon procuring good seed which will yield large returns, and special efforts have been made to provide such supplies. Plant diseases have been studied mainly from the practical side, with special reference to their control. The entomological studies have dealt largely with the relation of insects to the spread of disease.

Naturally there has been a great deal of work along food lines, with tests of various kinds of material for human food and for feeding stuffs. Yeast preparations, for example, have been devised as substitutes for meat, and found very digestible, and an egg substitute has been made from blood serum. Food preservation has taken great strides, especially desiccation by freezing or drying.

A process has been devised for preparing a cattle food from potatoes which can be kept for a long time with small loss, by fermenting small and refuse potatoes in vats by means of special cultures. To meet the need for stock feed in Germany, methods have been perfected for utilizing straw, peat, and other coarse materials by chemical means and by fermentation, reinforcing the product with dried yeast or with potato flakes and molasses. Many substitutes for oats have been devised and experimented with, among others one called chicory crumbs, made from dried chicory roots.

In veterinary lines there has been much investigation upon antiseptics to take the place of more expensive ones, sugar and salt being found effective in many cases in the treatment of animal wounds. The use of polyvalent serum, formerly used in the treatment of human wounds, has been applied to animals. Some of the institutions formerly prominent in research work have been quite extensively occupied in serum making. Considerable work in the veterinary line is reported as coming from the field service instead of the laboratory.

In Germany there has been much activity in the fixation of atmospheric nitrogen, for general uses and for fertilizers, some marked advances having been made in the direction of efficiency and economy. Small beets, cull apples, beet residues, etc., are being employed in alcohol making; and many studies are reported on vegetable sources of oil.

The testing of farm machinery has been given special impetus on account of shortage of labor, and in some sections co-operative farm implement societies were formed to provide funds for their purchase or joint ownership. Of late, however, some difficulties have been experienced in securing the allotment of petrol for their operation. It was announced during the past summer that the Italian Government contemplated extensive purchases of labor-saving agricultural machines to meet the difficulties caused by lack of farm hands—a new experience in that country.

[*The Chemical Trade Journal and Chemical Engineer*, June 12, 1915, p. 527.]

By a decision of the Bundesrat there has lately been established in Germany a monopoly of all nitrogenous materials for a period of seven years, i. e., till March 31, 1922. It applies to the following products: Inorganic nitrogen materials (nitrate of potash and soda), primary artificial nitrogen products (nitric and nitrous acids and ammonium cyanamide), and all nitrogenous fertilizers prepared from these products or in other ways. It is quite clear that the

German Government intends making money out of nitrogen, or, in this case, out of the air. This is probably the first instance in history of a government going to use the atmosphere as a source of money.

THE CONTROL OF FOOD SUPPLIES IN BLOCKADED GERMANY

[From articles in the *Saturday Evening Post* by Alonzo Englebert Taylor.]

Shortly after war was declared the German Government called together a commission of scientists, to which was intrusted the preparation of a report upon which the defensive food measures of the empire should be based. This commission, commonly called the Eltzbacher Commission, devoted several months to the study of production, distribution, and consumption of food in Germany.

The Eltzbacher Inventory

There is nowhere any adequate checking up of waste; there is nowhere any clear separation of the proportions of produce that go to the maintenance of domesticated animals and of human beings. Nevertheless, the Eltzbacher Commission proceeded to make an inventory of the food consumption, food production, and food needs of Germany in accordance with correct scientific procedure; though it is evident from reading the report that they were not always able to see the forest for the trees. Classified on the basis of derivation, the peacetime food supplies of Germany were naturally arranged as follows:

1. Plant food grown from German fertilizer.
2. Plant food grown from imported fertilizer.
3. Animal food produced from vegetation not fit for human consumption.
4. Animal food produced from nutrients fit for human consumption.
5. Animal food produced from imported feeding stuffs.
6. Animal food derived from inclosed and adjacent fresh and salt waters.
7. Plant food grown in surrounding neutral countries from native fertilizer.
8. Plant food grown in surrounding neutral countries from imported fertilizer.
9. Animal food produced in surrounding neutral countries from fodder native and not fit for human consumption.

10. Animal food produced in surrounding neutral countries from domestic nutrients fit for human consumption.

11. Animal food produced in surrounding neutral countries from imported feeding stuffs.

12. Animal food from fresh and salt waters of surrounding neutral countries.

13. Plant food from overseas direct.

14. Plant food from overseas via neutral surrounding countries.

15. Animal food from overseas direct.

16. Animal food from overseas via surrounding neutral countries.

17. Colonial wares from overseas direct.

18. Colonial wares from overseas via surrounding neutral countries.

A complete blockade would obviously exclude all food under numbers 2, 5, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, and 18; but the financial interest of the citizens of the surrounding neutral countries does not coincide with the purpose of the blockade, which cannot be made complete under numbers 7, 8, 9, 10, and 12. It was the purpose of the blockade to place every contiguous neutral country in an inclosed situation, exportation to Germany being made indirectly impossible. It was clear to the Eltzbacher Commission at the outset that the direct results of the food blockade must result largely from the abolition of importation of fertilizers, feeding stuffs, meats, and fats. An attempt was made to evaluate the food-stuffs produced in surrounding neutral countries independently of their own importations, but the results were very evasive. As a matter of fact, it has been the results of application of the blockade that taught both the Germans and the Allies the extent to which the surrounding countries were able to contribute foodstuffs to Germany.

In the Eltzbacher report the German population was taken as 68,000,000. The number of children each year and the number of adult males and females were known. The figures for the number of children of each year of age was multiplied by the figure for the food-need of that year. The number of adult females and the number of adult males were multiplied respectively by 85 and 100. The final figure for the needed food units—a compromise between several standards—was 51,822,908. This figure means that the population of 68,000,000 would be nourished if it received the ration of 51,822,908 adults. Three thousand calories was the figure set for the adult need—100.

Hindsight has made it certain that the figure set for caloric needs a day—3,000—was too low. It was, of course, realized that the workingman would need much more; but this, it was felt, would be balanced by the large number of women who would need less. But in a great war most women are laborers, not nurses, as the preparedness-for-women movement in this country seems to assume. The units allotted the growing child from 12 to 18 were too low. A boy of this age has a heat production one-fourth larger than an adult; in fact, an active growing boy consumes as much food as a hard-working man. More important than this, the extra work that must be done in a state at war was disregarded. Practically ten million men have been withdrawn from their occupations. The work done by these men may be fairly stated to have necessitated a thousand calories intake each a day. If the work these men used to do was to be done by the remaining civilians, these must be given a proportional increase in diet. That the work has been done by the extra exertions of the civilians is the testimony of all who have been in Germany during the war. In other words, the fifty-eight million civilians must be allowed ten billion extra calories. As the extra work is done by civilians from twelve years of age, these denominated calories must be divided between some thirty-nine million, or about two hundred and fifty calories a day above the needs of the peace diet. With these considerations in mind, the writer has calculated the protein and caloric needs of the German people in wartime and reached these figures: Protein, 1,524,000 tons; calories, 63,000,000,000,000.

On paper, therefore, it seemed clear to the German scientists that if the German people would reduce their consumption to the plane of physiological needs and maintain the production on the peacetime basis they would be able to sustain a food blockade without injury. It will be of interest to tabulate the recommendations of this commission, not only because they make the whole question clearer, but because they illustrate the systematic scientific consideration given to the question.

The difference between need and use, the waste of one-third to one-half in protein, fat, and carbohydrate *must* be obliterated, since, if this waste continues under domestic production, want would be inevitable.

All luxurious living to be controlled, especially in public eating places.

The plane of peacetime production must be at least maintained. Necessary to this end is adequate labor on the land, sufficient use

of fertilizer, proper rotation of crops, careful garnering and proper storage.

Production to be increased by cultivation of vacant land.

The cultivation of vegetables to be encouraged and the public exhorted to eat more vegetables and cereals and less of animal products.

The use of rye bread to be encouraged; that of wheat reduced.

The raising of hares, goats, and sheep to be encouraged.

Exportation of foodstuffs to be prohibited and the importation of foodstuffs from neighboring states to be encouraged.

The use of grain for the manufacture of starch and alcoholic beverages and for other industrial purposes to be reduced.

The use of starch for the manufacture of alcohol for technical use to be reduced to the plane of "important uses of alcohol."

Waste in soap to be reduced.

Domestic animals to be reduced in number by slaughter to that number which can be fed on domestic feeding stuffs; the meat thus secured to be conserved for future use.

The prohibition of feeding bread grains to animals.

Regulation of feeding of potatoes to animals.

Reduction of milch cows to plane of necessity; no milk to be fed to swine.

Regulation of use of oats and barley in feeding animals.

Control of use of sugar beets as fodder.

Equal distribution of foodstuffs to all.

In reading the report of the Eltzbacher Commission one is impressed with the fact that the commission was composed of competent and conscientious men, who acted high-mindedly and solely in the interests of the consumer. They had, in a manner that was regarded as drastic, recommended the slaughter of one-tenth of the milch cows and one-third of the swine, in order to reduce the number to the plane of feeding stuffs of domestic origin. This ran counter to the interests of the agrarian classes.

Nevertheless, this was done. The recommendations of the commission for the control of bread grains were also placed in effect and the entire people placed upon a bread and flour ration. From this point on it was apparently assumed that the people would follow the recommendations of the scientists; it was assumed that producers and tradesmen would carry out recommendations designed to protect the consumer. Had the producers, tradesmen, administrators, and politicians of Germany exhibited the same high-mindedness, foresight, and regard for the consumer that was evident in

the investigations of the scientists, the crucial problem of the nutrition of the industrial classes—which has been second in importance only to the military situation, or possibly equal to it—would never have arisen.

There is a fable in Russia to the effect that three generals protect Russia from invasion: General Cold, General Distance, and General Swamp. Three generals directing the attack on the nutrition of the German people were General Blockade, General Crop-Failure, and General Mismanagement; and a review of the situation leads the impartial observer to the conviction that General Mismanagement was not subordinate to the others.

The recommendations of the scientific commission were directed at the problems of production and distribution in the interests of equitable consumption, even at the expense of the commercial interests of the producer and distributor. Though it was important that the producer should continue to find production profitable, it was of greater importance that each individual in Germany should possess a diet sufficient to maintain nutrition. If foodstuffs should be wanting, it was important that the lack be shared by all classes.

The warning of the Eltzbacher report that if the per capita consumption of food continued at the customary figure of 90 units, when only 56 were needed and only 67 were available, the supply would soon be reduced from 67 to below the needed 56, was seriously received by one class alone, the Social Democrats, who, as a class, have proved themselves the most objectively thinking class in Germany. The agricultural population did not concern itself in attempting to measure how far its produce would reach into the industrial population.

Two measures of conservation were enacted during the first year of the war: (a) All grains were declared subject to confiscation; the bread grains were reserved for human consumption; a bread ration established: feeding of bread grains to domestic animals was prohibited. The utilization of bread grains for industrial purposes was restricted; the use of barley for the manufacture of malt was reduced one-third; the oats were confiscated for the use of the army and work horses, and the feeding of barley and maize placed under a general regulation.

This was, in part, a paper regulation only: the grains were subject to confiscation, and such quantities as were needed weekly or monthly were taken possession of; but the grains that lay with the producers were not held in reserve in the same manner as though they had been impounded in government warehouses. The

millers were instructed to mill rye flour to 82 per cent of the grain. The flours thus obtained were somewhat more nourishing than the finer bolted flours of peacetime, and the yield in flour was, of course, materially greater; but the lessened residue of grain offal for feeding purposes was a disadvantage, since the fodder calculations had been based upon the normal production of grain offal.

(b) The recommendations of the Eltzbacher Commission for the reduction of swine and cattle were carried out during the first four months of 1915. Approximately one-third of the swine and 10 per cent of the milch cows—supposedly about a million and a half—were killed. About the time when the killing of the swine was under way, in March, an inventory of the potato stocks led to the official statement that these were low. Since the potato in Germany was one of the staple swine feeds, it was decided to kill rather more than the denominated number of swine in order to meet the loss in potatoes. Two months later another potato inventory was taken, revealing the fact that the previous inventory had been in error, and that the killing of the additional swine had been unnecessary, since the potatoes were available; and these potatoes were thrown upon the market at a huge loss in price and to a large extent underwent decomposition.

No oxen were killed and the killing of calves was not in excess of the usual number; the slaughter did not extend to sheep and goats, which, on the contrary, were conserved with foresight. The presence of such huge amounts of meat upon the market unquestionably resulted in increased consumption during the first six months of 1915. According to the plan, by far the largest portion of the meats thus obtained was to be conserved for future use, and should have represented a very large stock of conserved meat. The processes of conservation were, however, carried out very inefficiently, with the result that a large portion of this meat underwent decomposition and became a complete loss.

The basic slag produced in the mills was not sufficient in quantity to cover the phosphate needs of the fields that had always been dependent to a large extent upon soluble phosphate imported from the United States and elsewhere. Potassium, in various forms, was, of course, available in unlimited amounts.

Nitrogen, as nitrate, ammonia, or cyanamide, was scarce. . . .

The new organization [the War Nutrition Office in 1916] included the acquirement of original authority in its affairs, and the creation of a complete set of legal and technical machinery. The individual units of the empire relinquished—presumably for the

period of the war—their control over the business affairs of their own citizens, and the Controller of Food Supplies (President of the War Nutrition Office) was given police powers, under martial law, that are absolute in their scope.

Under the new organization the powers centralized in one department authorize the following procedures:

The produce of the soil, plant and animal, may be confiscated in toto.

The amount of his produce that is to belong to the producer for the use of the producer class is determined by the authorities.

The feeding of all livestock is governed by regulation.

The acreage and rotation of crops may be regulated.

The use of fertilizer is under official control.

The use that the grower may make of the crop allotted to him is specified.

The price for produce to the producer is fixed by regulation.

The milling of grain, the composition of flour, the composition of bread, and the disposition of grain offal are determined by regulation.

The amounts of grain that may be used in the manufacture of alcohol beverages is limited by order.

The manufacture of industrial products from produce of the soil—such as starch, alcohol, soap—is limited and regulated.

The disposition of livestock is under regulation; so much and such stock is prepared for market, set apart for the dairy, and so on. The slaughtering of animals for food is under central control.

The uses to which milk is put are determined by regulation. The importation and exportation of all foodstuffs and fodders are under central control.

The number of middlemen that may handle a food is limited by order.

The number of wholesalers and retailers that may engage in the sale of foodstuffs and fodders is limited and specified.

The selection of retailer by consumer is under regulation.

The hours of doing business in sale of foods is under control.

The prices that may be charged by wholesalers and retailers, and the number of dealers in any line, are matters of regulation.

More regulations

The amount of the several foodstuffs that could legally be in one's possession is limited.

The menus that are to be served in restaurants, eating houses, and hotels are limited by regulations.

The ration of the entire people is subject to limitation and specification; so much of this and that article of diet a day, week, or month, for each infant, child, adult, hard-working laborer, for the sick, and so on.

It is incumbent upon the controller to see that equality is maintained in the food supplies and fodders allotted to the agricultural classes; that waste is eliminated; that transportation is facilitated; that the prices are not elevated by manipulation; that the prices of all foods are kept to the level consistent with the increased cost of production and the increased scale of wages; and that absolute equality in distribution and consumption is attained.

There were metaphysical distinctions between conditional and unconditional confiscation, and limited and unlimited control; for practical purposes the power of the food controller is absolute.

The new system was installed, with the appointment of the food controller, on June 1, 1916. Under this system Germany passed into a state of communism surpassing the visions of Marx and Lassalle. But it was communism from without, not from within. It did not represent altruism; merely repression of commercial interests of individuals and classes under stress of military necessity. Nevertheless, the workings of the system will illustrate to the world how men may be expected to react to the operation of a communistic system of government.

It is interesting to recall that France in 1792-94 passed through an experience quite like that of Germany to-day. The government seized foodstuffs and attempted to regulate amounts, prices, distribution, and use upon a socialistic basis. The experiment failed, according to French historians, because of the impossibility of making the producer, the peasant, play square.

The crop of wheat and rye of 1916 was larger than that of the previous year, equaling that of 1914—over fourteen million tons. As soon as this was assured the food controller announced an added ration of one ounce and eight-tenths of flour for children between the ages of 12 and 17, increase in the bread ration to nine-tenths of a pound for all manual laborers.

The public, short of fat, consumed so much sugar that by March it was very scarce, and a house-to-house search was made for concealed sugar. The sugar ration was reduced by April to a little over a pound a fortnight. The inventory in May revealed only six hundred thousand tons, to last until October. Allotments were

made to marmalade factories, cake bakers, and for household canning of fruit. Finally the state confiscated the early apples and plums, and canned them in order that the sugar and fruit might be thus conserved for general utilization.

The reaction of the public to the scarcity of sugar was unmistakable in tone. The scarcity could not be explained away. Germany, which before the war exported a million tons of sugar a year, was without export reduced to the plane of consumption of one hundred thousand tons a month. The scarcity in meats and fats could be explained in several ways, as directly or indirectly due to the blockade; but the dearth of sugar could not be explained as the result of the stoppage of export. The simple truth was that the peasant fed sugar beets, the large feeder fed crude sugar, the distillery used crude sugar, and the household consumed refined sugar—all at excessive rates and simultaneously.

The irony of the restriction in sugar must have been most keenly felt by the German when he perused the widely distributed *Nutrition of the People in War*, a collection of lectures delivered before the Department of the Interior of Prussia. On page 259 of this publication was an article by Naumann, in which suggestions were given for lectures, to be held in popular language, for the purpose of instruction of the common people in the ways and means of household management. Among the things urged upon the housewife was the doubling of the consumption of sugar!

When the cold and dry year 1915 turned in to the German people fifty-five million tons of sound potatoes, the fact was the basis for widespread rejoicing, since, with the failure of the grain crops, the added millions of potatoes constituted veritable salvation.

Late in January scarcity in potatoes developed in the cities. This was at first attributed to manipulation. An inventory taken in January, however, showed that only eighteen million tons remained, from which the seed had still to be reserved, leaving only eleven million tons to last for six months. Potatoes had been consumed by man, beast, and industry at the rate of over five million tons a month. Thereupon potato cards were introduced and the attempt was made to limit the feeding of potatoes to livestock. The potato card for swine, for example, allotted four pounds a head a day; for man, one pound. It was when the authorities determined to uncover and seize the stocks of stored potatoes that the unexpected losses by decomposition became apparent.

When the government, in the spring of 1915, killed off 10 per

cent of the milch cows, it was with the idea that the remaining 90 per cent could be so fed as to regain normal production. In other words, the milk production of the empire would be reduced not over 10 per cent. In any event it was obvious that reduction in the milk supply, at least down to 50 per cent, need have no effect upon the children if the adult population permitted the reduction to fall upon their butter and cheese.

The calculations of the commission have been shown by events to have been unfulfilled, since the feeding stuffs that were supposed to be diverted to milch cows were, in fact, not so diverted; whereby the ratio of milk production as against maintenance per head was materially lowered.

The authorities attempted to force production. The producers replied that in the reduced condition of the cows forced production was not profitable at the prices of feeding stuffs and at the price of milk. The scarcity of feeding stuffs tempted the peasant to feed milk to his young stock. Grain offal was supposed to go to the milch cows rather than to beef cattle. It is clear, however, that at the prevailing prices of milk and beef it was more profitable to convert it into meat than into milk; and we may be sure that this was done. The low ration of flour resulted in a larger consumption of milk by the peasant class. The high prices of butter induced the peasant to produce butter rather than sell milk.

Gradually the price of milk at retail was raised from five to eight cents a quart. Nevertheless, increase of price did not bring increase of production. During the winter months the public was urged to be patient until the coming of spring, which would yield the green fodder on which the freshened cows would again produce satisfactory amounts of milk. The spring came, but with it little increase in milk. The cows had calved in such poor physical condition that when the new fodder became available the excess of intake over maintenance went to restitution of lost tissue and not to increase in the flow of milk.

The final system inaugurated in October was founded on four considerations: the milk of peasants and of dairies was separated in the regulations; the use of milk in the household, guaranteed on the milk cards, was based on the composition of the family; the amounts of milk devoted to household use and to the manufacture of butter and cheese were regulated at the source; and the feeding of milch cows was effected by rationing by the authorities. Large dairies are supplied with rations, and must return specified amounts of milk. The small producers' milk was not confiscated. They

were advised to use the normal amounts and turn the balance over to the authorities.

Here, obviously, was left unguarded an opportunity for a leak, since the peasant might feed milk to swine or calves. The non-agricultural population has been placed upon a strict milk regulation. During the last three months of gestation, during the period of nursing and period of recovery therefrom, a woman receives one liter of full milk daily. The bottle-fed child up to the second year is to receive daily one liter of full milk; between two and four years, three-fourths of a liter; between five and six years, one-half of a liter. After the age of six, no milk ration is guaranteed, but of skim milk the child may receive as much as the market affords.

According to the plans of the scientists, the number of head of domestic animals was to be kept down to the available fodder. When, in the fall of 1915, the available feeding stuffs were recognized to have fallen far below the plane of the number of animals, a second slaughter should have been decreed. If the slaughtering of animals was necessary in 1914-15 it was doubly necessary in 1915-16. Now this did not meet the views of the agricultural population at all. They wished to nurture their stock in order to restore their possessions and stand equipped, ready for the return of peace, which was regarded as certain to come within a year.

If the peasant fed up his young stock this could only be done at the expense of proper feeding of the milch cows and by the utilization of potatoes, sugar beets, and molasses; to some extent also of grains, the feeding of which to stock was prohibited. All of these the peasant did feed, with the aim of restoring his count of livestock.

During the winter of 1915-16 a great deal of meat was requisitioned for the army. The peasants killed many animals in domestic slaughtering, consuming the meat themselves outside of all control and dispensing large amounts outside the channels of trade, to people living in small towns and in the large cities. Under these circumstances the stock in the best condition was killed. There was not enough feeding stuff to maintain all the animals in reasonably good condition; therefore, the remainder of the stock was carried along on what was little more than a maintenance ration.

Local meat cards appeared in various portions of the empire late in 1915 and became universal in the cities early in 1916. Two meatless days were established—Tuesday and Friday. There was little control in the country districts or in small towns that could secure their supplies through personal dealings with the growers.

The country districts made the exportation of animals and meat products to the cities directly and indirectly difficult or impossible.

In September the final system of the war nutrition department was put into effect. The essential feature of this system was the confiscation of the livestock and the control of the feeding of this stock and its delivery to the market, precisely comparable to the system described for the dairies. The livestock remains in the physical possession of the peasant, but the use belongs to the state; the state furnishes the feeding stuffs, allots to the peasants a certain fraction of the meat, and claims the balance for the non-agricultural population.

One concession was made to the peasant which, it was fully realized, carried grave dangers: the peasant was permitted to slaughter stock for his own use, but was supposed to kill such animals as gave a meat ration comparable to the meat card of the non-agricultural population. There is good evidence that this concession was being widely abused in the early months of the autumn of 1916; and, indeed, nothing else was to be expected.

The number of swine left at the time of the great slaughter in 1915 was supposed to have been some seventeen millions. In October, 1915, the count was over nineteen millions. In December, 1915, it had fallen to seventeen millions. The count in April, 1916, gave a figure a little over thirteen millions. This indicates the number of pigs that were killed during the winter for use by the peasants and for sale outside the open channels of trade. On September 1 the number had risen to over seventeen millions. In November, 1916, another census of swine indicated that the count had risen to practically the figure of June, 1913—some twenty-one millions. In other words, the young pigs born early in 1916 had been fed up during the summer.

The count of cattle in April, 1915, was 24,900,000; in April, 1916, it was 19,900,000; and the milch cows were only eight hundred thousand less than in December, 1914. In November, 1916, the number of milch cows was back to the number before the great slaughter. In other words, the calves had not been killed; the heifers had been raised to milch cows. All in all, the peasants during the year from May, 1915, to October, 1916, had accomplished the restoration in numbers of the livestock in Germany.

If Germany, in December, 1914, did not have the feeding stuffs to maintain the animals then she certainly did not have them in November, 1916; and all the work of the Eltzbacher Commission to regulate the relative consumption of food units by domesticated

animals, and by man, has been in vain. Germany during the winter of 1916-17 is consuming, according to the card, a little over half a pound of meat a week from the same number of animals that in time of peace yielded over two pounds a week, of which one-fourth of a pound came from imported feeding stuffs. The experience of the past year has been an experiment to determine how many head of stock and of human beings could be maintained on a minimum of food and feeding stuffs; but this has not redounded to the credit of the agrarians or to the nutrition of the industrial classes.

Now that it has passed, it may be a source of satisfaction to the people of Germany to realize that these animals will be of utility in the near future. It is, however, improbable that the present crop will fatten and fatten the number of animals now in hand. Until the enactment of the comprehensive regulations of the food controller in September the agrarian population was permitted to decide between the maintenance of their domesticated animals and of their fellow citizens; and the fellow citizens had a close shave.

During the first year of the war there was little scarcity of fat and butter, and there were no regulations concerning their uses. The second year brought scarcity and regulations. Butter, margarine, and other fats became so scarce in December, 1915, that regulations were enacted compelling the large dairies to turn over to the Central Buying Bureau portions of their output for distribution to the cities. Cities, towns, and communals then introduced butter cards and fat cards. Two fatless days were prescribed—Mondays and Thursdays; on those days the use of fat on the table and in the preparation of food was prohibited.

With the advent of the new controller all fats were confiscated. The outputs of dairies were exacted on the basis of their milk supplies, and their cattle were rationed by the state. The killing of milch cows was made illegal.

Communal authorities seized all butter produced by dairies of over fifty-quarts capacity a day, determined how much should be distributed locally and how much should be sent to the Imperial Bureau for Fat for the Use of the Cities. Peasants were not allowed to sell butter except to the communal authorities and the peasant's butter and milk were both liable to requisition.

To illustrate how hard it is to scotch the peasant, one needs but to state that, in Bavaria, it is contrary to law to sell a centrifuge or churn to a peasant, unless he contracts to sell his butter to the communal authorities.

The margarine and fats are now distributed by the same organization. The results of the new system have been a marked reduction in prices, but no increase in quantity. During October the usual ration in cities was three and two-tenths ounces of table fat a week; butter, two-thirds; margarine, one-third.

From one-half to two-thirds of the supply of sea fish in peacetime was drawn from waters that are now more or less closed to German fishing. Importation of fish from Holland and the Scandinavian countries was extensive until the pressure of the blockade forced these countries, first, to reduce the scope of their fishing operations, and, second, to prohibit indirectly or directly the sending of fish to Germany.

THE SITUATION OF A NEUTRAL (DENMARK)

[Special Correspondence of New York *Evening Post*, Dec. 10, 1916.]

Already the Danish state has taken control of all vital industries. It regulates production and consumption; expropriates excessive profits for public use; enforces a living wage; and guarantees a minimum standard of comfort for all classes. Stauning promises that these measures will be developed in still more drastic forms, and Prime Minister Zahle agrees. He has warned a Copenhagen mass-meeting that the economic crisis caused by the war will become much worse than it is, and that no country which does not take exceptional measures will survive.

Stauning at the end of November delivered an exposition of Denmark's war-socialism to a meeting of Swedes at Malmö. He declared that the chief Socialist measure of 1917 will be the standardization of products in the interest of economy. Already standard foods exist; it is forbidden to sell more than two kinds of flour, the composition of which is fixed under penalty of imprisonment. Next year, says Stauning, there will be "standard shoes" and "standard clothes." Already rigid Government measures prevent leather and textiles from rising unduly in price; but this does not prevent scarcity, and there will soon not be enough leather or textiles to go round.

Denmark's newly founded State Necessaries Commission and Price Regulations Commission have complete autocratic power. Through the Necessaries Commission the Danish state is now the chief import merchant for wheat and corn. Already the Necessaries Commission controls the import of colonial wares and next year it will itself import on a vast scale. The Price Regulations

Commission has established its control over all factories and workshops, also over farming, which is Denmark's greatest industry. The Commission demands from the farmers and from all the great industries, particularly the sugar, leather, and brewing industries, exact tables showing the cost of production. On this basis the Commission fixes prices. Nominally, the producers can refuse to sell at the State's prices; but when they refuse, the State threatens to expropriate their plant, to work it directly, and to pay what compensation it considers fair. All Denmark's productive industries have now accepted State control.

Prime Minister Zahle declares that the State must accept full and direct responsibility for the health and welfare of every citizen. His Cabinet, backed by the Radical-Socialist majority in the Folkething, is taking measure after measure to embody this principle. These measures involve vast expenditure for a small country like Denmark, but they are being unshrinkingly carried through.

The minimum income

First of the principles insisted on is "the minimum income." The State declares that a family with earnings under a fixed sum cannot live without outside help. Without requiring such a family to prove that it is destitute, the State pays it a war supplement. At present the minimum income is \$500; on this before the war many Danes lived relatively well. To subsidize such families the Cabinet has formed a Need-Help Fund. All families with less than \$500 a year are subsidized in money according to number of children, and further relief is given in kind. The State sells them goods at less than cost price. The very poor get coal and coke at half the market price. In Copenhagen the authorities feed ten thousand persons a day. Out of the Need-Help Fund also come supplements to eke out social insurance pensions. All persons drawing old age, sickness or unemployment pensions are allowed 30 per cent supplements. The Government promised that if living conditions become worse, supplements will be increased.

In carrying out these measures, Denmark has the experience that State socialism of one kind leads to State socialism of another. At first only the very poor were guaranteed living conditions. To-day the Government finds itself obliged to take responsibility for the better situated classes. Many dealers and storekeepers find it impossible, as a result of the severe regulation of maximum prices, to make a living. On condition that they observe the maximum prices, the State pays them allowances out of the Need-

Help Fund. This practically turns traders into salaried officials who are guaranteed a fixed wage. It is a new stage, says Stauning, towards direct State proprietorship of all food stores.

Fierce controversies are raging over this last measure. The State finances are badly hit; and the problem of finding money grows harder every day. The mass of the people, being already supported by the State, cannot be taxed. Finance-Minister Eduard Brandes lays the whole burden on the rich, in particular on citizens and foreign settlers who profit from the war. M. Brandes has raised the income tax, imposed a heavy tax on shipping, and a still heavier war profits tax. In 1916 the war profits tax will bring in \$18,750,000, which is equivalent to \$600,000,000 on basis of United States population. For next year are proposed prohibitive taxes on luxuries, in the spirit of Prof. Adolph Wagner, who seven years ago laid before the German emperor a plan for preventing excessive expenditure by making it a criminal offence.

CHAPTER XXXI

HOUSING

WHILE governmental efforts for the housing of the working classes have been undertaken chiefly by municipalities, it has sometimes happened that national governments have taken the lead in this direction. For example, the public housing of the German working classes has largely developed as a by-product of the social insurance system. The administrators of this system, having decided to invest funds as largely as possible in enterprises of special value to the health of the working classes, have placed a considerable part of the whole fund in housing schemes for working people.

Since the United States Government has recently undertaken a thorough investigation of the whole subject, we have taken our information chiefly from its report, which contains a digest of all previous material.

[SOURCE: "Government Aid to Home Owning and Housing of Working People in Foreign Countries," Oct. 15, 1914, Bulletin of U. S. Bureau of Labor Statistics, No. 158.]

Germany

In Germany, where Government aid for the betterment of housing of the working people has been given more largely probably than in any other country, four agencies have been employed, using various methods, the most important of which are the following:

1. The Empire:

- (a) Houses built directly for rental to lower-paid Government employees.
- (b) Housing fund established for making loans to building associations for workmen's dwellings and for purchasing land to be leased on long-time grants for building.

2. Individual States:

- (a) Houses provided for lower-paid State officials and workmen.
 - (b) Building loans and building premiums granted to State officials and workmen.
 - (c) Houses built for rental to State officials and workmen through housing fund.
 - (d) Loans for building associations and others through housing fund.
 - (e) Exemptions from and concessions in taxes, fees, etc., on workmen's dwellings.
3. Invalidity and old-age insurance funds:
- (a) Loans to communes, unions of communes, savings banks, corporations, building associations, and employers, and in some cases to employees.
4. Municipalities:
- (a) Houses provided to be rented to municipal workmen.
 - (b) Houses erected for rental to the general working classes and people of small means.
 - (c) Loans by cities to building associations for the erection of workmen's dwellings.

The housing work of the Empire for rental to its own employees has been quite extensive. In 1904 the amounts so invested were shown to be in excess of \$8,000,000. More important, however, is the work of the housing fund established in 1901. Up to 1908 its loans to 84 enterprises amounted to nearly \$6,000,000. These enterprises had expended on land and buildings \$27,335,259, having erected 1,619 buildings with 7,856 apartments. In addition land purchases had been made at a cost of \$1,302,870.

Of the individual German States which have engaged in the work of promotion of better housing, Prussia has been most active. Its housing fund, established in 1895, had in 1911 reached a total in excess of \$34,000,000, its building operations and loans amounting to \$33,655,637. Of this amount there had been expended for direct building for rental to State officials and workmen \$17,269,562, in loans to building associations for building \$15,367,907, and in other loans \$1,018,168. In Prussia also building loans and building premiums granted to industrial employees are important. For mining employees, for example, loans amounting to \$2,281,506 and building premiums of \$1,451,053 were reported at the end of 1910. These were in connection with the provision of 8,353 houses with 17,799 apartments.

Most important of the funds for the promotion of better hous-

ing in Germany are the invalidity and old-age institutes. Between 1891 and 1913 loans from this source amounted to \$114,867,744.

An official investigation of the activities of German municipalities made in 1909, covering cities with a population of 50,000 or more and a few others, showed that 42 cities had provided houses to be rented to municipal workmen, 15 cities had erected houses for rental to the general working classes and people of small means, and 33 cities had made loans to building associations for the erection of workmen's dwellings. Of the 15 cities which had erected houses for rental to the general working classes, 8 were in Prussia, 4 in Alsace-Lorraine, 2 in Baden, 1 in Saxony. In this form of housing 5 cities had been especially active, Freiburg, Mülhausen, Düsseldorf, Strassburg, and Essen. Among those cities most active in making loans to building associations were Berlin, Munich, Frankfort, Hamburg, Posen, and Stuttgart.

Great Britain

In Great Britain government activities in the interest of improved housing are controlled by the housing and town planning act, 1909, the latest of the series of Housing Acts. . . .

The slum clearance schemes in London under the various housing acts have been in several instances on a large scale, and the schemes undertaken between 1875 and 1913 cost over \$13,000,000. The gross rentals from the dwellings of the London County Council in the year 1912-13 amounted to \$1,073,057. The total cost of the clearance schemes in cities other than London is not known, but the official reports show that the amount of loans sanctioned on account of such work was in excess of \$24,000,000.

The power which local authorities have to take action against small slums and insanitary houses has not been largely used and has not called for large expenditures. In London 16 schemes have been undertaken at a cost of \$1,030,978 and in Manchester 3 at a cost of \$169,885. A more important power, that of closing or requiring the demolition of unhealthful houses, if the owners could not or would not put them in proper condition, which was formerly difficult of application, has been strengthened by amendments in the act of 1909 and has been found of great usefulness.

In the way of financial aid to improve housing the General Government has made loans to both urban and rural local authorities, to philanthropic and semi-philanthropic organizations, to building associations, and to private individuals. These loans up to March 31, 1913, had amounted to \$25,448,496; of which about one-half

were to local authorities and slightly less to associations, corporations, and private persons. The loans in the last year were mostly at $3\frac{1}{2}$ per cent, the remainder at $3\frac{3}{4}$ per cent. Of the loans to local authorities all but about 4 per cent were to run 80 years, while the greater part of the loans to associations, etc., run from 20 to 30 years.

The total loans to organized private enterprises 1891 to 1913 were \$7,076,530. Since the amendments in the law introduced by the act of 1909 the amounts loaned annually have greatly increased—from \$327,477 in 1909 to \$1,515,049 in 1913.

Hungary

The city of Budapest, which owns large areas of land suitable for building purposes, availed itself of the benefits of this law, and in order to lessen the excessive scarcity of workmen's dwellings voted nearly \$13,000,000 for the erection of such dwellings. Up to 1913 the city built dwellings containing a total of 4,816 apartments, housing 22,481 persons, of whom 81.5 per cent were workingmen and their families, electrical workers, etc.

The great scarcity of workmen's dwellings in the capital caused the enactment of the law of July 20, 1908, in which the ministry of finance was authorized to build workmen's dwellings at a maximum total cost of approximately \$2,000,000. These dwellings were to be occupied primarily by workmen employed by the State and secondarily by those in private employment. The result of the law is the workmen's colony at Kispest, a garden city, in which up to 1913 dwellings have been built that house 3,535 families with 18,000 persons. The colony will ultimately house about 4,200 families.

Government aid for housing work was given not only to industrial workers, but also to agricultural workers who needed aid in this respect still more than the former. Action was first taken in 1901 by the ministry of agriculture, which in the period 1901 to 1906 expended a total of about \$365,000 appropriated by Parliament for State subsidies to workmen to aid them in acquiring their own homes. About 600 houses were erected annually with the aid of these subsidies. This slow progress was not satisfactory to the Government, and therefore caused the enactment of the law of 1907 (No. 46), which provided that a maximum annual amount of \$60,000 should be made available for subsidies to be granted to communes to pay the interest and refund of loans contracted by municipalities, communes, and authorized corporations for the erection of dwellings for agricultural workmen. Each dwelling

under the act must be for one family only. About 6,000 dwellings for agricultural workers in 23 districts and in over 200 communes have been erected with the aid of such Government subsidies.

Italy

In Italy the legislation is intended to encourage the building and acquisition of cheap dwellings for workmen by co-operative societies, charitable associations, and mutual aid associations. When their activities are not adequate the commune has authority to establish a municipal bureau of cheap dwellings.

The total number of cheap buildings for the people constructed, subject to the legal exemption of taxes, etc., at the beginning of 1911 was 1,038. The Milan society had built, up to September 30, 1912, 52 apartment houses having 2,759 apartments, and 22 houses with 160 apartments.

The most recent data concerning the municipal management of people's dwellings show that in 18 communes where the building and management of such dwellings has been undertaken, an expenditure of \$1,078,063 was involved. In addition, in 13 communes where the building and operation of people's dwellings is being carried on by a system of independent management, the investment for building was \$1,006,148, almost the entire amount having been raised by loans from the institutions authorized under the housing laws.

Austria

The amount of the Government endowment of the State housing fund as fixed by law is 25,000,000 crowns (\$5,075,000), to be made available during the years 1911 to 1921, inclusive, in yearly amounts ranging from about \$300,000 to \$800,000. A public-welfare building association which serves as an intermediary in most of the housing loans as defined in the law is one which limits its dividend to 5 per cent of the paid-up shares, and in case of dissolution refunds to its members only the paid-up capital, devoting any remaining balance to public-welfare purposes. At the end of April, 1913, the direct loans of the State housing fund amounted to about \$165,000. Up to the same date the fund had guaranteed loans and advances amounting to about \$2,735,000.

At the end of 1912 there were 634 public-welfare building associations in the Empire, the associations having increased to this number from 336 in existence at the end of 1910. This rapid growth is due to the organization of the State insurance fund

authorized by the law of 1910. An investigation made at the end of 1912 showed, for 405 associations reporting, capital invested in buildings and building lots amounting to \$12,967,640.

For the work of the State as employer the Government first appropriated in 1907 4,000,000 crowns (\$812,000). A further amount of 1,000,000 crowns (\$203,000) was provided for a special fund for workmen in State salt mines. The State also provides service dwellings for some of its officials and employees in nearly all branches of administration. As an industrial employer it has done extensive housing work for the employees of State railroads, tobacco factories, and salt mines. At the end of 1912 the administration of State railroads had built houses at a cost of \$5,022,423 and had in process of erection houses estimated to cost \$1,048,292. These houses are for rental to employees of the State railroads, preference being given to members of building associations of such employees. Renters are prohibited from keeping lodgers or roomers. A large number of the municipalities in Austria have built dwellings especially for their own employees. A number of cities have also made loans for the erection of dwellings for the general working population. The cities most active in this work have been Vienna, Trieste, Olmütz in Moravia, Prague, Roveredo in Tyrol, and Villach in Carinthia.

The carriers of the State social insurance (the accident insurance institutes and sick funds) assist in housing work by the erection of dwellings and the issuing of loans to public-welfare building associations. The report for the year 1910 shows an investment in lands and buildings of \$732,000. The net income on these properties ranged from 3.32 to 4.22 per cent, in most cases reaching 4 per cent. The amount of mortgage loans for workmen's dwellings was \$216,914. All the loans have been made at 4 and 4½ per cent.

Belgium

To Belgium belongs the credit of being one of the pioneers in the housing movement through State intervention.

Since the law of 1889 became effective, up to December 31, 1912, the General Savings Bank had advanced more than 103,000,000 francs (\$19,879,000) to workmen's dwellings associations, permitting the building of about 57,500 houses. On December 31, 1912, the number of these associations having loan contracts with the General Savings Bank was 176. The total amount of operations by 175 of these associations from their formation to December 31, 1910, reached 138,000,000 francs (\$26,634,000). On December

31, 1912, 167 stock companies (131 loan companies and 36 building associations), which do the bulk of the housing work, owed to the General Savings Bank about 89,134,000 francs (\$17,203,000).

France

French housing legislation is very similar in its provisions to the Belgian and Italian laws. . . . Probably the most important feature of the law is the authorization of the Bank of Deposits, a Government institution, to make loans to Building and Loan Associations, and of the National Old-Age Retirement Fund to make advances to the real estate loan companies for the construction of low-cost workmen's dwellings. . . . From the Bank of Deposits and the National Old-Age Retirement Fund advances have been made to the amount of 37,589,600 francs (\$7,254,792.80), in addition to sums received from the participation of charitable and poor-relief institutions.

Denmark

In Denmark several laws have been enacted—the first in 1887 and the most recent in 1914—intended (1) to aid cities by loans in the clearance of congested areas and the erection of sanitary houses for the laboring population, and (2) to aid cities and building associations by loans in erecting individual laborer's dwellings. The four acts passed have provided for these purposes \$1,742,000.

Special facilities have existed since 1899 for the purchase of small holdings. For this purpose the State had advanced \$9,013,912 up to March 31, 1914.

Norway

In Norway the law of June 9, 1903, in regard to loans on small property holdings of workmen and their dwellings established a loan bank with three branches under the guaranty of the State. The capital of the bank, constituted out of State funds, was authorized originally at 3,000,000 crowns (\$804,000), and increased in 1912 to 10,000,000 crowns (\$2,680,000). This bank is also authorized to raise funds by the issue of bonds guaranteed by the State in a sum not to exceed 60,000,000 crowns (\$16,080,000).

The bank grants loans for two purposes: (1) For the purchase of small holdings; (2) for the building, completion, or purchase of laborers' dwellings.

Since its organization up to June 30, 1913, the bank has made 22,600 loans, of which 13,140 were for the purchase of land hold-

ings and 9,460 for the building of homes. Somewhat over two-thirds of those who have borrowed to build homes own their garden plots. About one-third of the outstanding loans are for 1,000 crowns (\$268) or less; only about one-seventh exceeded 2,000 crowns (\$536). The outstanding loans on June 30, 1913, were approximately 32,000,000 crowns (\$8,576,000).

Sweden

In Sweden a royal decree of 1904 created a State fund to be available to lend to workingmen or others of small means for the purchase of small holdings and for the building and completion or purchase of laborers' dwellings. Loans are made through intermediary associations or employers.

The total amount set aside for the five years 1905 to 1909 was in round numbers \$2,894,000, but proving inadequate it has gradually been raised to \$2,010,000 a year. During the year 1911, 1,096 small-holding loans and 447 low-cost dwelling loans were made.

Public lands are also set aside in Sweden and buildings and homes for rental to those of small means are erected upon them. The State also provides homes for many of its own employees on its canals and railroads, the details of which do not lend themselves to a summary statement.

During the period 1871 to 1911 Stockholm advanced about \$1,206,000, by the aid of which 761 houses were constructed, consisting of 1,728 apartments, each containing on the average one room and a kitchen. Other cities in Sweden are doing similar work.

Attractive garden cities have also been created, although only one, that of Solheim, has been really successful.

More recently (1907) Parliament prepared to aid companies desiring to buy up large private estates to sell to those of small means or to erect homes for them thereon. Loans are to be made by the companies up to 80 per cent of the value of the security. Only the small sum of approximately \$540,000 has been voted for this purpose.

Australia

Although Australia is primarily an agricultural country, housing loans to workers from State funds direct to borrowers have been in force there since 1909. The legislation authorizing such loans is State and not Commonwealth legislation. Five of the six States of Australia have such laws. Queensland was the first State to inaugurate the system in 1909, to be followed by South Australia

and Victoria in 1910, Western Australia in 1911, and New South Wales in 1912.

Besides making loans direct to individuals for the purchase of homes, Western Australia and New South Wales provide for the Government purchase of land or setting aside of Crown lands for leasing to workers of small means and will build upon such land either for purchase or rent.

The total amounts of loans advanced under the above acts in each of the States indicated on the date specified stood as follows:

Queensland (June 30, 1913)	\$2,933,000
South Australia (June 30, 1912)	1,238,000
Victoria (June 30, 1912)	3,262,000
Western Australia (January 31, 1912)	620,000

In South Australia the amount above did not include about \$476,000 which the State had invested in purchasing homes for rental, nor did it include \$318,000 which had been borrowed in order to discharge other mortgages.

Thus far New South Wales has been engaged only in setting aside Crown lands and building houses thereon for rental to workmen. The first project of this kind developed, the Dacey suburb, is situated five miles from the center of the city of Sydney adjoining the suburb of Kensington. The area of the suburb consists of approximately 336 acres. On June 30, 1913, there had been completed 67 dwellings, all of which had been rented. Twenty-two additional dwellings were then in course of construction. The rents are reported from 15 to 20 per cent lower than those charged by private landlords for similar accommodations in the suburbs. A glance at the occupations of those renting these houses would indicate that the semi-skilled workmen are the ones who more commonly take advantage of securing these houses.

As to the number of houses which have been constructed under State loans in the other States of Australia the latest figures show that in Queensland it was 1,837 (June 30, 1913) and in South Australia 1,193 (June 30, 1913). In Victoria the State Savings Bank had actually in force 2,359 loans for the purchase of homes or small shops in connection therewith, as is provided by the law of that State.

New Zealand

Under the State advance acts (1908-1913) there may be loaned for the purpose of purchasing or erecting a dwelling on a land allot-

ment a sum not to exceed approximately \$2,200, such loan not to be in excess of the value of the dwelling or house to be erected.

The total advances to workers up to March 31, 1913, including moneys repaid and again advanced, was approximately \$11,000,000. During the year 1912-13 alone there was advanced \$2,186,000, involving 1,321 loans.

The main purpose of the Workers' Dwellings Act, 1910, which supersedes an earlier act of 1905, is to set apart Crown lands or to acquire private lands and to erect dwellings for workers thereon. The purchase of a dwelling is effected by a deposit of about \$50 and the payment of the balance is distributed over a period of 25½ years in equal annual installments. A "worker" under the act is defined as one whose earnings do not exceed about \$850 per annum and who is landless.

On March 31, 1913, the number of houses erected under the act of 1905 was 126, while up to March 31, 1913, 138 dwellings had been erected for purchasers under the 1910 act. The report of the superintendent administering the act indicates that the larger proportion of the purchasers of homes under the act are ordinary laborers.

Arrangements have been made under the act with the Government life insurance department by which any purchaser of a worker's dwelling may insure his life for the amount that may be owing on his dwelling at the time of his death, if such should occur before all of his payments have been completed.

Other countries

A considerable number of other countries have been active in giving public aid for the betterment of housing conditions. In no case, however, is the work yet on a large scale nor are the details available for this report of such length as to make their summarization in this place necessary. The reader will find the significant details, as far as available in published form, given in the body of this report. The other countries covered are: Luxemburg, Netherlands, Roumania, Spain, Switzerland, Canada, Cuba, and Chile.

CHAPTER XXXII

THE TAXATION OF CAPITAL AND INDUSTRY FOR SOCIAL PURPOSES

THE most important fact to be noted in connection with collectivist taxation is that it forms an essential, indispensable, part of the whole scheme of collectivist efforts on behalf of the individual, which is the subject of all the chapters in Part V. of the present volume. Public health, education, and recreation, public housing, and food supply may all be considered from the economic standpoint as sound investments which *in the end* will produce a profit to the nation and to all classes of the nation, including capitalists and property owners. But the financial returns on such "investments" are very indirect, slow, and even uncertain, from the point of view of those economic classes whose profits from such government expenditures is most indirect. It is therefore necessary to consider most governmental outlay for such purposes rather as "communistic" expenditures for the welfare of the masses than as economic investments. Therefore the money to support these governmental activities must be secured rather through taxation than through loans. Undoubtedly governmental housing and governmental control of the food supply *in their present stage of development* should be considered rather as merely socialistic than as communistic enterprises. For at the present time such activities are made to pay their way. At any rate public activities in regard to health, education, recreation, and the development of science and art are not expected "to pay" from a purely financial standpoint, but only from the point of view of the economic profit they should bring to the nation as a whole after the lapse of a considerable period of time.

A large part of the proceeds of the graduated direct taxation

(chiefly income and inheritance taxes) of recent years has been used for the social or collectivist purpose of raising the economic level or industrial efficiency of that part of the population which has been most in need of such assistance. Such taxation had reached a very high level in many countries; for example, Great Britain, Germany, and Australia before the war.

The "taxation of the rich for the benefit of the poor" had so well demonstrated its practicability and value to the nation by May, 1914, that even *The London Times* endorsed the radical extension of the principle in the new budget. The *London Nation* remarked that this method of improving the national efficiency through "raising the earning power and the physical and intellectual forces of the nation" was by that time approved by all political parties.

Since the war not only have such taxes been increased in nearly all the countries of Europe, but they have been applied also for the first time since the Civil War by the National Government of the United States. The income taxes, first enacted in this country in 1914, were considerably increased in 1916 and 1917, even before our entry into the war. We read the grounds of the new policy in the report of the Committee of the House of Representatives in 1916 (Report No. 922, 61st Congress, 1st Session):

"Up to the present time our revenue system, in order to meet the increased demands on the Treasury, has passed through three stages. For over 50 years the National Government depended for its necessary revenue almost exclusively upon one system of indirect taxation, namely, customs revenue. During the Civil War the shortcomings of this system became apparent. Secretary of the Treasury Chase, in 1863, was obliged to admit that 'the chief reliance for any substantial increase, and even for the prevention of any possible decrease, must be on internal duties.' Thus the second permanent method of taxation was added, namely, internal revenue. Up to the enactment of the tariff act of August 5, 1909, our revenues were almost entirely collected from these two sources, both being taxes upon consumption. The increasing demands of the Treasury made it necessary to incorporate into the tariff act of August 5, 1909, a provision imposing a special excise tax on corporations. The tariff act of October 3, 1913, imposed a permanent and comprehensive tax on the net incomes of corporations and individuals. Of the total receipts from customs and internal revenue, amounting to \$625,456,318 during the fiscal year ended June 30, 1915, practically all except \$80,201,758.86, the receipts

from incomes, were consumption taxes. No civilized nation collects so large a part of its revenues through consumption taxes as does the United States, and it is conceded by all that such taxes bear most heavily upon those least able to pay them.

“It is probable that no country in the world derives as much revenue per capita from its people through consumption taxes as does the United States. It is therefore deemed proper that in meeting the extraordinary expenditures for the Army and Navy our revenue system should be more evenly and equitably balanced and a larger portion of our necessary revenues collected from the incomes and inheritances of those deriving the most benefit and protection from the Government.”

Of course, the purpose of the 1916 increase in taxes in the United States was not *exclusively* military. The appropriation of the year contained, for example, the sum of 21 million dollars for rural credits and good roads, to say nothing of 20 million dollars for a nitrate plant and 50 million dollars for a Government merchant fleet, to be provided for by loans—for which the Government would have to provide interest. The Democratic Textbook of 1916 summarizes the American taxation situation as follows:

For the year 1913 the American people as a whole were annually paying \$2,130,000,000 taxes for governmental purposes, Federal, state, and local. These comprised tariff taxes, general and special property taxes, business, license, occupation, poll, and other taxes.

The tariff taxes persons upon what they eat and wear and use. Under this method the poor man with a large family pays more taxes than the rich man with a small family. The \$318,000,000 paid to the Government in tariff taxes for the year 1913 came principally off the day laborer and the person of small means who comprise the masses of the people. The internal revenue tax on whisky and tobacco, amounting to \$309,000,000 for the same year, was likewise distributed.

The less than 2 per cent of our population who own or control more than 50 per cent of the accumulated property of the country contributed but a very minor portion of the \$627,000,000 thus paid to the Federal Government in 1913. The chief burden of the \$1,500,000,000 taxes paid the states and their subdivisions in 1913 fell mainly on the small property owner.

Less than 20 per cent of all personalty, and probably less than 10 per cent of all intangible personalty, is reached for taxation under existing laws. Bonds, mortgage notes, and other intangible

personalty, aggregate near \$50,000,000,000, or about one-third of the total wealth of this country. Urban real estate evades the chief portion of its fair share of taxes under present laws.

It is important to note that the new inheritance and income taxes were estimated to bring in a new income of 175 million dollars, by far the larger part of the new taxes required in 1916. These two new direct taxes should give a total for 1917 of 300 million dollars.

1. The Income Tax

Great Britain has led in the early enactment of an income tax, in the increase in the rate of that tax, and in its graduation; and also in effecting a distinction and separation between "earned" and "unearned" income—all income from rent and interest being considered as "unearned." For incomes over \$12,500 the distinction, for obvious reasons, ceases. For smaller amounts earned incomes receive a certain abatement in the tax which reduces them a little more than two-thirds the rate on unearned incomes.

Before the war the British income tax rates, as proposed by the budget of May, 1914, were approximately 1 per cent on incomes less than \$5,000, 5 per cent on \$10,000, and 10 per cent on \$50,000, reaching a maximum of 13 per cent on incomes of \$500,000 a year. The war increased these rates on incomes under \$5,000 to 12½ per cent on earned and 20 per cent on unearned incomes; on amounts over \$10,000 to 22½ per cent on earned and 25 per cent on unearned incomes, and on incomes over \$50,000 to 32½ per cent, and on incomes over \$500,000 to approximately 42 per cent. These were the rates applied for the financial year 1916-1917. The total amount of the budget of May, 1914, had been less than £198,000,000, a little less than £75,000,000 having been produced by graduated direct taxes. For the financial year 1916-1917 the total taxes had risen to £469,000,000, approximately half of it, £234,000,000, being raised by graduated direct taxes.

Thus the sums raised from direct taxation in Great Britain since the war have increased threefold. Inheritance taxes, already at a high figure, were not materially increased. In the financial year 1913-1914 they brought in £27,000,000 pounds; in 1916-1917, £33,000,000; but income taxes were made to produce more than four times as much, rising from £47,000,000 in 1913-1914 to £200,000,000 in 1916-1917.

But we are by no means assured that these taxes may not be still further increased in the succeeding financial year. Sidney

Webb seriously proposed that 75 per cent of all incomes over \$50,000 should be taken.

Even before the war the total of taxes levied in Germany was from $18\frac{1}{2}$ to $32\frac{1}{2}$ per cent on incomes over \$250,000, varying according to locality. The Imperial investigation of State and communal taxes in 1909 showed that in the great majority of localities the total of taxes on incomes of over \$25,000 a year varied from 8 to 15 per cent, and on incomes over \$5,000 a year from 7 to 12 per cent.

Before 1913 this tax was applied principally for state and city purposes, rising to 4 and 5 per cent in the states and still higher in the cities. In the larger cities the income tax which was *added* to the state tax was usually equal to the latter, but was often twice as great. In the smaller places the town income tax was sometimes four or five times as heavy as the state tax. The income tax rate in Hamburg rose rapidly to $6\frac{3}{4}$ per cent on an income of \$5,000, and reached 9 per cent on an income of \$50,000. The income tax rate in Bremen rose from $7\frac{1}{2}$ per cent on \$5,000 to $8\frac{1}{2}$ on \$25,000.

The cities of northern Germany raised from 50 to 75 per cent of their revenue through the income tax, while the German States have been raising from 60 to 80 per cent of their taxes in this way, the proportion increasing rapidly of late. The average for the whole country, however, was brought down to 54 per cent because of the relatively low proportions, from 36 to 54 per cent, raised in this way in the more or less agricultural communities like Württemberg, Baden, Hesse, and Oldenburg. However, the proportion shows a tendency to increase. Prussia, which raised 70 per cent of its taxes in this way in 1908, was raising 86 per cent in the same way in 1913. In 1913 the Imperial Government of Germany levied an income tax rising from 1 per cent on 5,000 marks to 8 per cent on 500,000 marks.

It is to be noted that in the fight in the Reichstag over the direct taxes in 1913 and 1914 the German Government refused absolutely to exempt from the income tax even the very low incomes under 1,500 marks, as demanded by the Socialists. It therefore remains the custom in Germany, as in many other countries of Continental Europe, to levy a considerable tax on very low incomes. There are exemptions in almost every case, but these exemptions often apply only to the income of the unskilled laborer, leaving the skilled laborers and the lower middle class with a considerable (though, of course, not a very high) tax.

The war has as yet brought a comparatively little increase of the direct taxes in Germany. However, such increase is inevitable. The Government, it is already clear, will seek to raise a large part of the necessary funds from the extension of governmental monopolies and increase of prices of those already in government hands. But a large part will remain to be raised from incomes over \$750 a year, the total of which are estimated approximately at a little less than 10 billion dollars per annum. On the other hand, even if this tax is put at 17 per cent on \$750 and rises to 90 per cent on incomes over \$25,000, it is calculated that it would not raise the entire sum needed.

The income tax in France at the beginning of the war was at a rate lower than in any other great country, namely, 2 per cent. On March 25, 1915, the French Socialist Party issued the following warning (which took effect, as we show below) :

“ We know that recourse to loans is inevitable to meet the expenses of this long war. But it is also inevitable that deficits should be covered by direct taxation of the rich ; that the unjust indirect taxes on the poor be abolished ; that provision be made to meet the interest on the new debts, and that the future be made as safe as possible.

“ This far and clear-sighted policy has already been adopted in many other countries, even in some countries not at war. Either they have already put it into practice, or entrusted commissions with the working out of practical methods.

“ We call attention to the admirable example of England. In the hour of greatest distress, with disaster abroad and failing credit at home, England adopted the income tax, giving a proof of her power to create new finances and make great sacrifices.”

Praising the income tax as a great remedy for the present financial distress of France, the Socialist declaration continues: “ Did not the same policy, already practically employed in Switzerland, Italy, Holland, and Norway, meet with the sanction of the Russian Government? Russia improved her revenues by proposing and effecting a sweeping reorganization of the great monopolies, enabling the government to draw revenues from motor powers and direct taxes.

“ But in France, where a certain press stirs unrest against the workers, assailing their patriotism, some classes carry on a reckless campaign to block a plan of fiscal reorganization which the majority of the nation demands.

"While this press hurls new attacks against the Parliament at the very time when we are trying to apply the common law of sacrifice to rich and poor alike, we are blocked by the timidity of the government in matters of finance. The government listens too eagerly to the sighs of the happy, and respects too much the inertia of its bureaus."

The declaration warns the government that the policy of raising loans cannot be continued indefinitely. "Be on your guard, gentlemen," it continues. "At the end of the war, during the first hours of peace, we shall not have any mechanism ready at hand to meet the most pressing necessities. We shall have no method to meet the interest on the war debts. We shall have no means to adjust our industries to peace conditions. And there will be no plan for social reforms.

"You will then be compelled to undertake the work of reorganization by improvised methods under enormous difficulties. You will have more opposition to meet from people who will have forgotten the war perils. And then, for many years, while waiting for better methods, you will again fall back on indirect taxes.

"The poor, bloodless victims of criminal improvidence will have to raise the means that shall fill the deficits.

"The Socialists will refuse from now on to place still heavier burdens on the backs of the small manufacturers and merchants, who have already been bled by the war. We shall oppose any more taxation of the small farmers, who will have to do a heavy share of the work of recuperation. And we shall refuse to sanction any more indirect taxes on the working class.

"We demand, to-day, that the government take immediate steps to create a socialized fiscal program."

It was only after this protest and many previous years of discussion that a tax even of 2 per cent could be levied, and the application of this tax was postponed until 1916. At the beginning of 1917 a new graduated tax was enacted. But its maximum was only 10 per cent on incomes over 150,000 francs (about \$30,000), falling to 2 per cent on incomes from \$1,600 to \$2,500. At the same time the tax was extended to very moderate incomes, the minimum tax being lowered from \$1,000 to \$600. One per cent is now paid on all incomes above \$600 and below \$1,600.

In 1916 the United States increased its income tax rates so as to practically double the total revenue from this source.

“The new rates (like the old) were subject to exemptions, so that the real rates are much lower. The *real* rates were:

.4%	on	\$5,000
1.2	on	10,000
1.4	on	15,000
1.6	on	20,000
1.9	on	25,000
2.3	on	40,000
2.6	on	50,000
3.1	on	60,000
3.8	on	80,000
4.4	on	100,000
5.6	on	150,000
6.5	on	200,000
7.6	on	250,000
9.3	on	500,000
10.6	on	1,000,000
15.0	on incomes which exceed	5,000,000

“As more than 95 per cent of the total income of the wealthy and well-to-do classes reached by this tax receive incomes smaller than \$500,000 a year, the rates beyond that point are *socially* unimportant.

“We see then that the new rates rarely went beyond 10 per cent and that as to the majority of income taxed (that of persons receiving between \$4,000 and \$20,000) they yielded an average of about *1 per cent.*”

The wealthy classes in America regarded these taxes as high, but the following table comparing them with the British and German taxes *before* the war shows that these foreign taxes were then several times greater than the new “high taxes” of this country.

Comparative Income Taxes

	\$5,000 a year. Per cent.	\$25,000 a year. Per cent.
England—May, 1914	1	8
Germany—1913	7 to 12	8 to 15
United States—1916	4/10	2

The defect of the income tax was noted in Germany when the property income tax was instituted. It was noted in this country with the proposed enactment in 1917 of a tax on all profits over 8 per cent. The income tax is considered a sound tax, but it has several serious shortcomings. It does not cover the rental value of dwellings owned by the taxpayer, nor that increase of the value of

land or of other property which does not raise the income. The former defect is probably covered by the existing graduation, which sufficiently taxes the wealthy and exempts the income as well as the dwelling of the poorer classes. Gains made from an increasing value of land in Great Britain, Germany, and other countries are covered by a special tax on land values (see below). The new tax on profits in the United States and the "property-increase" tax in Germany are efforts to cover the remaining types of property increase.

2. The Inheritance Tax

The graduated inheritance tax is considerably older than the graduate income tax, having been in use in the American states and several foreign countries for a number of years. It was introduced in England in 1904, the rates rising from 1 per cent on estates of 100 pounds to 8 per cent on a million. In the budgets of 1910 and May, 1914, the figures for the larger estates were considerably raised, until the tax on estates of a million pounds reached first 15 and then 20 per cent. The rates on fortunes of less than 10,000 pounds were, however, raised only from 4 to 5 per cent. These British rates are considerably higher than at first appears because in addition to the tax on estates there is a tax on legacies and a succession duty which in some cases goes often as high as 10 per cent in addition to the estate tax.

The German Imperial inheritance tax enacted in 1906 provided that two-thirds of the proceeds should go to the Empire and one-third to the States. The tax was on legacies and rose from 4 to 10 per cent for direct heirs. In 1913 the rates on the larger fortunes were slightly raised, until they were 6 per cent for 20,000 marks and 12 per cent for a million marks. The high rates on very moderate fortunes, 10,000 and 20,000 marks, are noteworthy, being nearly double those levied by Great Britain and several times the highest American State rates, those of California, or the Federal rate of the tax of 1917.

The highest American State tax is that of California, rising from 1 per cent on inheritances of \$5,000 to 2 per cent on \$25,000, 4 per cent on \$50,000, and 15 per cent on a million dollars.

The Report of the House of Representatives for 1916 [61st Congress, 1st Session, No. 922] sums up the situation in this country which led to the enactment of the Federal tax of 1916:

"Great Britain, before the European war, during her fiscal year ending March 31, 1914, collected from income taxes \$230,000,000

and from 'death duties,' or inheritance taxes, \$132,000,000. Great Britain's total revenue was \$620,000,000, and of this amount taxes upon incomes and inheritances yielded \$362,000,000, or 58 per cent of the total. In other words, Great Britain, in times of peace, collected 58 per cent of her revenue from the taxation of incomes and inheritances. With less than one-half the population and wealth of the United States, the revenues from income and inheritances, including 'death duties,' in Great Britain were more than four times the revenues derived from these sources by the United States. Similar facts might be cited as to some of the other leading nations.

"The inheritance tax laws of the various States never have been a source of large revenue. The total inheritance tax receipts of the 42 States having inheritance taxes amounted in 1913 to only \$26,470,964, and in 1915 to \$28,217,735.55, as compared to Great Britain's receipts from her 'death duties' or inheritance taxes amounting to \$132,000,000 in 1914.

"It is estimated that when the law is in complete and normal operation it will yield \$54,000,000 annually (\$65,000,000 in bill as finally passed)."

The rates of the tax of 1916 were as follows:

Amount of "net estate."	Tax, per cent.
\$000— \$50,000	1
50,000— 150,000	2
150,000— 250,000	3
250,000— 450,000	4
450,000— 1,000,000	5
1,000,000— 2,000,000	6
2,000,000— 3,000,000	7
3,000,000— 4,000,000	8
4,000,000— 5,000,000	9
5,000,000— all over	10

In 1917 Congress proposed to increase the rate on the largest fortunes to 15 per cent and to graduate the intermediate scale accordingly—in a way to add \$20,000,000 to the \$65,000,000 to be raised from the tax of the previous year. If we compare the American Federal tax of 1917 with the British rates before the war we see that the British taxes were fully several times as high on fortunes under \$50,000 and nearly twice as high on those of \$500,000. If we further take into account the existence of State taxes in America, these are fully offset by the additional legacy and succession duties in Great Britain. Furthermore, the German rates on legacies may be estimated as being fully as high on fortunes

over \$25,000 and, as previously mentioned, considerably higher on smaller fortunes.

Senator Norris proposed in 1915 that the tax be raised to the figure of 20 per cent on fortunes of \$8,000,000 and 75 per cent on \$50,000,000. Senator Johnson of Washington in 1913 had proposed 15 and 20 per cent, respectively, as the rates on such fortunes. In the *Atlantic Monthly* of January, 1915, Alvin Johnson recommends a rate *averaging* 5 per cent on legacies below \$50,000 and *averaging* 15 per cent on legacies above that amount. Judging from English results this would yield \$100,000,000 and \$300,000,000 (i. e., a total of \$400,000,000) in this country. This would require a tax on estates (not legacies) rising to a maximum of 50 per cent at one million dollars.

United States Inheritance Tax of 1917

[Actual rates, allowing for exemptions.]

Up to \$50,000	1.5%
On 250,000	3.3
1,000,000	6.15
5,000,000	10.23
25,000,000	14.04
100,000,000	14.74

The tax approaches 15 per cent, therefore, on fortunes of \$100,000,000 and not on fortunes of \$5,000,000, as it would if we did not allow for exemptions. On \$5,000,000 the rate is only a little more than 10 per cent. Similarly the tax on \$1,000,000 is 6 per cent (and not 9 per cent), i. e., about one year's interest. The great mass of American wealth will be taxed at a rate of from 2 to 6 per cent (a fraction of a year's interest).

Comparative Peace Time Inheritance Tax Rates

	Great Britain. May, 1914.	United States. Feb., 1917.
Up to \$50,000 ...	1 to 4%	1½%
50,000 to 1,000,000 ...	5 to 11	3 to 7½
1,000,000 to 5,000,000 ...	12 to 20	9 to 13½
5,000,000 and over ...	20	15

3. The Taxation of the Unearned Increment of Land

Like the taxation of profits, the appropriation by the State of a part or the whole of the increasing value of the land (apart from the value brought by improvements) is a clear case of collectivist taxation, provided the proceeds are used chiefly for social purposes rather than merely to increase the profits of private industry or

the value of private property. In fact all forms of direct taxation may be considered social, even if the benefit of their expenditure accrues largely to private interests—provided only that a considerable and an increasing part goes for social purposes—as is now nearly everywhere the case.

It is often forgotten that in a number of countries the whole of the rent of certain parts of the land (which increases with the increase of land values) goes to the State. In Russia, Prussia, and other countries of eastern Europe, the State is in possession of large areas of land in cultivation—even if we exclude the still larger governmental forests which are directly exploited by the State. A part of these State domains is also directly exploited—though by far the larger part is rented. In Russia, for example, 41,000,000 rubles were secured as rent for domains and the proceeds in 1914 were estimated at 48,000,000, or 5 per cent of the total Russian budget. We have already seen that the domains of Prussia produced in the financial year 1913-1914 nearly 16,000,000 marks. Further examples of the governmental appropriation of land rent and increasing land values are found wherever governments directly exploit their landed properties, as in the case of governmental forests (see our section on that subject) and the direct operation of farms by various governmental bodies, especially municipalities (see section on governmental development of agricultural lands). Another example rises, of course, wherever Governments purchase large tracts of land for the housing of the working classes or other purposes. As long as the government remains the owner it absorbs the increasing land value in one way or another (see chapter on MUNICIPAL SOCIALISM).

The ownership of land, for income purposes, by German cities is described by Davies as follows:

[Emil Davies: *The Collectivist State in the Making*, pp. 23-26.]

“Freiburg-im-Breisgau (Germany), a town of 84,500 inhabitants, at the end of 1912 owned exactly 77.4 per cent of its total area. Coblenz, Augsburg, and Stettin possessed over half the land on which they stand, whilst such large towns as Cologne (516,000 inhabitants), Darmstadt (87,000), Breslau (512,000), Wiesbaden (109,000), Strassburg (178,000), and Aix-la-Chapelle (156,000) owned between 30 and 50 per cent of the land on which they stand.

“The Land Department of Frankfort-on-Main, which started in 1897 with land assets valued at £1,300,000, and a borrowed work-

ing capital of £300,000, on March 31, 1912, possessed land of the book value of £15,000,000, so that it is a veritable municipal duke. At this date the city owned 15,600 acres, or 21 per cent of its own area, 9,445 acres consisting of forests and woodlands.

“Ulm, in Württemberg, owns three-quarters of the land on which it stands, and has invested so successfully in land that it has not only trebled its property in eight years, but during that period made a cash profit on its transactions of £40,000.

“*Klingenberg in Lower Franconia* pays each burgher £15 per annum, besides furnishing him with a supply of wood and litter. *Freudenstadt in Württemberg* consists of about 1,300 householders, and possesses some 6,000 acres of forest and 32 acres of meadowland, its revenue from which exceeds £7,000 per annum. Of this, £5,300 takes the place of local rates and taxes, £75 is spent on common needs, and £1,650 is divided among the citizens. *Hagenau (Alsace)*, a town of about 12,000 inhabitants, receives over £14,000 from its public lands, which, together with the receipts from its gas and water undertakings, almost meets all the outgoings, so that local rates and taxes are practically non-existent.

“In the Grand Duchy of Baden alone in 1899, 121 districts, and in Bavaria in 1898, 526 districts, were absolutely free of rates and taxes on account of the amount of land owned by them.

“It is interesting to note that the Burgomaster of Philippsburg, a small town in Baden, with 2,400 inhabitants, after proudly stating that all local rates and State taxes were covered by the revenues from the town's own lands, added: ‘The enjoyment of the public land also enforces the love of home and is a dam against the tide of social democracy.’”

The above forms of appropriation of land rents by governments have existed for many years. The deliberate policy of absorbing a large and increasing portion of the increasing value of all urban land, as reflected in increasing rent, is relatively new. Aside from relatively small experiments in New Zealand, nearly all the important examples have occurred since 1900. One of the most valuable and most recent cases is that of Germany. In 1904 the city of Frankfort adopted a graduated tax on increasing land values, being followed by Cologne, Essen, Dortmund, Breslau, Hamburg, and Berlin, all within the period of five years. The law as passed in Lippe illustrates the general character of these taxes. The tax was applied at the times of any transfer of any piece of land, and the increasing value was calculated from a date already considerably in the past, so that nearly all of these German laws, including

the Imperial law that finally superseded them, were retroactive. Sometimes the date was set back as far as 1885. The law of Lippe, for example, took 4 per cent of the increase in the value of any piece of land transferred, calculating from the date set (whatever it may have been), provided the increase amounted to 10 per cent of the original value of the land. If this increase was 25 per cent the tax was raised to 10 per cent of this increase. The tax was then graduated by steps until it reached the following point: If the land increased in value 150 per cent, 25 per cent of this increase went to the city.

These municipal taxes were considered a great success, although they had not yet developed to the point of giving in any instance more than 10 per cent of the total city revenues (the larger part of such revenues coming, as we have pointed out above, from a graduated income tax). The maximum tax rate reached was 25 per cent in most cases, but in Berlin it was only 20 per cent and in Hamburg only 12½ per cent. (Report on New Sources of City Revenue, published by New York City, 1913.)

Nevertheless, the tax was so successful that when the Government found itself hard pressed, in 1910, to raise the comparatively small sum of \$6,000,000, it decided to do so by nationalizing this whole tax. It enacted a uniform statute according to which the Empire was to get 50 per cent of the proceeds of the tax, the cities 40 per cent, and the States 10 per cent, to cover the cost of collection. The States had also the right to claim any part of the 40 per cent allotted to the cities, but in that case the cities had a right to add an amount equal to that taken away—being limited only by the clause that in no case should the total tax against any individual exceed 30 per cent of the increase in the value of the land.

The chief features of the German land tax were as follows: First, from the increased value of the land 4 per cent per annum was deducted as a normal rate of profit. Then 10 per cent was taken by the State from the remaining increase in value. If the increase was threefold, 20 per cent was taken, and if the increase was fourfold, 30 per cent—with graduated steps in between these points. However, the longer the period of ownership of the land since the last transfer the less significant, of course, would be an increase in value; for example, if a piece of land increased threefold in value in one year, this is in large measure “unearned,” and the city might claim a large part of the increase. But if the same increase took 30 years it would not be so startling. Therefore, the Government reduces its taxation 1 per cent per annum for the period of

taxation up to 30 years. So that if the increase took 30 years, the rate of taxation would only be 70 per cent of the increase above quoted. Finally, an exemption was made for the homes or the property of very poor persons, but this exemption was placed very low, applying only when the income of the whole family was less than 2,000 marks. It is hardly necessary to add that provision was also made for levying the tax where there was no transfer to fix the new value of the land—in this case the tax is one-ninetieth, or a little more than 1 per cent annually.

In 1910 Great Britain also levied a tax on the increment of land at the level rate of 20 per cent, applying the same rate to long leases. Ten per cent profit was allowed for the owner, and if there was no transfer the tax was levied upon the estimated increase in the value of the land every fifteenth year in any case. As in Germany, all agricultural land was exempt and also houses of small rentals, and the sites of flats and tenements. In 1913, £715,000 (or \$3,575,000) was raised in this way, a sum even smaller than that raised in Germany, but promising to increase steadily and rapidly during the fifteen years following the imposition of the tax.

Moreover, the English Parliamentary Land Inquiry Committee has recommended that "all increases in local expenditure that are chargeable to the local rates should be met by a rate upon site values."

Perhaps an equally important form of land taxation takes place where all the buildings and other improvements are exempted from the real estate tax, thus throwing the whole of it upon the ground value. For many year the largest cities of Hungary have granted exemptions from taxation to all buildings for periods varying from 15 to 18 years. Italy grants a similar exemption for workingmen's dwellings and further allows municipalities to tax all unused land 3 per cent in order to erect such dwellings. (Report of Committee on Taxation of the City of New York, 1916, pp. 193 and 194.) But the most important examples of this form of land tax have been in Canada and Australasia. Very recently the city of Toronto enacted a law untaxing buildings and improvements, by a referendum vote of by more than four to one. In Northwestern Canada, Vancouver and Victoria had enacted the same law several years before, while Winnipeg and other important cities had exempted a large part of the value of such improvements.

Queensland, Australia, has had a tax of this character since 1890, and New Zealand since 1896, while in New South Wales 64 out of 73 municipalities and shires have adopted this plan. In

New Zealand the tax was graduated, rising to 3½ per cent on the property of residents, and 6 per cent on the property of absentees, valued at more than £200,000 (\$1,000,000). Half of the boroughs have accepted this form of tax. In New Zealand the rate rose only to 2½ per cent on the larger properties.

This taxation closely resembles in many aspects the single tax, but Professor E. R. A. Seligman has pointed out in his *Essays on Taxation* that only a small part of the revenue is raised in this way and that the tax was therefore not a "single tax." He further points out that it relieves the average farmer more than it does the average city lot owner—a fact which the promoters of the tax of course expected and desired.

The exemption of the taxation of buildings has been voted upon by a number of American municipalities and states, having been in every city defeated, until adopted in a moderated form in Pittsburg in 1912. It should be pointed out, however, that Houston, Texas, and Pueblo, Colorado, temporarily experimented with this form of taxation, and that it was defeated in the state of California in the fall of 1916 only by a rather narrow margin. Mr. Arthur Nichols Young, in his book, *The Single Tax in the United States*, reports on the new experiment in Pittsburgh and Scranton, Pa., as follows (pp. 210, 212-215):

"The staid old commonwealth of Pennsylvania gained the distinction of being the first state of the United States to witness the application, in a manner constitutionally sound, of the plan of land value taxation which, under the name of 'single tax,' has attracted so much attention of late in western Canada. In May, 1913, the legislature passed a law directing cities of the second class to assess a lower rate of tax upon buildings than upon land. Pennsylvania has divided its cities into three classes in order to get around the constitutional limitations upon municipal autonomy, and the cities of the second class, to which alone this law applies, are two, Pittsburgh and Scranton.

"The law provides for an extremely gradual application of the idea of partially exempting improvements from taxation, and one can hardly accuse Pennsylvania of undue haste in moving toward the single tax. For 1914 and 1915 the prescribed rate of tax upon buildings is reduced to 90 per cent of that upon land; for the next three years, to 80 per cent; and so on by reductions of 10 per cent every three years, until in 1925 the rate reaches 50 per cent, which obtains thereafter.

"In a special report, December, 1911, the Committee on Housing

of the Pittsburgh Civic Commission strongly recommends that the tax rate for improvements be reduced gradually to one-half that for land. In the fall of 1911, this plan received the indorsement of the Keystone Party of Pennsylvania, whose platform contained a plank urging that the assessment of improvements in cities of the second class be reduced annually 10 per cent for five years. Later the Real Estate Dealers' Association and the Pittsburgh Board of Trade endorsed the measure. Mayor W. A. Magee favored it, having sent a special investigator to some of the cities of western Canada to look into their tax methods.

"In the spring of 1915 there was an unsuccessful attempt to do away with reduced taxation of buildings. This attempt aroused considerable public interest in Pittsburgh. The repeal was urged on the ground that the measure was a discrimination against owners of land and a 'decided step toward the single tax theory of Henry George.'* Mayor Armstrong took the leading part in urging the repeal, which was also advocated by the Chamber of Commerce and other interests.† The repeal was opposed by a number of organizations, including the Pittsburgh Board of Trade, the Pittsburgh Civic Commission, the Pittsburgh Real Estate Board, by some of the press, and by the single taxers."‡

The repeal was gotten through both Houses at Harrisburg, but Governor Brumbaugh vetoed it. In vetoing the bill, the Governor said:

"This repealer is opposed by the largest group of protestants that have been heard on any bill. It is advocated by those now in charge of the fiscal policy of one of the two cities concerned.

"Inasmuch as there is such a conflict of opinion, and inasmuch as the law has scarcely yet been tried, it is well to allow it to operate until a commanding judgment decrees its fate. Let the people concerned study freely and fairly the operations of the present law and, if found after two years to be inadequate to the needs of the cities or unfair in its provisions, it can be repealed. To disturb it now when a preponderance of opinion favors it is unwise. For these reasons the bill is not approved."

Single taxers are making an effort to secure the extension to cities of the third class of the plan of taxation now being applied in Pittsburgh and Scranton.

* See the summary of reasons for repeal of the law, cited in *The Public*, April 30, 1915, p. 427. See also *Ibid.*, May 7, 1915, p. 452.

† *Ibid.*, May 7, 1915, p. 452.

‡ *Ibid.*, May 28, 1915, p. 522.

The relation between State Socialism and the State appropriation of ground value is even more vital from another point of view than that of mere taxation or the uses to which the proceeds of taxation are applied. For land owners may favor large measures of government ownership and other real or alleged State Socialist policies principally or solely because they realize that the resulting increase in the value of land will bring them (through sales or rentals) more than such State enterprises cost them. This is a fact of the very greatest importance. For example, governmentally operated railways may be favored by land owners even in cases where they secure no benefit other than the increasing value of the land. Though such railroads may not decrease taxes (in cases when they produce no profits), though the cost of transportation may not be lowered and though no advantages of any kind may be gained from nationalization, land owners may favor it—even when it produces an annual deficit which must be covered in part by taxes paid by themselves. We see, therefore, that a State Socialist policy not accompanied by a radical taxation of increasing land values may be chiefly a means of subsidizing land owners. However, in many instances, graduated direct taxation may partly fulfil the same function—if the land owners are wealthy or even well-to-do so as to be reached by such taxes. Even though their gains from increased land values escape taxation, they will be taxed on rents paid to them and on their income from agricultural operations, on interest, and on profits in other forms. Only the man who has the bulk of his property in unused and unimproved land will escape.

4. *New Forms of Direct Taxation—(a) The Property-Increase Tax*
 (b) *The Tax on Profits*

(a) The German Government has instituted a new tax which is both direct and graduated. As part of the same tax bill of 1913, a property increase tax was instituted, levied on all increases of property during each three-year period. The rate was three and three-fourths of 1 per cent on increases of from 10,000 to 15,000 marks per individual and was graduated until it reached $1\frac{1}{2}$ per cent on increases over 1,000,000 marks. The tax was also graduated according to the total wealth of the person paying the tax, varying from one-tenth of 1 per cent on a property of 100,000 marks to 1 per cent on a property of 10,000,000. This tax is as clearly collectivist in character as the tax on profits discussed in the following paragraph.

(b) The new American tax on excess profits, introduced in

1917, was a complete example of collectivism, as far as it went. Eight per cent was taken on profits in excess of 8 per cent. If this latter figure is considered merely as interest plus the wages of superintendence (as was doubtless the idea in the minds of the legislators), then we have only to raise the excess profits tax from 8 to 100 per cent to establish collectivism. And the tax on excess profits has been levied at rates up to 50 and 90 per cent in several countries of Europe during the war. There is, of course, a vast difference between an excess profits tax of 8 per cent and one of 100 per cent, but the difference does not stand in the ratio of 8 to 100, for the new tax serves as an opening wedge. The legal and technical difficulties of the initial levying of the tax will have been overcome. Undoubtedly the proceeds of a small tax like this *may* be used to strengthen private property and business interests against other collectivist tendencies. But in proportion as the rate increases the expenditure of the tax is likely also to become more and more collectivist, since collectivist expenditures make up a larger and larger part of nearly every governmental budget.

It was estimated by government officials that this excess profits tax would produce \$226,000,000.

NOTE—The proof-reading of this book was completed several weeks after the United States had entered into war with Germany. In our opinion this great event rather augments than diminishes the timeliness of the material we have gathered together. The two chief means of taxation now being considered, for example, are the income and excess profits taxes already instituted (as noted above). Other war measures, such as governmental control of railroads, shipping, and food supply, have received all the space that could be allotted in a volume of this size and cost.

Our chief concern has been to center attention on those collectivist tendencies that give promise of permanence, and we believe that these were all in operation—though on a smaller scale—even before the European nations went to war.—THE EDITORS.



INDEX

- Abyssinia, 344, 393
 Adams and Hatch and Morrill Acts,
 101, 149-153
AFRICA
 Forestry, 186
 Shipping, 283
AFRICA, SOUTH
 Commerce, State Aid to, 480
 Municipal Ownership, 546-547
 Railways, 296, 337
 Shipping, 282-283, 295
 Telegraphs, 344
 Telephones, 344
 Agrarian Conference, 44
 Agricultural Collectivism, 93-101
 Agricultural Extension Act, Co-
 operative, 143
 Agricultural Science, 110-113, 470
 Agriculture, 69-248
 U. S. Department of, 114-131;
 Annual Report of, 138, 201;
 Chief Divisions of, 128-131;
 Leading Bureaus, 132-185; Re-
 port of Secretary, 115-116, 132,
 136, 144, 152, 157, 168, 171,
 179, 181, 217; Weekly News
 Letter, 172; Year Book, 220,
 424
 Ain, 73
 Aix-la-Chapelle, 38, 556, 561, 628
 Alabama, 126
ALASKA
 Fisheries, 238-239
 Railways, 328
 Shipping, 286
 Telegraphs, 344
 Telephones, 344
 Weather Service, 139
 Alberta, 93, 95, 489
 Alexander, James W., 548
 Alexandria, 277
 Allies, 592
 Alps, 75, 189
 Alsace-Lorraine, 105, 299, 301-302,
 472, 609
 Altona, 37-38
American Economic Review, 384
American Political Science Review,
 225
 Amsterdam, 356
Annales de la Régie Directe, 568,
 572
Annalist, The, 26
Annals of American Academy, 509
 Antwerp, 291
 Apenrade, 37
 Appenzell, 573
ARGENTINE REPUBLIC
 Fisheries, 231
 Petroleum, 381-382
 Railways, 296
 Arizona, 139, 174
 Arkansas, 236
 Armour Company, B. J., 326
 Armstrong, Mr., 633
ASIA
 Forestry, 186
 Assuan Dam, 79
 Atlanta, 478
Atlantic Monthly, 627
 Augsburg, 556-558, 628
 Augusta, 580
AUSTRALASIA
 Taxation, 631
AUSTRALIA
 Banks, 21-23, 33
 Forestry, 186
 Housing, 614-615
 Industrial Science, 433
 Insurance, 60
 Land Development, 87-92
 Manufacturing, 411
 Mining, 367-378
 Public Health, 492, 497-499,
 501
 Railways, 296, 337
 Shipping, 278, 295
 Social Insurance, 492, 497-499,
 501
 Taxation, 618
 Telegraphs, 344, 347
 Telephones, 344, 350, 352, 357,
 358
 Year Book, 21-22

- AUSTRALIA, SOUTH**
 Banks, 33
 Housing, 614-615
 Mining, 376-377
 Telegraphs, 349, 351, 353-354
 Telephones, 349, 351, 353-354
- AUSTRALIA, WESTERN**
 Banks, 33
 Housing, 615
 Mining, 373-376
 Public Health, 489
 Telegraphs, 348-349, 351, 353-354
 Telephones, 348-349, 351, 353, 354
- AUSTRIA**
 Banks, 19, 28-29, 33-34
 Commerce, State Aid to, 480
 Forestry, 187
 Housing, 611-612
 Industries, "Subsidiary," 426
 Land Development, 81
 Mining, 368
 "Monopolies," Government, 403
 Municipal Ownership, 574-575
 Petroleum, 382, 387-388
 Public Health, 489-490, 493, 500-502
 Recreation, National Aid to, 536
 Shipping, 276, 278-279, 281-282, 289-290, 295
 Social Insurance, 489-490, 493, 500-502
 Telegraphs, 344-345, 347-348
 Telephones, 344-345, 351-354, 356, 358-359, 361
 Waterways, Inland, 266
- AUSTRIA-HUNGARY**
 Banks, 28-29
 Commerce, State Aid to, 483
 "Monopolies," Government, 399
 Shipping, 290, 292
 Telegraphs, 344-345
 Telephones, 344-345
 Water Power, 244
 Waterways, Inland, 270
- Ayres, Mr., 518
 Azores, 138
- BADEN**
 Agricultural Science, 105, 108, 113
 Banks, 37-38
 Commerce, State Aid to, 472
 Forestry, 187
 Housing, 609
 Insurance, 65-66
- BADEN (Cont.)**
 Municipal Ownership, 561
 Railways, 299, 302
 Taxation, 621, 629
- Balboa, 262-263
 Bale, 572
 Bâle-ville, 573
 Baltimore, 356, 357, 580
 Bamberg, 552
 Banks, 1-59
 Agricultural, 42-59
 Central, 3-23
 Savings, 25-41
 Bark, M., 393
 Barmen, 558, 584
 Barnes, G. S., 405
 Barnhart, Mr., 413
 Basch, Mr., 575
 Baugh, Hubert G., 404
- BAVARIA**
 Agricultural Science, 104-105, 109-110
 Banks, 38-39, 40, 48
 Commerce, State Aid to, 472, 475
 Forestry, 187, 188
 Insurance, 63-65
 Municipal Ownership, 556, 559, 561
 Railways, 299, 301-302
 Taxation, 629
 Water Power, 244-245
- Beaufort, 240
- BELGIUM**
 Banks, 28-29, 33
 Housing, 612-613
 Public Health, 489-493, 497
 Railways, 307, 337
 Shipping, 276-277, 292, 294
 Social Insurance, 489-493, 497
 Telegraphs, 344-345, 347-348
 Telephones, 344-345, 351-354, 357-359, 361
 Waterways, Inland, 265-266, 268, 270-273
- Bell System, 344-361
 Bengal, 79
 Berlin, 37-40, 104-107, 110, 356-357, 550-553, 560, 583, 609, 629-630
 Berne, 357, 572-573
 Bielfeld, 583
 Biological Survey, 179-181
 Birmingham, 578
 Bismarck, 299
 Boehme, Alice K., 548
 Bogota, 471
 Boldman, Charles, 526

- Bolivia, 344
Bombay, 78-79
Bordeaux, 273, 304
Bosnia, 28
Bosnia-Herzegovina, 344, 351, 353-354, 501
Boston, 238, 356, 478, 521, 579, 580
Bouches-du-Rhône, 73
Brandenburg, 109, 557
Brandes, Eduard, 606
BRAZIL
 Agricultural Science, 126
 Land Development, 89-90
 Railroads, 296
 Shipping, 276-278, 291
 Telegraphs, 344
 Telephones, 344
Bremen, 472, 475, 552, 556, 621
Breslau, 549, 552-553, 555-556, 561, 628-629
Brest, 304
Bridgeport, 576
British Columbia, 489
Brittany, 304
Brookhart, Smith W., 299, 322-323
Bruay, 273
Bruenn, 574
Bruere, H., 535
Brumbaugh, Gov., 633
Brunswick, 36-37, 316, 472, 550
Brussels, 357
Bryant, L. S., 519-520
Bucharest, 471
Budapest, 356, 575, 610
Buenos Aires, 471, 481
Buffalo, 579, 580
BULGARIA
 Food Supply, 584
 Public Health, 489
 Shipping, 280, 291
 Social Insurance, 489
 Telegraphs, 344
 Telephones, 344
Bullard, Arthur, 252
Bunge, M., 393
Burgas, 291

Cahill, C. H., 35, 42, 103, 108
Calcutta, 471
California, 87-88, 124-125, 139, 141, 159, 162, 171-180, 195, 198, 209, 230, 232, 374, 517, 540, 625, 632
CANADA
 Agricultural Collectivism, 93-98
 Banks, 25, 32
 Commerce, State Aid to, 480
CANADA (Cont.)
 Fisheries, 238-239
 Forestry, 186, 193, 206
 Housing, 616
 Industrial Science, 433
 Insurance, 62
 Land Development, 81
 Manufacturing, 418-420
 Railways, 296, 315-321
 Shipping, 291, 295
 Taxation, 631-633
 Water Power, 243
 Weather Service, 138
Canadian Commission, 82
Cape Colony, 282
Cape of Good Hope, 489
Cape Town, 471
Carlsruhe, 37
Cassel, 109, 244
Central America, 263, 480
Central Buying Bureau, 603
Cevennes, 189
Chadwick, Sir Edwin, 325
Charleston, S. C., 579-580
Charlottenburg, 556, 558
Chemical Trade Journal and Chemical Engineer, 590
Chemnitz, 552, 554
Cherbourg, 304
Chicago, 348, 356, 471, 478, 578
Chicago Herald, 429
Chihli, 383
Children's Bureau, 512-513, 523
Chile, 344, 616
CHINA
 Forestry, 186
 Manufacturing, 420
 "Monopolies," Government, 404
 Petroleum, 382-384
 Weather Service, 139
China and Japan Trading Company, Ltd., 405
China, Cochin, 404
Chosen, 351, 353-354
Christiania, 356
Cincinnati, 356, 578
Clark, Evans, 546, 576
Cleveland, 578
Cohlenz, 557, 628
Coire, 572
Colmar, 557
Cologne, 549, 552, 556-559, 628-629
Colombia, 344, 401
Colon, 125, 150, 162, 180, 198, 256, 259, 262, 263, 286
Colorado, 139, 141, 178
Columbus, 578

- Commerce, 367-487
 Commerce and Collectivism, 460-483
 Communication, 341-363
 Conderque, 568
Congressional Record, 425
 Connecticut, 70, 170, 222
 Constantinople, 277
 Constanza, 277
 Copenhagen, 356, 471, 605
 Corsica, 74
 Costa Rica, 344
 Cox, Mr., 345-355, 357
 Crédit Lyonnaise, 3
 Crefeld, 558
 Cristobal, 254-259
 Cuba, 170, 344, 610
 Curzon, Lord, 420
- Dahomey, 344
 Darmstadt, 557-558, 628
 Davies, Emil, 60, 62, 94, 99, 243,
 303, 312, 315, 367, 368, 372,
 411, 428, 536, 582, 628
 Dawson, W. H., 548, 583
 Delaware, 70
Democratic Text-Book, 114, 143,
 153, 215, 619
- DENMARK**
 Banks, 30
 Commerce, State Aid to, 471
 Food Supply, 604-606
 Housing, 613
 Land Development, 83-85, 90-91
 Public Health, 489-490, 492, 497-
 499
 Shipping, 283, 292, 294
 Social Insurance, 489-490, 492,
 497-499
 Telegraphs, 344-345, 347-349
 Telephones, 344-345, 351, 353-354,
 357-359, 361
- Denver, 356
 Dervain, 273
 Dietrich, Herman R., 401
 District of Columbia, 117, 119, 133
 Dockery, Alexander M., 26
 Dordogne, 73
 Dortmund, 244, 557, 583, 629
 Douai, 273
 Dover, 277, 537
 Dresden, 549, 551-552, 556
 Drugs, 130, 132-135, 167-168, 185,
 412, 420-421, 502-512
 Dublin, Dr. I. L., 503
 Duisburg-Ruhrort, 552, 561
 Duluth, 323, 358, 599
 Dunn, Mr., 317, 328, 331-336
- Du Puy, W. A., 509
 Düsseldorf, 549-550, 552, 554, 556,
 559, 609
- DUTCH EAST INDIES**
 Mining, 368
 Shipping, 279-280
- Ecuador, 401
Educational Review, 520
 Edwards, Clement, 325
- EGYPT**
 Land Reclamation, 80
 Railways, 296
 Taxation, 618, 624-625
 Telegraphs, 344
 Telephones, 344
- Elberfeld, 549
 Emden, 552
 Emerson, Dr. Haven, 526
Engineering Magazine, The, 372
- ENGLAND**
 Agricultural Collectivism, 99
 Banks, 3, 7-14, 25, 33, 35, 43, 51
 Commerce, State Aid to, 480-481
 Food Supply, 582, 585-589
 Housing, 609-610
 Industrial Science, 428, 429-433
 Land Development, 84, 91
 "Monopolies," Government, 405-
 406
 Municipal Ownership, 546-547,
 560-566
 Public Health, 480-493, 497-501,
 505-506, 520
 Railways, 296, 309, 314-315
 Recreation, National Aid to, 537
 Shipping, 289, 291-295
 Social Insurance, 489-493, 497-
 501, 505-506, 520
 Taxation, 625-626, 631
 Telegraphs, 344-345, 347-350
 Telephones, 344-345, 352, 356-358
- Erfurt, 556
 Erie, 579
 Essen, 559, 609, 629
 Experiment Stations, U. S., 130,
 149, 152
- Fabian Committee, 506
 Fairport, 239
Far Eastern Review, 382
 Faroe Islands, 138
 Farrell, F. D., 72
 Federal Aid Road Act, 215-216
 Federal Farm Loan Board, 55
 Federal Health Service, 507-509
 Federal Reserve Board, 4-10
 Federal Trade Commission, 379

- Finance, 1-66
FINLAND
 Forestry, 192
 Public Health, 489
 Social Insurance, 489
 Fisher, Edmund, 304
 Fisher, Irving, 500, 514
 Fisheries, 227-242
 Fiume, 289
 Florida, 126, 141, 159, 162, 167,
 174, 233
 Food Supply, The, 130, 132-138, 510-
 512, 581-606, 617
 Forestry, 186-214
 Formosa, 344, 351, 353-354, 478
FRANCE
 Banks, 3-4, 12-13, 25, 31, 33, 55
 Commerce, State Aid to, 480
 Food Supply, 582, 585-587, 598
 Forestry, 187, 189-190
 Housing, 613
 Industrial Science, 427, 428
 Insurance, 62
 Land Development, 91
 Land Reclamation, 69, 73-77
 Manufacturing, 411-412, 420-421
 Mining, 367, 371
 "Monopolies," Government, 393,
 399, 400, 402, 406-408
 Municipal Ownership, 546, 567-
 568
 Public Health, 489-497, 499, 501,
 502, 520
 Railways, 296, 303-305, 307, 309
 Shipping, 276, 278-280, 288-295
 Social Insurance, 489-497, 499,
 501-502, 520
 Taxation, 622-623
 Telegraphs, 344-345, 347-349
 Telephones, 344-345, 351-354, 356,
 358-359, 361
 Waterways, Inland, 265-266, 268-
 273
 Waterways, International, 259
 Frankfort, 550, 609
 Frankfort-on-Main, 549, 552, 556-
 559, 628
 Frankfort-on-Oder, 557
Frankfurter Zeitung, 369
 Frazier, Arthur Hugh, 401
 Freiburg, 551, 557, 582, 583, 609
 Freiburg-im-Baden, 557-560
 Freiburg-im-Breisgau, 628
 French Guinea, 344
 French Indo-China, 344
 Freudenstadt, 629
 Fürth, 557
 Galveston, 579
 Ganel, Mr., 573
 Gascony, 74
 Gatun, 259
 Geneva, 572
 Geological Survey, 70, 373, 378,
 379
 George, Henry, 633
 Georgia, 126, 181
GERMANY
 Agricultural Science, 102-113
 Banks, 14-16, 28-31, 35-42, 54, 56
 Commerce, State Aid to, 469-477,
 480-481, 483
 Food Supply, 582-596, 598-604
 Forestry, 188-189
 Housing, 607-609
 Industrial Science, 427-429
 Insurance, 62-66
 Land Development, 83, 85-86, 90-
 91
 Land Reclamation, 69
 Manufacturing, 411
 Mining, 367-372
 "Monopolies," Government, 403,
 406
 Municipal Ownership, 546-548,
 561
 Petroleum, 384-391
 Public Health, 487-496, 500-503,
 505-506, 520
 Railways, 297-303
 Shipping, 283, 289-295
 Social Insurance, 487-496, 500-
 503, 505-506, 520
 Taxation, 618, 621-622, 624-626,
 628-631, 634
 Telegraphs, 344-345, 347-349
 Telephones, 344-345, 351-354, 356-
 359, 61
 Water Power, 243-246
 Waterways, Inland, 265-273
 Waterways, International, 259
 Ghent, 272, 492
 Gibbons, I. G., 505
 Glarus, 572-573
 Glucksburg, 37
 Goddard, L. H., 148
 Goethals, Geo. W., 251, 259, 283
Good Housekeeping Magazine, 511,
 512
 Goode, Dr., 227
 Gorgas, W. C., 255
 Gorodskoye Delo, 421
 Gotha, 472
 Göttingen, 37, 244
 Government Printing Office, 423

- Great Britain, see England
- GREECE
 "Monopolies," Government, 404
 Public Health, 489
 Social Insurance, 489
 Telegraphs, 344
 Telephones, 344
- Grenoble, 567
- Guam, 286
- Guerande, 75
- Gulick, Mr., 518
- Gustavburg, 272
- Habana, 481
- Hagman, 629
- Hague, The, 356
- Halifax, 316
- Halle, 551, 556, 558
- Hamburg, 37, 428, 472, 475, 550, 552, 609, 621, 629-630
- Hanna, G. Dallas, 242
- Hanover, Province of, 38, 39, 45, 549, 551, 558, 560
- Hanyang, 478
- Harding, W. P. G., 5
- Harvey, Roland B., 403
- Hatch Act, 149-153
- Hatch, William H., 149
- Havana, 255
- Hawaii, 139, 232, 279, 286
- Heidelberg, 557
- Henrick, B. J., 511
- Herault, 73
- Herrick, Mr., 87
- Herriot, Edouard, 582
- Herzegovina, 28
- Hesse, 48, 105, 108, 113, 187, 244, 299-300, 472, 561, 621
- Hesse-Nassau, 28, 38
- Historical and Statistical Handbook*, 370
- Hoag, Ernest, 518, 521-522
- Holcombe, A. N., 312
- HOLLAND
 Banks, 33
 Food Supply, 584, 604
 Land Reclamation, 69
 Mining, 368-369
 "Monopolies," Government, 406
 Taxation, 622
 Waterways, Inland, 266, 273
- Holman, Premier, 22
- Housing, 607-617
- Houston, 632
- Hugo, Victor, 394
- HUNGARY
 Banks, 19-20, 28, 34
- HUNGARY (*Cont.*)
 Forestry, 187
 Housing, 610-611
 Industries, "Subsidiary," 422, 425
 Mining, 368
 "Monopolies," Government, 403
 Municipal Ownership, 575
 Petroleum, 382
 Public Health, 489-490, 500-502
 Shipping, 279, 289-290, 295
 Social Insurance, 489-490, 500-502
 Telegraphs, 344-345, 348
 Telephones, 344-345, 351-354, 358-359, 361
 Taxation, 631
 Waterways, Inland, 266
- Huntington, C. P., 325
- Iceland, 138, 234
- Idaho, 139, 141, 155, 159, 198, 374, 540
- Idelson, Prof., 16
- Illinois, 117, 237
- INDIA
 Agricultural Collectivism, 99
 Commerce, State Aid to, 480-481
 Forestry, 192
 Land Reclamation, 78-79
 "Monopolies," Government, 404
 Railways, 296
 Telegraphs, 344
 Telephones, 344
- India, British, 69
- Indiana, 117, 225, 236, 523
- Indianapolis, 576
- Individual and Collectivism, The, 487-635
- Industrial Relations Committee, 83, 523
- Industrial Science, 427-468
- Industries, "Subsidiary," 422-426
- Industry, 367-487
- Insurance, 60-166
 Fire, 61
 Hail, 62
 Health, 500-501
 Live Stock, 62-63
 Maternity, 488, 501-503
 Old Age, 493-499
 Property, 61-62
 Social, 487-535
- Iowa, 224, 236, 237, 282, 338
- IRELAND
 Banks, 11
 Land Development, 83-84, 90-91

ITALY

Banks, 25, 30, 33
 Commerce, State Aid to, 480
 Forestry, 186, 187
 Housing, 611
 Land Development, 86-87, 91
 "Monopolies," Government, 399-400, 403
 Municipal Ownership, 556, 568-571
 Public Health, 488-493, 502
 Railways, 296, 307-312, 338
 Shipping, 276-277, 283, 289-293, 295
 Social Insurance, 488-493, 502
 Taxation, 622, 631
 Telegraphs, 344-345, 347-348
 Telephones, 344-345, 347, 349, 361

JAPAN

Agricultural Collectivism, 99
 Banks, 20-21, 28-29, 35
 Fisheries, 231
 Forestry, 192-193
 Industries, "Subsidiary," 422, 425
 Mining, 372-373
 "Monopolies," Government, 399-400, 404-405
 Municipal Ownership, 546
 Railways, 321, 337
 Shipping, 276, 278-279, 289-291, 295
 Telegraphs, 344-345, 347-348
 Telephones, 344-345, 351, 353-356, 358, 361
 Weather Service, 139

Johannesburg, 471
 Johnson, Alvin, 627
 Johnson, Clarence T., 79
 Jones, Grosvenor M., 276, 288
 Jones, Mr., 580
 Junge, Dr. Franz Erich, 372
 "Junkers," 103, 107
 Jura, 75

Kansas, 124, 150, 162
 Kappeln, 37
 Karlsruhe, 113, 552, 557-558
 Katsura, Marquis, 20, 35
 Keely, James, 429
 Kenna, Eduard Dudley, 325-326
 Kerr, J. U., 509
 Kiaochow, 404
 Kiel, 37, 557
 Kirchwey, Freda, 548
 Kispest, 610

Klingenberg, 629
 Knoop, Mr., 561
 Königsherg, 558
 Königshütte, 557
 Kosel, 272
 Kreutznach, 582
 Kwangtung, 404

La Chaux-de-Fond, 572
 Lancaster, 315
 Land Development, 81-92
 Land Reclamation, 69-80
 Landes, 74
 Lane, Commissioner, 323
 Lane, Franklin K., 247, 539
 Lapland, 370
 Lassalle, 598
 Lausanne, 572
 Laws, Captain, 325
 Lederle, Dr. Ernst, 532
 Leignitz, 557-558
 Leipsig, 549, 556-557, 583
 Lennep, 582
 Leuppe, Constance, 524
 Levis, 316
 Lewis, Mr., 345-361
 Lexis, Prof., 16
 Limberg, 37
 Linz, 575
 Lippe, 629-630
 Loire, 73
 London, 11-14, 84, 87, 315, 356, 360, 521, 566, 567, 609
London Gazette, 405
London Nation, 618
London Times, 618
 Long Beach, 172
 Los Angeles, 578-579
 Louisiana, 126, 158, 175, 194, 515, 517
 Lovett, Robert S., 339-340
 Lübeck, 37, 472, 475
 Lucas, Lord, 405
 Lucerne, 572
 Ludwigshafen, 552
 Lugano, 572
 Luigi, Luigi, 309
 Lusk, Mr., 83
 Luxemburg, 28, 344, 347-349, 353-354, 489, 501, 616
 Lyle, R. P., 405
 Lyon, 273
 Lyons, 568

MacGibbon, D. A., 95
 MacLean, W. F., 318, 320
 Madden, Mr., 349-350, 357, 360

- Madsen, G. W., 399
 Magdeburg, 549, 552-553, 556, 583
 Magee, W. A., 633
 Maihle, Prof., 427
 Maine, 208
 Malno, 604
 Manchester, 315
 Manchuria, 351, 353-354
 Manitoba, 95-96, 489
 Mannheim, 272, 550, 552, 554, 556-559, 582-583
 Manning, Isaac A., 402
 Manufacturing, 410-421
 Marseilles, 420
 Marx, 598
 Mason, Frank H., 402
 Massachusetts, 70, 117, 208, 222, 515
 Mather, Stephen T., 538
 Mayence, 549
 Mayo, Earl, 514
McClure's Magazine, 511
 McKenna, Mr., 398
 McPherson, Mr., 313
 Mecklenburg-Schwerin, 302
 Melbourne, 22
 Mendelssohn, Dr. A. L., 395
 Metropolitan Life Insurance Company, 503
 Metz, 554
 Mexico, 138, 263, 296, 344, 489
 Michael, W. H., 404
 Michailis, Dr., 582
 Michigan, 117, 122, 208
 Middle Ages, 470
 Milan, 492, 611
 Milhaud, 572
 Milner, Sir Alfred, 80
 Milwaukee, 579
 Mines, 367-487
 Minneapolis, 323-358
 Minnesota, 117, 208, 237
 Mississippi, 126, 180, 194, 239
 Missouri, 150
 "Monopolies," Government, 392-412
 Monroe, La., 579
 Montague, Hon. E. S., 405
 Montana, 125, 139, 155, 159, 175, 178, 179, 195, 198, 374, 540
 Montenegro, 55, 344
 Montevideo, 481
 Moore Culture Union, 586
 Morristown, 576
 Moscow, 421
 Muir, John, 538
 Mülhausen, 557, 559, 609
 Munich, 549, 552-554, 556-559, 609
 Municipal Ownership, 546-580, 628
 Munro, Dana G., 384
 Nantes, 304, 420
 Naruse, S., 35
 National Child Labor Committee, 525
 National Conservation Commission, 214
 National Park Service, 539-545
 National Radium Institute, 464
 Natural Resources, Conservation of, 169-248
 Naumann, Mr., 599
 Nebraska, 162
 NETHERLANDS
 Housing, 616
 Public Health, 489
 Shipping, 292
 Social Insurance, 489
 Telegraphs, 344-345, 347-349
 Telephones, 344-345, 351, 356
 Neuköln, 549, 556, 560
 Nevada, 70, 120, 374
 New Brunswick, 316
 New Caledonia, 344
 Newfoundland, 489
 New Hampshire, 70, 208
 New Haven, 356
 New Jersey, 159, 208, 225, 269
 Newlands, Senator, 321
 New Mexico, 124, 139, 162, 195
 New Orleans, 274, 478, 576, 579-580
 New Republic, The, 513
 NEW SOUTH WALES
 Housing, 615
 Manufacturing, 411
 Mining, 372, 374, 378
 Social Insurance, 499
 Taxation, 631
 Telephones, 351, 353-354
New Statesman, The, 91, 283, 430
 New York City, 8-9, 233, 254, 263, 267, 348, 478, 512, 519, 521, 526-535, 579-580
 New York, 117, 208, 269, 515
New York Evening Post, 604
New York Evening Sun, 100
 New York School Lunch Committee, 519
 NEW ZEALAND
 Banks, 21, 25, 32
 Fisheries, 231
 Housing, 615-616
 Industrial Science, 433
 Industries, "Subsidiary," 426
 Insurance, 60

NEW ZEALAND (*Cont.*)

- Land Development, 82-83, 87
- Mining, 368-370
- Municipal Ownership, 546-547
- Public Health, 489, 497-499
- Railways, 296, 305-307, 337
- Recreation, National Aid to, 536-537
- Shipping, 276, 282, 291, 295
- Social Insurance, 489, 497-499
- Taxation, 629, 631-632
- Telegraphs, 344-351
- Telephones, 344-345, 352, 356, 358
- Water Power, 246
- Year Book, 246, 369
- Normandy, 304
- Norrbotten, 370-371
- Norris, Senator, 626
- North Carolina, 194
- North Dakota, 125, 160
- NORWAY
 - Housing, 613-614
 - "Monopolies," Government, 398
 - Public Health, 489-490, 492, 501-502
 - Shipping, 279, 283, 292, 294
 - Social Insurance, 489-490, 492, 501-502
 - Taxation, 522, 631
 - Telegraphs, 344-345, 347-349
 - Telephones, 344-345, 351, 353-354, 356, 358-359, 361
 - Water Power, 243-244
 - Nova Scotia, 316-318, 489
 - Nuremberg, 549, 552, 556, 558
 - Oakland, 356, 579-580
 - Offenbach, 552
 - Offenbach-on-Main, 582-583
 - Ohio, 269, 388
 - Oklahoma, 124, 162
 - Oldenburg, 108, 113, 299, 302, 621
 - Olmütz, 612
 - Omaha, 576
 - Ontario, 316,
 - Oregon, 139, 141, 155, 178, 194, 208-209, 213, 230, 239, 374
 - Ostend, 29, 277
 - Otisville, 529
 - Oullins, 568
 - Outlook, The*, 514
 - Owen Bill, *The*, 514
 - Panama Canal, 251-263, 284-286
 - Panama Steamship Line, 283-286
 - Paraguay, 344
 - Paris, 272, 356-357, 360, 420, 480

- Parsons, Frank, 329
- Pasadena, 580
- Paterson, 576
- Payerne, 572
- Payne, J. L., 316
- Pearson's Magazine*, 524
- Peking Daily News*, 420
- Peking Gazette*, 420
- Pennsylvania, 208, 269, 388, 632-633
- Pennybacker, J. E., 220
- Persia, 344
- Peru, 344, 401-402
- Petrograd, 394, 421
- Petroleum, 381-392, 463
- Philadelphia, 233, 356, 580
- Philippine Islands, 139, 286
- Pittsburgh, 438, 457, 580, 632-633
- Platz, Hubert, 382
- Poirier, Senator, 408
- Poland, 55
- Pomerania, 109
- Poona, 79
- Portland, Me., 579
- Portland, Ore., 580
- Porto Rico, 232, 286
- Port San Luis, 579
- PORTUGAL
 - Commerce, State Aid to, 480
 - "Monopolies," Government, 399
 - Telegraphs, 344
 - Telephones, 344
 - Weather Service, 138
- Posen, 109, 558, 609
- Postal Check System, 28
- Post Alexandrovsk, 280
- Postal Savings Banks, 21-45
- Postmaster General, 25, 341-344, 350
- Post Office, see Banks; also Telegraphs
- Prague, 612
- Primrose, Sir Henry, 405
- PRUSSIA
 - Agricultural Science, 102-112
 - Banks, 14, 35, 37-41, 44-53
 - Commerce, State Aid to, 472-475
 - Forestry, 187, 189
 - Housing, 608
 - Industrial Science, 428
 - Industries, "Subsidiary," 426
 - Land Development, 81
 - Manufacturing, 411
 - Mining, 367-369, 372
 - "Monopolies," Government, 403
 - Municipal Ownership, 548-549, 551, 555-556, 558-559, 561
 - Railways, 297-303, 329-337

- PRUSSIA (Cont.)**
 Recreation, National Aid to, 537
 Taxation, 621, 628
 Water Power, 244
 Waterways, Inland, 265
 Public, The, 633
 Public Health, 487-535, 617
 Puebla, 632
 Putnam, H. St. Claire, 246
 Pyrenees, 75, 189

 Quebec, 317, 489
 Queensland, 33, 349, 351, 353-354,
 489, 614-615, 631
 Quick, Herbert, 54

 Racine, 580
 Raiffeisen, Mr., 52-53
 Railways, 296-340
 Read and Sons, Holliday, 429
 Reclamation Record, 71
 Recreation, National Aid to, 536-
 545, 617
 Regina, 95
 Reimers and Company, Otto, 405
 Reutlingen, 582
Review of Reviews, 509
Revue Générale des Sciences, 427
 Rhein, 272
 Rhine Province, 38, 53, 109
 Richmond, 578
 Riesser, Prof., 51
 Rio de Janeiro, 471, 481
 Ripley, Prof., 335
 Roads, 215-226
 Robertson, W. Henry, 401
 Rockefeller Sanitary Commission,
 517
 Rome, 357, 471
 Rotterdam, 277, 356
 Roveredo, 612
 Rubinow, I. M., 487, 493, 496, 500-
 501, 503, 506
RUMANIA
 Banks, 55
 Food Supply, 584
 Forestry, 187
 Housing, 616
 "Monopolies," Government, 399,
 403
 Petroleum, 387-389
 Public Health, 489, 501-502
 Shipping, 276-277
 Social Insurance, 489, 501-502
 Telegraphs, 344
 Telephones, 344

 Runanga, 370
 Runciman, Walter, 405
RUSSIA
 Banks, 16-19, 25, 33, 55
 Commerce, State Aid to, 469,
 478
 Food Supply, 584, 595
 Forestry, 186-187, 191
 Land Development, 81, 87, 91
 Manufacturing, 412, 421
 Mining, 368
 "Monopolies," Government, 392-
 399
 Municipal Ownership, 546, 547
 Petroleum, 387-389
 Public Health, 489-491, 493, 500-
 502
 Railways, 296
 Shipping, 276-278, 280-281, 292,
 295
 Social Insurance, 489-491, 493,
 500-502
 Taxation, 622, 628
 Telegraphs, 344-345, 347-348, 350
 Telephones, 344-345, 351, 353-354,
 358, 361
 Waterways, Inland, 270
 Weather Service, 138
 Year Book, 421, 469

 Saarbrücken, 557
 Sacramento, 579
 Sage, Henry M., 100
 Saint Chamond, 568
 Saint Claude, 568
 Saint-Gall, 572
 Sakatani, Baron, 20, 35
 Sakhalin, 351, 353-354
 Sale & Frazer, Ltd., 405
 Salt Lake City, 177
 Salzmann, Evelyn, 487, 507
 Sammons, Thomas, 404
 San Antonio, 576
 San Diego, 172, 579-580
 San Francisco, 89, 267, 274, 348,
 356-357, 478, 576, 579-580
 Sanitary School House Law, 523
 San Paulo, 89
 Santiago, 256
 Santos, 481
 Sao Paulo, 481
 Sardinia, 403
 Saskatchewan, 62, 95-97
Saturday Evening Post, 591
 Saxe-Altenburg, 472
 Saxe-Coburg, 472
 Saxe-Meiningen, 472

- Saxe-Weimar, 108
 Saxony, 38, 48-49, 105, 109, 112,
 187, 244, 299, 302, 411, 475,
 561, 609
 Sayville, 363
 Scandinavia, 91, 604
 Schaffhouse, 573
 Schenectady, 580
 Schereschensky, J. W., 518
 Schleswig, 37
 Schleswig-Holstein, 38
 Schmoller, Prof., 19, 299
 Schulze-Delitzsch, Mr., 53
 Schumacher, Hermann, 297
 Schwerin, 302
 Scotland, 84, 92
 Scranton, 576, 632, 633
 Seattle, 239, 356, 478, 578-580
 Seavey, C. L., 82
 Selbourne, Lord, 586
 Seligman, E. R. A., 632
 Serajevo, 29
 Serbia, 55, 399
SERVIA
 Food Supply, 584
 "Monopolies," Government, 403
 Public Health, 489, 500-502
 Telegraphs, 344, 351, 353-354
 Telephones, 344, 351, 353-354
 Shanghai, 471
 Shensi, 383
 Sherwill, Arthur, 393
 Shipping, 276-295
 Siam, 344
 Siberia, 87, 469
 Sibert, William L., 252
 Sicily, 403-404
 Silesia, 38, 45, 109
 Singapore, 471
 Slaughter, W. C., 405
 Small Holdings Act, England,
 84
 Smith, Baird, 78
 Smith, George Otis, 378-380
 Smith, James A., 403
 Smith-Lever Act, 143-147
 Social Democrats, 595
 Social Insurance Bureau, 505
 Soissons, 568
 Soleure, 572-573
 Solheim, 614
 Sologne, 73, 74
 South Africa, see Africa
SOUTH AMERICA
 Agricultural Science, 102, 546,
 547
 Commerce, State Aid to, 480-481
SOUTH AMERICA (Cont.)
 Forestry, 186
 Waterways, International, 263
 South Australia, see Australia
 South Carolina, 126, 225
 South Dakota, 125, 139, 178, 198
 Sozialistische Monatshefte, 304, 389
SPAIN
 Commerce, State Aid to, 480
 Forestry, 186-187
 Housing, 616
 "Monopolies," Government, 399-
 401
 Public Health, 489, 491, 493
 Shipping, 289-290, 292, 294-295
 Social Insurance, 489, 491, 493
 Telegraphs, 344
 Telephones, 344
 Spandau, 558
 Sprague, O. M. W., 20, 35
 Stafford, Mr., 349
 Standard Oil Company, 382-391
 States Relation Service, 147, 153
 Stauning, Mr., 604, 606
 Steenerson, Mr., 346, 358, 360-361
 Sternberg, George M., 514
 Stettin, 552-553, 557, 628
 Stevens, John F., 252
 Stock Exchanges, 3
 Stockholm, 356, 471, 614
 Stockton, 579-580
 St. Gall, 573
 St. Joseph, 576
 St. Louis, 478
 St. Paul, 323, 358
 St. Petersburg, 33, 471
 Strassburg, 272, 552, 556-558, 609,
 628
 Stratton, S. W., 434, 451, 453
 Stuttgart, 37, 559, 583, 609
SWEDEN
 Banks, 30, 34
 Forestry, 187, 189-191
 Housing, 614
 Mining, 367-368, 370-371
 "Monopolies," Government, 399,
 401
 Municipal Ownership, 546
 Public Health, 489-490
 Shipping, 276-277, 283, 292, 294-
 295
 Social Insurance, 489-490
 Telegraphs, 344-345, 347-349
 Telephones, 344-345, 351, 353-354,
 356, 358-359, 361
 Water Power, 244
 Swingle, Mr., 176

SWITZERLAND

Banks, 28-29
 Forestry, 187
 Housing, 616
 Insurance, 60
 Land Development, 91
 "Monopolies," Government, 403-404
 Municipal Ownership, 546, 571-574
 Public Health, 489-490, 501
 Railways, 296, 302, 312-315, 337
 Recreation, National Aid to, 536
 Social Insurance, 489-490, 501
 Taxation, 622
 Telegraphs, 344-345, 347-349
 Telephones, 344-345, 351-354, 357
 Water Power, 245
 Sydney, 282, 357, 471
 Syria, 404

Tacoma, 580

Tasmania, 22, 32, 351, 353-354, 377-378

Tavernier, René, 73

Taxation, 617-635

Taylor, Alonzo Englebert, 591

Telegraphs, 341-363

Telephones, 341-363

Texas, 124, 126, 158, 162, 170, 174, 178, 225

Thackara, A. M., 403

Thomas, M. Albert, 305

Todd, David W., 362

Tokyo, 356

Tolstoy, 394

Transportation, 251-363

Transvaal, 489

Trieste, 289, 612

True American, The, 93

Tuckerton, 363

Tunis, 344, 351, 353-354

TURKEY

"Monopolies," Government, 399-404

Telegraphs, 344

Telephones, 344

Turwing, 567

Tutuila, 286

Ulm, 559-560, 582-583, 628

UNITED STATES

Agricultural Science, 102

Agriculture, Department of, 70, 102, 114-185

Banks, 4-10, 25-27, 54-59

UNITED STATES (*Cont.*)

Commerce, State Aid to, 469-470, 477-483

Fisheries, 227-242

Food Supply, The, 596, 606

Forestry, 186-187, 193-214

Industrial Science, 427-429, 433-468

Industries, "Subsidiary," 423-425

Land Development, 81

Land Reclamation, 60-73

Manufacturing, 410-413

Mining, 378-380

Municipal Ownership, 546, 560, 576-580

Panama Canal, 251-263

Petroleum, 387-388

Public Health, 487-489, 493, 500-501, 503-504, 507-535

Railways, 296-297, 309, 321-340

Recreation, National Aid to, 536-545

Roads, 215-226

Shipping, 276-278, 283-289, 291-295

Social Insurance, 487-489, 500-501, 503-504, 507-535

Taxation, 617-620, 623-628, 632, 634

Telegraphs, 341-363

Telephones, 341-363

Water Power, 247-248

Waterways, Inland, 264-267, 269, 274-275

Waterways, International, 251-263

Uruguay, 344

Utah, 70, 139, 141, 180, 374

Vail, Mr., 351

Valence, 567

Varna, 291

Venezuela, 402

Vevey, 572

VICTORIA

Banks, 22, 32

Housing, 615

Mining, 368-369, 377

Public Health, 499

Telegraphs, 349, 351, 353-354

Telephones, 349, 351, 353-354

Vienna, 357, 575, 612

Vignon, Léon, 428

Villach, 612

Villefranche, 568

Virginia, 178, 179, 506

- Vladivostok, 280
 Vrooman, Carl, 313
- Wagner, Adolph, 606
 Wald, Lillian D., 512
- WALES
 Land Development, 84
 Mining, 372
 Municipal Ownership, 562-566
- Ward, Sir Joseph, 306
 Washington, 139, 141, 155, 194,
 198, 208-209, 230, 239, 374
 Washington, D. C., 141, 233, 356,
 479, 579
 Washington, Ore., 139, 141
 Water Power, 243-248
 Waterways, Inland, 264-275
 Waterways, International, 251, 263,
 469
- Watt, William, 521
 Weather Bureau, U. S., 138-143
 Weatherford, 580
 Webb, Sidney, 27, 620-621
Weekly News Letter, 172
 Weisbaden, 109, 557, 628
 Wellington, 282
 Wermelskirchen, 582
 Western Australia, see Australia
 Westphalia, 49, 368
 West Virginia, 178
 White, Sir Thomas, 319
- Wiley, Dr. Harvey, 511-514
 Williams, Henry E., 138
 Willis, H. Parker, 4
 Wilson, Herbert M., 78
 Winnipeg, 631
 Wireless Telegraphs, 362-363
 Wisconsin, 201-208, 236-237
 Withers, Hartley, 10
 Witte, M., 393
 Wood, Dr. Thomas D., 522
 Woods Hole, 237, 240
 Works, Senator, 332
 Worms, 549, 552
 Württemberg, 38-39, 105, 109, 112-
 113, 187, 189, 299, 301, 302,
 472, 475, 561, 621
 Wurzburg, 552, 557
 Wyman, Walter, 514
 Wyoming, 125, 139, 198, 374, 540
- Yellowstone National Park, 196,
 539
 Yokohama, 471
 Yosemite Valley, 538
 Young, Arthur Nichols, 632
- Zahle, Prime Minister, 604-605
Zeitschrift für Agrarpolitik, 110
 Zuckerkandl, Prof., 19
 Zurich, 572-573



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