

THE UNITED STATES STEEL CORPORATION

A Study of the Growth and Influence of Combination
in the Iron and Steel Industry

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PREFACE

THE following dissertation is an attempt to discuss the rise, character, and influence of the United States Steel Corporation. So much has been written about this organization that little can be said of its history that is absolutely new. The works which have treated this subject, however, have generally been either descriptive rather than analytical in nature, or confined to certain limited phases of its development and financial policies. The purpose of this essay is not so much to give a detailed description of the Steel Corporation as to discuss the influences which gave it birth, and to interpret its general character and reaction upon industrial conditions in the light of those influences. The sources upon which the writer has mainly relied have been the annual reports and other publications of the Steel Corporation itself; several trade journals, of which the most important are the *Iron Age* and *Commercial and Financial Chronicle*; and certain governmental documents, particularly the *Report of the Industrial Commission*. The writer has also derived aid from interviews with officials connected with the Steel Corporation and other steel companies. He is also under obligations to Drs. E. R. A. Seligman and H. R. Seager who have looked over his manuscript and offered several valuable suggestions.

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CHAPTER I

INTRODUCTION

§ 1. The making of iron and steel has probably advanced farther along the line of capitalistic development than has any other manufacturing industry. It has had a large share of the attention of trust promoters; and it is doubtful if any other industry better exemplifies the general character and operations of the so-called trust movement. The conditions which have contributed toward consolidation in iron and steel manufacture have in many respects been similar to those which have facilitated the formation of combinations in general; and the reactions of consolidation upon the conditions contributing toward this movement illustrate some of the most salient tendencies inherent in large-scale production.

The concentration of production which had been going on in the iron and steel industry during the closing decades of the nineteenth century—and especially during the closing years of that century—reached a climax in the formation of the United States Steel Corporation in 1901. The forces or conditions which evolved this organization cannot be stated in a few categorical sentences; nor can their influence be properly gauged by mere statement. In the development of this great consolidation several forces, immediate and remote, industrial and financial, co-operated. Some of these, though usual accompaniments of the evolution of large-scale production, have exercised only subordinate influence; others stand out prominently as determin-

ing factors in the iron and steel situation. It is with reference to these latter forces or conditions that the existence, character, and influence of the Steel Corporation can be best interpreted.

§ 2. Fundamentally, the conditions which gave birth to this great combination are similar to those which have given rise to other consolidations. In several characteristics, iron and steel goods resemble those which are ordinarily produced under trust management. They are subject to standardization—to certain uniformities of shape, size and quality. They are in general demand over a wide extent of territory. They are most economically manufactured on a large scale. At distances from certain local points, or places of manufacture, freight charges enter largely into their prices; and in so far as large producers have been able to secure better terms in the matter of transportation than their smaller rivals, the movement toward concentration has been accelerated.

In certain particulars external to the mere manufacture of iron and steel, the industrial situation has been influenced by conditions similar to those contributing to the growth of other combinations. Intensity of competition, due partly to mal-adjustments between the number and size of competing producers and the strength and extent of the demand for goods, have furthered the desire for consolidation. The protective tariff, too, by limiting the area of competition has encouraged producers to combine in the hope of securing control over certain branches of the trade in the home market. The geographical distribution of the sources of raw material, in so far as these sources are conveniently located for a single corporate or unified control, has helped to the same end.

These influences and others which might be mentioned, are not peculiar to the iron and steel industry. The condi-

tions, however, which exercised the most determining effects were peculiar in magnitude and mode of operation. Such were the influences exerted by the existence and geographical distribution within the country of large ore and coal fields; by the superior efficiency of large over small capital; by the extreme fluctuations in the demand for iron and steel goods; and by the restrictions imposed on foreign trade by the protective tariff. All these influences co-operate in promoting the growth of concentration.

As is well known, the existence of the iron and steel industry on any large scale is dependent upon adequate ore and coal supplies and facilities for the easy assembling of material. With these essentials the United States is richly endowed, and it is to-day leading the world in the production of iron and steel. The greater part of this industry is carried on in the northeastern part of the country where the leading producers depend, for their raw material, upon the Lake Superior ore districts and the Pennsylvania and West Virginia coking-coal areas. About eighty per cent of the country's iron and steel is produced from ores mined in the region about Lake Superior. The localization of so much ore within such a limited area with cheap transportation over the Lakes to Ohio and Pennsylvania has favored combination. Dependence upon the same or adjacent sources of raw material, common transportation facilities, and trade in the same market have brought producers into relations with one another which have not infrequently led to pooling or consolidation of interests. Geographical conditions, therefore, have favored the growth of the industry in the United States, and have facilitated to a very appreciable extent the tendency toward concentration.

More potent even than geographical conditions in developing this tendency has been the superior efficiency of large capital. There are other industries which require a

great outlay of capital for the most economical production, but the making of iron and steel is in a pre-eminent sense the industry of large capital. The proper equipment of a steel plant for effective competition involves extraordinary costs. Not only must the rolling mills be furnished with elaborate and adequate machinery, but the producer must be prepared to manufacture his own iron and steel, and even secure his own ore and coal fields. Such a condition is incompatible with mere individual or partnership management. It necessitates not only corporate control, but involves a consolidation of interests engaged in different stages of production. The nature of the industry itself thus tends toward large-scale production; and this helps to limit its management and control to a relatively small number of producers.

Co-operating with these influences making for concentration there have been violent oscillations in the demand for iron and steel due to alternating periods of prosperity and depression. No other industry is more susceptible to general trade conditions or has been more influenced by such susceptibility. The fluctuations which have characterized the iron and steel industry explain much of the tendency toward consolidation and in no small degree the special character which consolidations have assumed. The demand for iron and steel is great or small according as the times are prosperous or dull. The opening up and shutting down of furnaces and mills, incident to this changing demand, involve much waste; and hence the necessary cost of production is greater than if the demand for goods were normal and steady. During a prosperous epoch, also, an unduly large number of producers are induced to enter the industry; and this makes competition exceedingly severe and even ruinous during a period of depression. These considerations make some control over the conditions of the trade peculiarly desirable from the standpoint of producers.

Furthermore, this varying demand for iron and steel has influenced the character of the resulting consolidations. It was the stress of competition during dull times that led the manufacturers of finished material to reduce as far as possible their costs by securing the sources of their raw material and the producers of crude material to extend their markets by manufacturing finished goods. This tendency has resulted in making the more important combinations largely independent and self-sufficient—a feature which is pre-eminently characteristic of the industry. Capitalization has also been influenced by these oscillations. Combinations, as a rule, are formed during periods of prosperity or rising prices. Capitalization is generally based upon real or supposed earning power. As earnings are more than normal during so-called brisk times, capitalization tends to become inflated. It is true that monopoly advantages resulting from consolidations have been capitalized; but the fluctuating character of the iron and steel trade must be looked upon as a prime cause of what has been considered the over-capitalization of the Steel Corporation and its constituent companies.

The influence of the tariff has been not unlike that in other industries. In restricting foreign competition it has rendered control of the industry within the country easier of attainment. As great consolidations are usually formed with the object of controlling trade, the existence of the tariff has been an important factor in fostering their growth. Such combinations as the American Tin Plate Company and the American Steel and Wire Company, whose aims were monopoly control, would hardly have been formed without tariff protection. These companies included practically all the plants of the country in their respective lines, and were enabled to secure temporary monopolies by virtue of the high duties on tin plate and

wire goods. The tariff co-operating with other influences has thus facilitated combination by limiting the area of competition.

The conditions, therefore, under which iron and steel have been produced in the United States have been favorable to a considerable degree of concentration. Fundamentally, it may be said that it was the co-operation of these conditions that developed the Steel Corporation. The geographical distribution of ores and coal favored the growth of the iron and steel industry in this country, and in large measure facilitated consolidation. The large capital necessary for the most economical production and the protective tariff, by shutting out foreign competition, tended to limit the domestic market to a relatively small number of great producers. The fluctuations of the trade, resulting in much waste and uncertainty, contributed still more to accentuate this growth toward concentration by increasing the desire among producers for some control over the industry.

The immediate cause of the formation of the Steel Corporation was a desire on the part of certain financial interests to secure some control over the iron and steel industry, and avert a threatened competition. By the close of the last century the bulk of the trade was already under the control of a few great consolidations or corporations. While some of these organizations had secured some measure of monopoly in their respective fields, the vicissitudes of the trade—especially the depression of the latter half of 1900—led to a threatened invasion on the part of some concerns of one another's fields. The organizations most vitally interested in this threatened invasion were the Carnegie Steel Company, the Federal Steel Company, the National Tube Company, and the American Steel and Wire Company. The outcome of this condition was a consolida-

tion of these and other potential rivals into the United States Steel Corporation.

§ 3. By the formation of this great corporation more than half of the country's iron and steel production came under the control of a single organization. While the original purpose of the Steel Corporation was to avert threatened competition and exercise some measure of control over the steel industry of the United States, the conditions which fostered the tendency toward concentration have not operated, thus far, to promote permanent monopolization. The sources of raw material have not as yet come under the control of this organization. The Steel Corporation, like other great concerns engaged in the same business, owns or controls its sources of ore and coal supply. While holding some of the best ore lands in the Lake Superior region, it has not gained full possession of the productive forces of this district. Notwithstanding several additions to its holdings in this region, probably more than a fifth of the ore lands of the Lake Superior district are owned or held on lease by concerns in competition with it. The existence of considerable ore in other parts of the country under the control of independent companies renders any monopoly of the country's deposits of this material improbable in the immediate future.

Nor has the Steel Corporation, by virtue of its size, been enabled to secure control over the output of crude and finished products. The iron and steel industry requires large capital for the most economical production; but the principal economies seem to be achieved long before such a high capitalization as that of the Steel Corporation is reached. One of the officials of the Jones and Laughlin Steel Company declares that at least twenty or thirty million dollars are necessary to equip a steel plant for effective competition. The nominal capitalization of all the companies in the

United States, engaged in the manufacture of steel, is about two billion dollars, of which amount a billion and a half is represented by the Steel Corporation, and the remaining five hundred million by ten or twelve large companies. Notwithstanding the preponderating position of the Steel Corporation, its size apparently gives it no competitive advantage over its smaller rivals. During the six years of its history, it has absorbed other concerns, increased its holdings of ore and coal, and expended large sums on improvements and additions to plants. Yet its relative share of the country's output of iron and steel has shown no tendency to increase, and in some important lines of manufacture has even appreciably diminished. During its career its net earnings, while large, have not been extraordinary in comparison with its huge capitalization, and in view of the prosperity of the period during which it has existed. For more than two years these earnings were not deemed sufficient to pay dividends on the common stock.

The Steel Corporation, while organized to avert a threatened competition, has been compelled to withstand not a little rivalry. Outside of a few lines of manufacture guaranteed by patents it has achieved no monopoly. Paradoxical as it may seem, it is less of a monopoly than were some of the companies out of which it was formed. These companies, being consolidations of practically all the concerns of the country engaged in certain lines of production at the time of their formation, were enabled to control their markets. This control was safeguarded, so far as foreign competition was concerned, by the protective tariff. However, domestic competition soon developed; and by the time the Steel Corporation was organized much of this control was being undermined, and to-day most of it is entirely gone.

§ 4. In forming any estimate, therefore, of the stability of the corporation, its reaction on the conditions that gave

it birth, and its probable future evolution, we must remember its character as a great, but not monopolistic organization. Its financial integrity and its influence on trade conditions do not rest upon any present control exercised over the steel industry. Its tendencies and significance for the future must be interpreted in the light of conditions which characterize the iron and steel trade as a whole.

Viewing the Steel Corporation as a competitive concern and at the same time the largest industrial organization in the world, the question of its financial stability is one of interest and significance. This organization started on its career with a capitalization in round numbers of \$1,400,000,000—several hundred millions more than the aggregate capitalization of all its constituent companies before they became parts of this great consolidation. Most of these companies were themselves capitalized on the basis of incomes earned during a period of prosperity, or of real or supposed monopoly achievement. This fact has tended to give the capitalization of the Steel Corporation a highly inflated aspect, and has seemed to make its ability to meet its corporate obligations extremely problematical. This capitalization, however, has been defended on the ground that the constituent companies, both before and after the organization of the Steel Corporation, have made several additions to their plants, and that their ore and coal properties have greatly increased in value. Indeed, the principal asset of the corporation is held to be its ore properties which, on account of the increasing use of steel, are becoming more and more valuable.

This defense has a certain basis of justification. The properties of the Steel Corporation are unquestionably more valuable to-day than they were at the time of its organization. Barring such contingencies as the discovery of new and extensive ore fields in other regions advantageously

situated and cheaply worked, and the invention of new processes transforming the character of the steel industry, the holdings in the Lake Superior district will remain a most valuable asset. In capitalizing such a business, however, some discount should be made for the contingencies described. This is especially urgent in view of the fact that more than a third of the corporation's capital consists of a bonded debt whose obligations must be met during a period of depression as well as in normal and prosperous times. When it is remembered that the iron and steel industry is exposed to great vicissitudes in trade and that new discoveries and inventions may change its character and places of operation, it can hardly be said that the financial stability of the organization is fully assured. Viewed in the light of existing conditions, however, the assets of the Steel Corporation are unquestionably of great value. The critics of the financial policies of the corporation have probably more frequently underestimated its resources than the defenders have overestimated them.

§ 5. The Steel Corporation, while not a monopoly, has, nevertheless, reacted upon the conditions which favored its growth. Its career has been too short to justify any very sweeping generalizations in regard to this influence, but certain facts stand out in considerable prominence. Since the formation of this organization, the fluctuations in the prices of iron and steel have been less marked than in any other period of similar length since 1860. One of the most potent forces in the development of the tendency toward concentration of production has been these fluctuations incident to changes in demand. To reduce these oscillations in prices is an avowed purpose of the officials of the Steel Corporation. Controlling more than half the steel trade of the country, this organization has considerable influence on the policy of producers in fixing prices. In times of prosper-

ity it has pursued a conservative course in the matter of raising prices; and independent concerns have found it to their interest to follow suit. By keeping prices relatively low in brisk times no inducements are offered to outsiders to enter the industry as competitors. This policy renders competition among those already in the field less severe in times of depression. As a consequence prices have tended toward greater uniformity.

The Steel Corporation is favored in the pursuit of this policy by the fact that the steel industry of the country is nearly all controlled by about a dozen concerns. All these companies control most of their sources of raw material; and practically all the known deposits of ore are held by them. By keeping the prices of finished material in periods of prosperity at a low level, relative to those of raw and crude products, producers who do not control their own deposits of ore and aspire after more than a local market are virtually excluded. As a result of this policy there would not be such a cutting of prices in a time of depression as has heretofore proved so ruinous to many establishments because more firms or companies had entered the industry than the trade could support.

While the influence of the Steel Corporation has been in the direction of greater stability of prices, its power to achieve this end has been limited. It can exert an appreciable influence on trade in the way described, but it does not control the productive forces of the industry. It is still exposed in a considerable degree to the vicissitudes of trade. While the officials of this organization disclaim any intention of controlling the industry, it seems not improbable that they will seek to extend the corporation's influence. The holdings of the corporation in the Lake Superior region have been greatly increased since its formation; and efforts to augment them still further are likely to

be made. This may indicate a desire ultimately to control the trade by controlling the sources of raw material. Such a consummation, however, will be difficult of achievement. Much of the Lake Superior district is held by independent concerns which have no present intention of selling their holdings. These holdings and ore lands in other parts of the country are sufficiently extensive to make it difficult for any iron and steel consolidation to control the sources of raw material. Even were such control secured, the growing public sentiment against monopoly would probably show itself in a clamor for abolition of tariff duties on iron and steel.

§ 6. If the Steel Corporation secures fuller control over the iron and steel industry of the United States in the near future, it is likely to achieve this end in association with other producers. The industry is still exposed to great changes in the demand for commodities; and the desire to regulate production in accordance with these changes as well as to secure monopolistic advantages will incite to further attempts to gain control over the trade. Such attempts have been made in various lines in the past by means of pools or associations. These organizations have had a prominent place in the history of the industry; but in most cases they have been weak on account of the number of concerns involved, the consequent difficulty in securing harmony among the members, and the ease with which outside capital could enter the field and break up the pool. The relatively small number of companies in the United States now engaged in the steel trade on any large scale would facilitate the making and keeping of agreements in regard to production and prices. The small number of concerns engaged in the manufacture of steel rails accounts in large measure for the success of the steel rail association, which for six years has held the price of steel rails at \$28.00 per

ton In this association, as in others, the Steel Corporation with its large share of the country's trade has had a preponderating influence. On account of the attitude of public opinion and the more active enforcement of the anti-trust laws many of these associations have been nominally discontinued. Tacit understandings, however, in regard to prices prevail now as ever, and seem nearly as effective as definite pooling agreements.

What the influence of such associative action will be upon the interests of consumers can only be conjectured. The number of steel producers being relatively small, agreements or understandings in regard to prices will tend to be more stable in the future than in the past. There may be some marking up of prices as a result of such associative action; but the attempt to raise them much above what market conditions would justify would in all likelihood weaken the ties of the association, induce outside competitors to enter the field, and provoke much public opposition. In Germany the great coal syndicate has for these reasons often resisted the movement to raise prices in periods of prosperity. In this country at the present time it is worthy of note that it is the Steel Corporation and not the independent companies that is resisting the attempt to raise prices. This opposition, of course, is due to the recognition of the importance of a steady rather than fluctuating volume of trade. Unless the steel industry becomes monopolized by the Steel Corporation or some other combination having the sanction of the law, the interests of consumers do not seem to be menaced by the attempt to reduce the oscillations of the trade.

In the above outline it is seen that the Steel Corporation is an expression of the centralizing tendencies of the iron and steel industry, that it has assumed a certain position as

a result of these tendencies, and that it has reacted upon the conditions that gave it birth. In the following pages an examination of this organization will be made with the theory above outlined in view.

CHAPTER II

DETERMINING FACTORS IN THE IRON AND STEEL SITUATION

§ 1. FOR an adequate appreciation of the forces which have evolved the United States Steel Corporation, and are fixing its character and economic position, some analysis is necessary of the determining factors in the iron and steel situation in this country. As has already been indicated several forces co-operated in the development of this great organization. However, the movement toward consolidation and the most salient features of this movement are the outcome principally of these four determining conditions: first, the natural distribution of ore and coal which made the growth of iron and steel manufacture in this country possible and favored in great measure large scale production; second, the nature of the industry which necessitated large capital for economical production; third, the fluctuating demand for goods which made some control over the trade peculiarly desirable from the standpoint of producers; fourth, the protective tariff which shut out effective foreign competition and acted as an inducement to the great producers to combine for the purpose of monopolistic control.

§ 2. A. For several years the United States has easily ranked first among the world's producers of iron and steel. This pre-eminence has in part been due to the productivity of the ore and coal fields with which the country is endowed. Through its ownership of land richly supplied with raw material, and by the application of large capital to

both mining and manufacture, this country has been enabled to supply nearly all the home markets and to export large quantities of iron and steel goods.

Of the world's production of iron ore in 1903—estimated by the American Iron and Steel Association to have been about 100,198,000 tons¹—the United States produced 35,019,308 tons, or about 34.95 per cent. The countries next in rank were Germany and Great Britain, which contributed respectively, 21.19 per cent and 13.96 per cent. In the same year this country produced 18,009,252 tons of pig iron, or 38.83 per cent of the world's total, and 14,534,978 tons of steel, or 40.57 per cent. The production for 1904 fell off somewhat on account of the depression of that year, the output of pig iron in this country having declined to 16,497,033 tons, and that of steel, to 13,767,306 tons. The years 1905 and 1906 were years of unsurpassed prosperity in the iron and steel trade, not only in this country but in Europe as well. It is estimated that the output of pig iron in the United States during 1906 reached 25,850,000 tons; in Germany, 12,300,000 (metric) tons; and in Great Britain, 10,100,000 tons.² The tonnage of steel in this country for 1905 attained the enormous total of 19,912,757.³

From these figures it will be seen that the United States in recent years has been producing a large proportion of the world's iron and steel. Whether or not this country will continue to retain this preëminence for a long period is doubtful. Much depends upon the country's deposits of workable ore; and these have been variously estimated from a little over 1,000,000,000 to more than 4,000,000,000 tons. The first of these estimates is probably much too low.

¹ *Iron Age*, Sept. 14, 1905. Unless otherwise indicated in this work, the word tons means gross tons.

² *Ibid.*, Dec. 20, 1906, p. 1683.

³ *Ibid.*, March 22, 1906, p. 1042.

While an estimate of this character is necessarily very uncertain, it may serve as a rough indication of the probable limits of our ore capacity. The ore fields of Germany, including Luxemburg, are thought to contain over 2,000,000,000 tons. Recent discoveries credit China with ore deposits of great magnitude. These large and less developed fields are likely in the near future to be worked at a much lower cost than those in this country, as they are to a great extent surface deposits and as labor cost is less than here. With the gradual exhaustion of the more superficial deposits, the law of diminishing returns will make itself felt sooner or later in the United States; and prices here will tend to be higher than in regions which have been more recently worked. The position of the United States as the leading producer of iron and steel will, however, probably be preserved for many years.

B. The iron and steel industry in this country has developed mainly in the states east of the Mississippi River. Within this region are the principal coal and iron-ore districts of the country and the chief markets for iron and steel goods. Outside of this region the known fields of ore and coal are either too limited or too unfavorably situated for the assembling of material seriously to affect the present trade of the country. Within the section mentioned, iron and steel manufacture is carried on principally in two districts: a region extending from New York and New Jersey on the east to Illinois on the west, and the country about Birmingham, Alabama. The first of these is much the larger in extent and productivity, and contains most of the plants of the Steel Corporation. The existence of large manufacturing establishments in this region is due to the proximity of extensive coking-coal fields, to the nearness of excellent markets, and to cheap transportation facilities over the great lakes from the ore regions of Minnesota and Michigan.

Pennsylvania, which is the center of the industry in the United States, easily leads in the amount and value of her products. In 1900—the year before the formation of the Steel Corporation—the value of the iron and steel manufactured in this State constituted fifty-four per cent of that of the entire country. In 1905 Pennsylvania produced forty-six per cent of all the pig iron and fifty-five per cent of all the steel made in the United States.¹ This predominance is to be attributed to the natural advantages of the state in the matter of coal deposits and limestone, to the easy communication with the Lake Superior ore fields, and to its excellent position as a distributing center for the eastern part of the country. Toward the east and south of Pittsburg is the famous Connellsville coking-coal region. The importance of this district to the iron industry of Pennsylvania is seen in the fact that in 1905 63.8 per cent of all the coke produced in this country came from this state.

Ohio ranks next to Pennsylvania in the amount and value of her iron and steel products. Illinois, New Jersey, Indiana, West Virginia, and New York are also producers in this northern section. The industry in Ohio and West Virginia may be regarded as western and southern extensions of that of western Pennsylvania. The trade in West Virginia is due also in part to the noted Pocahontas coal district. The industry in Illinois and Indiana has developed largely on account of the excellent market for iron and steel goods in Chicago and the West. These states are also in close proximity to the ore supplies of the Lake Superior region. The mills of New Jersey and New York are largely mills for the manufacture of finished material and are located for easy distribution to eastern markets.

The iron and steel manufacture of Alabama is entirely

¹ *Bulletin* of the American Iron and Steel Association, Dec., 1906.

separate from the industry of the northern section. Its development has been due to purely natural causes,—closely adjacent supplies of iron ore and coal. The facility with which these essentials to iron manufacture can be assembled and the cheapness of labor bring the cost of production down to a lower level here than in any other part of the Union. Mills and furnaces in some instances get both their ore and coal within half a mile of the plant. While Alabama is thus favored with productive facilities, her development has not been so rapid as that of the Lake states—a fact which may be partly attributed to her remoteness from the best markets of the country. Present indications, however, point to a great future development of the industry in this region.

The iron and steel industry of the country is carried on mainly in these two regions. The first, which is much the more extensive and important, draws its supplies of raw material from the ore fields of the Lake Superior district and the coal fields of Pennsylvania and West Virginia, and depends upon the cheap transportation of the Great Lakes for the assembling of material. To a considerable extent the producers of this region sell in the same markets. Geographical proximity thus brings them into certain relationships with each other; and both community of interests and competition have favored combination. The second is centered mainly in Alabama, and depends upon the ore and coal of that State. Its markets are limited for the most part to the South; and it has therefore had much less commercial influence and a more restricted growth than the northern section.

C. The most important natural condition affecting the status of the iron and steel industry is the supply of ore. Iron ore is found in appreciable quantities in half the states of the Union. Considerable deposits are known to

exist in some of the Rocky Mountain and Pacific Coast states, notably in Colorado and Utah.¹ Many of these ore lands are owned by the Colorado Fuel & Iron Company. Extensive areas of ore deposits are found in the Atlantic States, especially in Pennsylvania, which up to the early eighties was the chief ore producing state in the country. The main supply of the country, however, is derived from the Lake Superior region, which during the last six years has produced over seventy per cent of the country's total. Owing to the fact that this ore contains a larger percentage of iron than the ores of the South and West, the proportion of iron derived from the Lake Superior district would, during these years, exceed four-fifths. During the last two years the proportion of ore supplied by this region has increased. Of the 42,526,133 tons of ore mined in the United States in 1905, 34,522,965 tons were shipped from this district; and the proportion for 1906 is even greater.

This ore region is located along the southern and western shores of Lake Superior, principally in Minnesota and Michigan. Most of the mines are within a hundred miles of the Lake coast, from which easy and cheap transport is made to the lower lake ports. The extent of the deposits of this region has been variously estimated; but most recent estimates place it at upwards of 2,000,000,000 tons.²

The next most important ore district of the United States is the Alabama region upon which the iron interests of that section depend. At the time the Twelfth Census was taken Alabama ranked third among the states in the production of iron ore and fifth in the production of coal. Its rank

¹ For account of ore deposits in Utah, see *Iron Age*, Oct. 27, 1904, p. 3.

² Richard H. Edmonds, in *Review of Reviews*, Dec., 1906. For an interesting account of consolidation in this region, see H. R. Mussey, *Combination in the Mining Industry*, in the *Columbia Studies in History, Economics and Public Law*.

as a producer of ore remains the same to-day. Notwithstanding this high rank the output of the state is rather small compared with that of Minnesota or Michigan. Nevertheless the possibilities of the Alabama region are great. While the extent of its ore fields is much less than those of the Lake Superior district, the facilities for assembling material make the cost of utilizing the ore less than at the North. Owing to differences in the character of their products, the iron interests of Alabama have not, thus far, come into serious competition with the industries depending for their supply of ore upon the Lake Superior region. It seems not unlikely, however, that these interests with their facilities for cheap production will at no distant day be rivals of the great combinations of the North.

The Lake Superior and Alabama regions are estimated to contain at least ninety per cent of the workable ore of the country. While such an estimate is necessarily uncertain, it seems probable that these two regions will supply the bulk of our native ore for many years to come.

The ores of these two districts differ in certain noteworthy particulars. While high and low grade ores are found in both regions, the percentage of iron contained in the Lake Superior material which it has been profitable to mine ranges from fifty-two to sixty-seven, while that of the Alabama product averages about forty-five. The Lake Superior product which is ordinarily utilized is thus richer in the proportion of iron contents.

Another difference of more vital importance is the variation in the percentage of phosphorus contained in the ore. On this difference depends the suitability of the material for the manufacture of Bessemer steel. Ores containing more than five or six hundredths of one per cent of phosphorus are unavailable for the Bessemer process. The Lake Superior product varies on the average from one hundredth

to fifteen hundredths of one per cent, while the Alabama ores contain from one-tenth of one per cent to one per cent. Much of the former, therefore, is suitable for the manufacture of Bessemer steel, while the latter is not. The open-hearth process, however, is being used to manufacture steel from more phosphoric ores; and the development of this process seems to be neutralizing the importance of this difference in the ores of the two regions. The steadily increasing demand for open-hearth steel is also noticeable. The following table shows the increased production of steel both of the Bessemer and open-hearth grades for the years 1900-1905:¹

	<i>Open-hearth steel, Gross tons.</i>	<i>Bessemer steel, Gross tons.</i>	<i>Total for country, Gross tons.</i>	<i>Per cent of open hearth.</i>
1900.....	3,398,135	6,684,770	10,082,905	34
1901.....	4,656,309	8,713,302	13,369,611	35
1902.....	5,687,729	9,138,363	14,826,092	38
1903.....	5,829,911	8,592,829	14,422,740	40
1904.....	5,908,166	7,859,140	13,767,306	43
1905.....	8,971,376	10,941,375	19,912,751	45

The steady increase of the production of open-hearth steel is noticeable, and its increasing relative importance is significant. The fact that this product seems fully the equal of the Bessemer material,² and is even supplanting it, has allayed much of the fear once felt concerning the effects of the possible monopolization of the Lake Superior region.

From this brief consideration of the ore and coal districts of the country and of the industries depending upon these districts, it will be seen that natural conditions have determined the location of iron and steel plants. The great combinations of these regions have been formed among corporations either engaged in different stages of the manu-

¹ *Iron Age*, Mar. 22, 1906, p. 1042.

² *Ibid.*, Feb. 8, 1906, p. 513. See account of meeting of American Society of Civil Engineers.

facture of the same class or classes of commodities in one or other of these regions, or depending upon the same sources of raw material and competing in the same markets. In neither district has the trade been monopolized. In the North, where consolidations have attained their greatest development, there is still much competition. The ore and coal fields have thus far proved too extensive for monopolization. Even if these fields should come under a single control, there would still be much effective competition from the South, and possibly from the West.

§ 3. *A.* Another factor of prime importance in determining the iron and steel situation is the large capital necessary for economical production. This condition has favored the formation of large corporations. The fact that only large concerns can compete successfully tends to limit the number of producers and facilitates combination among these producers. In order to form some estimate of the influence of this condition we may note, first, the fact of concentration, and then consider the question of the economies achieved.

The tendency toward concentration has been very marked during the last two or three decades. During this period an increasing amount of capital has been used to equip properly blast furnaces and rolling mills, and secure requisite mining and transportation facilities. The acquisition of mining and transportation facilities was not considered essential to an efficiently organized manufacturing company until the later nineties; but it is now almost indispensable to a corporation aspiring after more than local trade. The trend toward more elaborate equipment can be seen in a comparison between the number of iron and steel establishments and the amount of capital invested. During the twenty years from 1880 to 1900 the number of active blast furnaces in the United States declined from 341

to 224. The amount of capital invested in blast furnaces—including rented property—increased in the same period from \$89,531,362 to \$148,226,113.¹ In other words considerably more than twice as much money was expended in the equipment of the average blast furnace in 1900 than in 1880. The number of active establishments producing steel ingots or castings and rolled iron and steel numbered in 1880, 358; and in 1900, 438. The capital invested increased from \$116,458,390 to \$441,795,983.² Thus, while the number of rolling mills and steel works increased during these two decades less than twenty per cent, the capital invested was augmented by nearly three hundred per cent.

This trend in the direction of concentration in the steel trade may be illustrated by organizations in rail manufacture. In 1887 the first rail pool was organized; and this combination consisted of fifteen members. At first it was weak, owing to considerable outside competition, and also to internal dissatisfaction with the allotments of trade. In the allotment of 1888, the largest percentage granted to any one company was 13.5; and this share was given to the Carnegie Company. In 1897, ten years after the formation of the first pool, this rail association consisted of but six members. The only considerable manufacturer of steel rails outside of the pool was the Illinois Steel Company, which did not enter this association on account of the Illinois laws against pooling. In the allotment of 1897 the Carnegie Company was given 53.50 per cent of the pool's trade, and the Lackawanna Company, nearly two-fifths of the remainder. Thus within a single decade the number of companies producing steel rails on any considerable scale was reduced, and the tendency of the industry to come under the control of a few large corporations became more

¹ *Twelfth Census*, vol. 10, p. 29.

² *Ibid.*, vol. 10, p. 54

and more apparent. Since the spring of 1901, nearly three-fifths of the steel rails manufactured in the United States have been produced by the constituent companies of the Steel Corporation; and the remainder, principally by five companies,—the Lackawanna, the Bethlehem, the Cambria, the Pennsylvania, and the Maryland, of which the most important is the Lackawanna.

Another indication of this drift toward large corporate ownership is seen in the number of abandoned establishments. In 1900, according to the Twelfth Census, there were 123 iron and steel establishments with a total capital of \$23,831,819 reported idle. This was the largest idle investment shown for any industry. Such an abandonment of industrial establishments is significant both of the shifting location of the iron industry and of the increasing concentration in large plants. In many states there exist abandoned mills which were built to utilize a local supply of ore and which have been rendered permanently unproductive by the competition of new mills, either better equipped, or in proximity to superior raw materials.

The tendency toward large-scale production has not only been in the direction of larger and better equipped blast furnaces and mills, but also in the direction of consolidation of plants and companies. This trend is exemplified in two kinds of combinations: the union of concerns engaged in different stages of the production of a class or classes of commodities; and the consolidation of companies manufacturing the same grades or classes of articles. An example of the former would be the Federal Steel Company, organized in 1898, and now a part of the Steel Corporation. This company consisted principally of the Minnesota Iron Company owning ore fields in the Lake Superior region and manufacturing crude iron, the Elgin, Joliet and Eastern

Railroad Company providing certain transportation facilities to some of the coal regions of Illinois, and the Illinois Steel Company manufacturing crude material like bars, slabs, etc., and some finished products like steel rails. Such a union is formed to secure a higher degree of productive efficiency by adjusting more economically the production of raw and crude material to the demand for finished goods. An example of a consolidation manufacturing the same grade of articles would be the American Tinplate Company, also merged in the Steel Corporation. This company consisted of more than forty rival concerns. A combination of this character generally aims to restrict or destroy competition, although economy of production may also be sought. An indication of the extent to which this integration of industries in both these directions has gone is seen in the fact that nearly all the great steel concerns of the country are producers of raw, crude, and finished material, and that more than half the country's trade is now controlled by a single corporation.

B. The progress of this concentration has been due in part to the fact that increasing returns have resulted from the application of large capital. To-day it is practically impossible to carry on an extensive manufacturing business in the higher and more important grades of iron and steel goods with a capital of less than fifteen million dollars. This fact may be illustrated by considering the cost of such an item as a modern blast furnace. Such a furnace is likely to be from 500 to 700 tons capacity. A rough estimate is, to the effect that a 500 ton furnace costs about \$500,000, and takes upward of a year and a half to build.¹ In addition to this investment, the labor of some hundreds of men and the transportation of 1,500 tons or more of

¹ *Report of Industrial Commission*, vol. 1, p. 945.

material must be provided for each day. This of itself requires a capital of half a million. In other words it would take about \$1,000,000 capital to build, start, and keep in operation a single 500 ton furnace. The cost of producing a ton of pig iron in such a furnace is from forty to fifty per cent less than in the average furnace of the early eighties, which represented an investment of \$250,000 to \$300,000.

Plants with large capital have thus supplanted those with small capital because of their superior efficiency and economy. How far production on an enlarging scale continues to be more economical it is difficult to determine. The application of repeated "doses" of capital does not necessarily continue indefinitely to be more economical. The point on this enlarging scale at which the most efficient production is reached varies with conditions. Under similar conditions, a capital of forty or fifty millions would, in the opinion of one of the officials of the Steel Corporation whom the writer interviewed, be as efficient in the iron and steel industry as a capital of ten times that amount. One of the witnesses before the Industrial Commission testified that a capital of \$20,000,000 to \$30,000,000 would build and equip a steel plant for effective competition.¹ It would seem from these statements that the principal economies achieved in the industry by large investment of capital can be attained with less than \$50,000,000. With capital of this amount or more a steel concern can own and equip the most efficient blast furnaces and mills and secure control of its sources of raw material.

C. The question whether or not a corporation whose capital is many times this amount has any competitive advantage merely by virtue of its size is difficult to answer. To this

¹ *Report of Industrial Commission*, vol. 13, pp. 504-106.

question certain steel officials, as has already been noted, have given a negative reply. There are, however, some considerations which seem to favor a large consolidation. The well known savings in the matter of advertising and in the employment of a smaller number of traveling agents and salesmen are worthy of mention, although these economies are not so marked as in the case of some other industries. The amount of capital employed for advertising and agency purposes in the iron and steel trade is small compared with the total investment. A more important item of economy is found in the organization of the mills consolidated. In concentrating departments of manufacture, for example, instead of compelling each establishment to make numerous sizes and parts of the same product considerable saving can be made. Stopping a mill to change the rolls to suit each size or variety of a commodity involves waste of time. This waste is obviated when the different sizes and shapes are distributed among a number of mills whose productive work need not be interrupted. In many of the more finished varieties of iron and steel goods the estimated saving through this multiplicity of mills amounts to more than one dollar per ton.

It may be said in general that the iron and steel trade from its very nature demands large capital. To some extent productive efficiency seems to be increased by consolidation. Increasing returns have in large measure followed increasing outlays. It is improbable, however, that this law of increasing returns operates indefinitely. As has already been noted the principal economies attained by an iron and steel concern are achieved with a capital of less than \$50,000,000. There are some savings, as has also been indicated, in the multiplicity of mills in cases where the capital may exceed this limit. It is unlikely, however, that any considerable economies are gained by very large con-

solidations by virtue of mere size. The fact that the Steel Corporation, as will be noted later, has not increased its proportion of the country's trade during the six years of its existence is some evidence of the truth of this assumption. The necessity of large capital to equip properly a steel concern limits the number of such organizations. This facilitates combination for the purpose of controlling the industry. The motive for organizing the larger consolidations is not, therefore, competitive efficiency but the desire for monopoly control.

§ 4. *A.* The third great factor in the iron and steel situation furnishes a powerful incentive toward combination for the purpose of control. This factor is the varying demand for commodities. Alternating periods of prosperity and depression act with great force upon this industry, and make some control over the trade peculiarly desirable from the standpoint of producers. The demand for iron and steel varies, not according to the pressing needs of consumers, but according to changes in the development of new enterprises. These changes are periodic; and this periodicity is closely associated with variations in the spirit of investment. In so-called good times new enterprises of all sorts are freely launched. In succeeding periods of dullness comparatively few ventures are entered upon. But investment and fresh ventures imply the erection of plants and the increased use of tools and machines. These in turn mean iron and steel.

The heaviest consumers, too, of iron and steel, like railroad corporations, purchase their material in large shipment, and this material is intended to supply a need for many years ahead. The demand is generally great with the advent of prosperous times or when confidence is felt in the future. It is then that liberal outlays can be made for the improvement of stock and for embarking upon

new enterprises. If steel cars are to be substituted for wooden ones, they are ordered by the scores and hundreds; if a new railroad is to be built, shipments of rails must be made in thousands of tons. During periods of depression, on the other hand, little iron and steel is ordered beyond the maintenance of plants and stocks. Old material, if servicable at all, is likely to continue in use until the outlook points to the return of more prosperous times.

Until very recently these fluctuations have been accentuated by the influence of intermediate producers. The demand for finished products varies considerably and with great uncertainty from year to year. From the mining of ore to the sale of finished products there are several stages of manufacture and transportation. The intermediate producers must adjust their scale of production—which, for obvious reasons, cannot be immediately enlarged or contracted—to a changeable and often fitful demand on the part of consumers of finished products. This adjustment is necessarily very imperfectly made where the intermediate producers are independent concerns. This fact has made the combination under one control of all the stages of production from the mining of raw material to the sale of finished goods desirable and economical. This integrated system is becoming characteristic of nearly all the larger consolidations of the iron and steel trade.

B. These oscillations of the industry are reflected in variations of prices. In December, 1898, steel rails were selling as low as \$17.00 per ton. A year later the price had risen to \$35.00 per ton. In another year the price had declined to \$26.00 per ton. Steel billets on December 29, 1898, were quoted at \$16.25 per ton; on November 29, 1899, at \$39.50 per ton; and on October 3, 1900, at \$16.50 per ton. The lowest and highest quotations for wire rods during the years 1898 to 1900 inclusive, were respectively

\$20.00 and \$50.00 per ton. After the latter price had been reached early in 1900, there was a drop to \$30.00 per ton before the close of the year.

Unstable prices necessarily cause great variations in earnings. The income of the Republic Iron and Steel Company during the two prosperous years of 1900 and 1901 is fairly typical of what one is likely to find in a trade marked by great and uncertain changes in the demand for goods. This company showed on its books for the year ending June 30, 1901, a total of \$51,000,000 assets. Its capital stock was \$47,497,000, of which \$20,306,000 was preferred. In 1900 the company's net earnings were \$5,684,101, and in 1901, only \$1,034,248. The amounts paid out in dividends for the two years were \$3,643,729 and \$309,099 respectively.¹ This falling off means that in 1901, which was generally regarded as a good year, the Republic Iron and Steel Company paid out in dividends only one-twelfth of what it had paid in 1900, and only a little over one-fifth of the amount needed to cover the seven per cent dividends on its preferred stock, leaving nothing at all for the common stock.

The vicissitudes in the demand for railroad supplies are strikingly shown in the experience of the Pressed Steel Car Company. This organization from 1899 to 1903 more than earned large dividends on its full stock—its common stock securing twenty-eight per cent in 1902. In 1904, however, it had so little business, less than one-seventh that of 1902, that it was obliged to draw heavily on its surplus to pay the dividends on its preferred stock and was compelled to pass the dividends on the common.²

¹ *Report of the British Iron Trade Commission on American Industrial Conditions*, p. 300.

² *Iron Age*, Feb. 23, 1905, p. 655.

The experience of the Pressed Steel Car Company is illustrative of the fact that the more specialized a phase of the iron and steel industry is the more exposed it is to the vicissitudes of the trade. The larger consolidations, in addition to securing control of their sources of raw material and the stages of manufacture from raw to finished product, have embraced under their control several different lines of manufacture. By thus extending their markets these combinations have to some extent steadied their profits. The greater the number of markets the more certain the income is likely to be.

C. This desire to lessen the fluctuations of the industry has been a leading incentive to consolidation. The necessity of opening up and shutting down mills and furnaces with varying periods of demand causes much waste. The mechanical waste involved is great enough to increase appreciably the cost of production. But this is not the only loss. Brisk times are periods of high money wages. The attempt to curtail expenses in times of severe depression by lowering wages meets with resistance from workmen—especially labor unions. The demand for increased remuneration during flourishing periods and resistance to any curtailment in dull times with consequent strikes and lockouts have been sources of great loss to iron and steel establishments. Another feature of the situation giving rise to waste is what may be called a tendency to abnormal competition. During a period of prosperity—especially if long continued—an unduly large number of competitors are induced to enter the field. With the advent of dull times there is great “slashing” of prices among these rival concerns to secure trade. This competition frequently causes prices to sink below the level of cost, and many establishments are driven out of business with consequent loss of capital. This feature of the industry has not only caused

waste, but has tended to accentuate the naturally great oscillations of the trade.

The uncertainties and fluctuations of the business have been responsible for another characteristic of the industry. The prices at which the securities of steel concerns have been sold have been relatively low and very fluctuating. Men put money into the iron and steel business, not as an investment, but as a means of making a fortune. Steel stock was thus a favorite with speculators rather than investors; and the industry as a whole was permeated with a speculative spirit.

One of the great ends of consolidation has been to reduce the waste incident to fluctuation and to render returns steadier and more certain. Such an aim could not be achieved without an organization controlling a large percentage of the trade of the country. If the organization of the Steel Corporation is to be attributed to any one cause more than another, it is to be assigned to the desire of achieving this end and placing the industry on an investment level.

§ 5. *A.* Another determining influence acting on the iron and steel trade of the country and an important factor in facilitating combination has been the protective tariff. It is not the purpose of this dissertation to enter into any detailed discussion of such an intricate subject as the relation of the tariff to the growth of the iron and steel manufacture, but simply to indicate the nature of that relation, especially in its bearing upon the growth of consolidation.

It has frequently been asserted that one of the chief causes of combination is the protective tariff. Mr. Havemeyer's dictum that the tariff is the mother of the trusts has many supporters. It may be doubted, however, if this assertion is to be taken without reserve. In this country some of

the largest and most monopolistic combinations have no direct tariff protection; and in England, where there is no protection, combinations have been formed and operated with success. At the same time many consolidations in this country would never have been organized without the tariff. The restriction which the tariff places upon foreign competition has acted as an incentive to combination where industrial conditions were in other respects favorable. Whether or not such a combination secures permanent control over the domestic market depends upon circumstances. If a consolidation secures control of the sources of raw material within the protected area, and a tariff is levied upon such material imported from foreign countries, it is clear that domestic competition has lost in part at least its power to lower prices. Without such control or some other monopolistic advantage within the country itself, the tariff will not give a business organization a permanent monopoly. A combination of all the manufacturers of a nation may secure a temporary control of the market: but new capital will enter the field and reduce prices to a competitive level.

It is true that trust officials in those industries where high tariffs are levied are generally strong defenders of protection. Among several reasons usually cited by them for the maintenance of a high tariff is one directly opposed to the assertion that monopoly is thereby fostered. It is contended that protection should be maintained, as its withdrawal would involve the ruin of competing organizations and thus leave the domestic field in the possession of combinations. The validity of this contention, which has gained a certain popularity, is difficult to see. If a consolidation achieves economies by which it can sell goods more cheaply than its smaller competitors, it can hardly be said that the alleged more expensive methods of

those competitors should be encouraged by a tariff. The public is concerned with securing cheap products of good quality whether produced by a large or a small concern. If a large organization, by virtue of its size, can manufacture at a cost sufficiently low to meet foreign competition, but its smaller rivals need tariff protection, it is evident that the public derives no benefit from the economies achieved by the combination in safeguarding its rivals by protective measures.

Upon the iron and steel industry of the United States the tariff has exercised considerable influence. Until very recently the cost of manufacturing iron and steel has been, in general, higher in this country than in Europe; and an important part of this expense has been labor cost. The contention of manufacturers that the abolition of the tariff would necessitate the payment of lower wages in the industry has not been without some basis of fact. The tariff has protected the American industry by neutralizing the advantages which foreign producers had in the matter of lower costs.

It may be said further that protective duties on raw and crude material have restricted the area of competition within the United States. Hermann Levy has shown that import duties on pig-iron have worked injury to steel establishments east of the Alleghanies, which at one time were dependent on foreign producers for their raw and crude material.¹ The tariff of forty cents per ton on iron ore is probably sufficient to prevent the establishment of iron and steel plants on the Atlantic sea-board, which could easily secure cheap raw material from Nova Scotia, Spain, and Cuba. This duty, moreover, would be an important safe-

¹ Levy, *Die Stahlindustrie der Vereinigten Staaten von Amerika*, II.

guard to any concern which secured control of all the best ore fields of the country.

While the tariff has thus restricted the area of competition, no consolidation has, as yet, secured a permanent monopoly in any of the more important branches of the iron and steel trade. The ore and coal fields of the country have thus far proved too extensive for monopolization; and no control has been secured over transportation. Internal competition has thus been free to act and has often been sufficient to reduce prices to a point very near the European level. The tariff has acted as a stimulus to combination, and has enabled organizations to secure temporary monopolies. In such cases new capital has entered the field, and has soon destroyed the control that had been achieved over market conditions.

B. A fair illustration of the working of the tariff in the iron and steel trade is the career of the tin plate industry from 1890 to the time of the organization of the United States Steel Corporation. This industry in this country is generally cited as a product of protection. The development of tin plate manufacture in the United States may be said to date from the enactment of the McKinley Bill. Previous to 1890 practically all the tin plate used in this country was imported. An industry of hardly any significance underwent great development almost immediately after the enactment of the McKinley law.

The method of manufacturing tin plate is rather simple, so far as process is concerned; but considerable skill is required to turn out good plates. By tin plate is meant a thin sheet of steel or iron coated with tin. The standard size of these plates is 14 x 20 inches. These plates are usually placed in boxes containing 225 sheets and weighing 108 pounds each. What is called *terne plate*—an allied product—is a similar sheet of steel or iron covered with

an alloy of lead and tin, generally two-thirds lead and one-third tin.

Before the enactment of the McKinley Bill, the tin plate industry in the United States had been maintaining a struggling existence. Though protected by a duty of one cent per pound on the foreign product, American tin plate was not in a position to withstand English competition. The competitive strength of the industry depended mainly upon three things: the price of pig tin, the price of steel, and the labor cost. In regard to the price of pig tin, the English manufacturer did not seem to have any special advantage over the American producer. Block tin was sold about as cheaply in New York as in London.¹ The reason for the high price in London, notwithstanding its proximity to Cornwall, is that the Cornish mines did not supply the entire English demand, and the price was governed by the quotations of tin from Australia and the Strait Settlements. Regarding the price of steel the advantage in 1890 was with the English manufacturer. By the middle nineties, however, Bessemer steel bars, which were used in both countries, sold about twenty per cent cheaper in the United States than in England. The prices per ton in these two countries in April, 1896, were \$15.50 and \$18.70 respectively. In the matter of labor cost the American manufacturer was handicapped in the early history of the industry by the high price of labor and the lack of technical knowledge. These difficulties were partially overcome by the middle nineties, as considerable technical skill had been developed, and wages, owing to the depression of 1893, had fallen some fifteen per cent. Nevertheless, the disparity in

¹ On Mar. 4, 1898, the quotations in London and New York were \$311.10 and \$310.44 per ton respectively. Variations before and after this time seem to have been about the same.

labor cost was great. According to Sir R. Giffen, the Welsh laborer in the tin plate industry received on the average, in 1897, \$5.46 (£1 2s 5d) per week, while the Pennsylvania workman, whose efficiency was no greater, received \$10.68 per week. The advantage, therefore, in respect to labor cost was greatly in favor of the English producer.

Taken all in all, the English manufacturer could make tin plate nearly thirty per cent cheaper than the American, and this at a time when the expense of production in this country was at a very low point. For the English producer, the price per box at the factory reached as low as \$2.20; and a box could be delivered in New York, freight paid, for about \$2.50. The cost of American tin plate of first class material was not below \$2.75 per box. Without a tariff duty, therefore, the English product could easily undersell the American material; but in the middle nineties when wages in the United States were very low, a low duty was sufficient to enable the native producer to compete with the foreign merchant.

In 1890, owing to the high price of steel bars and the high wages of labor combined with a very imperfect knowledge of technical processes American tin plate sold in New York City for \$5.50 per box while the English product sold for \$3.88 plus \$1.08 of tariff duty. The price of English tin plate was considerably above cost, but the American manufacturer being unable to offer any competition, a price of nearly \$5.00 per box was paid by the American consumer for the imported product.

With the enactment of the McKinley Bill, the duty on foreign tin and terne plate was increased to 2.2 cents per pound, or about \$2.37 per box. For the first time in our history, American tin plate was enabled to undersell the English product in the home market. The clause relating to tin and terne plate in the McKinley law went into effect

July 1, 1891. From that date the imported material was gradually supplanted by the native product. The imports of tin and terne plates in 1890 were 737,955,079 pounds; in 1891, 734,425,267 pounds. By 1897 the importations had declined to 230,073,683 pounds.¹ Contemporaneous with this decline, was an increasing production of tin plate in the United States. In 1890, the amount produced was negligible. In 1892, it reached 13,646,719 pounds. In the following year, the native product increased to 99,819,212 pounds; and by 1897 the amount of tin and terne plate produced in the United States was 446,982,063 pounds.

The tin plate industry in the United States may be said, therefore, to date from the time when the McKinley tariff act went into effect, and seems to have been intimately related to it. It is to be remembered, however, that this tariff bill was one of three or four contributing causes of the growth of the industry. As has already been noted, the price of steel and labor cost declined greatly during the first half of the nineties. This decline enabled the American manufacturer to hold the home market when the Wilson Act of 1894 reduced the duty on tin plate to 1.2 cents per pound, or about \$1.30 per box. In 1897 the Dingley Act raised the duty to 1.5 cents per pound, thus rendering the American manufacturer somewhat more secure. The tariffs, therefore, since 1890 have been sufficient to give protection to the industry in the United States, and may be said to have stimulated its growth. At the time when the price of steel and the cost of labor were very low in this country, the English manufacturer was still able, without the tariff, to undersell his American competitor. It was the tariff, co-operating with the declining price of

¹ For effect on the Welsh tin-plate mills, see *Consular Reports for May, 1896*, pp. 67 and 68; *November, 1897*, p. 323; and *May, 1898*.

steel and low labor cost, which enabled the tin plate industry to take root on American soil.

During the early and middle nineties the price of American tin plate steadily declined. Under the protection of the tariff the number of plants increased to over forty; and competition among these, co-operating with improvements in processes, low wages, and cheap steel, brought the price of the American product down to \$2.70 per box, at mill, in 1898.¹ Toward the end of this year and the beginning of 1899, the cost of production was being raised on account of the increased prices of steel and pig tin. About the same time, the encouraging prospects of the industry incident to the revival of trade toward the close of the decade, seemed threatened by the competition of an increasing number of plants engaged in the business. Early in 1898 negotiations were opened to ascertain if it were possible to form a company that could control all the plants of the country. As a result of these negotiations, the American Tin Plate Company was formed in December, 1898, embracing nearly all the plants of the country.

This industry was now virtually in the hands of a monopoly. The new company endeavored to secure itself from outside competition by agreements with merchants and producers of raw material and by patents on the latest devices in machinery. In this attempt the company was for a time measurably successful. The Dingley tariff imposing a duty of 1.5 cents per pound on imported tin and terne plate protected this monopoly from foreign competition.

In January, 1899, the price of tin plate was increased from \$2.70 per hundred pound box at the mill to \$3.00; and before summer it had been raised to \$3.50. Imported tin plate could not be sold in this country for less than \$4.00

¹ *Tin and Terne*. Jan. 26, 1898.

per hundred pound box, although English plate was selling at Liverpool at \$2.30 per box. The rise in the price of the American product cannot be attributed to any increase in labor cost, as wages and salaries remained low and in some cases were reduced.¹ The price of tin had increased, but not more so than for the English producer. While the price of steel was rising during the early months of 1899, this rise did not greatly increase the relative cost of production for the American manufacturer. The English manufacturer was affected by the rise, though to a less extent. The principal element, moreover, in the expense of production was labor cost; and this had not yet increased. The increased price of American tin plate, therefore, must be attributed to a combination which had achieved a temporary monopoly, the power of which was in a measure safe-guarded by a protective tariff.

The tariff was thus a contributing factor in the development of the American tin plate industry and an important aid to consolidation. It has not been, however, a complete protector of monopoly where the possibilities of home competition have not been greatly reduced. This was shown in the later history of the American Tin Plate Company. Notwithstanding the measures taken to control the domestic trade, by the time the Steel Corporation had formed in 1901, several independent tin plate mills were being built; and at present these independent concerns are increasing their trade at the expense of the older organization,² which has been merged with the American Sheet Steel Company.

What has been said concerning the influence of the tariff on the tin plate industry and combination can be said with

¹ *Tin and Terne*, Jan. 12, 1899.

² *Iron Age*. Jan. 3, 1907, p. 65.

certain modifications concerning other branches of the iron and steel trade. The tariff by shutting out foreign competition enabled the home industry to grow, and by limiting the field of competition facilitated the formation of combinations whose object, if not achievement, has been monopoly. The careers of these combinations, however, have been illustrations of the persistence of competition. No sooner were these organizations formed than new capital entered the industry in competition with them.

§ 6. Such are the determining factors in the iron and steel situation in this country. All these factors have cooperated to produce concentration of production. They have been potent influences in promoting or facilitating the development of the Steel Corporation, and to-day are helping to fix its character and operations. Other conditions may have helped toward the same end, but they seem to have been of minor consequence. The railroad rebate which played such an important rôle in the growth of certain other capitalistic organizations exercised relatively little influence in developing the Steel Corporation and the consolidations out of which it was formed. These steel combinations were not due to the absorption by great corporations of smaller rivals which had been brought to terms by means of railroad discriminations, local underselling, and the like. They were unions of various establishments upon a certain plane of business equality formed for increasing productive efficiency or for controlling the market in their several lines of manufacture.

The iron and steel situation in the United States with its tendency toward concentration must be ascribed to the factors which have already been considered. The distribution of ore and coal fields made the industry on a large scale in this country possible and to a considerable extent facilitated consolidation. The growth toward concentra-

tion was greatly influenced by the superior efficiency of large over small capital, which tended to limit the number of producers to large corporations, and by the protective tariff which put foreign manufacturers at a disadvantage in the home market. The fluctuation of the iron and steel trade still further accentuated this development by making the desire to control the industry peculiarly strong.

CHAPTER III

THE BEGINNINGS OF THE UNITED STATES STEEL CORPORATION

§ 1. IN order to explain the nature of the Steel Corporation it will be necessary to devote some space to a discussion of the organizations existing in the North and East which became parts of the corporation at the time of its formation or immediately thereafter. At the beginning of the last decade of the nineteenth century the large iron and steel establishments of the country had come to depend upon the Lake Superior region for most of their ore and upon the coal fields of Pennsylvania for their coke. The introduction of the use of coke and the opening of the ore fields of Michigan and Minnesota had already changed the center of trade activity from the region east of the Alleghanies to that section immediately west. The growth of new markets in the West as well as the relative proximity to the principal ore and coking-coal areas had already made the region in the vicinity of the Great Lakes the great iron and steel producing section of the country. This pre-eminence the district has retained to the present time.

In the same decade the individual and partnership basis of the industry had been supplanted in all the more important concerns by the corporate form of organization. This was due in the main to the growing need of large capital in the equipment of furnaces and mills. At least one organization had already begun the policy of insuring its supply of raw material by securing control of ore and

coal fields. This policy, afterwards followed by other concerns, necessitated an increasing amount of capital. As a natural result the industry was already tending strongly in the direction of concentration of production.

The period from 1893 to 1897 was one of extreme depression in most branches of manufacture. It was especially so in the iron and steel trade, where a large number of establishments went permanently out of business. It is significant of the tendency toward large-scale production that of the 123 establishments reported in the Twelfth Census as abandoned—most of which went out of business during this critical period—the average capital invested per establishment was only one-fifth that of the organizations flourishing in 1900. It was the large concern well equipped and well situated with respect to ore and coal that was enabled to survive the crisis of the middle nineties.

§ 2. In 1897 and 1898 the country was recovering from the severe depression of 1893; and with this recovery the iron industry awakened to new life. In much of the industrial field the new era of prosperity was marked by the formation of great consolidations. Among the most prominent in the iron and steel trade were the Federal Steel Company, the American Steel and Wire Company, the American Tin Plate Company, the National Steel Company, the National Tube Company, the American Steel Hoop Company, the American Sheet Steel Company, and the American Bridge Company. In the Pittsburgh region of Pennsylvania was the Carnegie Company, which, while not strictly speaking a consolidation, had for several years past been absorbing a number of establishments, making it the largest concern of its kind in the world. All these organizations became parts of the United States Steel Corporation.

With the exception of the Carnegie Company all these

concerns were themselves consolidations of pre-existing corporations. In September, 1898, the Illinois Steel Company, the Minnesota Iron Company, and the Elgin, Joliet, and Eastern Railroad Company were combined to form the Federal Steel Company with an authorized capital of \$200,000,000, of which only \$99,743,900 were ever issued.¹ Shortly after the Lorain Steel Company of Ohio and the Lorain Steel Company of Pennsylvania were added to this combination. On December 14, 1898, the American Tin Plate Company was organized with an authorized capital of \$50,000,000, of which \$46,325,000 were issued. This consolidation, as has been seen, embraced about forty companies and some two hundred and sixty-five mills, producing about ninety-five per cent of the total production of the country.² The American Steel and Wire Company, incorporated under the laws of New Jersey, followed on January 13, 1899. This company was successor to the American Steel and Wire Company of Illinois, formed in March of the preceding year.³ At the time of its formation, it virtually controlled the production of wire goods in this country. Its capital was \$90,000,000, all of which was issued. The National Tube and National Steel companies were both organized in February, 1899. The former was capitalized at \$80,000,000, and the latter at \$59,000,000. The National Tube Company included over a dozen companies. At the time of its organization, it was the largest concern of its kind in the world, and the third largest engaged in the iron and steel business—the Carnegie Company and the Krupps of Germany, alone being larger.⁴

¹ *Commercial and Financial Chronicle*, Sept. 18, 1898, p. 530. *Iron Age*, Sept. 15, 1898.

² *Iron Age*, Feb. 16, 1899, p. 17.

³ *Commercial and Financial Chronicle*, Mar. 12, 1898.

⁴ *Ibid.*, July 1, 1899; July 15, 1899.

On April 14, of the same year, the American Steel Hoop Company was formed with a capital of \$33,000,000.¹ In March 1900, the American Sheet Steel Company, embracing over a score of companies, was incorporated with an authorized capital of \$52,000,000,² of which \$49,000,000 were issued. In the following month the American Bridge Company was formed with an authorized capital of \$70,000,000, of which \$61,055,600 were outstanding. This consolidation absorbed twenty-six firms or companies, and at the time of its organization embraced over nine-tenths of the bridge building interests of the country.³

These consolidations which have just been described were regarded as industrial experiments. Their capitalizations were based upon the prediction of promoters that they would be successful. As much time would be required for a justification of such predictions, and as serious dangers from the competition of new enterprises threatened these organizations, their stocks sold at low prices. The organizers of these concerns relied upon the returning prosperity of the country and the monopoly which most of these organizations seemed likely to enjoy, for a considerable period at least, in their several lines of trade.

The future plans, moreover, of these corporations were generally far in advance of any early realization. These plans, in at least one instance, were reflected in an excessively large authorized stock. The Federal Steel Company with an authorized capital of \$200,000,000—\$100,000,000 preferred, and \$100,000,000 common—had by October, 1899 issued only \$53,000,000 preferred and \$46,000,000 common.⁴ The American Sheet Steel Company, too, held a considerable portion of its stock in reserve.⁵

¹ *Iron Age*, Oct. 19, 1899.

² *Ibid.*, Apr. 5, 1900.

³ *Ibid.*, May 17, 1900.

⁴ *Ibid.*, Oct. 26, 1899.

⁵ *Ibid.*, Apr. 5 and May 29, 1900.

§ 3. With extensive plans for future growth and apparently bright prospects for the immediate future, the tendency toward over-capitalization was marked. A large proportion of the issued stock was without any tangible basis. It was determined mainly by possible future gains. According to testimony before the Federal Industrial Commission, the book value of the constituent companies of the Federal Steel Company was placed by experts at \$45,000,000, to which, however, should be added \$10,000,000 cash and the value of certain ore and coal properties.¹ According to Mr. Graham, a director of the American Tin Plate Company, only \$18,000,000—the amount of the preferred stock—represented the actual value of the mills of the company.²

The iron and steel consolidations of 1898-1900 thus tended toward over-capitalization. In this respect they resembled the early period of railroad financiering. There was, however, one important difference: a large part of the capital of railroads has always been represented by bonds, while the industrials which we have just been considering had but little bonded indebtedness. Both had eventually to pass their dividends; but the railroads unable to pay interest on their bonds went into receivers' hands.

The period embraced between the last half of 1898 and the first half of 1900 was an epoch of great prosperity in the iron and steel industry. During this prosperous period the steel combinations followed a policy which threatened their ruin. In an industry subject to such extreme variations in the volume of trade it is wise to build up a substantial reserve during a period of prosperity. It is only by such a policy that the securities of new iron and steel

¹ *Iron Age*, Oct. 26, 1899, p. 35.

² *Rep. Industrial Commission*, vol. i and vol. xiii, p. 517.

consolidations can eventually be brought up to an investment level. Organized as these new combinations were, the pursuance of such a course would necessitate the passing of dividends. This policy would temporarily lower the market value of their securities and render their sale more difficult; but the corporations would unquestionably have been strengthened.

The interests in control of these various combinations failed to follow this conservative policy; and all of the companies paid regular dividends on their preferred stock from the dates of their organization to January, 1901. The Federal Steel, the American Steel and Wire, and the National Tube companies paid in addition good returns on their common stocks. The total dividends of the Federal Steel, the American Steel and Wire, the National Tube, the National Steel, the American Tin Plate, and the American Steel Hoop companies from their several dates of organization to January 1, 1901 were approximately \$30,000,000. Their aggregate capital amounted to over \$408,000,000. Their bonded debts were \$31,341,271. The surplus reserves at the close of 1900 aggregated \$32,687,250, or seven per cent of the total capitalization.¹ When it is remembered that the preferred stock of these combinations represented about the capitalized value of the average earning power of the constituent plants in their separation, and that the common stock represented real or supposed monopoly advantages, economies due to combination, and such working capital as was provided by underwriters, and that fifty-three per cent of the total stock capitalization of the six consolidations already named consisted of common stock whose value could not yet be demonstrated, it is seen that the financial position of these steel concerns after two

¹ *Iron Age Supplement*, Dec. 27, 1900.

years of high prices and large profits was scarcely better than at the outset of their careers.

With this exception the business of these organizations seems to have been ably and honestly conducted. Many improvements were made in their several properties and considerable economies effected. The policy of management in almost every direction was a distinct advance over former methods of trade. However, the lack of ample reserves unfitted these consolidations to withstand trade depression and serious competition. Such depression and threatening competition confronted them in the latter half of 1900.

§ 4. Before discussing the nature of this competition, it will be necessary to describe the business of the Carnegie Steel Company. In the Pittsburg district this organization had, during a period of four decades, grown from a small firm managed by the Kroman Brothers into a concern which owned the most complete and best managed steel plant in the world.¹ The change from the use of anthracite coal to that of coke in the manufacture of iron and steel had given the Pittsburg region peculiar advantages in the matter of assembling material. The region, furthermore, was not far from the best markets. The mills of the Carnegie Company had also been well concentrated; and this fact gave them a pronounced advantage over the companies we have already considered whose mills were generally quite widely scattered. Nor did the advantage of the Carnegie Company stop here. As a result of a policy of large expenditure upon betterments persistently pursued for a number of years, the average excellence of its equipment was far above that of any of its rivals. "Every new pro-

¹ For an interesting, though one-sided, account of the Carnegie Company, see Bridge's *Inside History of the Carnegie Steel Company*.

cess and every new machine which would in any way increase the efficiency, reduce the cost, and improve the products of the Carnegie Company has been adopted, until this great concern has raised the physical condition of its mills to a point which is unsurpassed."¹

The labor force of the company was also strained to the utmost. Trade unions were banished in 1892, and workmen were encouraged to utmost exertion by high wages and the promise of advancement. Official rank was strictly the reward of merit. Every head of a department had an interest in the business apart from his salary.² Every visitor was impressed by the intensity of effort displayed by the workers in each department. It has been said that the terrific speed made break-downs frequent at thirty-five, and old age common at forty-five.

In the early eighties the Carnegie Company—or rather the Carnegie, Phipps and Company, as it was then called—had begun the policy which eventually issued in the control of all the factors contributing to the production of steel,—from the ore and coal in the mine to steel billets and steel rails. A controlling interest in the stock of the H. C. Frick Coke Company, the largest owner of coal land in the Connellsville region was secured. This insured the Carnegie Company not only a majority share in the earnings from the sale of coke and coal, but also a supply of coke at prices very close to the cost of production. Notwithstanding Mr. Carnegie's repeated assertion that the best way to obtain ore is to buy it in the open market,³ ore supplies with accompanying transportation facilities were also obtained. In 1896 a five-sixths interest in the stock of the

¹ U. S. *Investor*, Feb. 9, 1901.

² See Schwab's testimony, *Report of Industrial Commission*, vol. 13.

³ Bridge's *Inside History*.

Oliver Iron Mining Company was purchased; and this purchase secured for the Carnegie Company large ore deposits in the Gogebic and the Mesaba ranges. By a fifty year contract with the Rockefeller iron, mining, and transportation companies 1,500,000 tons of soft ore were supplied and transported to the lower lake ports annually. Thus an abundant supply of hard and soft ore at stable and cheap prices was secured. Controlling interests were also obtained in the Pittsburg Steamship Company, which owned, in 1900, eleven steamships and two tug boats, with six additional steamers under construction, and the Pittsburg, Bessemer and Lake Erie Railroad extending from Conneaut, Ohio, to the Carnegie mills at Duquesne. By the close of 1897, the Carnegie Company was almost self-sufficient in all the factors of production. The profits which other steel companies were then adding to their costs, this concern was adding to its earnings.

The example of the Carnegie Steel Company was not lost in the consolidations formed in 1898-1900. The Federal Steel Company, through the Minnesota Iron Company, came into control of large supplies of ore. The company also acquired a considerable acreage of coal land, and aimed to secure adequate means of transportation for the assembling of material. The National Steel Company in like manner obtained control of the sources of some of its ore and coal supply. Indeed, it may be said that all the consolidations of the period were organized with a view of becoming ultimately self-sufficient.

§ 5. Though organized and largely capitalized with such a purpose in view, the manufacturing companies which became constituent parts of the United States Steel Corporation at its beginning were, nevertheless, largely dependent upon one another. The companies may be divided on the basis of their principal products into two classes, the

Carnegie, Federal Steel, and National Steel companies were largely producers of steel billets, ingots, bars, plates, and slabs, materials not in their final form. The National Tube, American Steel and Wire, American Tin Plate, American Steel Hoop, and American Sheet Steel corporations were, as their titles indicate, producers of finished steel goods. These latter companies obtained most of their materials from the primary producers of steel, and converted them into wire, pipes, tin plates, sheets, structural material and the like.

These two groups of companies from their location and the nature of their products had extensive dealings with each other. The western plants of the American Steel and Wire Company and the Ohio plants of the National Tube and American Bridge companies were supplied with wire rods and steel billets by the Federal Steel Company, whose principal plants were located at Chicago. The National Steel Company supplied a portion of the demands of the Tin Plate, Sheet Steel, and Steel Hoop companies, whose financial control was identical with its own. The Carnegie Steel Company furnished material for the finishing mills of the Pittsburg district including representatives from all the companies of the second group.

So long as the various companies confined their trade to certain fields of the iron industry and to certain territories, the harmony of their interests was not seriously disturbed. However, as has been indicated, all these organizations aimed to be ultimately self-sufficient. When the primary producers were about to enter the lines of finished material or the producers of finished material attempted to become independent by invading the fields of those who supplied them with pig iron and steel, a serious competition threatened their financial standing. Being large producers, the successful invasion by any one of the

companies of a field hitherto controlled by the others, meant serious injury, if not absolute ruin, to the original occupants.

§ 6. From the winter of 1898-99 to the spring of 1900 prosperity reigned in the steel industry. By the middle of 1900 a reaction in the steel market had set in; and it became evident that trade must adjust itself to a smaller margin of profits. If dividends were to be continued during the periods of reduced demand, every effort must be made to reduce expenses. In no other way could the companies engaged in the manufacture of finished material accomplish this than by securing the largest measure of independence in the field of raw material.

The depression of 1900 hastened the movement towards ultimate independence. The American Steel and Wire Company, a large customer of the Carnegie concern in the Pittsburg region and of the Federal Steel Company in the West, had already acquired two thousand acres of Connellsville coal, and also ore properties with an annual output of 916,000 tons. A fleet of twelve steamers had been acquired from the American Steamship Company. A large steel plant at Milwaukee which would supply raw material to the company's western mills was projected, and in the Pittsburg district there was begun the installation of a complete system of production from ore and coke to wire, wire nails, and springs.¹

The National Tube Company adopted a similar policy. In the fall of 1900 it began the construction of a large open-hearth steel plant at Wheeling, West Virginia, designed to supply steel billets to all its plants in the Central West. The company, though owning no coal or ore, relied upon its friendly relations with the Federal Steel Company to secure its ore and coal on favorable terms.

¹ *Iron Age*, Dec. 21, 1899.

The National Steel Company which had hitherto relied very largely upon outside corporations for its supply of iron ore and coal now greatly increased its holdings of ore and coal properties. It purchased iron mines with an annual output of 1,300,000 tons and considerable tracts of coal land in the Connellsville and adjoining districts. It also began the installation of a furnace capacity sufficient to supply the total requirements of the Tin-plate, Sheet Steel, and Steel Hoop companies, whose financial control, represented by William & J. H. Moore, was identical with its own.¹

These threatening movements toward industrial independence led to counter movements on the part of the two chief primary companies. The Federal Steel Company threatened to build wire mills unless the American Steel and Wire Company should abandon the plan of producing its own raw material and renew its wire-rod contract with the Federal Steel Company. As there was nothing to be gained for the present from such a competition, the Steel and Wire Company abandoned its western extensions. In the Pittsburg district, the Carnegie Company began to expand in a similar fashion. In January, 1901, it was announced that the company would construct a large tube mill at Conneaut, Ohio, sheet mills at Homestead, and mills for other finished products in the Pittsburg region. At the same time the Carnegie Company was preparing to secure an independent railroad to the sea-board.

These proposed movements caused serious anxiety to the leaders of the consolidations of the Middle West. In the Pittsburg district, the four Moore companies, the National Tube Company and the eastern trade of the American Steel and Wire Company were threatened by the

¹ *Iron Age*, Dec. 28, 1899; Jan. 4, 1900.

Carnegie organization; and in the Chicago region, the Federal Steel and American Steel and Wire companies were naturally uneasy.

The results of this threatened competition would obviously be ruinous to most of the concerns involved. Heavily over-capitalized, as most of the companies were, and fortified by very inadequate reserves, such competition would mean decreasing profits and the passing of dividends. As a consequence of this there would be a heavy fall in the value of steel stocks. Industrial warfare, too, demands new appliances, and these could only be secured by issuing bonds or by increasing the floating debt. The interests in control of the consolidations strove in every way to avert the impending calamity. Coupled with these interests were the interests of underwriters and promoters who still held large amounts of stock which they had been unable to sell to the public, and thus to reap the large profits upon which they had counted. The decline in the value of these securities, owing to the temporary reaction in the steel trade, made their sale still more difficult in the face of a competition which threatened to overwhelm the new companies. The promoters, underwriters, and original owners of the plants, therefore, were all vitally interested in preventing a break in the harmony of the various steel interests.

§ 7. After the election of 1900, the tide again turned in favor of steel. Everything pointed to an upward movement in steel stocks¹ if the threatened competition among the new consolidations could be averted. Failure to come to some harmonious arrangement would issue in severe loss, and in addition, lock up cash resources at a time when

¹ See quotations of steel stocks in *Commercial and Financial Chronicle* during October, November and December, 1900, and January and February, 1901.

projects of new consolidations promised large profits. The emergency was, therefore, a financial, as well as an industrial, one. The controlling interests in the steel trusts wished to protect their own holdings; while the promoters and underwriters not only desired to sell theirs at a good margin of profit, but also to retain their prestige with the speculative public. To do this they must prevent a general decline in stock values and avert the impending steel war.

The course to be adopted by the interests involved was necessarily one which must not be construed as a reflection upon their credit. The Carnegie Company was unquestionably the most powerful of the organizations which we have considered, and the one least likely to be seriously injured by the threatened rivalry. The other corporations might have surrendered to it; but such a course would have been a serious compromise of all plans for industrial independence, upon the attainment of which their capitalizations had been in part based. The course adopted was a plan by which all the conflicting interests were united into one corporation organized to own at least a majority interest in the various steel companies which it was necessary to control. In this way would competition be removed. This movement received the backing of the strongest financial houses in the United States. Mr. Morgan and his friends, who had been instrumental in the formation of several of the trusts of the West, now did all in their power to avert the disaster threatened by the steel war, and to further the harmony of interests which was achieved in the formation of the United States Steel Corporation.

The plan to combine embraced at first only four companies—the Carnegie, the Federal Steel, the National Tube, and the American Steel and Wire. It was principally over

these organizations that the threatened competition was impending. A quick survey of the field, however, showed at least four other concerns which might offer inconveniently active competition, but which could easily be persuaded to enter the confederation. These organizations were the National Steel, the American Tin Plate, the American Steel Hoop, and the American Sheet Steel companies. An attempt was made to purchase the Jones and Laughlin plant at Pittsburg for \$30,000,000, but the offer was refused. The Rockefeller ore properties in the Lake Superior region were secured by the payment of \$80,000,000 of stock—\$40,000,000 preferred, and \$40,000,000 common; and the ore carrying fleet was purchased for eight and one-half millions cash. This purchase gave to the new corporation about two-fifths of its ore and nearly one-half of its ore fleet.

The Steel Corporation was organized on February 23, 1901, under the laws of New Jersey with a capital of \$3000. This nominal capital was shortly afterwards increased to \$1,100,000,000, of which authorized capital stock, \$550,000,000 was to be preferred, and \$550,000,000 common. The charter gives the corporation the right to increase its preferred and common stock "in such amounts and proportions as shall be determined by the Board of Directors, and as may be permitted by law."¹ The holders of preferred stock are entitled, "to receive when, and as declared, from the surplus or net profits of the corporation yearly dividends at the rate of seven per cent per annum and no more, payable quarterly on dates to be fixed by the by-laws." The cumulative feature of the preferred stock was also guaranteed to the holder in the charter.

¹ *Charter* of U. S. Steel Corporation. See also *Iron Age*, Feb. 28, 1901, p. 25.

When all cumulative dividends are paid, dividends may be declared on the common stock.

The United States Steel Corporation bought the stock of its constituent companies and controls these organizations by virtue of being the single stockholder in each case. As has already been indicated the companies which became the first members of this consolidation were the Carnegie Steel Company, the Federal Steel Company, the American Steel and Wire Company, the National Tube Company, the National Steel Company, the American Tin Plate Company, the American Steel Hoop Company, and the American Sheet Steel Company. Shortly after its formation the American Bridge Company and the Lake Superior Consolidated Iron Mines entered the organization.

The Lake Superior Consolidated Iron Mines had been incorporated under the laws of New Jersey in 1893. Its purpose was to acquire and operate iron mines in the Mesaba Range, Minnesota. It owned valuable ore properties in the Lake Superior region, some of which it leased to the Carnegie and other steel companies. It owned the Duluth, Mesaba, and Northern Railway, extending from Duluth to Iron Mountain, Minnesota. Its authorized capital was \$30,000,000, of which \$28,722,000 had been issued at the time of the organization of the Steel Corporation.

§ 8. The exchange of securities between the Steel Corporation and the various constituent companies was affected in such a manner as to afford a bonus to most of the latter. Leaving out of account the Carnegie Steel Company, the aggregate capitalization of the original concerns entering the new organization was \$457,070,200. On becoming subsidiary members of the Steel Corporation, this capitalization was raised to \$531,914,300, an increase of nearly \$75,000,000.

Concerning the ratio of exchange for the securities of the

