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The Steel and Metal DIGEST

VOL. VI. NEW YORK, JANUARY, 1916. NO. 1.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer.
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Future Business Prospects.

The business story of 1915 is a fascinating tale of thrilling adventure, the climax being reached in the closing pages at the end of the year, and more so in the iron, steel and metals than any other commodities, for the reason that they have been so extraordinarily subject to conditions, demands and changes occasioned by the greatest war in the history of the world. The high coloring drawn from the war atmosphere fires the imagination of the reader in each chapter. Tales of the El Dorada and the fountain of eternal youth are not more interesting than the recital of commercial and industrial facts developed almost daily in the metal life of 1915. Statistical facts usually cold and dry become warm and glowing with interest, while the rise and fall of prices are events to conjure with when making or unmaking fortunes in a few weeks in the markets of the country. The achievement of the mine, smelter and refinery, of the furnace and the mill, of transportation rail and marine, of the financier, are each and all elements in the remarkable story. The perils of the sea, the vicissitudes of the rail, the unprecedented restrictions, embargoes of foreign countries in the economic war they have waged for the protection of

their own interest, and the defeat of their enemies, are woven into the plot of the metal romance that is published in the following pages. Never has there been such a period probably in the history of the world which has constituted as great a test of business ability, courage and resourcefulness, than the collapse that overtook business at the opening of the war, to gradually change in our country to the prospect of unprecedent opportunities, and the prosperity of today demonstrates how fully this prospect has been siezed and appropriated.

The year 1915 is now behind us and most of us who have not been mesmerized by what it has brought and the conditions existing today as the result of its sensational developments, are anxiously trying to peer into the future, to try and correctly estimate at its truest significance what has happened, and the conditions it has created, to try and find out how much has been real and how much the result of an excited and strained imagination, therefore, what is to be expected when a change in the present excited optimism should take place from something coming up to change sentiment.

To our mind the most real and permanent thing which no sentiment can destroy, is the hard cash profit that has come to us as shown in the phenominal balance of trade in our favor, the purchase from foreigners by our own people of the securities issued against our own properties, and the investments we have made in foreign loans. It will take years of disaster before what we have gained in this direction can be lost. Any country therefore that has so added to its wealth can with safety expect a long period of good times and prosperity. Also the war has weakened our competitors financially and economically. We have gained a position of great advantage in the economic contest that is to follow the return of peace. The natural advantages of soil and climate and mines have been enhanced by the greater wealth and power that has come to us wherewith to exploit their resources. This same wealth that has come to our manufacturers means the power to improve our facilities in machinery and the hundred ramifications that put the wealthy and up-to-date manufacturer ahead of his less favored competitors. We hear a great deal of what is before us in competition from abroad after the war from cheap labor and the necessity of Europe to limit her foreign purchases and build up by economy her wasted treasure boxes. It will have to be reckoned with, but we must also remember our increased capital and what comes with it, the power to exploit machinery to its intentest capabilities, shown repeatedly in the past as able to more than compete with a lower per man wage.

Fundamentally this country was never in such a sound condition or one that promised so well for the future. What is the danger then? We see it we think in the American temperament and this temperament is being put to a severe test and temptation. As usual we travel too quickly when we get started no matter in what direction. We lack the conservativeness of the older nations in our business conduct. A year ago nothing was too dolorous and blue for us; today nothing too rosy. We lack what Grecian culture tried to inculcate as the acme of human conduct, namely, "nothing in excess." As our readers will know a year ago when our iron and steel industry outlook was so dark, and our operations 25% to 35% of normal, we predicted that within a year this industry would be found undersized to meet the demands that would be made on it.

It has come true, although even more sensationally than we expected. Our plea now is to try and realize, that we may have reached our business summit of advances and activities, and be prepared for a gradual reaction to less excited and a sounder state. There were sound reasons for nearly all that has happened, but do those reasons still exist for the pace at which we are proceeding? With the advances we have been having, we acknowledge, all of us, that it has been a run-a-way market. We also know what follows a run-a-way market if it is not stopped and controlled, and that is a smash-up. Instead of being decried for the warning note Judge Gary has lately issued, we think he should be thanked, and we hope his warning will be heeded. It is a comfort to know that our greatest business corporation has not been carried away by the wave of prosperity on which it is now swimming.

The war must end some day, perhaps quicker than we think, and so must the conditions it has created in our country. It is a time, for while taking every advantage of the situation while it lasts, to see to it that we do not forget that there is "danger ahead" if we continue to travel at our present pace The man who will come out of present conditions when they change without regrets, is the one who soaks his profits away, and while keeping up and improving his machinery and facilities, does so on the realization that present volume of orders cannot indefinitely continue, and that if he is not careful he may find himself with a surplus plant into which his profits have gone, for which with normal conditions restored he has no use, —dead capital tied up to wait for years for employment again. We do not address ourselves to those who always come up with a boom and usually as quickly disappear when it is over, as we know they are not likely to waste their time in such uninteresting reading to them, as trends of markets and past performances. They live only in the present and in times like we have been having "the sky is the limit and everything goes." Unfortunately they become very powerful in such times, and are a menace to business security. We have, however, had a great change in the past five or six years in our business leadership. Adversity has brought into control of our great business corporations, men of a very different industrial point of view than formerly shaped our business destinies. We know from experience that never was less left to chance in the conduct of business, never was there such a scientific study made from day to day of the changes and trends of business, and the statistician and market reporter has become not only respectable but recognized by them as a valuable adjunct in their conduct of business. It is because this is so, that we feel confident that the power of the corporations they lead, will be thrown on the side of conservatism, and that in all the present excitement of high prices and overflowing order books they are not forgetting what normal prices and normal order books are, and that sooner or later such conditions must again rule. Were it not for this opinion we would view the future with apprehension.

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Business Trends.

BANK CLEARINGS IN 1915 LARGEST EVER PRODUCED.

Never before in the history of the country were bank clearings so large as they were in 1915, the year being fittingly concluded by a record-breaking total for December; thus, the total for the entire year according to Dun's Review was $186,440,785,445, an increase of 20.9 per cent. as compared with last year and of 10.5 per cent. as contrasted with 1913, while that for December aggregated $20,167,494,500, reflecting a gain of one-half of one per cent. over October, the previous high point. This indeed provides satisfactory evidence of the activity in this country's business during 1915.

RECORD PIG IRON PRODUCTION.

Pig-iron output in December made a further gain, in spite of expected holiday slackening, the output being 3,203,322 tons, or 103,333 tons a day, as compared with 3,037,308 tons in November, or 101,244 tons a day, according to the Iron Age. Production on January 1 was at 105,400 tons a day for 295 furnaces, or against 103,033 tons a day for 287 furnaces at the beginning of December.

The country is now making pig iron at the rate of 38,700,000 tons a year, including charcoal iron. At the opening of 1915, with 147 furnaces in blast, or half the number now running, the active capacity represented only about 19,100,000 tons. One of the results of the year is thus an increased output per unit in operation.

NEW INCORPORATIONS IN 1915.

Emphasizing the revival of general business there was a perceptible increase in the formation of new enterprises in 1915. Paper filed in the Eastern States for new companies with $1,000,000 or over, represented a total for the twelve months of $1,426,267,100, compared with $894,947,500 in 1914, an increase of $531,319,600. The grand total of all companies which were incorporated with a capital of $100,000 or over, covering all States, including those of the East, amounted to $2,061,348,300, against $1,581,418,000 in the preceeding year, an increase of $479,930,300.

Following are the comparative figures as specially compiled by The Journal of Commerce and Commercial Bulletin of companies incorporated in the Eastern States during the last three years with an authorized capital of $1,000,000 or more.

	1915	1914	1913
Jan.	$51,150,000	$120,050,000	$332,450,000
Feb.	53,950,000	51,575,000	191,500,000
Mar.	70,050,000	57,700,000	166,030,000
April	32,200,000	136,185,000	198,718,000
May	78,950,000	62,700,000	172,200,000
June	181,247,100	70,050,000	79,550,000
July	71,100,000	68,700,000	83,650,000
Aug.	67,100,000	70,600,000	63,500,000
Sept.	286,625,000	54,800,000	42,750,000
Oct.	208,695,000	35,487,500	70,856,300
Nov.	196,075,000	81,650,000	77,800,000
Dec.	135,125,000	105,450,000	55,250,000
Year $1,426,267,100	$894,947,500	$1,534,254,300	

EXPORT TRADE GREATEST EVER KNOWN.

Exports of merchandise in November were a trifle larger—not quite 1 per cent—than those of October and accordingly the largest on record. Imports were the largest for any month since April, 1914, but the excess of exports for the month was the third largest ever recorded, the outward flow of merchandise slightly doubling that of imports for November. For eleven months the exports are just $40,000,000 short of being double those of imports.

Our foreign trade in November and eleven months compares as follows:

November.	1915.	1914.
Exports	$331,144,527	$205,878,333
Imports	164,319,169	126,467,062
Excess of exports	$166,825,358	$ 79,411,271

Eleven months ended November 30th:

	1915.	1914.
Exports $3,191,659,925		$1,927,991,492
Imports 1,615,586,684		1,674,619,456
Ex. of exports	$1,576,073,241	$ 253,372,036

Sixteen months, or since the war started:

Exports $4,104,301,863	
Imports 2,264,269,312	
Excess of exports $1,840,032,551	

Business Trends.

THE STOCK MARKET IN 1915.

Looking back over the events in the stock market in 1915 financial interests may well consider the last twelve months with satisfaction. Following a long period of chronic unsettlement and depression in the securities markets and unsatisfactory money conditions the past year witnessed a return ease to money (call loans at New York ruling throughout from 2½ per cent to 1½ per cent.) and sustained advances in values, with sensational speculative movements in which public participation was more eager and wide spread than for years past. The market, however, was slow to reflect the commanding position this country had gained in business and finance as a result of the war. Fear of a deluge of selling of American securities from abroad had a restrictive influence at intervals but the buying of American stocks and bonds returned from Europe was aided greatly by the marvelous trade balance in this country's favor. Foreign selling was restricted almost entirely to railroad shares and bonds, and may be accounted for by the slowness of this class of securities to respond to the many favorable influences.

A mild display of strength at the New York Stock Exchange marked last January's transactions, the increasing gain in our foreign trade and the commencement of the return flow of gold being favorable influences. Unsettlement soon followed however as an immediate result of Germany's announcement concerning the war zone around the British Isles and later by the unfavorable earnings of the Steel Corporation for the last quarter of 1914. Declines in prices ensued, lasting until about the third week in February when the lowest level of the year was reached.

Even before this early reaction ended reports of large war orders developed a bullish movement in certain industrials possessing plants equipped for the manufacture of war munitions. During March the general market though dull was steady, financial interests being impressed by the rapidly growing balance of foreign trade in our favor, by the additional placing of munition orders and the marked improvement in the iron and steel trades. April brought an awakening of public interest which was the year's feature. That month marks the commencement of buying of war stocks, as well as of steel, copper and motor and other industrials which rapidly developed into the wildest kind of a bullish speculation which lasted from the Spring until late in Autumn. However the movement was not continuous due to frequent profit-taking sales and severe setbacks caused by international complications arising from the sinking of the Lusitania on May 7th and the Arabic three months later.

Last year's war-stock boom like all great speculative movements flattened from its own weight. Rumors of peace and a crop of new issues based on munitions, steel, copper and oil enterprises and the tardy recognition of the exaggeration about war-order profits exhausted public buying and weakened the market. The year closed however with considerable activity and bullish enthusiasm and apparently the market felt confident regarding the immediate future, more especially as the prices of various industrials had undergone an adjustment from the unduly high levels of October and November.

The year's record as regards earnings and dividend disbursements was in every way satisfactory. The showing of the railroads while not so sensational as in the case of many of the industrials marks a healthy gain both in net and gross receipts and is in some respects one of the most favorable signs of the country's prosperity.

1915 FAILURE RECORD.

All records were broken as to number of commercial defaults reported during the calendar year 1915, but liabilities were five times exceeded in the Country's past history. Suspensions in December last numbered 1585 and while showing a marked increase over the figures of the previous month show a decrease of 28 per cent. as compared with the same month of the year previous.

While the calendar year just closed surpassed all previous years in regard to number of business failures it should be borne in mind that the worst twelvemonths' rec-

Business Trends.

ord in this respect was that period immediately following the commencement of the war. The total for last year therefore does not express plainly the very severe liquidation that went on in the closing months of 1914 or the first six months of 1915.

The first year of the war saw a total of 19,948 failures with liabilities of $344,000,000, whereas the calendar year just closed saw a total of 19,032 failures recorded with liabilities of $283,432,600. Failures in 1915 doubled those of 1909, while liabilities were larger than in any calendar year except 1914, 1913, 1908, 1907 and 1893.

The large numerical increase reflects the economic disturbance caused by the war, but after the first quarter of 1915 the insolvency returns showed pronounced improvement, and there were about 37 per cent. fewer failures in the third quarter than in the opening three months of the year, with a reduction of practically 50 per cent. in the amount of money involved.

The showing made by failures during 1915, and the assets and liabilities monthly and quarterly as reported to "Bradstreet's", are revealed in the following table:

1915	*No. of failures*	*Assets*	*Liabilities*
January	2,378	$35,428,030	$50,576,581
February	1,865	13,663,744	24,943,644
March	1,876	16,615,409	30,171,610
First quarter	6,119	65,707,183	105,691,835
April	1,674	20,755,179	33,950,205
May	1,436	9,973,210	18,138,775
June	1,485	11,045,707	19,843,816
Second quarter.	4,595	41,774,096	71,932,796
Six months	10,714	107,481,279	177,624,631
July	1,443	7,914,347	15,420,950
August	1,275	7,122,072	13,663,075
September	1,267	6,719,633	13,318,001
Third quarter	3,985	21,756,052	42,302,026
Nine months	14,699	129,237,331	219,926,657
October	1,349	8,001,238	16,685,764
November	1,399	9,130,817	19,871,295
December	1,585	8,135,142	26,948,893
Fourth quarter..	4,333	25,267,197	63,505,952
Twelve months	19,032	154,504,528	283,432,609

COMMODITY PRICES SOAR HIGHER

Commodity prices during 1915 have shown a steady advance owing to war influences and compared with a year ago the present index number is 17 per cent higher.

Little relief from high quotations need be expected, since Europe needs our products while from choice of necessity, it keeps certain articles from the counters of our American markets. To these factors must be added the widespread improvement that has taken place in domestic business and the greatly increased pay rolls of the country's chief industries, which in turn have augmented the purchasing power of the masses. In fact, those who have things to sell seem to be in a position to dominate prices.

All these factors considered it is not surprising to find that Bradstreet's index number of commodity prices as of December 1 moved up to another high level viz: 10. 647. Thus the ratio of advance within a month's time was 2.6 per cent, which increase folows one of 4 per cent in the preceding month. Comparison of the present number with that of December 1, 1913, reveals an increase of 15 per cent, and 11.5 per cent as compared with the same month in 1912 when the index reached the high point for the twenty year period 1892-1912. In this regard it is worth noting that in 1912 the dearness of commodities caused widespread agitation whereas just now discontent is negligible.

The following table gives "Bradstreets" index numbers (the totals of the prices per lb. of ninety-six articles, since Jan. 1, 1910.

	1910.	1911.	1912.	1913.	1914.	1915.
Jan.	9.231	8.836	8.949	9.493	8.885	9.143
Feb.	9.073	8.766	8.958	9.459	8.861	9.662
Mar.	9.111	8 692	8.902	9.405	8.832	9.619
Apr.	9.200	8.522	9.098	9.297	8.756	9.775
May	9.039	8.459	9.270	9.139	8.622	9.797
June	8.911	8.529	9.102	9.072	8.622	9.742
July	8.925	8.594	9.112	8.952	8.656	9.869
Aug.	8.822	8.657	9.159	9.011	8.708	9.821
Sep.	8.952	8.819	9.215	9.100	9.757	9.803
Oct.	8.927	8.806	9.451	9.152	9.241	9.977
Nov.	8.884	8.892	9.478	9.225	8.862	10.376
Dec.	8.784	8.982	9.546	9.229	9.035	10.647
Year	8.988	8.713	9.186	9.211	8.903	9.853

Publicity and The Human Mind.

A few years ago a celebrated scientist declared his belief, after long study and reflection, that in intellect and morals man had not advanced in the past 6,000 years, since the early Egyptian civilization. There were few then who were ready to agree with him. Now there are more. The war has taught us something.

We have been hearing continually that the world has been growing better, and there is also an impression in most quarters that man's intellect is growing keener. Give an ancient Egyptian the problem, what is the continued product of 39 multiplied by itself ten times, and he would find the answer after a laborious computation. With a table of logarithms the writer has just found the answer, approximately, in less than a minute. So could the Egyptian, if he had the logarithms. Take the ancient Egyptian and the average modern man, teach them both the rules of chess, and who would be disposed to pick the winner?

We accomplish much these days in industry and science, not because we have superior intellects, but because we have superior facilities, both in knowledge and in material equipment. The sum total of human knowledge is being constantly increased, and with more knowledge we can do more. Only two great strides have been made in man's accumulation of a knowledge of material things. Aristotle, a great philosopher in his way, taught that knowledge of how materials would act was best gained by reflecting how they should act, and that remained the dominant philosophy for more than a thousand years, until Roger Bacon enunciated the doctrine that to determine how things would act a multitude of experiments should be made, with all attendent circumstances carefully noted. That was a great stride, but there was another to be made. Bacon, although invited by the Pope to publish his discoveries, got into trouble by doing so. The stride of publicity was made later.

With these two strides, not in man's intellect, but in man's view of things, that knowledge should be gained by experiment and knowledge gained should be given to the world, the sum total of human knowledge increases rapidly and thus year by year we can do more.

Now in morals. What does the war show? Some of the learned undertake to explain it by "the psychology of the crowd" which the pyschologists teach, rightly enough, no doubt, is different from that of the individual, but we do not see the bearing. What we have to explain is that we thought the world was growing better, had grown better, and then we see the greatest and most cruel war in all history. We believe the world, as a world, had grown better and was still growing better, but the moral makeup of the individual had not changed. Man, the individaul, had not improved in morals. Through a variety of changes in environment, in habits of life, in facilty of communication, in a vast number of things, it came about that what was good in man became public. The meanest man in ancient Egypt was probably no meaner than the meanest man to-day and the most philanthropic possibly loved his kind as much as the best man to-day. Publicity has made the change. Through the changes in habits an environment the good in man and the bad in man have both come into the light of publicity, the good to be admired and initated, the bad to be condemned and avoided. The world, as a world, has grown better through publicity. That is where "the psychology of the crowd" comes in, to explain how the world really was growing better, despite this damnable showing of the war. The man as a man is as good or as bad as ever.

What, then, is the lesson for us? That publicity is the greatest force acting in human affairs. We admit no exception. Publicity, for which thousands of men who helped their fellowmen have suffered in the past, for which we Americans particularly stand, has been making the world as a world better in all the respects in which it is better. In intellect and morals we doubt whether man the individual has progressed. If he has, we cannot see that the progress accounts for the change.

What does publicity mean in its real essense? Analyse it as you will, it spells in capital letters CO-OPERATION. Publicity is no force unless it induces co-operation. Expose that which is bad and men co-operate to condemn it, to counsel its avoidance. Expose that which is good and

men co-operate to praise it and to go and do likewise. Publicity is the essential force, the prime mover, co-operation the channel through which its power is exerted to the useful and good end.

Let us not be down hearted about mankind because of the war. Men are as they always were. Human nature has not changed. The circumstances, the environment, by which either the good or the bad becomes the dominant motive of the individual, may change from time to time and in the constant flux occasions arise in which the bad becomes dominant somewhere. But we have publicity and co-operation and no one can take these great things, the force and the means of accomplishment, from us. The world must continue to grow better.

Some Business Problems Of To-day.

An Address by Edward N. Hurley, Vice-Chairman of the Federal Trade Commission, Before the Annual Meeting of the Association of National Advertisers in New York City, December 1, 1915.

It is a source of gratification for me to be with you here tonight, primarily because you are a group of business men who have been doing things, individually and collectively. There is a bond of fraternity among business men. You may not always be able to put your finger on it exactly, but it is there. It comes from having dealt with problems common to all business, and from a knowledge that every business man has had to go through the same ordeal. Every man who has had to meet a payroll has served his initiate in the fraternity and is in possession of its grand hailing sign.

Your organization has to deal with one of the largest factors in modern business life, advertising, a factor that is indispensable to success and that is developing into a veritable art, if not a science. Not all of us understand it thoroughly so far, nor have we all got to the point where its full indirect as well as direct benefits are manifest to us. For example, I do not think that all of us fully appreciate just how much the advertising man can do for us.

It is a curious anomaly that it is more difficult to sell anything to a man engaged strictly in the selling game than to any other class of business man. "That fellow thinks he can teach me something about my business" is the resentful remark one is apt to make when the advertising man sends in his card. But that is the wrong attitude to take. It may be that the advertising man has something he can teach, something gathered out of his broad outlook on the entire business world. It is a safe rule always to see him anyhow, and give him a hearing, for the germ of a great idea has been sown in just such conversations as these. In addition to this, business courtesy is served by seeing him. Right here let me interject the remark that courtesy is the cheapest thing a business man has to distribute and gets him more for the investment than anything else. Honesty in advertising is also an asset I am particularly pleased to see advertising men taking so decided a stand against dishonest advertising methods. It is one of the most hopeful signs of the times, also an indication that the competition of the future is to be conducted upon a higher plane.

It is probably true that the American business men lead the world in the matter of extending sales through advertising. If you gentlemen did not have a sound knowledge of it you would not be spending on advertising fifty million dollars a year, as I understand the members of your organization are doing. The problem of how, when and where to advertise has been pretty well solved. But there are other business problems to be solved.

The work of the advertising man is tied up closely with that of industry in general. Prosperous factories and busy stores mean advertising; the problems that affect merchants and manufacturers relate directly to prosperity in the field of advertising. Naturally you are interested in the conditions that make business prosperous, and the relation of government to business.

Government and business are and should be mutually helpful. Through a period of years the government has been gradually extending its machinery of helpfulness to different classes and groups upon whose prosperity depends in a large degree the prosperity of the country. To adjust, adjudicate and determine the questions that arise between shippers and carriers the Interstate Commerce Commission has come into being. The railroads and the shippers alike can secure prompt and definite rulings as to what they can and cannot do. The fruit growers of the country, the farmers, the farmers' co-operative elevator associations, the dairy producers' associations, all of which are co-operating and working to benefit their conditions, receive aid, advice and rulings on important questions from the Department of Agriculture. Now the bankers, through the Federal Reserve Board, can receive authoritative decisions as to their powers and duties, all of which is of general benefit to the whole country.

To do for general business that which these other agencies do for the groups to which I have referred was the thought behind the creation of the trade commission. To make that thought clear I will quote from the President's statement on the subject:

"The business of the country awaits also, and has long awaited and has suffered because it could not obtain, further and more explicit legislative definition of the policy and meaning of the existing anti-trust law. Nothing hampers like uncertainty, and the business men of the country desire something more than that the menance of legal process in these matters be made explicit and intelligible. They desire the advice, definition, guidance and information which can be supplied by an administrative body, an interstate trade commission. The opinion of the country would instantly approve of such a commission. It demands such a commission only as an indispensable instrument of information and publicity, as a clearing house for the facts by which both the public mind and the managers of great business undertakings should be guided, and as an instrumentality for doing justice to business where the processes of the courts, or the natural forces of correction outside the courts, are inadequate to adjust the remedy to the wrong in a way that will meet the equities and circumstances of the case."

The Federal Trade Commission is desirous of being helpful to business to the extent of the powers granted by Congress. In the different problems that are being submitted to us we find the business men anxious to present the facts, with the hope that they can be shown the right road to take to expand and develop their industries within the law.

One of the ways in which the Federal Trade Commission may help business is to gather, collect and make known the essential data regarding business. A friendly survey of the field of industry, with attention to industries in which conditions are not right, will be of great value. Just the simple statistics regarding business, never previously collected, are of immense importance, and when compiled and distributed to business men will be a most useful guide for their future action. The Trade Commission has under way at the present moment, the preparation of figures showing the size of our various business units. While this work is not yet completed, some significant items are beginning to appear.

Leaving out of consideration the banking, railroad and public utilities corporations, and referring only to these that have to do with trade and industry, we find that there are about 250,000 business corporations in the country. The astonishing thing is that of those, over 100,000 have not net income whatever. In addition 90,000 make less than $5,000 a year, while only the 60,000 remaining, the more successful ones, make $5,000 a year and over.

Turning now from net income to the total volumne of business done by those 60,000 corporations we find that 20,000 have sales of less than $100,000; 20,000 more sell from $100,000 to $250,000; 10,000 additional from $250,000 to $500,000; 5,000 corporations ship annually half a million to a million dollars worth of goods; 4,500 have total sales from a million to five million dollars; while only 462 industrial and mercantile corporations in the United States do an annual business of $5,000,000 or more.

These striking figures exhibit a condition which has existed for many years. They show conclusively that big business, while important, constitutes but a small fraction

the trade and industry of the United ates. They make clear that there is an ıduly large proportion of unsuccessful ısiness concerns. Do they not need help? 7hy have we not paid more attention to nall and middle-sized business? Is it not orthy of our consideration? What mea- ıres are we to take to improve these con- tions?

Speaking generally, the real, constructive elp must come from within. You know, ıd I know, that lumping all business to- ether the real need is for better business ıethods. When we were all working on a rge percentage of profit, and when it was case of filling orders at our own price, e didn't need any help. But, gentlemen, ıat day is past. We now have to get down o the hard facts of business. to learn pre- isely what they are, where the weaknesses nd losses exist. and practice the same horoughness which characterizes trade and ıdustry in Europe. We need to study tandard system of bookkeeping and cost ccounting.

The fact must be admitted that in order o put a selling price of a product a manu- acturer must first know exactly what it ost to manufacture and sell it.

A manufacturer who does not know with close degree of accuracy what it costs ıim to produce the different articles he nanufactures and what it costs him to sell hem, is not in a position intelligently to neet competition, and invites business lisaster.

Many of the larger manufacturers have horough cost accounting systems, which hey recognize as necessary in order to give hem the information essential to success- ful management. On the other hand, the ıumber of smaller manufacturers who have ıo adequate cost accounting system and who price their goods arbitrarily is amaz- ing.

Proper accounting for the smaller manu- facturer is most essential. It is necessary for his success that he know on what particular article he is making a fair profit and on what he is making only a narrow margin of profit or losing money. It he has this information he can concentrate on the manufacture and sale of the product on which the profits are satisfactory.

Whole industries, in many instances, are suffering from a general lack of intelligent knowledge of cost.

How can the Federal Trade Commission help to cure those conditions?

The Commission has no power and no de- sire to use compulsory methods. But it does hope to reach the desired end by endorsing standard systems of bookkeeping and cost accounting, and to assist in devising stand- ard systems, either at the request of in- dividual merchants and manufacturers or through the association that represents the industry. The Commission expects to have for this work an adequate force of experi- enced accountants and cost experts and the service, in an advisory capacity, of public accountants of national reputation.

What may be expected from such activi- ties of the Federal Trade Commission?

First, the individual enterprises will be helped. They will be enabled to know ex- actly where they stand. Their prices will be made on a solid basis of fact.

Second, the employees of these firms will be benefited. They will be trained to more thorough and more accurate methods of work. This improved knowledge will in- crease their effectiveness and their indi- vidual value to their employers.

Thrd, the investor wil be benefited. He will be able to invest his money with greater assurance that it will be used in the most advantageous manner.

Fourth, the public will benefit; it will not have to pay for inefficient methods.

To take a specific example, suppose that there are five plants making a certain line. Imagine that one of these plants is run efficiently and that the other four are managed in a slipshod manner.

Where is the sort of trouble going to appear that costs the public and the trade heavily? In the four plants run in slovenly manner, of course. It is in those four plants that the expensive strikes will occur, the dangerous dissatisfaction among workers will appear, and the demoralizing practice of selling below cost of manufac- ture will take root and other unfair methods of competition as a means of making sales.

If we can raise the level of effectiveness prevailing in these four plants to the level prevailing at the ably managed plant, or even higher, benefits will accure to every interest concerned. All five of the plants will be on a more satisfactory competitive basis. The employees in at least four of the plants will learn to do their work to better purposes. Consumers will be forced to pay for fewer inefficient methods. The

jobbers and retailers will get their goods under more advantageous conditions. And the bankers will have five excellent accounts on their books instead of one excellent and four doubtful ones.

An up-to-date system of accounting will enable the banker to extend to the smaller manufacturer the credit to which he is entitled, and which he needs in order to expand his business. The small manufacturer may have just as much brains, ability, knowledge of his wares and of his customers as the larger operator; he may even put out a superior product. But he can not show the banker a balance sheet based on proper accounting methods, and the banker does not feel ready to extend credit without the knowledge that such a balance sheet would supply, thus, because business men of this type can not give statements about their business affairs in the exact manner necessarily required by the bankers, their credit is restricted and their expansion checked.

There should be a greater degree of organization and of mutual helpfulness in all lines of trade and industry, so that American business may be welded into a commercial and industrial whole; the part of the government being to co-operate with business men, on request, to bring about the results that will benefit business and hence promote our national welfare.

On of the most effective forms of organization is the trade association. The association has a wide field of useful and proper activities. Concerns in the same industry may take common action looking toward improving their processes of manufacture, standardizing their product, improving their system of ascertaining costs, obtaining credit information and encouraging the development of trade journals. The welfare of employees is one of the important matters which can be best developed by co-operating in associations. The present tendency of the larger firms to think of the smaller man in the proper spirit and to assist him in arriving at some practical method of ascertaining his costs and meeting his many other problems—in short, to live and let live—is to be particularly commended.

So to-day the associations of manufacturers, associations of jobbers, associations of merchants, associations of advertisers, are doing good work, and if conducted in a spirit of mutual helpfulness, with the machinery of the Government standing by subject to call, will help solve problems and remove many of the present handicaps of business.

Another respect in which business may help itself is in the field of foreign trade.

Heretofore the American business men, whether manufacturer or otherwise, has been prone to show an interest in foreign trade only during dull periods. Now that business has improved and factories are running full time in this country, I am afraid there is a growing feeling of indifference toward opportunities ahead. The theory has been advanced that it will require years for the countries now at war to resume their normal rate of production, and that the business is bound to come to us anyhow. This is a serious mistake. It was only a few months after the Franco-Prussian war when France was producing almost as much as before. She did not recover her normal purchasing power for twelve years, but this was due to the heavy indemnity Germany laid upon her.

The American manufacturer should realize that not a smokestack has been destroyed during this war in England, Germany, or Italy, and only a few in a small part of France.

Unless we take advantage of the great opportunity we now have we will find that ninety days after war is over Germany, France and England, and other European nations, will be on their way to a position in the markets of the world even stronger than they occupied before.

True business preparedness demands that every American manufacturer who makes a product that can be sold abroad should aim to sell from 10 to 20 per cent of his output to foreign consumers. A market which includes both foreign and domestic business stabilizes industry and insures the manufacturer, his employees, and the country against the worst effects of financial and commercial depressions.

Business men are not lawyers, and naturally, their thoughts running in other channels, they evolve some strange ideas as to the construction of certain laws. I was astonished to learn that the belief exists among many of them that non-competing firms cannot co-operate and form selling agencies to develop foreign business. This idea is unfortunate, and I fear that it has resulted in actually restraining the development of our commerce abroad. And I

might mention, by the way, that such commerce can now be more easily developed, since for the first time in our history we have begun to establish our own banks abroad, thus removing many of the difficulties surrounding foreign exchange and credit information. With American branch banks established in South America and projected in the far East, there is no reason why our business expansion should halt.

Perhaps you may think that I am over earnest in this advocacy of organization, higher efficiency in business methods and modern practices, the adoption of European ideals of thoroughness, the standardizing of accounting, but my earnestness proceeds from an understanding of the conditions which confront American business. The Great War has brought to us great opportunities, and equally great dangers. The thought that we must keep in mind is: After the war, what? Shall we grow and expand while the growing is good, or calmly wait the time when peace in Europe will be followed immediately by fierce competition not only in foreign markets but in our domestic market as well?

Have we an inventory of our business resources? Are they being developed to the best advantage? Are our associations doing all they can? Are our methods and processes standardized? In short, are our industries mobilized?

Industrial preparedness must be the watchword. Let us have better organization and greater efficiency at home: let us push our trade abroad let us develop our industry so strongly that no foreign competition can dislodge it.

Zinc Industry In 1915.

Large Increases in Quantity and Enormous Increases in Value Reported by the United States Geological Survey.

Both the zinc smelting and the zinc mining industries of the United States enjoyed a year of unparalleled prosperity in 1915. According to the best information obtainable at this time the recoverable zinc content of zinc ores mined in the United States in 1915 was over 560,000 short tons compared with 407,000 tons in 1914 and 418,000 tons in 1913. With a continuance of high prices for spelter during 1916 the output will be greatly augmented, for the very high prices did not begin until April and May and it was naturally some time before much additional zinc mining could get under way. The production during the last quarter of the year was at a much higher rate than during the first quarter.

For the same reason the output of spelter during 1916 should be much greater than it was in 1915, provided the spelter market remains the same. The output during the first half of 1915 was at the rate of 433,000 tons a year; during the last half it was at the rate of about 550,000 tons. Though the total spelter produced in the United States in 1915 increased 40 per cent over the preceding year, the value of the output increased nearly 330 per cent. However, even this does not represent the true value, for it is based on the average price of prime western spelter whereas there was a large production of brass special intermediate, and high-grade spelter, all of which command premiums. The real value of the spelter output was therefore probably between 10 and 25 per cent more than the value as given.

Larger Smelting Capacity.

There was a large increase in smelting capacity during the last half of the year, the total number of retorts at the end of the year being 154,898, as compared with 130,642 at the midyear, and with 113,914 at the beginning. In addition 20,758 retorts were under construction or planned. New plants, the construction of which started since the Geological Survey's midyear report, are those of the American Steel & Wire Co., at Donora Pa.; the Kusa Spelter Co., the La Harpe Spelter Co., and the Oklahoma Spelter Co., all at Kusa, Okla.; the Henryetta Spelter Co., at Henryetta, Okla.; the American Spelter Co., at Pittsburg, Kans.; and the Owen Zinc Co., at Caney, Kans. In addition to these a four-block smelter with 2,560 retorts is planned in Oklahoma, the exact site not yet having been selected. This does not include the 10-ton electrolytic zinc plant at Anaconda, Mont., or the 100-ton electrolytic plant under construction at Great Falls, Mont., and others contemplated, or the electrothermic zinc smelter planned at Keokuk, Iowa.

It seemes certain that the zinc-reduction capacity of the United States will soon be equal to every conceivable call upon it. The all-aborbing question is as to what demands will be made upon it in 1916. Brass cartridge cases, large or small, may be used as many as 35 or 40 times. Doubtless it will be possible to save and reload many of the empty cases used in the war, and in time this should tend to lessen the demand for spelter. On the other hand, the recent lengthening of the battle lines in Europe should increase the demand for the metal. Furthermore, the growing demands for home consumption must become a greater factor in 1916. These demands will have to do not only with current operations but with restoring reserves and stocks that have been allowed to become depleted during several lean years. For this reason an average prosperous year should show a home consumption of zinc above the average.

The following figures have been compiled without change by C. E. Siebenthal of the Geological Survey, from reports furnished by all operating smelters of zinc ores except one, showing their output for the first 11 months of the year and their estimated production for December. The output of one smelter, treating both ore and drosses, has been estimated. Figures showing the imports and exports for 10 months were obtained from the Bureau of Foreign and Domestic Commerce and to these figures estimates for November and December have been added.

A Record Production.

The production of primary spelter from domestic ore in 1915 is estimated at 460,000 short tons, and from foreign ore at 30,000 tons, a total of 490,000 tons, worth, at the average St. Louis price, $139,160,000, compared to a total of 353,049 tons in 1914, worth $36,010,998, made up of 343,418 tons of domestic origin, and 9,631 tons of foreign origin. This was a gain of 137,000 tons and of more than $103,000,000 in value. As noted above however, the gain in value was considerably more than this amount. The production of spelter from both domestic and foreign ores, apportioned according to the States in which it was smelted, by six-months periods, was as follows:

Spelter production, 1914-15, by States in short tons.

State	1914		1915	
	First half.	Second half	First half.	Second half.
Illinois	62,062	65,884	74,982	85,348
Kansas	23,737	20,773	35,247	65,398
Oklahoma ..	45,443	45,924	51,172	57,532
Other states	43,816	45,410	55,131	65,190
Total 175,058		177,991	216,532	273,468
Yearly total	353,049		490,000	

While the output of each State was more in the second half of the year than in the first, Kansas showed the greatest gain, nearly doubling the production of the first half and getting back to old-time figures.

The number of retorts at the beginning of 1915 was 113,914, at the midyear it was 130,642 and at the end, 154,898. All available retorts were in active operation and new retorts were put into commission as fast as completed. The large amount of the higher grades of spelter made by redistillation from the ordinary grades necessitated a greatly enlarged retort capacity, so that the actual output of spelter in itself gives no reliable clue to the number of retorts in use. It is not feasible at this time to give the production of redistilled spelter.

The capacity of the zinc smelters by States, together with the additions now planned for 1915, exclusive of the proposed plant on an unselected site in Oklahoma with site undecided is as follows:

Zinc smelting capacity, 1915.

State	Total retorts end of 1915	Retorts to be added in 1916
Illinois	38,424	4,840
Kansas	40,366	....
Oklahoma	39,212	7,710
Other States	36,896	8,208
Total	154,898	20,758

Largest Increases in Exports of Zinc and Brass.

Exports of spelter and sheets made from domestic ore are estimated at 115,000 short tons, worth $25,530,000, compared with 64,807 tons in 1914. Exports of spelter made from foreign ore are estimated at 13,000 tons, valued at $2,250,000, compared with 5,580 tons in 1914. The exports of brass are estimated at 33,500 tons, valued at $12,200,000, compared with 3,558 tons in 1914. Manufactures of brass were exported

to the value of about $30,000,000, as compared with $3,756,888 in 1914. During the first nine months of the year there were also exported under drawback articles manufactured from 255 tons of foreign zinc, on which duty had been paid, compared with 4,981 tons in 1914.

The exports of domestic zinc ore were about 900 short tons, valued at $45,000, compared with 11,110 tons in 1914. Foreign zinc ore containing 609 tons of zinc and valued at $24,270 was reexported. The imports of spelter (probably mostly scrap) are estimated at 863 short tons, valued at about $122,358, compared with 880 tons in 1914.

The imports of zinc ore in 1915 were approximately 135,000 short tons, containing about 48,000 tons of zinc and worth about 40,000, compared with 31,962 tons of ore, containing 12,132 tons of zinc, in 1914. The zinc imports for the first 10 months of 1915 were as follows:

Imports of Zinc Ore January-October, 1915, in Short Tons.

Country	Ore.	Zinc content.	Value.
Australia	45,972	16,700	$1,273,431
Canada	8,907	3,494	148,636
China and Japan	7,572	3,213	193,604
Italy	5,312	2,125	153,388
Mexico	49,694	14,521	1,610,270

Domestic Consumption Increased.

The apparent domestic consumption of spelter in 1915 may be computed as follows: The sum of the stock on hand at smelters at the beginning of the year, 20,095 tons, plus the imports, 863 tons, and the production, 490,000 tons, gives the total available supply—511,000 tons. From this are to be substracted the exports of domestic spelter, 115,000 tons, the exports of foreign spelter, 13,000 tons, the exports under drawback, 255 tons, and the stock on hand at smelters at the end of the year (to be exact, on December 15), 20,758 tons, or a total of 149,000 tons, leaving a balance of 362,000 tons as the apparent domestic consumption. This calculation takes no account of the stocks of spelter held by dealers or consumers. On comparing the consumption in 1915 with the 299,130 tons consumed in 1914, the 295,370 tons in 1913, and the 340,341 tons in 1912, it appears that the indicated consumption is not large when the larger exports of brass and manufactures of brass are considered. The stocks are between three and four times as great as at the midyear, but these are probably to be explained as accumulations of the common grade of spelter, the demand being for the higher grades. Reviving domestic consumption will apparently take care in the future of such surplus output of prime western spelter.

Higher Prices.

Spelter opened at St. Louis in January at 5.5 cents a pound and immediately began the long rise, which except for one considerable setback in March and a smaller one in May continued until June 4, when spelter reached 26.5 cents a pound. A sharp drop immediately carried the price down to 17.75 cents by June 22, after which it recovered to 22.75 cents by July 9. Another sharp break let the price go down to 10.75 cents in the middle of August. Several ups and downs followed, after which the price rose to 19 cents in the later part of November. A sharp decline carried the price down to 15 cents at the middle of December. A rapid recovery followed, and spelter closed the year at about 17.25 cents a pound. The average price for the year of prime western spelter at St. Louis was 14.2 cents a pound.

The London spelter market opened at £28 2s. 6d. a long ton (6.1 cents a pound) and, nearly paralleling the American market, rose to £110 a long ton (23.8 cents a pound) in the middle of June, dropped to £55 a long ton (11.9 cents a pound) in August, rose to £105 a long ton (22.7 cents a pound) in November, and closed the year at £90 a long ton (19.5 cents a pound). In the first nine months of the year the London price was sometimes below and sometimes above the American price, but from October onward the London price was consistently the higher, in November and December averaging nearly 2 cents a pound more than the St. Louis price.

The price of the "brass special" grade of spelter at Waterbury, Conn., usually averages about 0.4 cent above the St. Louis price. During 1915, however, the differential ranged from 2.5 to nearly 5 cents, averaging about 3.3 cents. The price of the highest grades of spelter is not quoted, but sales are reported at more than 40 cents a pound when spelter was at the high point.

The price of sheet zinc generally ranges from 2 to 2.5 cents above the St. Louis

price of spelter. During 1915 sheet zinc has varied from 2.5 to 8.75 cents above the price of spelter.

Zinc dust, heretofore mostly imported form Europe, generally ranges from 1 to 2 cents a pound higher than spelter. In March, 1915, the price of zinc dust began to go up, and in the first two weeks of June it more than doubled, jumping from 17 cents to 40 cents. There was a decline of a few cents, but by the last week in July the price had settled back to 38 to 40 cents per pound, at which it has since remained.

Lead Industry In 1915.

Record Production Reported by Geological Survey.

The lead industry in 1915 made good gains in output, both in mining and smelting. The lead content of ore mined in the United States was apparently over 600,000 short tons, compared with 522,864 tons in 1914, an increase of 78,000 tons, or 15 per cent. With the higher prices prevailing the percentage of increase in value of the 1915 output was even greater as compared with other years.

During 1915 construction was begun on one lead smelter and plans were completed for another, both to treat ore from the Coeur d'Alene district of Idaho. The Hercules Mining Co. purchased the copper smelter at Northport, Wash., and began the construction of two lead furnaces. This company is affiliated with the Pennsylvania Smelting Co. of Pittsburgh, Pa. The Bunker Hill & Sullivan Co. of the Coeur d' Alene district also completed plans for a smelter, but the site is yet in abeyance. The National refinery of the American Smelting & Refining Co., at Chicago, was dismantled, and the Balbach Smelting & Refining Co. abandoned its older lead plant at Newark, N. J.

The following estimates have been compiled by C. E. Siebenthal from reports to the United States Geological Survey by all the lead refineries and soft-lead smelters in operation during the year, except two smelters in the Joplin district, for which estimates have been made. These reports cover actual production for the first 10 or 11 months of the year, with an estimate for the remainder of the year, and from them the figures of production are made up without change. The statistics of imports, exports, and lead remaining in warehouse have been taken from the records of the Bureau of Foreign and Domestic Commerce for 10 months, the figures for November and December having been estimated.

Largest Production to Date

The production of refined lead, desilverized and soft, from domestic and foreign ores in 1915 was approximately 565,000 short tons, worth at the average New York price $53,110,000, compared with 542,122 tons worth $42,285,500, in 1914, and with 462,460 tons in 1913. The figures for 1915 do not include an estimated output of 20,550 tons of antimonial lead, worth $1,886,000, against 16,667 tons in 1914 and 16,665 tons in 1913. Of the total production, desilverized lead of domestic origin, exclusive of desiliverized soft lead, is estimated at 306,682 tons, against 311,069 tons in 1914 and 205,578 tons in 1913; and desilverized lead of foreign origin at 48,318 tons, compared with 29,328 tons in 1914 and 50,582 tons in 1913. The production of soft lead, mainly from Mississippi Valley ores, is estimated at 210,000 tons, compared with 201,725 tons in 1914 and 161,300 tons in 1913. The total production of lead, desilverized and soft, from domestic ores, was thus about 516,682 tons, compared with 512,794 tons in 1914.

The final figures for the production of soft lead will show an increase of a few thousand tons over those here given, for the reason that the smelters and refiners of argentiferous lead undoubtedly treated more or less soft lead from the Mississippi Valley which is not distinguished from silver-lead ores in their preliminary estimates.

Imports and Exports.

The imports of lead are estimated at 9,625 short tons of lead in ore, valued at $653,000; 50,825 tons of lead in base bullion, valued at $3,496,000; and 400 tons of refined and old lead, valued at $28,000—

a total of 60,850 tons, valued at $4,177,000, compared with 28,338 tons in 1914 Of the imports in 1915 about 58,000 tons came from Mexico, against 23,141 tons in 1914. These imports from Mexico are to be compared with an average of over 100,000 tons before the civil strife in that country. The remaining imports of lead came mostly from Chile.

The exports of lead of foreign origin smelted or refined in the United States again show an increase, being estimated at 43,000 tons, against 31,051 tons in 1914 and 54,301 tons in 1913. For the last two years on the other hand, notable quantities of domestic lead have been exported to Europe, and the total for 1915 is estimated at 76,000 short tons, valued at $6,650,000, compared to 58,722 tons, valued at $4,501,674, in 1914.

Lead Available for Consumption.

The amount of lead available for consumption during 1915 may be estimated by adding to the stock of foreign lead (domestic stocks are not known) in bonded warehouses at the beginning of the year (7,668 short tons) the imports (about 60,850 tons), the additions by liquidation (1,795 tons), making an apparent supply of 587,000 tons. From this are to be subtracted the exports of foreign lead (about 43,000 tons), the exports of domestic lead (76,000 tons), and the stock in bonded warehouses at the close of the year (assumed to be the same as at the close of October, 16,000 tons,) leaving as available for consumption 452,000 tons compared with 449,052 tons in 1914.

High Prices.

Lead began the year at New York with a price of 3.8 cents a pound, nearly the minimum price of the year, and remained practically stationary until the middle of February. A gradual rise brought the price to 4.2 cents in April, and it remained there until the later part of May. A rapid rise next followed, and lead reached the maximum for the year at 7.56 cents on June 14. A sharp decline, followed by partial recovery and then by a more general decline, brought the price to 4.4 cents in the later part of August. After a slight recovery and another decline to 4.45 cents in September, the price gradually rose and closed the year at about 5.4 cents. The average New York price for the year was 4.7 cents a pound, compared with 3.9 cents in 1914 and 4.4 cents in 1913.

The London price of lead started at £19 a long ton (4.1 cents a pound) and rose until the latter part of March, when it reached £23 2s. 6d. a long ton (5 cents a pound), after which there was a sharp decline to £20 1s 3d a long ton (4.3 cents a pound, after which there was a sharp ascent to £28 2s. 6d. (6.1 cents a pound) at the middle of June. After several ups and downs the price dropped to £20 6s. 3d. (4.4 cents a pound) by the middle of August, and then a gradual rise carried it to £29 5s. a long ton (6.3 cents a pound), and it closed the year at about that figure. The London market was fairly parallel to the New York market and, except for the period of high prices in the United States during July and August, was uniformly higher than the American market.

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Steel Plants.

II. The Republic Iron & Steel Company.

The growth of the Republic Iron & Steel Company in the steel making field presents a very interesting, and also a very instructive, history. The Jones & Laughlin interest dates back to 1852. Lackawanna dates back to 1840, Bethlehem to 1860, and so on. The Republic Iron & Steel Company dates back to May 3, 1899. Of course its constituent companies were old when Republic was formed, but the Republic company as a steel maker does not date back even to 1899. The unique nature of the operations does not lie in the fact that a steel plant has been built since then. The Crucible Steel Company did that, at Clairton, and then gave the plant with its assets to the Steel Corporation, retaining the liabilities. Lackawanna has built a complete steel plant, and so has the Steel Corporation, at Gary, as well as others. These plants, however, were built from the ground up, practically as one undertaking. The Republic plant is a growth, a growth achieved without the risking of too much capital and attained while the plant was making money. Meanwhile the company gradually dismantled nearly all of its 22 iron mills.

The success of the Carnegie Steel Company in the decade of the nineties was due largely to the fact that on account of the courage of its management and through the acceptance of its commercial paper by practically every bank in the state of Pennsylvania it was able to finance the change from wrought iron to soft steel, when many other iron mills were not able. Some disappeared entirely. Nearly all that remained were consolidated as the Republic Iron & Steel Company, which then undertook not so much to finance the change as to accomplish it without financing.

Two of the various and somewhat nondescript heritages of the Republic Iron & Steel Company in 1899 were the Springfield Iron Company's plant at Springfield, Ill., containing two five-ton Bessemer converters, and the Union Steel Company's plant at Alexandria, Ind., containing among other things two five-ton converters which had been moved from Belleville, Ill., perhaps in hope that a change of climate would prove a benefit. The Republic company gathered up what was available in these two plants and established at Youngstown, O., under the management of John A. Campbell, what might be described as a Bessemer steel plant. The plant as put in operation in September, 1900, and although the utmost economy was necessarily practiced, was only 30% old and as much as 70% new. The converters were rated at six tons capacity. The plant made some money, and so by August, 1903, new converters of ten tons capacity were installed. Various additions and improvements, too numerous to mention even in a much more extensive review than this, have since been made, until the plant is a standard Bessemer steel works in all respects.

Incidentally the three Pioneer blast furnaces in Alabama were completely rebuilt and made among the very best blast furnaces in the south.

Early in 1905 the company completed a rail mill, really the conversion of a 26-inch semi-continuous billet mill, but the rail mill was not operated to any extent. Times have changed since then and it may surprise some to learn that there was printed in one of the trade papers a statement of the rail association showing an item of money paid the Republic company while its rail mill did not operate. Whether by design or otherwise the company found itself in position to sell sheet and tin bars and make quite a fair margin thereon, and eventually the rail finishing department was dismantled.

In 1909 it was decided to round out the enterprise as a steel maker by doing the perfectly logical thing of adding an open-hearth department which would consume the scrap made in rolling both Bessemer and open-hearth steel. The plant as built comprised eight open-hearth furnaces, with a capacity of about 25,000 tons of ingots a month, the Bessemer department producing about 50,000 tons. The plant has since been enlarged as to the number and size of the furnaces, and two additional are now under construction. Upon the completion of these the plant will comprise twelve 80-ton furnaces, making fully 50,000 tons of ingots per month.

In 1909 there was also projected a pipe mill, which was completed late in 1910. It is needless to say various other mills have been built from time to time, for making bars, skelp and plates

In addition to the three Pioneer furnaces in the south, the Republic Iron & Steel Company has seven stacks in the north. Four of these, Haselton (now Haselton No. 1) and Hannah at Youngstown, Hall at Sharon and Atlantic at New Castle, are old stacks, doubtless to be abandoned or rebuilt at some time in the future, while three, Haselton Nos. 2, 3 and 4, were completed and blown in from 1906 to 1911.

With the steel making, steel rolling and steel finishing departments made thoroughly modern and efficient, and the blast furnaces largely so, there remained, according to the latest modern viewpoint, one great work, that of establishing a by-product coke plant. True to its policy, the Republic company did this by steps also. The first step was to build a battery of 68 retorts, at Youngstown, to supply the coke needed beyond that which was made by the company's beehive ovens in the Connellsville region. This plant was completed and put in operation late in 1914. The next step was to build 75 more retorts, to make coke to supplant that made in the beehive ovens, and this plant was completed and put in operation late in 1915.

Except for a little blast furnace construction the Republic company now presents a complete thoroughly modern and well rounded out steel making finishing operation, the growth not of fifty years but of fifteen years, and yet distinctly a growth, not a single creation.

Topical Talks On Iron.

XXXIII. Duplexing.

In Talk No. 6, published in September, 1913, "Four steel making processes" the duplex process was referred to briefly, after the four generic processes, acid and basic Bessemer and acid and basic open-hearth, had been referred to. Not much time has elapsed since then, but the duplex process has become very much more important.

The following statistics tell more than statistics usually do. They give, in gross tons, the production of steel by the basic open-hearth process, the production by the duplex process one, and the percentage the duplex steel constituted of the total basic open-hearth steel.

	Basic O. H.	Duplex	Proportion
1912 ..	19,197,504	1,438,654	7.5%
1913 ..	19,884,465	2,210,718	11.1%
1914 ..	15,936,985	835,690	5.2%

The production of basic open-hearth as given includes of course the production by the duplex process as well as by the straight basic open-hearth process. The production of basic open-hearth steel was about the same in 1913 as in 1912, while the proportion of duplex steel increased by more than one-half. That shows under unchanged conditions the duplex process was growing. In 1914, however, the proportion decreased very greatly, and one sees that 1914 was a year of light production all around. That shows that when demand is light the duplex process is more or less given up.

The fact is that duplexing is an intensive method of production. It is cheaper largely because it produces more tonnage from a given capital investment. Starting with an ordinary open-hearth steel plant, a certain increase in the output can be secured with less capital outlay by investing the money in auxiliary Bessemer converters than by adding the requisite number of additional open-hearth furnaces. The molten iron is blown in the converter, eliminating nearly all the silicon and carbon, whereupon the blown metal is removed to the open-hearth furnace, where the phosphorous is run down and the refining otherwise completed. This is accomplished in much less time than is required to effect the entire purification in the open-hearth furnace, as it reduces carbon very slowly, even when the carbon is largely diluted by the addition of steel scrap.

In the past two years the duplex process has come into still more favor. It has become well recognized that the ordinary stationary open-hearth furnace is not the best type for the service, for several reasons, and the large tilting furnace is now the approved type when the plant is built from the ground up, though of course when

the open-hearth furnaces are already provided it may be found desirable to use them.

The most notable recent case of the adoption of the duplex process is that by the United States Steel Corporation at the South Works, South Chicago, and the Gary works. Late in 1915 it was decided to add to each plant two 25-ton Bessemer vessels and two 100-ton tilting open-hearth furnaces, and construction work will be pushed so that the new equipment will probably be ready for operation before July 1st, with a capacity each of nearly half a million tons of steel ingots a year.

The very rapid increase in production of basic open-hearth steel makes it impossible that the supply of scrap should keep pace, and the proportion of scrap available for the straight basic open-hearth process is therefore rapidly decreasing. This development necessarily gives a great impetus to the use of the duplex process, as it can get along without scrap, while for anything like quick and economical work with the straight process a fairly large proportion of scrap in the charge is necessary.

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,023	732	292			
December.	1,116	821	296	990	728	262			
January ..	1,021	795	226	936	716	220			
February .	914	746	168	897	678	219			
March ...	1,091	801	290	1,012	720	292			
April	1,038	782	256	1,010	722	288			
May	1,047	800	247	1,040	732	308			
June	1,097	789	308	1,090	730	360			

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Iron and Steel in 1915.

The year 1915 was the most remarkable in many ways the American steel industry ever passed through, yet after all that is not so extremely remarkable, for the American steel industry is not very old. While the steel rail came in the seventies, the change from wrought iron to mild steel for other finished products was not generally effected until the fore part of the decade of the eighteen-nineties. Steel has been the dominant product for scarcely a quarter century. The change was effected largely during a period of great industrial depression. When industry fully emerged from that depression, in 1899, there was a veritable boom in steel prices, and of late there has been a disposition to compare the latter part of 1915 in the steel market with "the boom of 1899". As to the strength of demand and the sharpness of price advances there is some comparisons to be made, but the circumstances, after all, were totally different. To show the fundamental difference it merely needs to be remarked that in December, 1914, just preceding this 1915 movement, the steel mills were operating at less than 35% of capacity, the depression being the most acute ever experienced, while both 1898 and 1897, the years preceding the boom year of 1899, broke all records in iron and steel production. There was, in other words, practically three years of full production, but at very low prices until nearly the close of the period, when a slight further increase in demand resulted in a famine becoming apparent.

The Movements in 1915.

One is interested in what occured and why it occured. It may be well to set down first what occured in the way of price movements. By a convenient chance, the market history of the year divided itself very closely into the regular quarterly periods of the calendar, and we set down below our composites of pig iron and finished steel on the quarterly dates, with the price changes per ton that occured during the quarter, but as certain steel price advances occurred on the first days of given quarters we use the last date of the quarter rather than the first date, thus:

	Pig iron.	Steel.
December 31	$13.03	1.4225c
	= .165	+1 80
March 31	12.865	1.5125
	+ .145	+ .35
June 30	13.01	1.5300
	+ 2.12	+2.95
September 30	15.13	1.6775
	+ 3.455	+7.95
December 31	18.585	2.0750
Year advance	$5.555	$13.05

The little table above tells most of the price story of the year. Pig iron backed and filled during the first half, advanced moderately in the third quarter and then advanced sharply in the fourth quarter, that is, sharply for pig iron. The price level at the close of the year was a trifle more than a dollar a ton above the top reached in the 1912 movement and somewhat more than 50 cents above the top reached in 1909, being thus the highest level since 1907.

During the first quarter of the year steel prices advanced, but chiefly on paper. The pendulum, in both prices and output, had swung too far in the preceding December. While consumption was light, production was still lighter, buyers depleting their already well reduced stocks. The mills effected some sales at minimum prices and then marked up prices, chiefly on paper, thereby stimulating specifications. Then the question was whether the market situation would stand the advances in invoice prices that would follow the working out of the lowest priced business. The second quarter opened with this question decidedly in doubt. There appeared reports of what seemed to be enormous war orders placed, and the trade at large doubted the genuineness of the orders. It was thought that at any rate there must be many duplications. A little time showed that the orders were real, and that the mills were making the steel. Buyers concluded that the market had some foundation, but that the foundation was largely war orders.

In May a fresh favorable influence developed. The Pennsylvania railroad system placed orders for 14,043 freight cars with outside builders, and 2,102 cars with its Altoona shops, a total of 16,145 cars.

From September 1 to May 1, eight months, orders had been placed for only about 15,000 cars by all the roads in the country. The Pennsylvania car orders were followed by definite news that the Russian and French governments had placed orders for nearly 20,000 cars. The total car buying in May and June amounted to 50,000.

By the end of June buyers of steel had become practically convinced that a real movement in the steel market of some proportions had developed. Throughout the first half of the year the question had been whether the mills, by this means or that, would be able to work up to an operation of say 85%, a rate that would enable them to hold prices firmly, even advance them on the situation, and one that would enable them to arrange their rolling schedules to their advantage, with reasonable length runs on a given size. That would throw deliveries somewhat behind and cause buyers to specify more freely.

At the end of June all eyes were turned upon July, normaly a dull month. If the mills should increase their operations in July and buying should prove good, the future of the steel market would be assured. July showed the increase, mill operations early in the month passing the 85% mark. Then buyers began to specify freely, and with domestic and export business increased the mills were operating substantially at capacity by the end of August. September showed still heavier bookings of specifications.

The fourth quarter stood by itself. The mills then began refusing to make open contracts, but a great deal of specific business developed, and order books filled more and more, while the mills, in a perfectly independent position, advanced prices sharply.

The Basis of Steel Activity.

The first buying that occurred was simply the buying that frequently occurs when buyers have allowed their stocks to run far down and prices have reached a particularly low level. Such a movement soon spends its force. Prices are advanced, on paper, and when the low priced tonnage has gone from mill to buyer the buyer refuses to pay the advanced prices and the market sags again. In 1914 there were two clear cases of such movements, in January and February and again in July and August.

In 1915 when the strength of the early movement was about exhausted the war orders and railroad buying gave the market a fresh impetus. Then came the buying to build up stocks, because stocks in buyers hands had to be much larger, to conduct business when the mills were behind in deliveries than when the mills were making almost instant deliveries even on miscellaneous specifications. Then came an actual and important increase in actual consumption. So rapidly did consumptive demand increase that buyers did not succeed in stocking up to the extent they would have liked. The stocks in buyers' hands at the close of the year were no more than average but they were of course greater than six months or a year earlier.

Influence of the War.

In April there were many who did not believe the reports of war orders, insisting they were greatly exaggerated. In July the same men insisted that the steel trade activity was largely due to these war orders. The difficulty then was to believe that the domestic demand could be important. The tonnage production of war steel, for direct and indirect export, was probably almost as large in July and August as in November and December, but it comprised a larger percentage of the total output. In the last three months of the year, when the steel mills were not only operating at capacity but were producing more steel than they had been thought capable of producing, the production was fully 75% for purely domestic use, and no more than 25% for export, direct and indirect in war material to the allied belligerents, and to neutral countries.

The direct exports of iron and steel the weight of which is returned by the government, reached a maximum in August, 405,853 gross tons, declining to 381,917 tons in September and to 351,000 tons in October. Deducting from these exports the pig iron, castings, etc., and making allowance for steel used in making shells, machinery, freight cars, locomotives, motor cars, etc., we estimate that in the closing months of the year the total finished steel shipped by the mills for all classes of export, direct and indirect, did not exceed a rate of about 7,000,000 tons a year, out of a total output equalling not less than 28,000,00 tons a year, or not over 25% at the outside.

The remainder, fully 75%, represented strictly domestic steel. Undoubtedly the war demand for commodities in general

had a great deal to do with making the country prosperous enough to buy this steel. The favorable trade balance in the foreign trade developed in the closing months of 1914, jumping to $79,000,000 in November, 1914 and then to $131,000,000 in December, while in 1915 a rate somewhat similar to that of December was maintained. Thus it was that the 12 consecutive months Dec. 1914, to Nov. 1915, inclusive showed very large trade balances, with relatively small fluctuations from month to month, and the total for those 12 months was $1,700,000,000. Over a period of years it had required about $500,000,000 a year to equalize the unseen balance, which is always against us, and thus it may be said that in the 12 months ending November, 1915, there was an extra trade balance of $100,000,000 a month. When this had accumulated for 12 months the country was naturally very prosperous. It is in that way chiefly, rather than in orders for "war steel" that the war has made American steel industry prosperous.

The Future.

Europe is spending in the United States not her income but her capital. England and France have pledged their credit to us to the extent of $500,000,000. England is mobilizing her American securities to use them for further loans. Everyone recognizes that the condition is temporary, that it may change with the partial exhaustion of resources on the part of the allies before the war ends, and will undeniably change when the war ends. One does not know when or how the war will end, whether one side or the other will be victorious, or whether both sides will really commit suicide. It is beginning to be realized, however, that the war does not represent the destruction of much property, and particularly of property that must be replaced after the war. What remains particulary in doubt, however, is the economic conditions under which the warring nations will resume their industries, whether that will be on a high or a low

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

1914—	Shapes,	Plates,	Bars,	Pipe,	Wire,	Wire Nails,	Cut Nails,	Sheets Black.	Sheets Galv.	Tin plate.	Composite Finished steel.
January	1.20	1.20	1.20	80	1.33	1.53	1.60	1.86	2.86	3.40	1.5394
February ..	1.25	1.21	1.22	79½	1.40	1.60	1.60	1.95	2.95	3.40	1.5794
March	1.21	1.18	1.20	79½	1.40	1.60	1.60	1.95	2.95	3.40	1.5638
April	1.18	1.15	1.15	79¾	1.40	1.60	1.60	1.90	2.89	3.39	1.5337
May	1.15	1.14	1.14	80	1.38	1.58	1.60	1.85	2.79	3.30	1.5078
June	1.12	1.10	1.12	80	1.32	1.50	1.58	1.81	2.75	3.30	1.4750
July	1.12	1.11	1.12	80	1.32	1.52	1.55	1.80	2.75	3.30	1.4805
August	1.18	1.18	1.18	80	1.37	1.57	1.55	1.88	2.87	3.50	1.5421
September .	1.20	1.19	1.19	80	1.40	1.60	1.55	1.98	2.97	3.48	1.5630
October ...	1.16	1.14	1.15	80	1.40	1.60	1.55	1.96	2.96	3.25	1.5236
November .	1.11	1.09	1.11	81	1.39	1.59	1.55	1.88	2.88	3.25	1.4769
December ..	1.05	1.05	1.05	81	1.31	1.51	1.55	1.83	2.80	3.20	1.4324
Year	1.16	1.14	1.15	80	1.37	1.57	1.57	1.89	2.87	3.35	1.5182
1915—											
January	1.10	1.10	1.10	81	1.34	1.54	1.58	1.80	2.80	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.55	1.80	3.09	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.55	1.80	3.40	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.55	1.80	3.40	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.55	1.80	3.60	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.55	1.76	4.80	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.55	1.74	4.65	3.10	1.5692
August	1.30	1.26	1.30	79	1.43	1.61	1.55	1.85	4.40	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.58	1.91	3.68	3.10	1..6506
October	1.44	1.42	1.43	79	1.63	1.78	1.65	2.03	3.57	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.72	2.30	4.07	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.85	2.53	4.75	3.60	2.0329
Year	1.30	1.29	1.31	79¼	1.48	1.66	1.60	1.93	3.85	3.19	1.6280

wage basis.

That the United States will remain prosperous during the war seems more than probable. As to the close of the war, there is one thing that seems reasonably certain, something that was taught by the changes that occurred after the war started, and that is that there will not be a sudden establishment of the new order of things. There will in all probability be sweeping changes first one way then the other. Just to sketch a possible picture, not to make a prediction: The end of the war may cause a sudden tightening of the reins of credit and a partial stoppage of all industry. Then, when the first shock is over, men may see they are not much hurt after all and there may be expansion on the basis that industry may now hum all over the world. Then, if the countries at war succeed in re-establishing their industries on an economical basis we may slowly but surely lose ground until eventually there will be more or less industrial depression throughout the world. The purpose of the sketch is to show how conditions after the war are likely to change not once but twice or thrice.

In the early days of January Chairman Gary of the United States Steel Corporation gave to the press an interview that promises to be memorable. He knew there was expansion and he feared there was even inflation, and he called on all forces to cooperate to meet the new conditions that would arise with the close of the war, which he predicted for an earlier time than generally assumed. He believed that both sides were more or less in straits, and that they surely would not proceed indefinitely and commit suicide.

In particular the country seems to need

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

							—— No. 2 fdy ——			Ferro-	Fur-
	Bessemer,	Basic,	No. 2 fdy,	Basic,	No. 2 X	fdy,	Cleve-	Chi-	Birm-	manga-	nace
1914—	Valley			Phila.	Phila.	Buffalo.	land.	cago.	ingham.	nese.*	coke†
Jan. ..	14.06	12.51	13.00	14.25	14.69	12.76	13.30	14.35	10.63	43.42	1.88
Feb. ..	14.13	13.21	13.21	14.00	14.88	13.02	13.58	14.46	10.52	38.33	1.90
Mar. .	14.20	13.05	13.25	14.10	15.00	13.38	13.75	14.75	10.75	38.40	1.92
April .	14.00	13.00	13.25	14.25	15.00	13.75	14.21	14.75	10.52	38.00	1.90
May ..	14.00	13.00	13.17	14.10	14.91	13.57	14.25	14.68	10.50	38.00	1.83
June ..	14.00	13.00	13.00	14.00	14.51	13.01	14.25	14.21	10.29	38.00	1.80
July ..	14.00	13.00	13.00	14.00	14.40	13.00	13.81	14.38	10.06	37.50	1.75
Aug. .	14.00	13.00	13.00	14.00	14.28	13.18	13.75	14.44	10.00	111.00‡	1.74
Sept. .	14.00	13.00	13.00	14.00	14.68	13.25	13.75	13.85	10.00	83.00	1.70
Oct. .	13.97	12.88	12.89	14.00	14.29	12.71	13.73	13.48	10.00	68.00	1.65
Nov. .	13.75	12.50	12.75	14.00	14.24	12.33	13.50	13.10	10.00	68.00	1.60
Dec. .	13.75	12.50	12.75	13.50	14.25	13.13	13.30	13.40	9.67	68.00	1.60
Year .	13.99	12.89	13.02	14.02	14.50	13.09	13.76	14.15	10.24	55.80	1.72
1915—											
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. .	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. .	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. .	15.12	13.98	13.71	14.83	14.91	13.82	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. .	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. .	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.
‡ Spot shipment; no contract market.

protection against cheap foreign goods. The administration purposes, apparently, to furnish what it thinks is needed by an anti-dumping provision. To this there are grave objections. The plan thus far proposed, in the first place, is to consider dumping as "unfair competition" and to proceed against it in the courts, when the extra duty on dumped goods has been proved in Canada very efficacious. In the second place, the country needs protection not merely against dumping, but against goods that are too cheap. Very low price standards may be established in the home markets of our competitors, and "dumping" in such case could not be proved. Finally, our prosperity is due to capital having come to us and it is wise, surely not selfish in a nation, to endeavor to retain that capital. If the clash comes under a low tariff, of prices being high in the United States and low abroad, the equalization will occur by the capital leaving us. That seems sucidal.

The Year Opening.

The conspicuous feature of the year opening in the steel trade is that the usual holiday lull, which is supposed by precedent to be entitled to last at least until the middle of January, was scarcely in evidence at any time, while January opened with such a formidable list of price advances that there can hardly be said to have been any interim. In the first week in January, the business days 3d to 8th inclusive, the following advances occurred; Standard steel pipe, line pipe and oil country goods, $1 to $2 a ton; wrought iron pipe, $4 a ton; steel boiler tubes, $4; railroad and small spikes, $3; rivets, $2; bolts and nuts, 10%; cold rolled strip steel, $5; bars, plates and shapes, $1; blue annealed sheets, $3—

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1909:

Quarter.	1915.	1914.	1913.
1st	$12,457,809	$17,994,382	$34,426,802
2nd	27,950,055	20,457,596	41,219,813
3rd	38,710,644	22,276,002	38,450,400
4th	.....	10,935,635	23,084,330
Year	.....	71,663,615	137,181,345

	1912.	1911.	1910.
1st	$17,826,973	$23,519,203	$37,616,877
2nd	25,102,266	28,108,520	40,170,961
3rd	30,063,513	29,522,725	37,365,187
4th	35,181,922	23,155,018	25,901,730
Year	108,174,673	104,305,466	141,054,755

Unfilled Orders.

(At end of the Quarter):

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	8,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,833	5,927,031
1910..	5,402,514	4,257,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	.....

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

	Shipments. %	Bookings. %	Difference. %	Difference. Tons.
January 1914	55	83	+28	+331,572
February ...	67	105	+38	+412,764
March	72	40	—32	—372,615
April	67	35	—32	—376,757
May	62	37	—25	—278,908
June	63	66	+ 3	+ 34,697
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September ..	62	24	—38	—425,664
October	55	28	—27	—326,570
November ..	45	32	—13	—136,505
December ..	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February ...	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September ..	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037

certainly an impressive list of advances for a year opening.

One subject of the moment is that during December the railroads maintained embargoes on nearly all steel to be shipped from mill for export, the shipments to the domestic trade being correspondingly increased, and yet steel appearing to be as scarce as ever. This has given rise to the question how domestic industries will suffer when the export orders on books can and will be filled. The railroad movement is gradually loosening, though severe winter weather may introduce fresh complications.

On January 6th the United States Steel Corporation announced a general wage advance, for February 1st. of about 10%, but already there had been inaugurated strikes at independent mills and furnaces in the Youngstown district for a much larger advance. At this writing (January 8th) the fresh news is that after rioting and destruction of much property the authorities have the situation in hand, but the plants involved are closed and it is not certain that the general wage advance of 10%, which all manufacturers will doubtless willingly grant, but which they certainly will not exceed, will be sufficient to end the strikes and restore normal production. The stoppage at the moment represents something like 7½% of the country's total steel production, and any serious loss of production at this time will seriously affect the market situation.

New Iron and Steel Works Construction.

The **Iron Age** annually makes a compilation of new construction in the iron and steel industry. From its last four reports we compile the following statistics

Blast Furnaces Completed.

	Number.	Annual Capacity. Gross tons.
1912	9	1,125,000
1913	4	495,000
1914	1	150,000
1915	3	430,000

Under construction, January 1, 1916, 10 furnaces, 1,750,000 tons capacity.

Open-hearth Steel Capacity Completed, Gross Tons.

ANNUAL INGOT CAPACITY.

	Steel Corporation.	Independents.	Total.
1913	730,000	2,190,000	2,920,000
1914	420,000	795,000	1,215,000
1915	280,000	1,125,000	1,405,000
Building	1,550,000	2,715,000	4,265,000

Some very interesting deductions and observations can be made from these statistics. Necessarily the statistics are not absolute, as they refer to rated capacities. The new equipment may not perform up to its rating, while on the other hand capacities of existing units are increased without the actual construction of new units.

The maximum rate of pig iron output until recently was attained in February, 1913, when very nearly the entire capacity, certainly much more than 90%, was supposed to be in operation. The new furnaces completed since then account for no more than 935,000 tons, as one of the Duluth furnaces, completed in 1915, was now blowing on January 1st, yet the rate of production January 1, 1916, appears to have been 38,700,000 tons. The comparison confirms what has been generally talked of in the trade, that of late many individual stacks have been making more iron than ever before.

Chairman Gary's interview of January 6th states that at "high water mark" in 1912 steel ingots were being produced at the rate of 35,000,000 tons a year, and that the rate is now 41,000,000 tons. The new construction shown above for the intervening three years amounts to 5,540,000 tons, thus checking up nicely with the increase indicated by Chairman Gary's estimates.

Will There be Enough Pig Iron?

In the past two or three years predictions have been made in some quarters that the next time the iron and steel industry as a whole should become active a scarcity of pig iron would be developed. In appeared that there was more new construction of open-hearth furnaces than of blast furnaces. The above statistics confirm the view, but the facts have not confirmed the deduction. In the three years 1913-4-5 new blast furnace construction amounted to 1,075,000 tons and new open-hearth construction

amounted to 5,540,000 tons. The situation was saved, apparently, by the old stacks making more pig iron than they had ever made before. Perhaps some aid was also rendered by the fact that the war steel being produced involves the production of a large amount of scrap, at the steel works where the ingots are cropped so liberally and at the finishing plants where shells are made.

It is quite certain that pig iron is now relatively scarce, yet the situation is confronted with 1,750,000 tons blast furnace capacity and 4,265,000 tons steel ingot capacity being under construction. Will the supply of pig iron undergo the further stretch thus involved?

A Year's Price Changes Of Iron And Steel Products.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our composite finished steel. In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the dates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
Jan. 1	Bars	1.05	to 1.10
" 1	Plates	1.05	to 1.10
" 1	Shapes	1.05	to 1.10
" 11	Wire nails	1.50	to 1.55
Feb. 11	Wire nails	1.55	to 1.60
" 11	Pipe	81%	to 80%
" 15	Galv. sheets	3.00	to 3.25
" 25	Galv. sheets	3.25	to 3.40
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 1	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galv. sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
" 21	Bars	1.25	to 1.30
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
" 31	Bars	1.30	to 1.35
Aug. 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galv. sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10

Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galv. sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galv. sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 4	Plates	1.50	to 1.60
" 4	Shapes	1.50	to 1.60
" 5	Tin plate	3.10	to 3.30
" 9	Galv. sheets	3.70	to 3.80
" 9	Blue ann. sheets	1.70	to 1.80
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galv. sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
" 18	Shapes	1.60	to 1.70
" 18	Galv. sheets	4.00	to 4.25
" 24	Galv. sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galv. sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
1916—			
Jan. 3	Tin plate	3.60	to 3.75
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%	78%	to 77%

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
July, 1914 ..	72,015	54,885	+ 17,130
August	51,231	54,112	— 2,881
September .	44,624	34,757	+ 9,867
October ...	45,241	39,410	+ 5,831
November .	35,325	40,748	— 5,423
December ..	27,458	42,525	— 15,067
January, 1915	20,684	31,556	— 10,873
February ..	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 ..	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ..	31,096	33,061	— 1,965
October ...	31,315	26,338	+ 4,877
November .	29,397	26,005	+ 3,293

United States citizens arrived and departed, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915..	9,027	5,115	+ 3,913
August	9,506	10,310	— 804
September .	9,054	8,188	+ 866
October ...	8,991	8,329	+ 662
November .	8,364	9,166	— 802

Net change in population caused by the movement of both aliens and citizens 1913, +754,205; 1914, +687,065; 1915, +117,237; July, 1915, +14,994; August, 1915, —15,128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490.

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Comparison Of Metal Prices.

Pig Iron.	Range for 1913. High.	Low.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Closing. Dec. 31.
Bessemer, valley	17.25	14.25	14.25	13.75	21.00	13.60	21.00
Basic, valley	16.50	12.50	13.25	12.50	18.00	12.50	18.00
No. 2 foundry, valley	17.50	13.00	13.25	12.75	18.50	12.50	18.50
No. 2X fdy. Philadelphia	18.50	14.50	15.00	14.20	19.50	14.00	19.50
No. 2 foundry, Cleveland	17.75	13.50	14.25	13.25	18.80	13.00	18.80
No. 2X foundry, Buffalo	18.00	13.00	13.75	12.25	18.00	11.75	18.00
No. 2 foundry, Chicago	18.00	14.00	14.75	13.00	18.50	13.00	18.50
No. 2 South'n Birmingham	14.00	10.50	10.75	9.50	14.50	9.25	14.50
Scrap Iron and Steel.							
Melting steel, Pittsburgh	15.00	10.75	12.00	9.75	18.00	11.00	17.50
Heavy melt. steel, Chicago	13.25	9.00	11.00	8.00	15.25	8.75	15.25
No. 1 R. R. wrought, Pitts.	15.75	11.50	12.75	10.00	17.25	10.75	17.25
No. 1 cast, Pittsburgh	15.00	11.50	12.25	10.50	15.00	11.00	15.00
Heavy steel scrap, Phila.	14.75	9.75	11.25	9.00	16.25	9.50	16.25
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Iron bars, Pittsburgh	1.65	1.35	1.35	1.20	1.90	1.20	1.90
Iron bars, Philadelphia	1.67½	1.22½	1.27½	1.12½	2.06	1.12½	2.06
Steel bars, Pittsburgh	1.40	1.20	1.20	1.05	1.80	1.10	1.80
Tank plates, Pittsburgh	1.50	1.20	1.20	1.05	1.80	1.10	1.80
Structural shapes, Pitts.	1.50	1.20	1.25	1.05	1.80	1.10	1.80
Grooved steel skelp, Pitts.	1.45	1.15	1.20	1.12½	1.75	1.12½	1.75
Black sheets, Pittsburgh	2.35	1.80	1.95	1.80	2.60	1.70	2.60
Galv. sheets, Pittsburgh	3.50	2.80	3.00	2.75	5.00	2.65	4.75
Tin plate, Pittsburgh	3.60	3.40	3.75	3.10	3.60	3.10	3.60
Cut nails, Wheeling	1.70	1.60	1.60	1.55	1.85	1.55	1.85
Wire nails, Pittsburgh	1.80	1.50	1.60	1.50	2.10	1.50	2.10
Steel pipe, Pittsburgh	79%	80%	79½%	81%	79%	81%	79%
Connellsville Coke at ovens.							
Prompt furnace	4.25	1.75	2.00	1.60	3.50	1.50	3.00
Prompt foundry	4.50	2.40	2.50	2.00	3.75	2.00	3.75
Metals—New York.							
Straits tin	51.00	36.75	65.00	28.50	57.00	32.00	40.50
Lake copper	17.75	14.50	15.50	11.30	23.00	13.00	22.75
Electrolytic copper	17.65	14.12½	14.87½	11.10	23.00	12.80	22.75
Casting copper	17.45	13.87½	14.65	11.00	22.00	12.70	21.75
Sheet copper	22.00	19.75	20.25	16.50	28.00	18.75	28.00
Lead (Trust price)	4.75	4.00	4.15	3.50	7.00	3.70	5.50
Spelter	7.35	5.10	6.20	4.75	27.50†	5.70†	....
Chinese & Jap. antimony	9.00	6.00	18.00	5.30	40.00	13.00	40.00
Aluminum, 98-99%	27.12½	18.50	21.50	17.37½	60.00	18.75	55.00
Silver	63¾	56⅜	59¼	47⅝	56½	46¼	55
St. Louis.							
Lead	4.72½	3.85	4.10	3.35	7.50	5.50	5.42½
Spelter	7.17½	4.95	6.00	4.60	27.00	5.55	17.25
Sheet zinc (f.o.b. smelter)	9.00	7.00	8.75	7.00	33.00	9.00	22.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	232	166½	188	132	190	148½	168
Standard copper, prompts	77⅛	61¾	66¾	49	86⅜	57⅛	86⅛
Lead	21½	15⅜	24	17⅞	30¼	18¼	30⅛
Spelter	26¼	20¼	33	21¼	110	28⅛	90
Silver	29¾d	25⅛d	27¼d	23¼d	27¼d	22⅝d	26¼d

† For first nine months; market nominal thereafter.

Comparison Of Security Prices.

	Range for 1913.		Range for 1914.		Range for 1915.		Closing.
Railroads.	High.	Low.	High.	Low.	High.	Low.	Dec. 31
Atchison, Top. & Santa Fe...	106⅜	90¼	100⅜	89½	111¼	92½	108¼
Atch. Top. & Santa Fe, pfd.	102¼	96	101¾	96½	102⅛	96	99¼
Baltimore & Ohio	106⅜	90⅝	95⅝	67	96	63¾	95⅞
Canadian Pacific	266¾	204	220½	153	194	138	183
Chesapeake & Ohio	80	57⅛	68	40	64¾	35⅝	64½
Chicago, Mil. & St. Paul	116¼	96¾	107⅛	84¾	101⅛	77¾	100⅞
Erie R. R.	32½	20¼	32½	20⅛	45⅝	19⅞	44
Great Northern, pfd.	132⅝	115½	134¾	111⅝	128⅜	112¾	127⅛
Lehigh Valley	168⅜	141¼	156¼	118	83⅜	64⅝	82⅛
Louisville & Nashville	142¼	126¼	141⅞	125	130¼	104½	129½
Missouri, Kansas & Texas ..	29⅞	18⅛	24	8⅜	15¼	4	7
Missouri Pacific	43⅝	21¼	30	7	18¼	1¾	4½
New York Central	109¾	90⅜	96⅝	77	110½	81½	110⅜
N. Y., N. H. & Hartford	129⅞	65⅝	78	49⅝	89	43	77
Northern Pacific	122⅝	101¾	118½	97	119	99⅛	118
Pennsylvania R. R	123¾	106	115½	102½	61½	51¾	59¼
Reading	171¾	151⅜	172¾	137	85⅝	69⅜	84
Rock Island	24⅞	11⅝	16⅝	⅝	1⅛	⅛	¾
Southern Pacific	110	83	99½	81	104⅛	81¼	103⅞
Union Pacific	162¾	137¾	164⅜	112	141½	115¾	139⅜
Industrials.							
Am. Beet Sugar	50½	19¾	33½	19	73⅞	33¼	70
American Can	46⅞	21	35⅛	19¼	68½	25	61¼
American Can, pfd.	129½	80½	96	80	113½	89	112
Am. Car & Foundry	56⅜	36½	53½	42¼	98	40	78¼
Am. Cotton Oil	57⅜	33½	46½	32	64	39	55⅝
Am Locomotive	44½	27	37¾	29¼	74¾	19	69
Am. Smelting & Refining	74¾	58½	71⅛	50¼	108⅞	56	108⅛
Brooklyn Rapid Transit	92¾	83¾	94¼	79	93	83¼	88⅛
Chino Copper	47⅝	30⅜	44	31⅝	57⅜	33¾	55½
Colo. Fuel & Iron Co.	41½	24½	34½	29½	66¼	21¾	52½
Consolidated Gas	142⅜	125⅛	139½	112½	150½	113¾	144⅛
General Electric	187	129¾	150⅝	137½	185½	138	174½
Interborough-Metropolitan ..	19⅝	12⅜	16⅜	10¾	25	10⅝	21½
International Harvester	111½	96	113½	82	114	90	110
Lackawanna Steel	49⅞	29⅞	40	26½	94¾	28	81
National Lead	56¼	43	52	40	70¾	44	66½
Ray Consolidated Copper	22	15	22½	15	27½	15¼	25¾
Republic Iron & Steel	38⅜	17	27	18	57¼	19	55½
Republic Iron & Steel, pfd...	92¼	72	91¼	75	112⅝	72	110
Sloss-Sheffield	45½	23	35	19½	66⅞	22	63½
Texas Co.	132½	89	149⅞	112	237	120	233
U. S. Rubber	69½	51	63	44½	74¾	44	56⅞
U. S. Steel Corporation	69⅛	49⅞	67¼	48	89½	38	88⅞
U. S. Steel Corporation, pfd..	110¾	102½	112¾	103¼	117	102	117
Utah Copper	60⅝	39⅝	59⅜	45⅜	81¾	48½	81½
Va.-Carolina Chem.	43⅜	22	34⅞	17	52	15	49¼
Western Union Telegraph ...	75⅛	54⅛	66⅞	53⅜	90	57	88½

COMPOSITE STEEL.

Computation for January 1, 1916.

Pounds.	Group.	Price.	Extension.
2½	Bars	1.80	4.500
1½	Plates	1.80	2.700
1½	Shapes	1.80	2.700
1½	Pipe (¾-3)	2.20	3.300
1½	Wire nails	2.10	3.150
1	Sheets (28 bl.)	2.60	2.600
½	Tin plates	3.60	1.800
10 pounds			20.750
	One pound		**2.0750**

Averaged from daily quotations:

	1911.	1912.	1913.	1914.	1915.
Jan.	1.7415	1.5123	1.7737	1.5394	1.4554
Feb.	1.7520	1.4878	1.7625	1.5794	1.4716
Mar.	1.7590	1.4790	1.7646	1.5638	1.5098
April	1.7600	1.5206	1.7742	1.5337	1.5357
May	1.7510	1.5590	1.7786	1.5078	1.5381
June	1.6817	1.5794	1.7719	1.4750	1.5312
July	1.6701	1.6188	1.7600	1.4805	1.5692
Aug.	1.6394	1.6784	1.7400	1.5421	1.6059
Sept.	1.6090	1.7086	1.7093	1.5632	1.6506
Oct.	1.5461	1.7588	1.6779	1.5236	1.7264
Nov.	1.4930	1.7750	1.6203	1.4769	1.9089
Dec.	1.4812	1.7789	1.5558	1.4324	2.0329
Year	1.6570	1.6214	1.7241	1.5182	1.6280

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet. Pitts.	No. 1 R. R. Wrought. Pitts.	No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1914—						
Mar.	12.25	9.00	12.85	12.40	11.50	10.50
Apr.	12.25	9.00	12.00	12.15	10.80	10.00
May	11.75	9.10	11.75	12.25	10.60	10.00
June	11.75	9.10	11.75	12.25	10.50	9.80
July	11.75	8.50	11.75	11.50	10.60	9.75
Aug.	11.50	8.50	11.50	11.25	10.75	9.75
Sep.	11.25	8.70	10.50	11.25	10.75	9.25
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.35	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.35	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99

COMPOSITE PIG IRON.

Computation for January 1, 1916.

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.00)	36.00
One ton No. 2 foundry, valley	18.50
One ton No. 2 foundry, Philadelphia	19.50
One ton No. 2 foundry, Buffalo	18.25
One ton No. 2 foundry, Cleveland	18.80
One ton No. 2 foundry, Chicago	19.00
Two tons No. 2 Southern foundry, Cincinnati (17.40)	34.80
Total, ten tons	185.85
One ton	**18.585**

Averaged from daily quotations:

	1911.	1912.	1913.	1914.	1915.
Jan.	14.375	13.420	17.391	13.492	13.070
Feb.	14.340	13.427	17,140	13.721	13.079
Mar.	14.425	13.581	16.775	13.843	12.971
April	14.375	13.779	16.363	13.850	12.914
May	14.242	13.917	15.682	13.808	13.026
June	14.032	14.005	14.968	13.606	13.047
July	13.926	14.288	14.578	13.520	13.125
Aug.	13.874	14,669	14.565	13.516	14.082
Sept.	13.819	15.386	14.692	13.503	14.895
Oct.	13.692	16.706	14.737	13.267	15.213
Nov.	13.532	17.226	14.282	13.047	16.398
Dec.	13.430	17.475	13.838	13.073	17.987
Year	14.005	14.823	15.418	13.520	14.150

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet bars. Pitts.	Rods. Pitts.	— Iron bars, deliv. — Phila.	Pitts.	Ch'go.
1914—						
Aug.	20.17	21.08	25.25	1.18	1.25	1.07
Sep.	20.75	21.75	26.00	1.18	1.20	1.07
Oct.	20.00	20.70	26.00	1.14	1.20	1.01
Nov.	19.25	19.75	25.00	1.13	1.20	.96
Dec.	18.75	19.25	24.40	1.12	1.20	.91
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	25.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24

* Premiums for Bessemer.
† Premiums for open-hearth.

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1910.	1911.	1912.	1913.	1914.	1915.
January	$14,513,394	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421
February	13,949,082	18,690,792	21,801,570	24,089,871	16,520,260	16,470,751
March	17,253,503	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505
April	16,529,260	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649
May	17,658,042	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612
June	16,503,204	20,310,053	24,795,802	25,228,346	18,927,958	31,757,103
July	16,108,102	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575
August	17,628,537	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822
September ...	16,776,178	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180
October	17,452,085	20,220,833	25,271,559	25,193,887	16,455,832	
November ...	18,594,806	20,823,061	26,406,425	20,142,141	15,689,401	
December ...	18,300,710	22,186,996	23,750,864	22,115,701	14,939,613	
Totals ...	$201,271,903	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$251,112,482

EXPORTS OF TONNAGE LINES— Gross tons.

	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
January	74,353	70,109	118,681	152,362	151,575	249,493	118,770	139,791
February	81,773	84,837	110,224	150,919	204,969	241,888	121,206	144,366
March	96,681	94,519	124,980	216,360	218,219	257,519	159,998	174,313
April	93,285	100,911	117,921	228,149	267,313	259,689	161,952	223,240
May	64,041	109,808	135,306	178,589	307,656	242,353	139,107	263,649
June	69,770	114,724	120,601	174,247	273,188	243,108	144,539	355,402
July	86,796	100,850	127,578	162,855	272,778	237,159	114,790	378,897
August	86,244	105,690	131,391	177,902	282,645	209,856	86,599	405,853
September	76,732	97,641	119,155	181,150	248,613	213,057	96,476	381,917
October	85,766	110,821	129,828	186,457	251,411	220,550	147,293	351,128
November	71,130	116,105	155,138	187,554	233,342	175,961	140,731	
December	77,659	137,806	150,102	190,854	235,959	181,715	117,754	
Totals .....,	961,242	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,503	2,818,556

IRON ORE IMPORTS.

	1912.	1913.	1914.	1915.
Jan. ..	154,118	175,463	101,804	75,286
Feb. ..	129,693	188,734	112,574	78,773
Mar. .	157,469	164,865	68,549	88,402
April .	178,502	174,162	111,813	91,561
May ..	194,482	191,860	125,659	98,974
June ..	180,122	241,069	188,647	118,575
July ..	185,677	272,017	141,838	119,468
Aug. ..	178,828	213,139	134,913	126,806
Sept. .	180,571	295,424	109,176	173,253
Oct. ..	202,125	274,418	114,341	
Nov. .	163,017	179,727	90,222	
Dec. ..	199,982	223,892	51,053	
Totals	2,104,576	2,594,770	1,351,368	971,098

IRON AND STEEL IMPORTS.

	1911.	1912.	1913.	1914.	1915.
Jan.	33,071	20,008	21,740	17,776	10,568
Feb.	20,812	11,622	25,505	14,757	7,506
Mar.	23,533	15,466	27,467	27,829	8,025
April	22,392	12,481	25,742	30,585	16,565
May	23,347	15,949	28,728	28,173	28,916
June	29,399	21,407	36,597	23,076	32,200
July	15,782	17,882	36,694	25,282	20,858
Aug.	10,944	20,571	18,740	28,768	27,556
Sept.	14,039	18,740	19,941	38,420	23,344
Oct.	21,035	25,559	20,840	22,754	34,317
Nov.	13,880	24,154	25,809	34,165	
Dec.	19,665	21,231	26,454	9,493	
Total	256,903	225,072	317,260	290,394	209,855

CAR BUYING.

Freight cars ordered:		
First half 1913	114,000	
Second half 1913	33,000	
Year 1913		147,000
First half 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
1915—		
January	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,210	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.

January, 1914	22,500,000
February	25,000,000
March	28,000,000
April	28,000,000
May	25,000,000
June	23,650,000
July	23,350,000
August	23,600,000
September	23,200,000
October	21,200,000
November	18,700,000
December	18,100,000
January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
On January 1, 1916	38,700,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1902	989,316,870	1,360,685,933	391,369,063
1903	995,494,327	1,484,753,083	489,258,756
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	*2,484,018,292	*691,421,812
1914	*1,789,276,001	2,113,624,059	324,348,049
1913—			
April	146,194,461	199,813,438	53,618,977
May	133,723,713	194,607,422	60,883,709
June	131,245,877	163,404,916	32,159,039
July	139,061,770	160,990,778	21,929,008
Aug.	137,651,553	187,909,020	50,257,467
Sept.	171,084,843	218,240,001	47,155,158
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	*184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
April	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,265,267	267,801,370	145,536,103
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,746,117	134,170,011
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	*334,638,578	*186,108,958
Nov.	164,319,169	331,144,527	166,825,358

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
	1914.	1915.	1914.	1915.
Jan. ...	$14.035	$13.5375	$12.325	$12.50
Feb. ...	14.225	13.60	13.059	12.50
Mar. ...	14.1667	13.60	13.041	12.50
April ...	14.00	13.60	13.00	12.50
May	14.00	13.659	13.00	12.65
June ...	14.00	13.75	13.00	12.724
July ...	14.00	13.991	13.00	12.959
Aug. ...	14.00	15.064	13.00	14.364
Sept. ...	14.00	15.906	13.00	15.00
Oct. ...	13.9375	16.00	12.85	15.0147
Nov. ...	13.6375	16.615	12.477	15.518
Dec. ...	13.75	19.021	12.50	17.487
Year ...	13.9793	14.870	12.854	13.810

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

BAR IRON AVERAGES.

Average realized prices on shipments of base sizes of common iron bars by the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and Highland Iron & Steel Company, as disclosed by wage adjustments of Amalgamated Association of Iron, Steel and Tin Workers, prices realized in bimonthly periods, governing wage rates for succeeding two months.

	1913.	1914.	1915.
January-February.	1.4831	1.1590	1.024
March-April	1.5430	1.176	1.087
May-June	1.5272	1.1257	*1.10
July-August	1.5029	1.0928	*1.15
September-October	1.3931	1.0847	*1.20
November-Dec'ber	1.2030	1.037	
Year's average	1.4421	1.1125	

* Settlement basis.

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1908	58,490	11,878
1909	62,593	9,327
1910	66,640	12,459
1911	14,098	61,466
1912	2,053	81,694
1913	20,680	57,812
1914	15,411	59,549
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
Ten months	2,336	122,031

British tin plate exports have been as follows, in gross tons:

1912	481,123
1913	494,921
1914	435,497
January 1915	29,216
February	25,101
March	36,170
April	40,135
May	33,727
June	33,986
July	39,528
August	22,572
September	20,002
October	31,968
November	25,556
Eleven months	337,961

BRITISH IRON AND STEEL EXPORTS.

1914—	Pig Iron.	Rails.	Tin Plate.	Total.*
May ..	95,037	56,881	48,628	437,648
June ..	88,569	39,700	36,565	366,066
July ..	74,617	43,133	47,237	385,301
Aug. ..	28,342	22,763	21,414	211,605
Sept. ..	37,793	39,185	23,440	228,992
Oct. ..	47,188	37,005	26,950	263,834
Nov. ...	49,666	16,181	30,942	240,608
Dec. ..	31,705	16,315	30,254	212,667
Year ..	90,405	435,440	435,497	3,977,468
1915—				
Jan. ...	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	25,101	198,804
Mar. ..	20,172	17,572	36,170	239,342
Apr. ..	35,209	21,602	40,135	264,244
May ..	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	33,224	39,528	351,984
Aug. ...	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ...	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Copper in 1915.

Activity, buoyancy and strength were the predominant features of the 1915 copper selling campaign. At the close of the year, the industry, having travelled from profound depression fifteen months previously, was on the heights of prosperity. Each of these extreme conditions was the result of the European war. At the end of December heavy buying, attended by much excitement carried prices to the highest level of the year—electrolytic selling at 22½c to 23c per pound—and within ½c per pound of the highest point reached in commercial history, without taking into account some sales made in the infancy of the industry.

At the beginning of 1915, although prices had advanced 1⅝c per pound from the lowest point touched in 1914, an extremely conservative sentiment prevailed. The refineries then were producing at the rate of only 35,000 tons per month, but as the demand increased and prices became more remunerative, larger output at the mines and smelters was reflected at the refineries. As it became evident from month to month that all of the copper refined would be needed to meet domestic and foreign requirements, redoubled efforts were made to increase production until in October the refined output was almost 75,000 tons, according to reliable estimates. This was record-breaking and was followed by a decrease of about 5,000 tons per month in November and December due to labor difficulties in the west.

Throughout the year commercial developments were unusually interesting and significant all of which received coloring from the attitude of the Allied governments who largely shaped the destinies of the copper situation. Conditions were ripe for heavy speculative transactions and the speculator was ubiquitious. During each active buying movement reports were circulated that German consumers had purchased large tonnages of American electrolytic copper to be delivered after the war. Sometimes it was asserted that as much as 2c per pound had been paid as a retainer. It may have been that the Teutonic operators were not unwilling to indulge in speculation at the expense of the enemies of the Fatherland but it is highly improbable that any such purchases were really made on German account. It developed later that most of these purchases were made by a pool which acquired about 60,000,000 pounds at relatively low prices which was subsequently resold at a handsome profit after having been transferred to Brooklyn warehouses during the interval. The source of many of Wall Street's tips on copper thus seems to be revealed.

Some large domestic consumers who had the temerity to purchase largely in excess of requirements were also tempted to sell their surplus metal after the market had advanced 4c to 5c per pound. Subsequently, however, some of this metal was repurchased by the same people at even higher prices when domestic melting was increased far beyond expectations entertained earlier in the year. The buying of copper to be used in the manufacture of war munitions began early in the year but it was not until April that the extraordinary demand culminated in a furor of buying which continued throughout May and June, prices rising from 15.80c to 18.87½c in April, up to 20c by the middle of June. Contracts were placed for various deliveries extending over the whole of 1915 and in some instances for shipment well through 1916.

At one time it was possible to purchase copper in Europe at lower prices than prevailed here and some negotiations were entered into to return metal to the United States but there were few import transactions of importance put through. One of the interesting developments during this period of great excitement and activity was the purchase of large tonnages of copper by the Allied governments who supplied it to American brass founders and other manufacturers of war munitions, who in turn delivered the brass and other products at a stipulated manufacturers profit for conversion. This heavy buying movement came to an end about the latter part of June when a reaction set in that carried prices downward to 15¾c about August 15th.

The statistical position had been growing less favorable for several months. Sur-

plus stocks were lowest during the latter part of May but increased during June, July and August and even in September, due mainly to the light exports and the heavy increase in production. During the dull period that followed the stupendous buying movement there was again talk of concerted action among producing interests to bring about another curtailment of production at the smelters and refineries. In September the output is understood to have reached 167,000,000 pounds, but domestic deliveries had increased from 25,000 tons in January to 40,000 tons in September.

The European markets were then finding an increased supply through larger offerings from Australia and Japan. These foreign producers accepted prices which American refiners would not entertain. Renewed demand, however, carried the New York market to 17⅞c within a few day, only to be followed by another reaction of nearly one cent per pound. This unsettled period brought out indications that manufacturing stocks were low but when producing interests attempted to exact onerous prices, domestic buyers temporarily withdrew.

There were only fractional changes in prices during October and an unusual phase developed through competition between Lake and electrolytic copper sellers. During the second quarter buying movement Lake producers obtained premiums of 2c to 3c per pound over Electrolytic. Lake copper is preferred, because of its fibrous character, in the manufacture of brass that is to be converted into cartridges, but for ordinary manufacturing purposes Lake will not command much, if any premium over electrolytic. Producers of Lake copper, however, who had sold far ahead and remained out of the market, for important tonnages, for nearly three months upon re-entering the market in October found the field had been pre-empted by the manufacturers of electrolytic, consequently they were obliged to accept lower prices to effect sales.

Another buying movement of great magnitude developed in November that carried prices rapidly from 18c to nearly 20c per pound. Not only did European governments again purchase heavily but domestic manufacturers of munitions, of electrical machinery, wire and other products, bought feverishly for deliveries extending over the first quarter and first half of 1916. Excitement again ran high and sales during the month were even greater than in June. Early in December a lull in buying, naturally developed the opinion that as the holiday season was at hand, dullness would prevail until the first of the year. Suddenly, however, another heavy buying movement carried prices rapidly to 22½c to 23c per pound. Particularly large sales were made for export but domestic consumers were most concerned to cover requirements for the first and second quarters of 1916. During the last few days of December numerous small smelters became urgent buyers for early shipment. The year closed with an active and feverish market and the conviction that prices would go higher in January.

COPPER PRICES IN DECEMBER.

	—— New York ——			London.		
	Lake.	Electro.	Casting.	Standard.		
Day.	Cents.	Cents.	Cents.	£	s	d
1	19.87½	19.75	19.37½	80	0	0
2	19.87½	19.75	19.25	79	10	0
3	19.62½	19.62½	19.12½	78	5	0
6	19.50	19.50	19.00	78	0	0
7	19.50	19.50	19.00	77	5	0
8	19.50	19.37½	18.87½	76	10	0
9	19.50	19.37½	18.87½	77	2	6
10	19.50	19.37½	18.87½	76	12	6
13	19.37½	19.37½	18.87½	76	2	6
14	19.37½	9.37½	19.00	76	12	6
15	19.62½	19.62½	19.12½	78	12	6
16	19.62½	19.62½	19.12½	79	2	6
17	19.75	19.75	19.25	80	12	6
20	20.00	20.00	19.37½	82	17	6
21	20.25	20.25	19.62½	84	5	0
22	20.50	20.50	19.75	82	15	0
23	20.75	20.75	20.00	84	2	6
24	21.50	21.50	20.50	84	10	0
27	21.62½	21.62½	20.50	.....		
28	21.87½	21.87½	21.00	85	15	0
29	22.37½	22.37½	21.75	85	17	6
30	22.37½	22.37½	21.75	86	7	6
31	22.75	22.75	21.75	86	2	6
High .	23.00	23.00	22.00	86	7	6
Low .	19.25	19.25	18.75	76	2	6
Av'ge	24.375	20.348	19.728	80	15	5

Production Of Copper.

In 1915, according to the Geological Survey, the output of copper from domestic ores only, was 1,365,500,000 lbs. This is smelter output and is an increase of 215,362,808 lbs. over the production in 1914. It is also an increase of over 100,000,000 lbs compared with the 1913 production. Thus the 1915 smelter output establishes a new high record. The heaviest production came during the last few months of the year and as it requires sixty to ninety days for pig copper to be reflected in the returns of the refineries, the indication is that about 1,212,000,000 lbs. of the smelter output was refined in 1915. To this must be added 324,800,000 lbs. derived from importations of foreign smelting. This gives a total of 1,536,700,000 lbs. refined copper produced from primary sources. It is estimated that about 50,000,000 lbs. was derived from secondary sources making the total production of refined copper in 1915. 1,586,700,000 lbs. This is 21,000,000 lbs. in excess of the total refined production in 1914 or an increase of scarcely 1½%. The final returns of the Government which will not be available for some months, may show that the 1915 refined output was even larger than that of 1913 but it will require close official figures to determine the exact status.

Stocks of refined copper at the refineries at the close of 1914 were 73,600,000 lbs., which added to the estimated refined output makes the total 1915 available supply 1,750,300,000 lbs. It is estimated that the deliveries into domestic consumption in 1915 were 952,000,000 lbs. eclipsing all previous annual deliveries into home consumption. The exports were 596,000,000 lbs. making the total deliveries into domestic and foreign consumption 1,548,000,000 lbs. leaving stocks of 202,300,000 lbs. at the end of the year. This is an increase of 29,000,000 lbs. over the surplus held by the producers at the close of 1914

The use of copper in military operations has been the most important feature in the industry during the past two years. It has been variously estimated that the belligerents are consuming this metal at an annual rate of 200,000 to 225,000 tons. Germany, in times of peace is the largest consumer of American copper having taken 146,000 tons in the year 1913 and 83,000 tons in 1914 before the war began. The great increase in domestic deliveries was largely due to the manufacture of copper products for shipment into the war zone. The mettallurgical achievements of the Teutons have been little less notable than their victories in arms.

Extreme Fluctuations of Metal Prices in 1915.

The following shows the **Opening, Highest, Lowest** and **Average** prices for Year 1915.

DOMESTIC—	Opening.	Highest.	Lowest.	Closing.	Average.
Pig Tin, (Straits) f.o.b. New York	33.25	57.00	32.00	40.50	38.658
Lake Copper, f.o.b. New York	13.10	23.00	13.00	22.75	17.641
Electrolytic Copper, f.o.b. New York	12.85	23.00	12.80	22.75	17.474
Casting Copper, f.o.b. New York	12.75	22.00	12.70	21.75	16.758
Waterbury Copper Average	.....	.....	.....	.....	18.937
Pig Lead, f.o.b. New York (open market)	3.80	7.62½	3.70	5.50	4.662
Pig Lead, f.o.b. New York (Trust price).	3.80	7.00	3.70	5.50	4.676
Pig Lead, f.o.b. St. Louis	3.62½	7.50	3.50	5.42½	4.566
Spelter, f.o.b. New York	5.75	*27.50	*5.70	.....	.....
Spelter, f.o.b. St. Louis	5.55	27.00	5.55	17.25	14.162
Waterbury Brass Mill Spelter Average	.....	.....	.....	.....	17.497
Antimony (Cooksons) f.o.b. New York	16.25	40.00†	16.00†	.....	.....
Antimony, (Halletts) f.o.b. New York	14.75	36.00†	14.50†	.....	.....
Antimony (Chin. & Jap.) f.o.b. New York	13.25	40.00	13.00	40.00	29.522
Aluminum (No. 1 Virgin 98-99%) N. Y.	19.12½	60.00	18.75	55.00	34.131
Silver, New York	48½	56½	46¼	55.00	49.688

* For first nine months; market nominal thereafter.

† For first quarter, no market since April.

LAKE COPPER PRICES.

Average monthly prices of **Lake Copper** in New York.

	1911.	1912.	1913.	1914.	1915.
Jan.	12.75	14.37½	16.89	14.76½	13.89
Feb.	12.73	14.38½	15.37½	14.98	14.72
Mar.	12.56	14.87	14.96	14.72	15.11
Apr.	12.41	15.98	15.55	14.68	17.43
May	12.32	16.27	15.73	14.44	18.81
June	12.63	17.43	15.08	14.15	19.92
July	12.72	17.37	14.77	13.73	19.42
Aug.	12.70	17.61	15.79	12.68	17.47
Sept.	12.57	17.69	16.72	12.44	17.76
Oct.	12.47½	17.69	16.81	11.66	17.92½
Nov.	12.84	17.66	15.90	11.93	18.86
Dec.	13.79	17.62½	14.82	13.16	20.37½
Av..	12.71	16.58	15.70	13.61	17.64

ELECTROLYTIC COPPER PRICES.

Average monthly prices of **Electrolytic Copper** in New York.

	1911.	1912.	1913.	1914.	1915.
Jan.	12.53	14.27	16.75½	14.45	13.71
Feb.	12.48	14.26	15.27	14.67	14.572
Mar.	12.31	14.78	14.92½	14.33½	14.96
Apr.	12.15½	15.85	15.48	14.34	17.09
May	12.13	16.16	15.63	14.13	18.60
June	12.55	17.29	14.85	13.81	19.71
July	12.62½	17.35	14.57	13.49	19.08
Aug.	12.57½	17.60	15.68	12.41½	17.22
Sept.	12.39	17.67	16.55	12.09	17.70
Oct.	12.36	17.60	16.54	11.40	17.86
Nov.	12.77	17.49	15.47	11.74	18.83
Dec.	13.71	17.50½	14.47	12.93	20.35
Av..	12.55	16.48	15.52	13.31½	17.47

CASTING COPPER PRICES.

Average monthly prices of **Casting Copper** in New York.

	1911.	1912.	1913.	1914.	1915.
Jan.	12.39	14.02	16.57	14.27½	13.52
Feb.	12.33	14.02	15.14	14.48	14.173
Mar.	12.20	14.53	14.76	14.18	14.34
Apr.	12.07	15.72½	15.53	14.18	16.48
May	12.08	16.01	15.45½	14.00	17.41
June	12.40	17.08	14.72	13.65	18.74
July	12.49½	17.09	14.40½	13.34½	17.76
Aug.	12.42	17.35	15.50	12.27	16.46
Sept.	12.23	17.51	16.37½	12.00	16.75
Oct.	12.21	17.44	16.33	11.29	17.32
Nov.	12.61	17.34	15.19	11.63	18.41
Dec.	13.56½	17.34	14.22	12.83½	19.73
Av..	12.42	16.29	15.33	13.18	16.76

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since March 27, 1915, are given in the following table together with the price of Lake copper on the same dates:

1915—	Sheet Copper.	Lake Copper.
March 27	20.75	15.75
April 8	21.00	16.50
April 13	21.25	16.62½
April 14	21.50	16.75
April 17	22.00	17.00
April 19	22.50	17.62½
April 22	23.00	18.00
April 28	24.00	18.93¾
June 8	24.50	19.62½
June 9	25.00	19.87½
July 27	24.50	18.87½
July 31	24.00	18.75
August 18	23.00	16.75
November 3	23.25	18.06¼
November 15	23.50	18.62½
November 16	23.75	18.75
November 17	24.00	18.87½
November 18	24.25	19.00
November 22	24.50	19.87½
November 23	25.00	19.87½
December 21	25.50	20.25
December 22	26.00	20.50
December 30	27.50	22.37½
December 31	28.00	22.75
1916—		
January 3	29.00	23.25

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1912.	1913.	1914.	1915.
January ..	31,229	25,026	36,018	26,193
February .	31,894	26,792	34,634	15,583
March ...	27,074	42,428	46,504	30,148
April	23,591	33,274	35,079	18,738
May	32,984	38,601	32,077	28,889
June	26,669	28,015	35.182	16.976
July	26,761	29,596	34,145	17,708
August ..	29,526	35,072	16,509	17,551
September	25,572	34,356	19,402	14,877
October .	25,020	29,239	23,514	24,087
November	19,171	29,758	24,999	23,168
December	29,474	30,653	22,166	*32,936
Total ..	327,965	382,810	360,229	†266,854

* Includes only exports from Atlantic ports.
† Approximate.

Tin in 1915.

The United States consumers of tin were victims of fortutitious circumstances in 1915—a year that will live in the memory of the trade for the rapid birth of many imaginary difficulties; yet inventions of the mind, were potent enough to derange the course of prices and to set ordinary calculations at naught. It was the American dealer, however, who felt the primary effect of the war and who was most imperiled, through the war-measures taken by the British Government to prevent tin from reaching the hands of the enemy. Other trials and tribulations to test the patience, endurance and ingenuity of the dealer were legion throughout the year.

About the middle of January a serious scarcity of spot tin at London developed from the congestion of shipping in the Thames. The inadequate labor forces at the docks—one result of the war—caused long delays in the discharge of vessels. Consequently, small supplies were available for transshipment to this country. This phase of the market was expressed in an advance in the price of spot Straits tin at New York from 33¼c on Jan. 15th—the same price that prevailed when the year opened—to 38c on Feb. 1st. Small deliveries to American consumers in January, following the meager deliveries in December—the smallest since the panic of 1907—were discouraging to selling interests.

Indifference of the American consumer was still obvious in February and while spot tin at London rose rapidly, because of the shipping congestion, the price at New York dropped to 36¼ on Jan. 17th which was nearly 4c per lb. under the cost at London. In the next two days, however, the activities of German submarines creating fear, the New York price jumped to 39½c but reacted to 38c before the month closed. One feature of interest at this time was the release of 1,900 tons of Banca tin for London, which had been long accumulating at Java, and the sale of other lots for direct shipment from Batavia to New York.

Early in March importers and dealers became alarmed about the continued freight congestion at London docks and the difficulty of securing freight room on ships sailing for New York. These facts pointed to probable default on March contracts. The sensational demand for spot tin thus created, caused an advance of 10c per lb. in five days—from 40¼c on March 1st to 50c on March 5th. A 5c per lb. reaction in the next few days was succeeded by a 10c rise to 55c on March 19th, from which time until the end of the month, the violent fluctuations ranged from 46 to 54c amid great excitement. The strain was even more severe than in the feverish days of August, 1914, following the beginning of hostilities. There was no lack of tin at London, but, as ships were withdrawn from commercial channels to transport troops, the metal could not be moved. Only one day's supply of tin reached the American market in the first eighteen days of March. An accident delaying a ship enroute from the East Indies to New York made the local situation worse. Some large consumers having tin due them on March purchases, realizing the serious outlook, relieved the strain by not calling for the metal to be delivered on contract time. Temporarily, there was no trading in future positions because no one could guarantee deliveries. Spot Straits tin sold at 51¼c at the close of the month when the London congestion was relieved and shipments to the United States were resumed. Strenuous conditions continued, however, because England placed a partial embargo on tin shipments from British possessions by requiring special licenses for such shipments to be procured from the Admiralty. It was also obligatory that all consignments should be made to the British Consul at New York, the metal to be released by him only when the consignee had agreed that the metal would not be re-exported in any form to any country other than Great Britain or France.

The embargo was designed primarily to prevent large shipments from London to Scandinavia and thence to Germany that through inadvertancy previously had been allowed. Early in April the British restrictions on American deliveries were severe. The importer was required to sign a guarantee for the performance of this contract to give the name of the consumer to whom he had previously sold, and to submit the original contracts and documents as evidence of the sale. The consumer interested was also required to guar-

VISIBLE SUPPLIES.

Visible supply of tin at end of each month.

	1911.	1912.	1913.	1914.	1915.
Jan.	18,616	16,707	13,971	16,244	13,901
Feb.	17,260	14,996	12,304	17,308	14,548
Mar.	16,682	15,694	11,132	16,989	15,467
April	14,441	11,893	9,822	15,447	15,785
May	15,938	14,345	13,710	17,862	14,646
June	16,605	12,920	11,101	16,027	15,927
July	16,707	13,346	12,063	14,167	16,084
Aug.	16,619	11,285	11,261	14,452	15,127
Sept.	16,672	13,245	12,943	14,613	15,191
Oct.	14,161	10,735	11,857	10,894	13,154
Nov.	16,630	12,348	14,470	11,483	16,451
Dec.	16,514	10,977	13,893	13,396	16,216
Av'ge	16,404	13,207	12,377	14,907	15,208

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States, as per Powell's returns:

	1910.	1911.	1912.	1913.	1914.	1915.
Jan.	5,895	4,290	4,018	6,050	5,290	5,200
Feb.	4,147	4,290	5,260	4,660	6,520	5,584
Mar.	2,877	4,510	5,150	4,810	4,120	4,970
Apr.	4,025	3,140	4,290	4,400	4,930	5,270
May	4,965	4,310	5,760	6,160	6,900	6,759
June	4,120	5,050	4,290	4,820	5,870	6,665
July	5,040	4,660	4,580	4,770	4,975	5,606
Aug.	5,700	4,680	5,210	6,030	3,315	4,712
Sep.	4,220	5,150	5,430	5,160	4,973	5,296
Oct.	4,480	4,350	4,450	5,020	4,610	4,441
Nov.	4,840	5,070	5,600	5,560	5,155	6,713
Dec.	4,270	5,970	4,980	5,110	6,435	5,301
	54,579	55,470	59,018	62,550	63,093	66,517
Av.	4,548	4,622	4,918	5,213	5,258	5,543

CONSUMPTION IN THE U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast.

	1910.	1911.	1912.	1913.	1914.	1915.
Jan.	3,500	3,200	3,700	3,700	3,600	2,300
Feb.	3,600	3,800	4,050	3,500	3,300	3,375
Mar.	4,000	5,100	4,000	5,900	4,450	3,200
Apr.	4,025	4,100	3,300	5,400	3,450	3,200
May	3,600	3,400	4,250	3,350	3,800	5,600
June	5,000	2,900	2,850	3,800	3,650	3,900
July	3,800	4,300	5,150	3,900	3,900	5,300
Aug.	3,700	3,800	4,300	3,600	2,900	4,500
Sep.	3,300	4,200	3,600	3,100	3,600	4,300
Oct.	3,350	3,500	3,850	3,700	3,700	4,900
Nov.	3,800	3,100	4,300	2,800	2,600	2,975
Dec.	3,600	3,700	4,050	3,100	1,900	5,200
	45,350	44,300	49,500	43,900	41,700	48,750
Av.	3,779	3,692	4,125	3,658	3,475	4,062

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	Dec.	Nov.	Dec.
Straits shipments	1915.	1915.	1914.
To Gr. Britain..	777	1,838	3,715
" Continent ..	959	825	400
" U. S.	3,565	4,050	2,320
Total from Straits	5,301	6,713	6,435
Australian shipments			
To Gr. Britain ..	245	298	nil
" U. S.	nil	nil	nil
Total Australian.	245	298	nil
Consumption			
London deliveries	1,189	1,402	2,464
Holland deliveries	105	147	58
U. S.	5,200	2,975	1,900
Total	6,494	4,524	4,442
Stocks at close of month			
In London—			
Straits, Australian	2,221	1,569	3,009
Other kinds	1,682	1,430	531
In Holland	.....	.....	.....
In U. S.	1,371	1,849	1,386
Total	5,274	4,848	4,926
Afloat, close of month			
Straits to London.	1,378	2,515	4,345
To U. S.	8,125	8,213	4,125
Banca to Europe..	1,439	875	.....
Total	10,942	11,603	8,470

	Dec. 31,	Nov. 30.	Dec. 31,
Total visible	1915.	1915.	1914.
supply	16,216	16,451	13,396

STRAITS TIN PRICES IN NEW YORK.

	1911.	1912.	1913.	1914.	1915.
Jan.	41.39	43.24	50.45	37.74	34.30
Feb.	42.83	43.46	48.73	39,93	37.32
Mar.	40.76	42.86	46.88	38.08	48.93½
Apr.	42.20	44.02	49.12	36.10	47.97
May	43.10	46.12	49.14	33.30	38.78
June	46.16	47.77	44.93	30.65	40.37
July	42.96	44.75	40.39	31.75	37.50
Aug.	43.45	45.87	41.72	50.59½	34.39
Sept.	39.98	49.18	42.47	32.79	33.13
Oct.	41.21	50.11	40.50	30.39½	33.08
Nov.	43.13	49.90	39.81	33.50	39.37½
Dec.	44.97	49.90	37.64	33.60	38.75
Year	42.68	46.43	44.32	35.70	38.66

antee that the tin delivered was solely for his own manufacturing purposes and that he would not execute any orders to be sent, directly or indirectly, to a country at war with Great Britain.

Should the instructions be enforced to the letter, it was clearly evident, that trading in spot tin at New York would be eliminated, as no provision was made for the delivery of tin to jobbers from stock, and no dealer could obtain tin imported until he had furnished the name of the consumer. Facing a chaotic condition in consequence, excitement in the trade again ran high in April; the price of spot tin leaping from 48½c on April 1st, to 57c on April 13th, after which there was a steady decline to 39½c at the close of the month. A recession in prices during the second half of the month followed negotiations between the Tin Committee of the New York Metal Exchange and the British authorities at Washington, through which plans were evolved by which the British Government could be safe-guarded without further demoralizing the American trade. The present arrangement allows tin to become available upon the signing of guarantees by the importer and the consumer or by the jobber as the case may be.

The American statistical position changed in April with the arrival of 4,300 tons at Atlantic ports and 1,100 tons at Pacific ports and deliveries of 3,200 tons into consumptive channels.

In May, a relatively quiet and steady market was experienced although an effort was made to further excite the trade upon the sinking of the Lusitania when spot tin sold at 40¾c after having declined to 39c a few days before. The industry was in no mood for another sensational whirl, but was rather inclined to be conservative and prices gradually receded to 37⅜c with a slight recovery later. One result of the experiences in April and May was the effort made by the small consumer to be better prepared for an emergency in the future which was reflected in the larger buying of future positions.

June proved to be a quiet and uneventful month in marked contrast to the dramatic developments in other metals. The restrictions imposed by the British Government at least have protected American consumers from the predatory incursions of the speculator that for many years have been the bane of the industry. Exploitations under present conditions, are difficult because of the increased expense in carrying tin when the importer is unable at once to furnish consumers' or jobbers' guarantees. Fluctuations in prices during the month ranged between 37,25 and 42.75c, due mainly to changing spot conditions.

July was an uneventful month from a market standpoint but prices steadily declined from 39.25c at the opening to 35⅛c at the end of the month. American consumption in May, June and July increased satisfactorily. Tin has suffered abroad somewhat with "peaceful" metals through the disorganization of industrial plants most of which have been converted into factories for war supplies.

The decline, that began about the middle of June, continued with slight reactions throughout August; that is, from 35.50c to 32.50c for spot. London no longer controlled the destiny of the metal being cut off from the continent by the logic of events, while more American orders were placed directly at the Straits. The excellent demand for tin in the United States was met with an ample supply without interruption from speculators, September was even quieter than August and fluctuations were narrow. A slight rise from 33½c to 33⅞c was followed by a decline, with a reaction to 32½c at the end of the month. Sales of some of the largest dealers were the smallest in two years. A development, that almost quenched buying-interest, was a new regulation by the British consul to govern the use of tin in the manufacture of goods for export The extremely low rate of sterling exchange also made the importers careful not to commit themselves on future contracts. Rumors that the British Government contemplated levying an export duty of 10% on tin was circulated but received small credence. It subsequently was contradicted but the effect was unsettling.

On October 1st, American stocks were shown to be the largest on record and a further drop in prices was naturally expected, but the revival of the export-duty rumor counteracted this depressing influence. Fear of such an impost engendered a better demand for spot and for tin on steamships afloat while sellers were reluctant to make commitments. Authorities at London and in the East Indies declared the export-duty rumors baseless but the idea still persisted in the trade.

The extension of active hostilities into the Balkans gave rise in October to fear

that transportation through the Mediterranean and Suez Canal might be imperilled. A desire to secure "safe tin" was thus aroused and caused an increased demand through which prices steadily rose from 32c on Oct. 4th, to 34¾c. at the close of the month.

An upward movement was suddenly inaugurated with the opening of November at London and the Straits, attributed to a decrease of 2,000 tons in the visible supply during October. Nine days later reports of the sinking of steamships in the Mediterranean by submarines, in the route of the tin laden boats, was followed by reports of similar losses two days later which set the market aflame. Excitement increased when it was reported that the British Government had ordered the Suez Canal closed. Had it been, this act would have necessitated the bringing of tin to America via the Pacific, entailing a delay of three weeks in transit. An active and urgent demand for "safe tin" again developed carrying prices from 36c to 44½c by November 15th. The irrational efforts to secure spot tin and metal afloat from London, rivalled the wild scramble to obtain tin at the beginning of the war. The speculators who circulated the false rumors, to exploit consumers, took profits on the rise causing a reaction. The decline continued until November 24th when sales were made at 39¼c. A recovery to 39¾c occurred before the month closed because of the delay in discharging the cargo of the steamship Indraghiri, while the Indrawadi was several days overdue

Other steamships were reported sunken in the Mediterranean but the November statistics made it evident that 1,000 tons or more might be lost without seriously affecting the available supply. Consequently the "news" for once fell upon barren ground.

Early in December the trade had lapsed into dullness from which it was startled by renewed reports of the sinking of East Indian ships by submarines. The ill-fated ships, however, carried rubber, not tin. Private cables again reported that thereafter all East Indian steamers would come to the U. S. via the Pacific. Some boats with products other than tin have taken the longer route to this country but Great Britain has intimated that direct shipments of tin from the Straits to the U. S. will not be allowed with freedom. Indeed, permits for such shipments were granted with much reserve in December. Permits were and are equally difficult to obtain at London although the English authorities encourage the traffic via the Thames.

The export of several small lots of tin from the U. S. in violation of the agreements made between some local jobbers and the British Government agents caused much concern to the English authorities. The culprits were later apprehended and some of the tin was held up in transit. A repetition of the offense may place the whole trade in jeopardy. The situation is now being closely watched by American and English authorities to safe guard all interests.

Some interest was shown in future positions of tin during the first half of Dec. were made. Spot tin slowly receded from 39c to 37½c during the same fortnight.

On Dec. 16th, private cables from London announced the intention of the British Government to maintain a stock of 4,000

TIN PRICES IN DECEMBER.

	New York.	London					
		Prompts.			Futures.		
Day.	Cents.	£	s	d	£	s	d
1	39.00	166	5	0	165	10	0
2	38.75	165	5	0	164	10	0
3	38.75	168	0	0	167	10	0
6	37.87½	166	0	0	165	5	0
7	37.37½	165	15	0	165	0	0
8	37.25	166	0	0	165	10	0
9	37.35	166	15	0	166	10	0
10	37.75	168	15	0	168	5	0
13	37.75	166	15	0	166	10	0
14	37.75	167	15	0	167	10	0
15	37.75	167	10	0	167	15	0
16	39.00	165	0	0	165	10	0
17	40.00	167	10	0	168	10	0
20	40.00	168	10	0	169	0	0
21	39.62½	167	5	0	168	5	0
22	39.00	166	0	0	167	0	0
23	38.75	166	0	0	167	0	0
24	39.25	168	0	0	169	0	0
27	39.12½	.....			.....		
28	39.12½	167	15	0	169	0	0
30	40.00	168	0	0	169	0	0
31	40.50	168	0	0	169	0	0
High	40.50	168	15	0	169	0	0
Low	37.25	165	0	0	164	10	0
Average	38.749	167	0	0	167	4	9

tons at London thereafter as a precautionary measure. The custom has been to maintain stocks of only 1,000 to 2,000 tons at London. These reports have not been confirmed but are accepted as probably true. The result was a stronger tone and an advance in spot to 40c. In the next two weeks prices ranged between 39c and 40c, the year closing at 40¼c per lb.

During the year there was a range of 24c between the highest point in April and the lowest level in October and the net result of the fluctuations was an advance of 7c per lb.

Spelter in 1915.

The events enacted in the zinc industry in 1915 were highly dramatic—with some comedy and much tragedy before the year closed. The market for spelter was essentially a child of the war god. Born and nurtured in a bellicose atmosphere it soon exhibited traits of a martial character. Fluctuations in prices were violent; transactions were heavy and dealings were made amid unusual excitement; in fact, there were frequent exhibitions of irrationality. From time immemorial tin has been regarded as the most erratic among metals; temporarily, it has given place to spelter.

When the year began spelter was selling at slightly under the average run of prices in the last decade, at 5.50c per pound but with the development of the phenomenal demand, largely for consumption in the manufacture of war munitions, prices of common spelter advanced in June to 26½c per pound; in fact, some small quantities sold as high as 27c and 28c while the high grades of brass spelter sold at 40c to 50c per pound. Subsequently there was a sharp reaction but prices still remained in the clouds when the year closed.

The result of the extraordinary call for the metal caused feverish activity in an effort to increase productive capacity. Obsolete plants were remodelled and even new smelters were laid down in the second and third quarters of the year which will result in a heavy increase in output during 1916. It required four or five months of sustained buying to convince the manufacturers of the practicality of increasing capacity. At first there was a natural disposition to regard the new conditions as ephemeral but as it became evident that the war would continue for possibly three years the building of new plants was pushed with vigor. The most important development of this character was the construction of the smelter at Donora, Pennsylvania, by the United States Steel Corporation which plant went into operation in October, having an annual capacity to smelt 100,000 tons of ore and to produce approximately 40,000 tons of refined spelter. This is the largest single zinc smelting plant in the world. Ordinarily it requires from eight months to a year to construct a smelter but by working night and day shifts and giving construction precedent over all other work, the Donora plant became active four months after the first spadeful of earth was turned. The United States Steel Corporation is one of the largest consumers of spelter and the loss of its trade to the merchant zinc smelters will be sadly felt in coming years. This was one result of the onerous prices prevailing for spelter during the second quarter of the year.

At the beginning of 1915 spelter sold at 5½ per pound at East St. Louis. During times of unusual industrial activity spelter on several occasions had sold as high at 8c per pound and for brief periods had touched 10c, but experience in the trade proved that any advance to 8c per pound was followed by a speedy reaction.

In normal times European consumers are dependent upon Belgium and Germany for their supply of spelter so that when the Belgium smelters passed into the hands of the Germans it was clearly evident that Europe must turn to the United States sooner or later for its supply of this metal. The demand did not develop into extraordinary proportions, however, until April when large orders were received from Europe as well as from domestic consumers. Military authorities, however, have small sense of merchandising and consequently the amateurish way in which buying was conducted at first resulted in unsettling

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc March 1st 1915 together with the price of spelter ruling on the same day.

1915—	Sheet Zinc.	Spelter St. Louis.
March 1	13.00	10.25
March 5	13.50	11.00
April 22	13.75	12.12½
April 23	14.50	12.37½
April 27	15.50	13.75
April 28	16.00	13.75
April 30	17.50	13.75
May 18	18.50	15.12½
May 20	19.50	16.00
May 25	20.00	18.75
May 26	22.00	19.25
Myy 29	24.50	20.75
June 1	26.00	22.50
June 3	30.00	26.00
June 9	33.00	25.75
June 14	30.00	22.75
June 23	27.00	18.25
July 27	24.00	18.37½
August 6	21.00	16.12½
August 16	17.00	12.12½
August 23	15.00	12.00
August 24	16.00	12.75
November 4	16.50	15.12½
November 9	17.00	15.87½
November 11	17.50	16.12½
November 12	18.00	16.31¼
November 17	19.00	17.25
November 18	20.00	17.37½
November 22	21.00	18.75
November 23	22.00	18.75

LEAD (Monthly Averages.)

	——New York*——			——St. Louis——		
	1913.	1914.	1915.	1913.	1914.	1915.
Jan.	4.35	4.11	3.74	4.20	3.99½	3.57
Feb.	4.35	4.06	3.82	4.20	3.95	3.72
Mar.	4.35	3.97	4.03	4.21	3.8	3.98
Apr.	4.40	3.82	4.19	4.25½	3.70	4.11
May	4.36	3.90	4.23½	4.22	3.81	4.16
June	4.35	3.90	5.86	4.21	3.80	5.76
July	4.37	3.90	5.74	4.25	3.75	5.52
Aug.	4.63	3.90	4.75	4.56	3.73½	4.59
Sep.	4.75	3.86	4.62	4.62	3.67	4.53
Oct.	4.45	3.54	4.59½	4.31	3.39	4.51
Nov.	4.34	3.68	5.15	4.18	3.58	5.07
Dec.	4.06	3.80	5.34½	3.94	3.67	5.26½
Av.	4.40	3.87	4.67½	4.26	3.74	4.57

* Trust price.

SPELTER (Monthly Averages.)

	——New York——			——St. Louis——		
	1913.	1914.	1915.	1913.	1914.	1915.
Jan.	7.23	5.33	6.52	7.04	5.14	6.33
Feb.	6.49	5.46	8.86	6.25	5.27	8.61
Mar.	6.29	5.35	10.12½	6.08	5.15	9.80
Apr.	5.79	5.22	11.51	5.59	5.03	11.22
May	5.51	5.16	15.82½	5.31	4.96	15.52
June	5.23½	5.12	22.63	5.05	4.93	22.14
July	5.41	5.03	20.80	5.23	4.84	20.53
Aug.	5.80	5.63	14.45	5.64	5.45	14.19
Sep.	5.83	5.52	14.49	5.65	5.33	14.10
Oct.	5.47	4.99½	*	5.27	4.81	13.89
Nov.	5.34	5.15	*	5.15	4.97	16.87½
Dec.	5.22	5.67	*	5.03	5.49	16.72
Av.	5.80	5.30	†13.91	5.61	5.11½	14.16

* Market nominal. † First nine months.

WATERBURY SPELTER AVERAGES.

	1911.	1912.	1913.	1914.	1915.
Jan.	5.77	6.78	7.56	5.54	6.55
Feb.	5.78	6.85	6.81	5.70	11.85
Mar.	6.01	7.17	6.56	5.59	12.15
Apr.	5.85	7.07	6.08	5.50	13.85
May	5.76	7.13	5.77	5.28	20.55
June	5.89	7.25	5.50	5.37	25.60
July	6.11	7.46	5.61	5.26	24.90
Aug.	6.29	7.34	5.99	5.66	19.30
Sep.	6.29	7.72	6.13	5.91	17.85
Oct.	6.49	7.83	5.74	5.23	16.85
Nov.	6.90	7.74	5.60	5.38	19.36
Dec.	6.81	7.65	5.44	5.90	21.15
Av.—	6.16	7.33	6.06½	5.53½	17.50

SPELTER PRICES IN ST. LOUIS.

Extreme fluctuations of Prime Western Spelter, East St. Louis delivery, by months and years:

	—— 1914 ——			—— 1915 ——		
	High.	Low.	Av'ge.	High.	Low.	Av'ge.
Jan.	5.25	5.10	5.14	7.62½	5.55	6.33
Feb.	5.35	5.20	5.27	10.00	7.65	8.62
Mar.	5.22½	5.12½	5.15	11.00	8.87½	9.80
Apr.	5.12½	4.85	5.03	14.00	9.25	11.22
May	5.51	5.16	15.82½	21.00	13.00	15.52½
June	4.97½	4.82½	4.93	27.00	17.50	22.14
July	4.95	4.80	4.84	22.75	17.75	20.53
Aug.	6.00	4.70	5.45	18.00	10.75	14.19
Sep.	5.85	4.95	5.35	15.25	13.37½	14.10
Oct.	5.00	4.60	4.81	14.62½	13.25	13.89
Nov.	5.20	4.80	4.97	19.00	14.37½	17.14
Dec.	5.65	5.20	5.49	18.00	14.75	16.72
Year	6.00	4.60	5.11½	27.00	5.55	14.16

the market and accelerating the upward tendency of prices.

The U. S. Government statistics published early in January, 1915, showing that the surplus stocks of spelter which had been weighing heavily on the American market throughout 1914, had been reduced to 20,000 tons, gave an incentive to the advance in prices that subsequently followed. It was assumed that speculators had taken a large tonnage of the metal from the market with similar intent. Whatever may have been the validity of this claim it had some influence in stimulating the rise in prices. Consumers, at first inclined to be dilatory in supplying their requirements soon awoke to the real situation and rushed wildly into competition with foreign buyers. The result was a rapid absorption of the surplus supplies and a variation in prices of spot spelter of from 2 to 3c per pound. Belated buyers were forced to pay extravagant premiums for prompt metal; but very little attention was paid to contracts for future delivery there being a general disposition to regard the buying movement, with its extraordinarily high prices, as a temporary condition.

By the fourth of March spot spelter had advanced to 11c per pound when the extraordinary buying temporarily ceased. Some producing interests at that time misreading the signs of unusual prosperity became anxious to make additional sales at the then relatively high prices, but this pressure to sell resulted in a reaction of 2c per pound and a further decline was anticipated. According to all precedent, the market should have dropped below 8c per pound, especially as there were numerous complaints that the high prices prevailing were ruining the business of the galvanizers. Early in April the demand for war purposes began with renewed vigor and as spot supplies had been previously exhausted buyers were anxious to place contracts for future delivery. The upward movement was again resumed energetically and the methods of buying previously referred to gave producers an opportunity to practically make their own prices. Sales were made at 16c before the month closed. In the desire to sell capacity ahead as far as possible they often compelled consumers to take double the quantity for which their inquiries called and for a long period of time. The impression seemed to be among the consuming interests that there was a famine in spelter which could never be relieved and they acted immediately and precipitately to secure a share of the light supply.

By the end of May sales were made at 21c. In June there was a wide variation between prices for spot and for future delivery but this extreme differential later was corrected. On June 4th common spelter sold from 26½c to 28c per pound, the latter in small quantities. From this high point the subsequent declines and rallies carried the market down to 10 to 12c per pound during the third quarter. About the middle of August the market had reacted to 10¾c from which there was a rally in November to 16 to 19c per pound. In December the market was relatively quiet with fluctuations between 14¾c to 18c per pound. Spot selling at the close of the year was at 17¼c per pound.

The easier feeling prevailing at the end of the year was attributed to the extraordinarily large output which was reported by the Government to have been 560,000 short tons—an increase of 40% over the preceding

SPELTER PRICES IN DECEMBER.

Day.	St. Louis. Cents.	London. £	s	d
1	17.75	99	0	0
2	17.12½	100	0	0
3	16.00	93	0	0
6	15.00	89	0	0
7	15.00	87	0	0
8	15.00	84	0	0
9	15.00	82	0	0
10	15.37½	82	0	0
13	16.00	82	0	0
14	16.37½	86	0	0
15	17.50	93	0	0
16	17.50	90	0	0
17	17.50	90	0	0
20	17.50	90	0	0
21	17.50	90	0	0
22	17.37½	90	0	0
23	17.37½	90	0	0
24	17.25	90	0	0
27	17.25	.....		
28	17.37½	90	0	0
29	17.37½	90	0	0
30	17.25	90	0	0
31	17.25	90	0	0
High	18.00	100	0	0
Low	14.75	82	0	0
Average	16.723	89	4	11

year. The production of primary spelter from domestic and foreign ores was 490,000 tons. Domestic consumption is shown to have been approximately 362,000 tons of which it is estimated that 200,000 tons were utilized in the manufacture of brass, 100,000 tons in galvanizing and 62,000 tons in the manufacture of sheet zinc and for miscellaneous purposes. The exports were 128,000 tons and stocks at the close of the year were slightly under 21,000 tons. It had been assumed that the surplus was smaller in tonnage. It is a significant fact that the industry begins the year 1916 with a spelter productive capacity in excess of 715,00 tons. Prior to the European war the annual productive capacity of the world was 1,100,000 tons. Great Britain also has increased capacity. The result of this development will doubtless be proclaimed in lower prices before the close of the European war.

Joplin Zinc And Lead Ore Market

The zinc blende ore market for December was strong and buying was fairly active throughout the entire month, with the exception of the second week of the month when the smelters bought a very limited tonnage and prices went to the lowest level for the entire month but rose rapidly the following two weeks till a high base price of $116 was paid. The lowest base price paid during the entire month was $80 per ton, the highest settlement price reported for premium ore was $119 per ton. The production has held up remarkably well for this season of the year, the sales for the month totaling 30,023 tons, selling at an average price of $89.70 per ton, giving a total value of $2,693,063. There was sold an average of 6,005 tons of ore each week, the total sales for the month were 4,953 tons greater than for the month of November, while the average selling price was $7.22 per ton less. The sales for the year total 293,373 tons, which sold at an average price of $78 per ton, giving a total valuation of $22,878,395; this total is greater than the 1914 production by 47,318 tons, selling at a price $38.90 per ton greater and giving a total increase in valuation of $13,258,890 The greatly increased production this year has been brought about by the abnormally high prices that have been paid for zinc ore during practically the entire year; the highest prices on record for zinc ore were paid last June, when ore sold at a high base price of $135 per ton. During the month of January 1915 zinc ore prices were comparitively low, spelter being quoted that month at 6 to 7c. St. Louis, but rose rapidly until the middle of June when the highest price was reached, being 27c per lb. The spelter market has fluctuated considerably up to the present time, during which time prices have not gone below 12c. or above 20c. per lb. The ore market has followed closely the trend of the spelter market. The strongest feature about the blende market is the demand for the high grade ore produced, due no doubt to the fact that a large tonnage of low grade ore has been produced in the Western States, and this is the only camp where high grade pure ore can be had in any quantity; the increased production has hardly been sufficient to supply the demand at all times. The unusually large surplus that was held by the producers the first part of the year has been absorbed, and until recently only a very small tonnage was being held. During the month of December some of the producers have held a large part of their production until the surplus has increased to approximately 7,000 tons, which is 3,000 tons greater than for the previous month.

Calamine ore was in good demand the first part of the month and production was normal, both demand and production slackened the latter part cutting down the sales for the month considerably. The prices paid during the month covered a range of $50 to $85 per ton on a basis of 40 per cent zinc. The sales for the month total 1,963 tons selling at an average price of $66.40 per ton giving a valuation of $130,343, which is 978 tons less than was sold the previous month. This month's sales make a total for the year of 21,569 tons selling at an average price of $50.56 per ton, giving a total valuation of $1,090,521. This year's production is greater than the 1914 production by 3,075 tons and $677,545.

The market for lead ore was strong and buying was active during the entire month, the highest price paid was $72.50, the lowest $65 per ton, the sales for the month totaling 5,286 tons at an average price of $69.76 per

ton giving a total valuation of $368,801.36, there was sold by weeks 1,057 tons. This month's production makes a total for the year of 46,035 tons which sold at an average price of $54.62 per ton, giving a total valuation of $2,514,313, which is greater than the 1914 production by 3,219 tons with an average price $8.42 greater, giving a total increase in value of $535,862.

The total value of all the ores produced and sold for the year 1915 is $26,483,229, which is more than double the value of all ores sold during 1914, the increase being $14,472,297, and is by far the greatest year the zinc mining industry has ever experienced in the Joplin District.

Lead in 1915.

Business in lead in 1915 was satisfactory from the standpoint of profits and liberal in volume. The foreign demand was the mainstay of the market. In comparison with other metals, such as copper and spelter, there was little to excite interest outside of the trade until in June when a speculative wave rushed over the industry resulting in a phenomenal volume of business, high prices and feverish excitement. The speculative fire was quenched with the passing of June and business resumed its ordinary channel with relatively moderate fluctuations. Renewed foreign buying restored a more vigorous tone after a reaction in July and August, but there were no dramatic developments when the year closed.

At the beginning of 1915 the lead producers, who generally hold the market well in hand, were disconcerted to find that production in 1914 had increased 100,000 tons over the preceding year in the face of a curtailment in output which it was presumed had been carried out with more or less fidelity according to program. The significant fact was that a large unsold stock was indicated. The immediate result was a decline in price from 3.80c to 3.70c per pound at New York the latter being an unsatisfactory price even in ordinary times. The salvation of the trade, however, came through the large export demand and the market, under this stimulus, gradually improved until the price had advanced to 4.25c in February. In March the outlook had so greatly improved that producers increased production. Prices remained steady until toward the end of May, when a new element was introduced through outside influences, evident in the sharp advance in prices which originated in the open market. Excitement began to run high in the first week of June, domestic and foreign consumers as well as speculative buyers made haste to place contracts for early shipment until the movement was little short of a runaway market. The American Smelting & Refining Co. at least lost its usual control and its successive advances were merely the reflection of the selling prices of independent producers. Speculative orders excited the actual consumers who placed large contracts for future delivery at steadily advancing prices.

In the aggregate a very heavy volume of business was placed in the first half of June, individual transactions running from 1,000 to 10,000 tons each. There were not a few in the trade, however, who were skeptical regarding large tonnages reported sold for foreign account. For several days, market events were most dramatic and prices had an unusually wide range—from ¾c to 1c per pound. Sales were made at New York from June ninth to June fifteenth at 6.25c to 7.50c per pound. A reaction to 5.40c came on June 22nd.

At this time excitement was running high in spelter, and lead was expected to follow in the same channel. Galvanizers whose business was paralized by the extraordinary advance in spelter came into the market for large tonnages of lead and it was naturally assumed that terne plate was to be manufactured at the expense of galvanized products. Large orders, for lead were actually placed by consumers for domestic and foreign shipment. Some exceptionally busy contracts were entered into for delivery over the first half and whole of 1916 . These transactions seemed to create a sound basis for higher prices but the mainspring of the movement was discovered to be in a speculative pool. Just prior to the sudden and sharp advance in lead Wall street operators were tipped to buy lead mining stocks in an effort to create new

"war brides." Some of the manipulators were identified as having been connected with the successful June copper pool.

Few, if any, transactions between producers and consumers were reported above 60c per lb. The speculators were held responsible for the subsequent rise to 7c and 8c per lb. An effort was then made to liquidate which resulted in much irregularity in the decline that followed, as there was a lack of solid foundation in the market previously established As the speculative operators withdrew the market again passed into the hands of producers at the 5.75c. per lb. level. Dullness and weakness followed in July, but in August, the spot price having fallen to 4.40c, when large sales restored healthful conditions. The market was uneventful during the remainder of the third quarter and the price was steady at about 4.50c to 4.90c. Early in November larger buying by domestic consumers and also contracts placed for military purposes for export developed a stronger tone and the price advanced to 5.25c. The extraordinary demand for sulphuric acid, among other chemicals to be used in the manufacture of high explosives, at this time was reflected in an active demand for special brands of lead to be utilized in the manufacture of sulphuric acid chambers. Fractional premiums were paid for this lead. In December liberal contracts were placed for export resulting in an advance to 5.50c per lb. A reasonably confident feeling prevailed as the year closed.

According to government returns just made made the production of refined lead from domestic and foreign ores in 1915 was approximately 565,000 net tons and the lead content of ore mined in the United States was apparently in excess of 600,000 net tons. This is a gain of 15% compared with the previous year and establishes a new record of output.

COMPOSITE METAL PRICES.

Computation of January 3, 1916.

Pounds.	Metal.	Price.	Extension.
2½	Spelter (St. Louis)	17.25	43.125
4	Lead (St. Louis)	5.45	21.800
3	Copper (Electro)	23.25	69.750
½	Tin (New York)	42.00	21.000
10 pounds			155.675
	One pound		15.5675

LEAD PRICES IN DECEMBER.

Day.	New York.* Cts.	St. Louis. Cts.	London. £ s d
1	5.25	5.20	28 17 6
2	5.25	5.20	28 15 0
3	5.25	5.20	28 5 0
6	5.25	5.17½	28 5 0
7	5.25	5.12½	27 15 0
8	5.25	5.12½	28 2 6
9	5.25	5.15	28 0 0
10	5.25	5.15	27 15 0
13	5.25	5.15	27 15 0
14	5.40	5.32½	28 5 0
15	5.40	5.32½	29 5 0
16	5.37½	5.30	28 15 0
17	5.37½	5.30	28 15 0
20	5.37½	5.30	28 17 6
21	5.40	5.30	29 0 0
22	5.40	5.32½	29 0 0
23	5.40	5.32½	29 0 0
24	5.40	5.32½	29 5 0
27	5.40	5.32½	.....
28	5.45	5.35	29 10 0
29	5.45	5.35	29 17 6
30	5.45	5.35	30 5 0
31	5.50	5.42½	30 2 6
High	5.50	5.42½	30 5 0
Low	5.25	5.10	27 15 0
Average	5.349	5.265	28 15 10

* Outside market.

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 10, 1915, have been as follows:

June 11, 1915	Advanced	.25c to 6.50
June 12	"	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	"	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	.10c to 5.00
November 10	"	.15c to 5.15
November 15	"	.10c to 5.25
December 14	"	.15c to 5.40
December 31	"	.10c to 5.50

Aluminum In 1915.

Aluminum in 1915 experienced a phenomenal advance in price in common with other metals largely used in the manufacture of war munitions. In January sales were difficult to make at 19c per lb. Late in the year transactions in the open market were reported at 60c per lb. A more ample supply and a less heavy demand brought about a reaction toward the close of the year.

After a quiet period, Jan. to April inclusive, in which prices ranged between 18¾ and 19½c per lb. for ingots, a large buying movement developed early in May, carrying prices upward rapidly, from 19½c to 26c per lb. on June 1st In two or three weeks the available supply for sixty days of domestic and foreign origin was sold by importers and the American producers. At this time, Government statistics made it known that importations during the nine months ending March 1915, were a little over 11,250,000 lbs. against arrivals during the corresponding period in 1913-14 and imports of 19,315,592 lbs. in the similar period of 1912-3. Thus, it was shown that the foreign supply for American consumption was being reduced. This was one result of the commandeering by the Governments, of all the aluminum works in France, to be devoted exclusively to the manufacture of war munitions. France is the second largest producer of aluminum in the world and in 1913 contributed 25% of the total output.

The extraordinary rise in the price of copper, spelter and antimony opened a wider field to ingot and sheet aluminum, while increased demand from automobile manufacturers and from the aeroplane industry, placed the foundries making aluminum castings in full operation after a long, lean period.

Manufacturers of aluminum utensils, also, freed from German competition, benefited from an increased demand, including repeat orders from several large foreign governments for water bottles and cooking utensils to equip the huge armies in the field and trenches.

At the close of June ingot aluminum sold at 32c per lb. and before the end of July sales were made at 33c per lb. In August it was evident that importantions had entirely ceased and open market operations were necessarily confined to small lots that commanded between 35 and 40c per lb. This brought out the fact that the situation was under the control of the American Aluminum Co, the one producer of ingots in the United States. Affairs of this company are not made public and prices of the product are a matter of private treaty. It was indicated, however, that the alumnium productive capacity was inadequate to meet the increased demand which grew greatly as the war progressed. The company was reported to be heavily sold into the future and behind in making deliveries on contracts.

Early in September the scarcity of spot metal was more pronounced and the few small lots available in the open market were difficult to buy under 43 to 45c with buyers bidding several cents less per lb. One significant development was the appearance of an export demand followed by one shipment of 181 tons. Stocks carried by dealers and by the recoverers of old material were reduced to a very low point but an advance to 48 and 50c per lb. discovered some previously invisible supplies. At this time it was reported that the Amercian producer had sold for 1916 delivery at 35c but that its capacity into the middle of 1916 had been disposed of to regular customers. The difficulty of obtaining supplies and the high prices prevailing caused the foundry industry to look for a substitute, which was found in grey iron—the demand for aluminum castings fell off 50%.

In October the most important event was the purchase of the French interest in the hydro-aluminum works that were buildnear Whitney, N. C. by the Aluminum Co. of America. Construction of this plant began early in 1914 but work was stopped shortly after the outbreak of the European war. At the end of October the price of No. 1 Virgin aluminum in the open market was 55 to 56c per lb. and it was reported that the largest interests had sold at the inside price. In November when prices had advanced to 58 to 60c per lb. producers were able to make closer deliveries on contracts. The domestic and foreign demand was less urgent and a large supply of old material was offered through trade channels when several hundred tons of alumnium

were derived through the substitution of copper wire for aluminum wire by power transmission, cable and telegraph companies. These companies had made aluminum installations in 1914 when aluminum was selling at 17¾c, the minimum price in the history of the industry and when copper prices were regarded as prohibitive.

December witnessed the placing of few contracts. Important domestic buyers remained out of the market and no export orders could be filled because of the embargo upon foreign traffic. Offerings by second hands were largely increased through accummulations of the interior. In consequence, prices dropped 3 to 4c per lb. The trade assumed a waiting attitude as the year closed.

Antimony In 1915.

Antimony was active and strong throughout the first quarter of the year, prices of all kinds steadily advancing under a continuous heavy demand from manufacturers of war munitions. Supplies were absorbed with avidity and by the end of February the stocks of Hungarian were exhausted. A quiet period was experienced during the first half of April without any reaction in prices and renewed heavy buying by shrapnel manufacturers caused a resumption of upward movement attended by feverish excitement. The volume of business transacted in the last two weeks of April was the heaviest in the history of the trade. It is estimated that 75% of the buying was for consumptive account. Probably one-third of the sales were to consumers other than manufacturers of munitions and of other war materials.

Early in May supplies of English antimony disappeared entirely and quotations were necessarily dropped. From Jan. 1st there had been a continuous rise of 23 ¾c. per lb. on Cooksons and from Jan 1st, to April 26th, an advance of 18¼c. per lb. on Hallets. As England had placed an embargo on exports of antimony in 1914, exhausted supplies could not be replenished. Hungarian had advanced from 13¼c. on Jan 1st, to 19c at the end of Feb. when it vanished from the market. Attention was therefore centered more upon the Chinese and Japanese metal. Russia had already placed huge contracts in the Far East so that in Feb. there were few offerings from Japan to the U. S. even for March-April shipment but there were fair sized local stocks to draw from when Japan later came into competition with Russia and Italy in the New York market for the Japanese metal. As domestic consumers also continued to buy freely the advance in prices was accelerated.

In May some dullness and a slight reaction were followed by active buying and higher prices, the rise extending into June. Prices were well sustained during the second half of June although there was less demand. At 34¾ to 37½c., it is said, that there is a profit of 500% to the Oriental producer of refined antimony. It is most dangerous to speculate on antimony at such levels, prices having doubled 7 times since the declaration of war, July 31st, 1914 but consumers are obliged to have the metal whatever the cost and some fair orders were placed in July for shipment to the Far East.

Concessions were made early in Aug. to stimulate buying and were successful. Russia was again in the market but was quickly satisfied. Renewed efforts to sell caused a dowward movement. Evidence of increased output seemed at hand. The decline, however, again brought ammunition makers into the market. As buyers withdrew prices receded. Late in Aug. some few lots of English metal were alowed to come from London on special permit to be used in the manufacture of munitions for the Allied Governments.

Relatively small business was transacted in Sept., but there were some active days during the month. Chinese offerings were few. The main feature of interest was the appearance of American antimony, refined on the Pacific coast. The output of the home product is estimated 100 to 150 tons per month. Importations increased.

In Oct. the closing of the Panama Canal stimulated buying and prices advanced

rapidly. Buying was larger especially for export to Canada. The result was reduced stocks. There was also a good demand for future shipments from China and Japan via rail from the Pacific coast. Domestic ammunition manufacturers were small buyers having covered requirements for six months or so. It is estimated that the monthly consumption by the U. S. and Canada for war munitions alone, is now 600 to 700 tons which is equal to the entire monthly consumption for all purposes in times of peace.

Continued buying in November caused a further advance in prices. The demand was mainly for prompt shipment and the spot market was excited. Shipments from China and Japan were restricted as a war measure and local stocks were reduced to a low point. Large sales were made in the last half of the month while spot sold up to 40c. per lb. Larger imports and more metal afloat relieved the market at the close of the month. An active demand and strong market for spot early in December carried the price to 41c, but gave place later to dullness and lower prices following the arrival of larger supplies from the Orient. Future positions were in more favor after the middle of the month and about the 20th, more interest in spot was developed prices recovering much of the loss sustained earlier in the month. At the close of the year stocks were again light.

CHINESE and JAPANESE ANTIMONY.

Average monthly price of **Chinese and Japanese** (ordinary brands) in New York.

	1911.	1912.	1913.	1914.	1915.
Jan.	7.15	6.89	8.77½	6.03	15.24
Feb.	7.53	6.78	8.16	6.00	17.62½
Mar.	8.75	6.78	7.91	5.94½	20.93½
Apr.	8.34	6.87	7.82	5.82	23.97
May	8.06	6.98	7.75	5.78	34.71
June	7.38	7.07	7.62	5.62½	36.53½
July	7.32	7.37	7.55	5.44	35.98
Aug.	7.22	7.58	7.48	13.05	32.57
Sept.	7.13	8.00	7.31	9.79½	28.50
Oct.	6.94	9.11	6.46	11.64	30.96
Nov.	6.94	9.11	6.28	14.14	37.881
Dec.	6.97	9.05	6.05	13.15	39.36
Av..	7.48	7.63	7.43	8.53½	29.52

ALUMINUM AND SILVER PRICES.

New York

	—Aluminum—			—Silver—		
	1913.	1914.	1915.	1913.	1914.	1915.
Jan.	26.31	18.86	19.01	62.93	57.56	48.89½
Feb.	26.20	18.80½	19.20	61.64	57.50½	48.48
Mar.	26.72	18.30	18.94½	57.87	58.07	50.24
Apr.	26.91	18.08	18.83	59.49	58.52	50.25
May	25.95	17.93	21.85	60.36	58.18	49.91½
June	24.79	17.87	29.60	58.99	56.47	49.03
July	23.34	17.59	32.50	58.72	54.68	47.52
Aug.	22.73	20.38	34.00	59.29	54.34	47.18
Sep.	22.00	19.28½	46.75	60.64	53.29	48.68
Oct.	20.32	18.25	54.17½	60.79	50.65	49.38
Nov.	19.49	18.83	57.85	58.99	49.10	51.71
Dec.	18.85	19.02	56.80½	57.76	49.38	54.97
Av.	23.63	18.59½	34.13	59.79½	54.81	49.69

ALUMINUM, SILVER and ANTIMONY PRICES IN DECEMBER.

	Aluminum.	— Silver —.		Antimony*
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents
1 ..	59.00	56⅛	26 15/16	39.87½
2 ..	58.00	55½	26 11/16	39.87½
3 ..	58.00	55	26 7/16	39.25
4 ..	.....	55	26 7/16	.....
6 ..	58.00	56¼	26 7/16	39.25
7 ..	58.50	56⅛	26 15/16	39.25
8 ..	58.50	55¾	26¾	39.25
9 ..	58.50	56	26⅞	39.25
10 ..	58.50	55¾	26¾	39.25
11 ..	.....	56	26⅞	.....
13 ..	58.50	55⅝	26 11/16	39.12½
14 ..	58.00	55⅝	26 11/16	39.12½
15 ..	58.00	55	26⅜	39.00
16 ..	58.00	54⅛	25 13/16	39.00
17 ..	57.00	54⅛	25 13/16	39.00
18 ..	.....	54¼	26	.....
20 ..	56.00	54⅜	26 1/16	39.00
21 ..	54.00	54⅜	26 1/16	39.00
22 ..	55.00	54⅛	25 13/16	39.25
23 ..	55.00	54	25 11/16	39.25
24 ..	55.00	53⅞	25¾	39.25
27 ..	55.00	53⅞	.....	39.50
28 ..	55.00	54⅛	25⅞	39.62½
29 ..	55.00	54⅜	26	40.00
30 ..	55.00	54⅞	26 3/16	40.00
31 ..	55.00	55	26¼	40.00
High	60.00	56¼	27 1/16	40.00
Low	53.00	53⅞	25¾	39.00
Av...	56.805	54.971	26.372	39.364

* Chinese and Japanese.

BRANDS OF COPPER IN UNITED STATES.

LAKE.

	Refined at:	Branded.
Adventure	Hancock, Michigan.	Adv. C. Co.
Atlantic	Houghton, Michigan.	A.
Calumet & Hecla	Hubbell, Michigan.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	B. L.
Centennial	Hancock, Michigan.	C. C. M. Co.
Copper Range	Houghton, Michigan.	C. R.
Franklin	Hancock, Michigan.	F. M. Co.
Isle Royale	Dollar Bay, Michigan.	I. R. C. Co.
Mass.	Hancock, Michigan.	Mass.
Michigan	Houghton, Michigan.	M. C.
Mohawk	Houghton, Michigan.	M. M.
Osceola	Dollar Bay, Michigan.	T. O.
Quincy	Hancock, Michigan.	Q. M. C.
Tamarack	Dollar Bay, Michigan.	T. O.
Victoria	Hubbell, Michigan.	V. C.
Winona	Hubbell, Michigan.	W. A.
Wolverine	Houghton, Michigan.	W.

ELECTROLYTIC.

	Refined at:	Branded.
American S. & R. Co.	Perth Amboy, N. J.	P. A.
Balback S. & R. Co.	Newark, N. J.	Cathodes only.
Baltimore Copper Works	Baltimore, Md.	B. E. R.
Boston & Montana Co.	Great Falls, Mont.	B. & M.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Copper Queen	Laurel Hill, L. I.	C. * Q.
Miami	Laurel Hill, L. I.	A. L. S.
Nichols Copper Co.	Laurel Hill, L. I.	L. N. S.
Orford Copper Co.	Chrome, N. J.	O. E. C.
Raritan Copper Works	Perth Amboy, N. J.	N. E. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. R. W.
United Metals Selling Co.	Laurel Hill, L. I.	R. M. C.

CASTING.

	Refined at:	Branded.
Balbach S. & R. Co.	Newark, N. J.	N. B. C.
Boston & Montana Co.	Great Falls, Mont.	M. A.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Duquesne Reduction Co.	Pittsburgh, Pa.	D. E. C.
Nichols Copper Co.	Laurel Hill, L. I.	C. N. C.
Phelps, Dodge & Co.	Laurel Hill, L. I.	P. D. Co.
Tottenville Copper Co.	Tottenville, N. Y.	C. T. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. S.
White & Bro., Inc.	Philadelphia, Pa.	W. B.

Trade Notes.

TORONTO, ONT.—D. M. Gilpin & Co., Ltd., has been incorporated to manufacture iron, steel and other metals; $250,000 capital stock; provisional directors Dalton McC Gilpin, D'Arcy B. Gilpin and James R. Roaf, Toronto.

Milwaukee,—Leo G. Smith former manager of the Prime Steel Co., Milwaukee, which went into bankruptcy several months ago, has organized the Electric Steel Casting Co. of Milwaukee, and will engage in the production of electric steel material at once.

The National Copper Works, Boston, Mass., is a new corporation with capital of $100,000. Morris Broomfield, Hubert H. Snow and John J. Connolly are the incorporators.

MONTREAL, QUE.—Canadian Electro-Products, Ltd., has been incorporated to manufacture metals; $500,000 capital stock; by Walter R. L. Shanks, Daniel P. Gillmor, Francis G. Smith Bush and others, Montreal; J. S. Norris of the Monrteal Power Co. and Julian C. Smith, of the Shawinigan Power Co., are interested. The new company proposes to smelt 50 tons of steel per day by the electric smelting process and will have one unit for 25 tons per day operating in about six weeks.

The Hoevel Mfg. Co., Hornell, N. Y., has been formed with $60,000 for the purpose of manufacturing sandblast machines and foundry equipment. F. W. Weiss, H. Lawson and H. G. Wenzel, Jr., are the officers.

AUGUSTA, ME.—The Rochester Machine Co. has been incorporated; $1,000 capital stock; by Ernest L. McLean, S. L. Hall and E. M. Leavitt, Winthrop.

The Marlin Arms Corporation, which has just taken over the Marlin Fire Arms Co., New Haven, Ct., has signed an agreement with the Colt's Patent Fire Arms Mfg. Co., Hartford, Ct., to make its machine guns of 1914 model, and has closed a $10,000,000 contract with J. P. Morgan & Co., New York, to furnish 10,000 guns for the allies, delivery to begin in February.

The Consolidated Steel Company, Ltd, Toronto, has been incorporated with a capital stock of $100,000 by William H. Beatty, Francis A. Hammond, Charles B. McClurg and others to manufacture machinery, shells boilers, rolling stock, etc.

The Valley Park Mfg. Company, Valley Park, Mo., a suburb of St. Louis, has been incorporated with a capital stock of $150,000 by Henry M. Blossom, I. Folger and E. D. Blossom, and will equip with woodworking machinery.

The Canadian Chadwick Metal Co, Ltd., Dundas, Ont, has been incorporated with $40,000 capital to carry on business as founder, engineer and machinist, by J. R. Marshall, A. B. Turner and H. A. Budbridge.

MUSKEGON, MICH.—The Lindermann Machine Co. is constructing an addition and will start to build metal working machines. The addition will be 31 x 153 feet. Thirty-two additional motors will be installed.

The Harding Metal Products Co., Philadelphia, Pa., has been formed with $25,000 capital by R. M. Harding, H. Bonsall and J. M. Frere, to manufacture steel, iron, copper, brass, etc.

ROCKAWAY, N. J.—The International High Speed Steel Co., 99 Nassau street, New York, is having plans prepared for a 1-story, 173 x 300-foot manufacturing building to be erected at Rockaway.

The Oldroyd Mfg. Company, Knxville, Tenn., has been organized with a capital of $50,000 to manufacture coal-cutting mamachines. The incorporators are C. S. Oldroyd, J. R. Foster, E. H. Ford and others.

The Yankee Farm Tractor Company has been organized at Westfield, Mass., with capital stock of $50,000, to manufacture a tractor invented by E. R. Pendleton, who is the president of the company. The factory site has not been selected, but the company will probably locate in Westfield

The Steel and Metal DIGEST

VOL. VI. NEW YORK, FEBRUARY 1916. NO. 2.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer.
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Remarkable Business Situation.

The opening month of the New Year has served to demonstrate the tremendous momentum that business in this country has attained. Several unsettling features have come up lately, which under ordinary circumstances would have caused hesitancy, and they have had this effect in Wall Street, but in all lines of industry these features have not had the slightest influence. The physical fact of there being more orders than our mills can fill has caused our manufacturers to be indifferent to everything except to keep up with the demand being made on them for finished goods and to get the raw material and labor to produce them, while capital has stood with open hands ready to do its share to its utmost.

Domestic and War Orders Late Last Year Underestimated.

It proves that the volume of orders placed in the closing months of last year were underestimated, and furthermore that they were for real necessities, and not subject to changes that might be expected to influence them if they contained any element of speculation or a draft on the future continuing to be promising.

Cause of Present Condition of Affairs.

To the requirements of a country

which for two years had undergone in its legitimate needs no fundamental curtailment, but which had cut to the bone in that time the purchase of all requirements that could be curtailed, in which operating production was cut in half, and stocks of merchandise in all hands were diminished to the vanishing point, there came in the last half of the year 1915 a mass of war orders, and with mounting prosperity, the opening of the floodgates of long pent up enterprise and confidence, it has taxed our facilities to cope with the situation.

In considering present conditions we believe too much credit has been given to the part these war orders have played, for even without them a great volume of trade for our home requirements would have come. But of course these war orders have made the movement spectacular, the profits from them have glutted our banks with money, speeded up operations enormously, advanced prices sensationally and overwhelmed the country with wealth and confidence. There has been the demand to make up the vacuum that had accumulated in 1913 and 1914 in diminished stocks and forced economy, and added to it is an extraordinary war demand and the natural movement to carry and accumulate supplies, which is always the case in an advancing market.

This explains our production of iron and steel having in about a year advanced from the rate of 18,100,000 tons per annum to to-day's rate of 39,000,000 tons per annum, with apparently greater amounts needed than we can supply, and this trade is so heavily booked into the future that operations at present rate seem assured for six months or more.

Is This Situation Assured for Months to Come?

Does this mean that the general business future is assured for months to come? We think not, because standing out beyond all other dangers to our present prosperity is the chance of the war coming to an early end also the danger of our being involved.

What Will Follow End of War?

As regards the ending of the war and its results, we refer our readers to a speech printed in this issue by Alba B. Johnson, President of Baldwin Locomotive Works, and which we reproduce as it seems to us to cover the queston better than anything we have seen. Also the change will not wait until peace is declared. Long before the end comes it will be foreshadowed and elect minds will take time by the forelock to anticipate the future. The chill will come before the fever, and it is this that must be watched for. When the change comes we will appreciate the danger of the price platform on which we stand, and when prices begin to decline we will again learn that while there is almost no limit to the buying power of the American public on an advancing market, there is also no limit to the way they can stay out of the market on a declining one. This is a trait of our national disposition that some of us have learnt by experience to hold in respectful fear.

Has our increased production made up yet the vacuum of reduced stocks? Perhaps not, plus war orders, but the longer the end of the war is delayed, the greater will be the collapse we think in the values and activities we have built up under war influences.

What Will Be the Effect on Iron and Metals If We Become Involved?

As we write, the situation has become grave between our country and Germany. Should relations be broken off it seems to us it would mean the instant starting in on our programme of preparedness which is so absolutely necessary, and that can only mean one thing, increased demands on our factories for war munitions, and this means a still greater demand for metals, iron and steel. True, it may upset speculation and confidence, and some industries that are swimming on such waters may be tossed about to the sickness and discomfort of those in such boats, but the ship in which the iron and steel and metal trade is sailing is not dependent on the winds of speculation or even confidence, but on the actual necessities of our requirements, which would be increased by our county joining the belligerents in demand for war supplies. We will proceed under a greater head of steam, and high as prices are it would seem they must go higher in such an event. Capital may become shy for ordinary requirements of peace and speculation, but it will be lavished into what is necessary for war if war is near at hand.

Baring a sudden and unexpected collapse of the war, and the settling down of the world to pay the bill by economy, we can see nothing in the trades we represent but continued and perhaps increasing activity; continued and perhaps still higher prices and profits, but the greater the facilities to produce which we bring into play, and the consequent increase in output, the more sensational will be the collapse when peace is declared.

Cyclone Cellar for Profits.

The wise man will meanwhile put his profits in safety, and perhaps it is because this is being done that bonds and undoubted securities continue to command a price out of all relation to the increased rate value of capital, and this is why securities that depend for their market price on the imagination and speculation, refuse to sell at what, in normal times, the prosperity of the country and their present earning power would seem to justify.

-o-O-o-

Business Trends.

1915—OUR GREATEST YEAR IN EXPORT TRADE.

The December exports of merchandise were the largest ever recorded in any month in the country's history. The calendar year's total of exports $3,550,915,393 exceeded that of 1914 by almost 68% and that of 1913, the hitherto record year in export trade by $1,066,000,000 or 42%, compared with imports, and which totaled $1,778,605,855 and which was only 2% below the high record year 1912.

Our foreign trade in December and for the year 1915 and 1914 compare as follows:

December.	1915.	1914.
Exports	$359,301,274	$245,632,558
Imports	171,841,665	114,656,545
Excess of exports	$187,459,609	$130,976,013

Year.	1915.	1914.
Exports	$3,550,915,393	$2,113,624,050
Imports	1,778,605,855	1,789,276,001
Ex. of exports	$1,772,309,538	$324,348,049

INCREASE IN NEW ENTERPRISES.

Not in years has the formation of new enterprises been on such an extensive scale as during the past month. The grand total of all companies incorporated with a capital of $100,000 or over, covering all States, including those of the East, aggregated $334,655,000. This in an increase of more than 50% over December, and more than 300% greater than in January, 1915. Papers filed for new companies in the Eastern States with a capital of $1,000,000 or over, however, involved $270,995,000. With the exception of September last, when the incorporations amounted to $286,625,000, the current exhibition is the best monthly showing in years. Very interesting details will be found on another page.

Following are the comparative figures as specially compiled by The Journal of Commerce and Commercial Bulletin of companies incorporated in the Eastern States during the last three years with an authorized capital of $1,000,000 or more:

	1916	1915	1914
Jan.	$270,995,000	$51,150,000	$120,050,000
Feb.		53,950,000	51,575,000
March		70,050,000	57,700,000
April		32,200,000	136,185,000
May		78,950,000	62,700,000
June		181,247,100	70,050,000
July		71,100,000	68,700,000
Aug.		67,100,000	50,600,000
Sept.		286,625,000	54,800,000
Oct.		208,695,000	35,487,500
Nov.		190,075,000	81,650,000
Dec.		135,125,000	105,450,000
Total		$1,426,267,100	$894,947,500

COMPARISON OF JANUARY FAILURES.

There were 1,771 failures reported in Bradstreet's Journal in January this year, a decrease of 25.5% from January a year ago, though they were 11% more numerous than in December 1915 and 2% in excess of January 1914.

Liabilities in January 1916 totaled $17,179,977, a decrease of 36% from December 1915 and 13% from November, and only about one-third of what they were in January 1915.

We give below a table showing the number of failures, assets and liabilities dating back to January 1893:

	No.	Assets.	Liabilities.
1916	1,771	$8,077,596	$17,179,977
1915	2,378	35,428,030	50,576,581
1914	1,729	20,421,273	35,196,682
1913	1,566	8,404,342	15,619,192
1912	1,701	10,766,526	20,120,690
1911	1,376	18,972,069	30,456,469
1910	1,241	9,560,351	17,333,849
1909	1,317	7,217,612	14,073,264
1908	1,706	45,344,483	64,922,450
1907	1,109	8,593,134	18,075,595
1906	1,213	6,636,350	15,360,188
1905	1,199	6,058,467	11,113,964
1904	1,121	9,765,868	17,076,595
1903	1,113	4,538,343	10,529,372
1902	1,343	6,113,284	14,589,064
1901	1,253	6,611,238	12,334,212
1900	1,138	4,166,630	10,256,120
1899	1,252	6,669,748	14,369,596
1898	1,540	7,083,327	14,359,335
1897	1,867	14,581,506	25,490,042
1896	2,147	16,097,359	30,207,250
1895	1,818	14,505,120	24,883,550
1894	1,953	11,913,989	22,516,848
1893	1,430	9,271,163	16,733,942

Business Trends.

HIGH RECORD FOR JANUARY BANK CLEARINGS.

Bank clearings for the month of January last, $19,958,401,410, represent a new high record for that month. The total is the third heaviest ever registered, the honors in this respect being held by October and December of last year, when the respective sums were $20,050,000,000 and $20,167,000,000. Indeed, the showing for January is but 1% under the high point made in the final month of 1915.

Following are the aggregates of clearings monthly at all cities, compared with the like periods in four preceding years:

(Six figures omitted.)

	1916	1915	1914	1913	1912
Jan.	$19,957	$13,389	$16,100	$16,090	$14,977
Feb		11,832	12,770	13,481	12,788
Mar		13,733	14,148	13,985	14,330
1st q'r		38,954	43,018	43,556	42,095
April		14,900	14,791	14,153	14,855
May		14,516	13,061	13,980	14,708
June		14,011	13,841	13,580	13,519
2d q'r		43,427	41,693	41,713	43,082
July		14,812	14,385	13,422	13,487
Aug.		14,170	9,840	12,260	13,097
Sept.		15,289	9,927	13,293	12,956
3d q'r		44,271	34,152	38,975	39,900
Oct.		20,050	11,624	15,551	17,002
Nov.		19,249	10,982	13,742	15,228
Dec.		20,167	12,540	14,537	15,217
4th qr		59,466	35,146	43,830	47,447
Gd. total		186,118	154,009	168,074	172,524

HEAVY IRON PRODUCTION.

Pig iron production in January fell off slightly from the December rate, but the loss was due entirely to the strikes at Youngstown. The 45,000 tons reduction there was nearly made up by the blowing in of furnaces in other districts. In January the country's output was 3,188,344 tons, or 102,850 tons a day, against 3,203,322 tons in December, or 103,333 tons a day.

There was a net gain of 12 in the number of active furnaces last month, 307 being in blast February 1st, with a capacity of 106,172 a day, against 295 on January 1st, with a capacity of 105,400 tons a day.

STOCK EXCHANGE TRANSACTIONS IN JANUARY.

During the month of January sales of stocks on the New York Stock Exchange aggregated 15,313,998 shares, as against 14,647,353 shares in December and 5,109,700 in January, 1915. The largest day's trading was 1,009,799 shares on the 3rd, and the smallest 465,300, on the 25th.

Bond business amounted to $114,683,000, against $120,110,000 in December, and $57,246,000 in the month of January, 1915. The largest single day's transactions were $7,062,000, on the 14th, the smallest, $3,449,000 on the 25th.

RAILWAY MILEAGE BUILT IN 1915 AND OTHER YEARS COMPARED.

Fewer miles of railroad were built in the United States during the past year than in any other year since 1864. There have only been three other years since 1848 in which the increase in mileage was less than 1,000. The following table taken from the Railway Age Gazette shows new railway mileage by years:

1915	933
1914	1,532
1913	3,071
1912	2,997
1911	3,066
1910	4,122
1909	3,748
1908	3,214
1907	5,212
1906	5,623
1905	4,388
1904	3,832
1903	5,652
1902	6,026
1901	5,368
1900	4,894

Steel Corporation Earnings.

Unlike the earnings reported by the Steel Corporation for the September quarter, which fell short of expectations derived from a computation based on the June earnings, the earnings for the December quarter are fully as high as would have been expected. They are, indeed a trifle higher. The $51,232,788 earnings reported exceed the highest estimate seriously made in the trade, $50,000,000, and they slightly exceed what we should have estimated just before the report was made.

The September earnings, $13,793,327, may be taken at around $13,000,000 for profits on goods shipped, dropping the $793,327 as representing in a rough way the profits on ore transportation. At estimated shipments of 1,110,000 tons there appeared to be a profit of $11.70 per ton. Dropping the odd figures from the December quarter's earnings there is left $50,000,000, on shipments which we estimate at 3,750,000 tons, making $13.32 earnings per ton, an increase over September of $1.62, or just about what would be expected from the working off of lower priced orders and the shipping of larger proportions of higher priced steel.

Estimating shipments in the current quarter at three times the December shipments, which is about as well as the corporation could do, the earnings at $1.40 per ton more than in December would be $58,000,000. The increase in invoice prices will probably average fully $1.40 per ton, but the wage increase effective February 1st increases the operating cost by about $1,500,000 a month, and costs are probably going up in other directions. Hence it does not seem probable that the earnings in the present quarter will materially exceed $55,000,000.

As the regular charges preceding the common dividend are only about $22,000,000, the declaration of a dividend of 1¼ per cent. on the common stock for the December quarter seems conservative, for the dividend amounted to $6,353,781, when there was nearly $20,000,000 left for the common stock, and the current quarter promises to show more than $20,000,000 left.

The statement for last quarter is as follows:

Earnings

	Before charging interest on subsidiary bonds.	Less: Interest on subsidiary bonds.	Balance of earnings.
Oct. 1915.	$17,335,747	$771,893	$16,563,854
Nov. 1915.	17,760,310	769,342	16,990,968
Dec. 1915.	18,440,024	782,058	17,677,966
	$53,536,081	$2,303,293	

Total earnings after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants and interest on bonds of the subsidiary companies		$51,232,788
Less charges and allowances for depreciation, viz.:		
Sinking funds on bonds of subsidiary and extraordinary replacement funds	$8,729,053	
Sinking funds on U. S. Steel Corp. bonds	1,650,622	10,379,675
Net income		$40,853,113
Deduct: Interest for the quarter on U. S. Steel Corp. bonds outstanding	$5,451,876	
Premium payable on bonds redeemable under sinking funds.	235,901	5,687,777
Balance		35,165,336
Add net balance of sundry charges and receipts		794,057
Total		$35,959,393
Dividends for the quarter on stocks of the U. S. Steel Corp. viz.:		
Preferred, 1¾%	$6,304,920	
Common, 1¼%	6,353,781	12,658,701
Surplus for the quarter		$23,300,692

World Trade Conditions After the European War.

By Alba B. Johnson

President of the Baldwin Locomotive Works, at National Foreign Trade Convention, New Orleans.

The subject which I wish to discuss is "World Trade Conditions following the War." This naturally divides itself into conditions in the United States and those abroad. I will treat them in this order.

Every great change from existing conditions introduces elements to which commerce is unaccustomed and brings about a dislocation of business. The outbreak of the present European War was such a change, and whilst our own country was at peace, nevertheless our business, in common with that of all neutral countries, was paralyzed. Far-sighted men could perceive that soon our crops and foodstuffs would become necessary for the subsistence of warring Europe, that our manufacturers would be needed as auxiliary to those of the belligerent nations, and that we were the only great industrial nation free to supply the world's needs. Nevertheless, it took about a year for this expectation to be realized.

But our industries are now overcrowded with war orders, our crops and foods are being shipped as fast as vessels can be found to carry them, new plants of vast capacity have been constructed and equipped with machinery, there is a shortage of skilled labor, and our banks are overflowing with idle money. So long as the war continues we shall enjoy a large degree of prosperity. Beginning with those lines of business which relate closely to the war, it affects secondarily other lines not so related, until the revivifying influence of war orders has infused prosperity throughout perhaps ninety-five per cent of all lines of business.

New Dislocation of Business After the War.

When the war stops—when the first peace negotiations begin, the uncompleted portions of all the vast volume of the foreign war contracts which are being executed in this country, will be suspended, thousands of men will be deprived of employment, numberless inflowing streams of golden profits will be stopped and business of every kind will suffer another dislocation.

In Europe, the return of men now under arms, together with the cessation of work on arms and ammunition, will alike affect the belligerent countries as well as ourselves, and great numbers of men will be forced again to seek employment.

It has been estimated that in Great Britain considerably over a million men will be thrown out of work within the three months following peace, and perhaps as many more in the United States and Canada. The lapse of time within which re employment will come, will depend there upon the extent of the exhaustion following the war, and here upon the soundness of the business conditions which will then exist. These were not sound with us prior to the war, and but for the powerful influence of war orders there is no reason to believe they would be better now.

Prime Factors Influencing American Business.

Let us consider for a moment what are the prime factors influencing American business.

Aside from the abundance of our crops, which is not within our control, amongst these factors are banking, inland transportation, the tariff, the labor situation and the merchant marine.

Except in war stocks and automobile finance, there has been no undue financial expansion. A guarantee of safety is to be found in continuing this conservative course.

After having worked for forty years under the national bank act, which well served the purpose for which it was intended but which had the objection of such inflexibility as to exaggerate the tendency to panics, if it did not cause them, we have now, by the Federal Reserve Act, created a currency responsive to the needs of business. The new system has wisely been developed slowly and much remains

to be done to enlarge its usefulness. It will, however, afford the country a powerful safeguard against panics. From this point of view our ability to withstand a financial storm is better than it has ever been.

Naturally, however, there can be little danger of a shortage of money after the war, because the money now employed as working capital in filling war orders, will be released, and because the demands from Europe for war loans will cease. The amount of idle money then will be large until reabsorbed in legitimate business enterprises at home or abroad.

Large Increase in Railroad Earnings.

Our railroads have shared the improved conditions due to abundant crops and to the war business, and during the last three months of 1915, they have experienced a large increase of earnings. The value of their stocks has responded to this increase of earnings, and the large volume of money seeking investment has further raised their market quotations. The fact is, however, that under normal conditions their rates are dangerously close to the cost of the service. With phenomenal tonnage, and with the advantages of economies which are possible only in times of stress, they are able for the present to make satisfactory earnings. It has not been shown that under the restrictions imposed upon them such earnings are normal.

There is every reason to believe that at the close of the war they will fall off to such figures as will not only again make the vast capital locked up in railroad stocks and debentures unattractive as investments, but also will again restore the difficulty of securing the new capital necessary for the continued growth of railroad facilities to keep pace with the industrial and agricultural development of the country.

Next to agriculture, transportation constitutes the largest industry in the land. It is of vital importance to every other interest that the railroads should be placed upon a permanent basis of soundness and prosperity. They are the largest purchasers. When they prosper every other industry prospers. When they are compelled to stop building the extensions necessary to open new and to develop old territory, and to cease placing orders for material and equipment, all manufactures and consequently all general lines of business dependent upon industrial prosperity are depressed.

Should the railroad interests be allowed to lapse into a doubtful position as to their earnings and as to the security of their investments, it must react disastrously upon every other business interest of the country, when we come to deal with the readjustments which are to follow the conclusion of peace. The appointment of the commission of inquiry proposed by the President, is wise and statesmanlike, and if realized it should prove productive of a broader and more liberal policy to the great interests affected.

The Place of the Tariff in Post-Bellum Development.

Prior to the last presidential election all three political parties declared themselves in favor of tariff reduction. The traditional adherence of the Democratic Party to a tariff for revenue only, would not have permitted a reduction, because the tariff which was in effect when that party came into power was not higher than was necessary to provide the expenses of government. The principle was adopted of transferring the burdens of taxation from consumption to wealth, and instead of a tariff for revenue only, one was enacted based upon the partial substitution of direct taxation in the form of an income tax for the indirect taxation derived from imports.

The war in Europe was unforeseen when this legislation was enacted, but it resulted in a withdrawal of foreign competition more complete than could have been desired by the most radical protectionist. Furthermore, the war prevented our manufacturers from obtaining abroad many raw materials essential to our industries but not made in this country. Great distress resulted from this cause, principally to our textile manufacturers. These needs have in part been supplied by the substitution of other things, and in part by our own enterprise in new lines of production.

So far as we have undertaken new lines of manufacture hitherto pursued only abroad and which after the war can be undersold by foreign competitors, we have actually created infant industries which should receive as full protection as that enjoyed during the last half century by other infant industries since grown to manhood, for our present pre-eminence as a manufacturing nation is the result of having so fostered our industries. Those who

by their enterprise and patriotism have supplied our national needs, should not be left to extinction by reason of international competition after the war.

Indeed it has not yet been proven whether under normal conditions, many of our industries can continue to exist under the present tariff. For the welfare of the nation, these should surely be placed upon a basis of assured prosperity.

Old methods of tariff revision by Congressional Committees have proven incapable of providing a tariff adaptable to the changing conditions of business. To be effective tariff laws must be responsive to changes in our own country and abroad. The only practicable method of creating a tariff sufficiently flexible and scientific to meet our national needs is by a permanent non-partisan tariff commission.

Necessity for a Merchant Marine.

Probably the most important question which has been forced upon our nation by the outbreak of war, is the absence of merchant fleets upon the sea. The vast destruction of ships during the war must be met by building a new supply before ocean transportation can be restored to its normal condition. If the existing obstacles to the commercial success of operating American ships were to be removed, a large part of this restored tonnage would undoubtedly be constructed in American yards and operated under the American flag. As to the importance of restoring shipping under our flag, all agree that this problem is likely to be one of the most important which will engage the consideration of the existing Congress. The facts relating to our ocean shipping as they actually exist, have been so fully and clearly set forth in the pamphlet recently issued by the National Foreign Trade Council, that it is unnecessary to enlarge further upon the subject on this occasion.

At the outbreak of the present war our industries were so depressed that the withdrawal from our labor supplies of the many thousands of reservists who left to join foreign armies, both by way of our Atlantic seaports and by Canada, caused no inconvenience.

The abnormal demand for munition workers has since provided work for so many skilled and unskilled laborers that there is now a shortage of labor. Many who have taken contracts for war supplies are bidding against each other for workmen, whilst the supply is inadequate to the demand. This condition will continue, and will probably become more intense, so long as the war continues.

Little interference by organized labor has resulted, because the wages paid are higher than labor organizations could generally demand. These high special rates have reacted upon the entire labor situation and will, doubtless, continue to affect it until the war stops, when a readjustment of wages will necessarily follow.

Depression Will Follow Present Activity.

Summarizing the views above expressed at length, I look for a period of feverish activity in this country during the continuance of the war, and upon its close a prostration of the industry and commerce of all countries. This will be due to the exhaustion caused by the waste of lives, of property and of treasure resulting from the war, to the changes which will be brought about by readjustment, and to the certainty of excessive taxation to replenish the exhausted treasuries.

It is impossible to foretell how long this depression will last. Slowly re-employment will come. Depleted stocks must be replenished, railways, towns, government buildings, forts, arsenals, and ships must be replaced. The labor necessary for reconstruction will be required throughout the countries devastated by war. Not only will the great demand for labor in Europe cause a permanent advance in the wages which will be necessary to keep their people at home, but it is quite possible that emigration may be checked by law. At the same time the shortage of labor here, due to the fact that since the outbreak of the war the inflow from Europe has been retarded or stopped, will for a time resist the tendency of business depression to lower wages. Eventually the latter must prove to be the stronger force and a readjustment of wages will result.

The history of every previous depression will be repeated. Sooner or later re-employment will come; manufacturers' stocks will be depleted and the continuous expenses caused by the necessary operation of railroads and public utilities must be repaid. Enforced economies will result in abnormal savings, thus creating new resources for investment and the re-establishment of prosperity.

Increased Demands by Europe After War.

Turning now to the conditions abroad

which will follow the war, it is clear that there will be an increased need of machinery. Many goods which have been produced by hand labor in Europe, and have therefore commanded high prices, must, because of the destruction of lives and the scarcity of labor, be made thereafter by machinery. France already has a commission in the United States investigating this subject. It will follow that the pre-eminence of Europe in the highest grades of goods largely produced by hand labor, will no longer exist, and that we shall be more nearly upon a parity with Europe in supplying machine-made products. To this extent the position of the United States in the world markets should be improved.

We must look for important changes in the political relations of the countries now at war. During the years 1806 to 1815, inclusive, owing to the Napoleonic wars, emigration was restricted, and ceased altogether, to begin again after the restoration of peace, when its volume was greatly increased for two or three years. Similarly the present war has caused a suspension of immigration, but when it is over, provided they are not prevented from doing so, many will seek a country not torn by the conditions of warfare and its resulting exhaustion.

The sacrifices which the self-governing colonies of Great Britain have been called upon to make for the mother country, and the recognition thereof by the latter, as well as the necessity for conserving British trade, are likely to bring about a closer bond of union which may take the form of some kind of World British alliance or federation which cannot prove advantageous to the interests of the United States.

Preferential Trade Among Allied Nations to Follow War.

Furthermore as the British armies have been fighting side by side with those of France, Italy, Russia and Servia, and in alliance with Japan, and as England has had to bear a part of the financial burdens of her allies, it is not unlikely that the alliances following the war will be broader than the British Empire, and will take the form of preferential trade amongst the allied nations. Strong as are the political reasons for such closer ties amongst them, and notwithstanding that they are not to be created in any spirit of hostility to us, nevertheless, their effect would be to increase the difficulties of our struggle for foreign trade.

The foreign trade of Germany which had been patiently developed by forty years of continuous, laborious, persistent effort, was totally destroyed at the outbreak of war by England's command of the sea. For years I have watched with great interest the subtle methods employed by German firms for forcing their wares in South American markets, methods which would never occur to the English, and which would never be approved by Americans. For the time being the moral sense of the world has been shocked by the German Government's violations of international law, and of their own sacred treaty obligations.

Distrust of Germany Will Long Survive.

Even were the seas free to German commerce, the distrust of German political and commercial morality would tend powerfully to destroy her export trade. This distrust will long survive the war and cannot be wholly eradicated during this generation. Recovery therefrom will vary according to the degree of political animosity engendered by the war. It will come first in countries like Sweden, China, Mexico, and in some of the South American countries, whose sympathies have not been strongly enlisted by the enemies of Germany.

The frugality and energy of the German merchant, backed by the power of German industry, finance and diplomacy, must again, however, in time make Germany a powerful commercial rival. Meanwhile, those who would take a leading position in the world's markets, must learn to produce the lines of goods in which Germany was pre-eminent, and to adopt the creditable methods of German trade. They must fortify themselves by strengthening their representation wherever possible, and by creating such financial relations as will so far as possible remove the business from competition.

One-sided International Trade Cannot Continue.

International trade must be reciprocal and cannot long continue if it is wholly or largely one-sided. We cannot continue to sell to other nations whilst buying nothing from them. What they can buy from us is limited by what we buy from them. Therefore our tariff policy should be based, so far as is consistent with adequate pro-

tection to our own industries, upon encouraging the importation of products of customer nations. Other nations are expending their resources at a prodigious rate and are accumulating colossal debts in maintaining the war, whilst we, save for our extravagance in luxuries, are accumulating at a rate far beyond what is required for the development of our own country.

For the first time in our history we have the resources both in money and in goods for investment in foreign development. Our bankers should carefully plan to ensure that our money shall be so invested abroad as to create markets for our goods. It must not be forgotten, moreover, that the present balance of trade in our favor, amounting to $1,500,000,000 annually, is abnormal and temporary, and is made up largely of commodities for which in times of peace there is little demand. Our sales of war materials are made at extraordinary prices.

Our expectations as to the future must not be based upon these present conditions. I quote the following from the "New York Journal of Commerce":

"The undeveloped countries of the world that have been financially dependent on Europe found their purchasing power greatly lessened by the interruption of the flow of foreign capital due to the outbreak of war. This was notably the case in South America, to which, in face of the enormous gain in the total of our exports, there was a decrease in our sales for the first nine months of the year as compared with the same period of 1913. When closer comparison becomes possible, however, the relative share of the United States in the trade of South American countries will be found to have been considerably enlarged. The drop in our exports to all South America for the nine months was, on the basis of 1913, $6,710,180. But for the first seven months of the year the imports of Brazil from all countries showed a shrinkage of $118,000,000, and those of Chili for six months of $41,000,000—losses which are duplicated by the enormous shrinkage in Argentine imports of $154,000,000 for nine months. In whatever way the industrial and financial experience of the year may be interpreted, there can be no escape from the conclusion that one result of it will be to demonstrate the necessity of largely extending the capital investments of our people in other lands if we are to create a really great foreign trade. In South America alone, British capital has already been placed to the amount of at least $4,000,000,000—half of which is in Argentina. Less than one-tenth of that total would represent the entire investment of American money in South American enterprises to-day. The only securities of any foreign government or corporation which are active on the New York Stock Exchange are those of Canadian and Mexican railroad companies. Except for the recent Argentine loans, no serious effort with the backing of first-class financial houses has been made to sell South American securities in this country on a large scale. There are evidences enough, of a highly satisfactory character, that by another year a very different statement can confidently be made.

"Those among us who deal in sanguine talk about making New York the financial center of the world fail to appreciate the magnitude of the change which that would imply. Take these figures of British foreign trade which have already been given in these columns: In 1913 the United Kingdom exchanged articles valued, in round figures, at $2,675,000,000. In return for the services of British shipping there stood on the credit side of the account a further sum ranging between $600,000,000 and $750,000,000, while an additional $1,000,000,000 was due for interest on foreign investments. But of this $1,700,000,000 the British creditor took only $670,000,000 leaving the balance to be added to existing investments. In other words, while the British people in 1913 produced a large amount of articles which they consumed, they produced a still larger amount which represented a surplus. As a similar process had been going on for long years before, Great Britain stood as the creditor of foreign countries for a very large sum, whose total at the outbreak of the war was placed at $20,000,000,000. The interest due on this sum meant that in addition to the articles exchanged with the debtor country the latter was bound to supply to the creditor a considerable amount more. In the case of the United Kingdom, the amount was so vast that the creditor did not take it all, but left much of the products exported to be reinvested abroad. Brilliant as the record of our export trade for 1915 has been, and impressive as is the readiness with which the productive energy of the country has responded to the sudden demands made on it, the fact must be stead-

ily kept in mind that we have been supplying needs almost wholly abnormal and temporary."

We cannot successfully compete with British goods until we begin to place ourselves in a position comparable with England in investment in and the development and management of those opportunities which other nations offer for the profitable extension of our business activities.

Correlation of Great Interests Essential.

Finally, it will be necessary for us to learn team work, by which is meant correlation of the efforts of manufacturer, merchant, banker and investor. Hitherto, our bankers have been reluctant to enter the field of foreign finance, and especially of that branch involving investment in enterprises requiring patient development. Commission houses have too frequently been free lances, pushing trade along lines of least resistance, but not in such a way as to create permanent and reliable trade. Our manufacturers have had to fight single-handed for their foreign trade and it is wonderful how well they have succeeded in view of the conditions of competition which they have had to meet.

The creation of the Federal Trade Commission must prove to be of great benefit to our manufacturers and exporters. The Board is studying with minds free from prejudice the complicated problems which affect our export trade, and I am sure they will remove any doubts as to the rights of Americans to engage in combinations for foreign trade such as are lawful to their competitors of other nations.

I rejoice at the establishment of American banks in South American and other foreign fields, and in the organization of the American International Corporation, with a capital of fifty millions for the development of American trade. I see the first great systematic attempt at the correlation of effort to which I refer. I hope that similar enterprises will be formed representing many different lines of business, for by this means alone can we effectively meet the world's competition.

Wages and Output Compared.

Coal, Iron and Other Products in Pennsylvania.

The latest available report of the Pennsylvania Bureau of Industrial Statistics gives light on the relation which the payrolls of Pennsylvania's various industries bear to the value of their manufactured products. During the year considered, 1912, there was turned out by plants of all kinds a total product valued at $2,450,000,000, with a total of payrolls amounting to about $600,000,000, or approximately 25 per cent. of the entire manufactured values. Of the important industries of the state other than mining, the relation that payroll bore to the value of the manufactured product varied from 11 per cent. in the making of enameled leather and glazed kid, valued at $21,700,000, to as high as 30 per cent. in the manufacture of locomotives and of iron and steel ingots and castings, outputs valued at $50,000,000 and $25,000,000, respectively.

In the mining and preparation of anthracite coal comparisons of these figures indicate a largely increased relative labor cost, as a payroll of over $99,000,000 was provided from a total value in production of $168,000,000, or about 59 per cent. of the whole, more than twice as much relatively as that of the combined plants of the state and 1½ times as great as in any industry outside of mining. It is quite evident, moreover, that the report of the Bureau is conservative in its statement regarding anthracite production, for according to the United States Census Report of 1909 the wages paid in that industry represented 63 per cent. of the total selling value of the output, and there were advances in the wage rate in 1912 as a result of the agreement made on May 20 of that year. The bituminous rate is higher still than that of anthracite, as 74 per cent. of the total value of $160,000,000 goes into the payroll.

The industry whose output stands highest in value was that of rolled iron and steel, of which there was produced in that year $477,000,000 in finished products, of which 21 per cent. or $100,100,000 went into payroll—an amount slightly greater than that paid out in anthracite mining.

Cars and car wheels were made to the

value of $58,900,000, on which the labor cost was $13,500,000, or 21 per cent. Iron and steel hedges, valued at $19,400,000, paid out 25 per cent in labor cost and a like percentage applied to the manufacture of boots and shoes, of which $21,500,000 were produced. On the production of $37,460,000 of tin plate, 26 per cent of the value represented labor cost, and the payroll was 28 per cent of the value in the cement and furniture plants, the total output of each being about $19,500,000.

The labor cost on the manufactured value of $21,500,000 of railroad supplies was 29 per cent and on $34,700,000 worth of machinery it was 36 per cent. The payroll on over $30,000,000 of manufactured electric supplies was 38 per cent of the total value.

In the production of $36,700,000 of yarns 16 per cent represented the labor cost and it was 17 per cent in the cotton goods industry, which production value was $40,000,000. On $27,000,000 worth of carpet and rugs the payroll was 23 per cent of the value. Hosiery valued at $34,300,000 had a payroll charge of 31 per cent and $39,840,000 worth of silk was produced at a labor cost of 37 per cent of the entire value.

In the manufactured products, to be sure, a large part of the difference between the labor cost and the value of the output is in the value of the raw materials which do not enter into the cost of coal mining. Outside of labor cost the chief expenses in mining is in the purchase of supplies, which in anthracite production constitutes about 20 per cent of the total cost. In bituminous production the cost of supplies constitutes about 14 per cent of the total expense. Nearly 6 per cent of the cost of anthracite is in the royalties paid to land owners.

Steel Plants.

III. The Edgar Thomson Works.

In 1872 William Coleman and Thomas M. Carnegie his son-in-law, secured an option on 107 acres of farm land, known as Braddock's Field, where General Braddock met his memorable defeat in 1755 at the hands of the French and Indians. On the first day of the next year the option was exercised, with the payment of $59,003.30 cash and the assumption of a mortgage of $160,000. Within a fortnight the firm of Carnegie, McCandless & Company was organized with $700,000 capitalization, Mr. Coleman putting in $100,000 and Tom Carnegie $50,000, while Andrew Carnegie put in $25,000 of his earnings in other iron enterprises, together with $225,000 he had just made in commissions by selling some railroad bonds as a side issue. Six men, some of whom are now well nigh forgotten, put in $50,000 each, Messrs. Kloman, Scott, Stewart, Shinn, McCandless and Henry Phipps. Less than two years later the partnership was dissolved and the Edgar Thomson Steel Company, Lim., with $1,000,000 capital stock, took its place. Under the supervision of A. L. Holley, experienced in the building of Bessemer steel plants, distinctly a pioneer industry at the time, a Bessemer steel plant was built. The first Bessemer blow was made August 25, 1875, and the first rail rolled September 1st following, under the management of a group of superintendents and foremen who had come from the Cambria works at Johnstown. Among these was the famous Capt. William R. Jones. The cost of making Bessemer steel rails at other works at that time was slightly in excess of $50 a ton, and it was one of Capt. Jones' tasks to bring this down.

In nearly all of its forty years the Edgar Thomson Steel Works has been practically a one-product plant. For many years it contained but one rail mill, which occasionally made billets. Eventually a second rail mill was built, and ten years ago a third, electrically driven, to roll light rails.

In 1880 the first of the eleven blast furnaces now at the plant was blown in. The battery of furnaces is the greatest in the world, having a capacity in excess of 1,500,000 tons annually.

The rapid change in demand from Bessemer to open-hearth steel for rails a few years ago made it that full employment could not possibly be found for a Bessemer rail mill with four 12-ton converters and capable of producing over a million tons of

rails a year. Early in 1912 the management of the Steel Corporation made appropriations for the construction of 14 basic open-hearth furnaces at Edgar Thomson, together with some other extensions. The main principle involved was to provide greater flexibility as to the steel rolled, rather than to increase the total capacity of the works in finished steel. The open-hearth department has a capacity of not far from a million tons of steel ingots a year, as the furnaces take charges of from 80 to 100 tons, and thus its capacity falls but little short of that of the Bessemer department. Plans were adopted some time ago for the rebuilding of one of the rail mills and when this has been done the finishing capacity of the plant will be brought somewhat closer to the steel making capacity. As the plant is now very busy making rails and large steel rounds the interruption which rebuilding a mill would occasion cannot be considered.

Topical Talks On Iron.

XXXIV. Meteoric Iron.

According to the common statement the oldest piece of iron in the world is a fragment of an iron tool, about 5,000 years old, found in 1837 in blasting at the pyramid of Cheops. This is in the British Museum. In the same collection is a mass, not of iron but of rust, found in Egypt wrapped in fabric together with a mirror and tools of copper, and supposed to date between 3300 and 3100 B.C., so that here is a trace of iron, though not the iron itself, dating slightly earlier.

These relics do not represent the oldest iron on earth, but the oldest iron known to have been made by dwellers on the earth. There has been found in the world about 140 tons of iron whose age is probably thousands of times 5,000 years. That is meteoric iron, made somewhere else, but how, when, where and why the writer is in no position to speculate.

The view has sometimes been expressed that the earliest use of iron by man was of meteoric iron, but this view does not stand the higher criticism. As a rule meteoric iron is extremely hard, and difficult to cut even with modern tools, so that it is hard to conceive of the ancients doing anything with it, except perhaps to the extent here and there of using a meteor as an anvil. Furthermore there have been so few iron meteors found all over the globe that it could be only in very rare instances that the ancients would have found any.

What is regarded as the earliest found meteorite is Hadscharel Aswad in the Kaaba at Mecca. The story, for which the writer does not vouch, is that it fell from heaven as a ruby, but the sins of mankind turned it black. At Otumba, Peru, was found a meteorite estimated to weigh 33,000 pounds. Another large specimen, 19,000 pounds, was found on the river Bemdégo, Brazil. On the Red River, Louisiana, a 3,200 pound specimen was found, while Krasnajarsk, Russia, contributes one of 1,800 pounds.

Several scores of samples of meteorites have been carefully examined, but not a large enough number to permit of anything like accurate generalization. The specimens can be arranged in a series, beginning with those which are practically meteoric stone and ending with those that are very nearly pure iron. The nickel content varies within wide limits. That it is impossible to generalize is shown by the fact that European scientists, examining their specimens, have found them as a rule unmalleable, while American scientists, using their specimens, have found precisely the reverse. Dana, the eminent American geologist of a past generation, says: "Meteoric iron is perfectly malleable and may be readily worked into cutting instruments and put to the same uses as manufactured iron." Obviously there is no astronomical reason why the meteorites found in one country should differ a particle from those found in another. The showing made is pure chance, which would be eliminated were a sufficiently large number of specimens available.

There is a geological theory that all the iron in the world may have originally have fallen as meteors, subsequently turning to rust. In the present state of knowledge of the history of the universe nothing definite can be said in this respect. A particular

difficulty in tracing the history of the iron in the ore now found is that as to many if not all deposits worked the ore we find is known to have been carried in geological times from another place. This is particularly well shown in the Lake Superior deposits, which exist as "lakes." The transportation was done when there was vegetation, all Lake Superior ores, however thick the deposit, containing throughout minute remains of vegetable matter. The existing deposit can be studied, but the nature of the preceding deposit, from which the material was carried by water, can only be matter for conjecture.

Joplin Zinc And Lead Ore Markets.

The month closed was one of the most remarkable in many ways that has ever characterized the local market. With a record of settlements and shipments of zinc ore reaching 6,935 tons and 945 tons lead ores weekly one wonders how it was possible in the face of the conditions that prevailed for three weeks of the month. For three weeks of the month the industry has been assailed with floods, zero weather and fuel shortages to an extent never before known and yet the actual shipments reached the wonderful weekly average shown above. That there will be diminution of this record for the next few weeks admits of no doubt for there has been remarkable team-work on the part of buyers, producers and transportation companies to keep ore moving even if the production did suffer. But had not the weather been bad the record shipments for the month would have been from 25 to 40% greater and the surplus stocks would not have been affected either.

The average weekly shipment of blende ores was 6,599 tons at an average of $98.90 per ton. The calamine shipped was 336 tons weekly at an average price of $74.17. This gives a total valuation of zinc ores of $2,707,,619 for the four weeks of the month. The surplus stocks of ore were estimated at the end of the month at 4,650 tons.

The variations of the market were from $80 up to $120. The market opened at $85 to $115 but eased off to $80 to $110. The following week there was a slight tendency to advance and $85 to $110 was the range. The next week the market went upward with a swing touching $120 as the maximum base but gradually eased off till the month closed at $95 to $112.50. The close was inexplicable based solely upon the local situation. Production was lower at the end of the month, conditions insure it being low for some time to come, and the surplus was drawn upon.

The lead ore market also developed strength as the month wore around. The month opened at $70 to $72 being paid for standard grades. The second week it advanced to $76 as a maximum dropping back to $73 and then again advancing to $78 to $81 at which point the monthly market closed.

Shipments for the month aggregated 3,781 tons at an average price of $75.68.

It is interesting to compare tonnages and prices against the same month one year ago. The total tonnage of zinc ore sold in January, 1915 was 18,187 tons as compared with 27,739 tons or an increase of 50%. Of blende ores there were 17,034 tons as against 26,396 tons, and 1,153 tons of calamine as against 1,343 tons of calamine and 2,963 tons as against 3,781 tons in 1916.

The average of blende ores for January, 1915 was $49.43 as against $98.90 this year; for calamine $28.08 as against $74.15; for lead $47 as against $75.68

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The Iron and Steel Position.

Position of Mills and Furnaces.

At the beginning of February pig iron is being produced at the rate of about 39,000,000 tons a year, steel ingots at 40,000,000 tons to 41,000,000 tons, castings at 1,000,000 tons or more and finished rolled steel at about 29,000,000 tons.

The steel mills have actual shipping orders and specifications on books for an average of about four months of operation, with contract obligations that in some instances would run them practically through the year, while the general average probably represents close to nine months of full operation. The blast furnaces are sold up to the extent of four or five months of production. A little iron has even been sold for the second half of the year, but not enough to affect the general average materially.

January Showing Indecisive.

It is very difficult to analyze the market's developments in January and reach any definite conclusion as to what they portend for the future. At the beginning of February a clearer conception as to what the future is likely to bring forth is to be obtained from a general survey of the market history of the past six months or year, such as was given in our last issue in the form of a general review of the year, than can be derived from a study of January's developments alone. A composite of the various items making up January's market history is rather colorless.

The month opened with enough signs of market activity to suggest plainly the thought that the holiday dulness which usually characterizes the iron trade at that time had passed, and had amounted to little in the aggregate. It was rather surprising to see things "pick up" before the middle of January, indeed, but the second half of the month developed a very distinct dulness. Viewed solely from the standpoint of market activity, of actual sales, there is now much less being done than at any time in December, holidays included, or in the fore part of January.

As to prices, there were advances in bars, plates, shapes, standard steel pipe and boiler tubes on January 4th, and these advances seemed to constitute a clear signal that steel prices had by no means ceased to advance. On January 21st (as to boiler tubes January 14th) these same products advanced again, while on January 24th wire products advanced. Despite these important advances in January, occuring after "the turn of the year" and therefore by ordinary rules furnishing a suggestion of the character of the year's market, it can hardly be said at the beginning of February that finished steel products as a whole show a definite advancing tendency.

In pig iron the quieter conditions of December, particularly the latter part of that month, developed in January into what may properly be called stagnation. There were no advances in pig iron prices in January except that southern iron early in the month became quotable 50 cents higher, but even with respect to this solitary advance it may be noted that at the close of the month some weakness was observed in southern iron. The pig iron market appears to have given a poor account of itself

The showing, on the surface at least, is not a good one. It is not what one had reason to expect when each of the closing months of last year was so full of favorable, even startlingly favorable, developments. One naturally recalls Chairman Gary's interview published January 6th, in which he indicated a strong belief that we were going too fast. The interview followed by two days the important price advances mentioned above, but contained the words "the requirements of purchasers and the offers they make fix the prices to a large extent." On the day the interview was published the subsidiary company presidents met and recommended that the Steel Corporation make a general advance in wages of about 10%, the Finance Committee immediately passing favorably upon the recommendation. Here was presented an interesting if not a complicated situation.

The General Outlook.

It is readily realized on all hands that the conditions are utterly abnormal. The trends of the moment cannot be judged by ordinary standards. For several months the steel mills have followed a policy of restricting as far as possible their forward

commitments. In proportion to the pressure for steel they have sold a less distance ahead than they did in 1906, in 1909 or in 1912. The general assumption has been that they pursued this policy in large part for the reason that they saw prices tending to advance rapidly and could not observe the same reasons for holding prices within a certain range that they adopted as sufficient in previous times of market activity. Doubtless they were also moved by consideration of the fact that buyers who were ready to sign open contracts for far forward delivery had much less means than usual of determining what their requirements would really be when the delivery period should arrive.

The position of the buyer is likewise one of being governed by circumstances. He may be very busy indeed at the moment, and may be filled with business for six months, but he knows little if anything about the seventh or the eighth month. It is really conjecture.

Thus there is some reason for concluding that the present quietness in the market may be due simply to the fact that practically everything in the way of buying or selling that can reasonably be done at this time has already been done. The market has been sold to a standstill. In past periods of activity great pressure for steel at the moment indicated that there would be continued pressure, until times should change, and the changes would be foreshadowed in various ways. Now the great change that is to occur is the end of the war. Mr. Gary expressed a conviction that it will end sooner than the majority of men think, which we take to mean in a year or less. Mr. Maxim, however, says "three to five years."

High Prices and Consumption.

As long as the war lasts one of the most important questions will be the extent to which high prices for steel will operate to curtail consumption. At the present time consumptive demand apparently greatly outruns the supply, in domestic channels, while there would be a much larger export movement if the mills make the shipments and ocean vessels could be found to carry them. The steel being consumed in the domestic market, however, is relatively cheap steel. Roughly, we should estimate that the average invoice price of steel shipped on the first day of February represented about two-fifths of the total advance that occurred in open market prices from the low point of December, 1914, to that date, the total advance being represented by a change in our **composite finished steel** from 1.42c to 2.19c, or between $14 and $15 per net ton.

Orders for about 21,000 freight cars were placed during January, a fact which does not indicate reduced buying on account of high prices, but a similar showing for three

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer, Basic, No. 2 fdy, Valley			Basic, No. 2X fdy, Phila.		No. 2 fdy, Buffalo.	Cleve-land.	Chi-cago.	Birm-ingham.	Ferro-mangan-ese.*	Fur-nace coke†
1915—											
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. .	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. .	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. .	15.12	13.98	13.71	14.83	14.91	13.82	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. .	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. .	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
Jan. ..	21.00	18.00	18.50	19.24	19.50	18.25	18.80	19.00	14.92	115.40	3.14

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

or four months additional would be much more conclusive. The ship building industry readily pays high prices, the limit of activity being the capacity of the yards, not the cost of material. The automobile, machine tool and similar industries the value of whose products is very high per ton have no occasion whatever to hesitate. The building industry, on the other hand, scrutinizes costs very carefully, and will undoubtedly be somewhat less active at least than if iron and steel prices were lower, other conditions remaining as they are. The whole subject is one of quantities, not of principles, whether the reduction in consumption caused by high prices will be sufficient to bring the total consumption to a level below the productive capacity.

How Much Steel is Stocked?

If the recent and present mill shipments were a precise index to the current ultimate consumption, the excess of demand over shipments, indicated by premiums being paid for many commodities for early delivery and by there being a large export inquiry that cannot be met, would indicate conclusively that the tendency to consume steel could be reduced materially without the consumptive demand passing below the level of productive capacity, and particularly so since we are approaching spring when in many directions the ultimate consumption should increase. It is not the case, however, that all the steel lately shipped has passed into ultimate consumption at once, or with anything like the rapidity that obtained say from July 1, 1914, to July 1, 1915. During that period the mills were able to make very quick shipment on all new orders and jobbers and manufacturing consumers carried extremely light stocks. In conditions that have obtained in more recent months buyers have been moved by two considerations, first that much larger stocks must be carried, or business in some directions come to a standstill, second that stocks laid in against old and low priced contracts are an excellent investment. Doubtless all jobbers and manufacturing consumers have been stocking up in the past few months to the greatest possible extent. It is simply a question of what was this extent. If half the total number of customers a mill carries on its books importune it for better deliveries a very strong showing indeed is made that steel is scarce, but the other half more lucky, may be accumulating stocks.

The fact that pressure for material arose very suddenly has two bearings. First it indicates that no great opportunity was afforded buyers to stock up. Second it indicates quite clearly that a sudden desire to stock up arose. It would have required a miraculous increase in consumption to account for all the increase in pressure for deliveries that arose.

Unless there are large "speculative" stocks, which seems improbable, the increase in stocks is healthy. For economical operation of mills and for the convenience of buyers themselves the buyers should carry moderate stocks. As long as the mills are behind in deliveries, and presumably

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

	Shapes.	Plates.	Bars.	Pipe.	Wire.	Wire Nails.	Cut Nails.	Sheets Black.	Sheets Galv.	Tin plate.	Composite Finished steel.
1915—											
January	1.10	1.10	1.10	81	1.34	1.54	1.58	1.80	2.80	3.10	1.4554
February	1.10	1.10	1.10	80⅜	1.38	1.58	1.55	1.80	3.09	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.55	1.80	3.40	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.55	1.80	3.40	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.55	1.80	3.60	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.55	1.76	4.80	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.55	1.74	4.65	3.10	1.5692
August	1.30	1.26	1.30	79	1.43	1.61	1.55	1.85	4.40	3.10	1.6059
September	1.33	1.33	1.35	79	1.54	1.69	1.58	1.91	3.68	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.65	2.03	3.57	3.15	1.7264
November	1.63	1.63	1.63	78	1.72	1.87	1.72	2.30	4.07	3.45	1.9089
December	1.75	1.75	1.75	78	1.88	2.03	1.85	2.53	4.75	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.58	1.85	4.40	3.10	1.6506
1916—											
January	1.87	1.90	1.87	76¾	1.98	2.13	1.90	2.60	4.75	3.75	2.1410

they will be behind for many months at least, the stocks are needed and the total should not decrease.

How Define "War Demand"?

The term "war demand" so often used, is largely a matter of words. Some observers urge that the demand is largely war demand. Others deny the assertion. It is a question of terms. For illustration, one reason why the country is as prosperous as is the case is because the favorable merchandise balance in foreign trade in the calendar year 1915 was $1,778,605,855, as against an average in normal years previously of about $500,000,000. That large favorable balance is due to the war. The country was not prosperous when the war started. It does not follow that it would not have become prosperous by this time if there had been no war, although it is certainly the case that with the war and no large favorable trade balance it would now be quite otherwise than prosperous. Again, if the war ended and no changes occurred otherwise, the country would be more prosperous, with the capital it has gained, than would otherwise be the case

There are gradations in the classification of steel demand with respect to its relation to the war. There is steel that is ordered for shells, illustrating the closest relation. There is steel required for ships, a decidedly more removed relation, for the war has destroyed many ships even though it has also interned many. There is steel that is bought by farmers who have realized high prices for crops, a much more removed relation.

There is, however, this pertinent observation to be made, that the steel that is being consumed in this country does not, at least in the main, represent the usual proportion of new construction. It is more than usual in the line of current consumption, such as may certainly be expected as long as the country is prosperous.

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1909:

Quarter.	1915.	1914.	1913.
1st	$12,457,809	$17,994,382	$34,426,802
2nd	27,950,055	20,457,596	41,219,813
3rd	38,710,644	22,276,002	38,450,400
4th	51,232,788	10,935,635	23,084,330
Year	130,351,296	71,663,615	137,181,345

	1912.	1911.	1910
1st	$17,826,973	$23,519,203	$37,616,877
2nd	25,102,266	28,108,520	40,170,961
3rd	50,063,512	29,522,725	37,365,187
4th	35,181,922	23,155,018	25,901,730
Year	108,174,673	104,305,466	141,054,755

Unfilled Orders.

(At end of the Quarter):

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	8,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,633	5,927,031
1910..	5,402,514	4,257,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

	Ship-ments.	Book-ings.	Dif-ference.	Dif-ference.
	%	%	%	Tons.
January 1914	55	83	+28	+331,572
February ...	67	105	+38	+412,764
March	72	40	—32	—372,615
April	67	35	—32	—376,757
May	62	37	—25	—278,908
June	63	66	+ 3	+ 34,697
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September ..	62	24	—38	—425,664
October	55	28	—27	—326,570
November ..	45	32	—13	—136,505
December ..	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February ...	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September ..	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037
December .	102	152	+50	+615,731

Comparison Of Metal Prices.

Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing, Jan. 31 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	21.00	21.00
Basic, valley	13.25	12.50	18.00	12.50	18.00	18.00	18.00
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.50	18.50
No. 2X fdy. Philadelphia.	1500	14.20	19.50	14.00	19.50	19.50	19.50
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	18.80	18.80	18.80
No. 2X foundry, Buffalo	13.75	12.25	18.00	11.75	18.00	18.00	18.00
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	18.50	18.50	18.50
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.50	15.00
Scrap Iron and Steel.							
Melting steel, Pittsburgh.	12.00	9.75	18.00	11.00	18.00	17.50	17.75
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	15.75	15.25	15.75
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	18.50	17.50	18.50
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	15.25	15.00	15.00
Heavy steel scrap, Phila	11.25	9.00	16.25	9.50	16.50	16.00	16.25
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.20	1.90	2.20
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.26	2.06	2.26
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	1.90	1.85	1.90
Tank plates, Pittsburgh	1.20	1.05	1.80	1.10	2.00	1.85	2.00
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	1.90	1.85	1.90
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	1.75	1.75	1.75
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	2.60	2.60	2.60
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	4.75	4.75	4.75
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	3.75	3.75	3.75
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.20	2.10	2.20
Steel pipe, Pittsburgh	79½%	81%	79%	81%	76%	78%	76%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	3.00
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.75	4.25
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	45.00	40.87½	41.75
Lake copper	15.50	11.30	23.00	13.00	25.50	23.00	25.25
Electrolytic copper	14.87½	11.10	23.00	12.80	25.50	23.00	25.25
Casting copper	14.65	11.00	22.00	12.70	24.25	22.00	24.00
Sheet copper	20.25	16.50	27.50	18.75	32.00	28.00	32.00
Lead (Trust price)	4.15	3.50	7.00	3.70	6.10	5.50	6.10
Spelter	6.20	4.75	27.50	5.70	19.42½	17.30	18.80
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	43.50	41.00	43.25
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	56.00	53.00	54.00
Silver	59¼	47⅝	56½	46¼	57⅝	55⅞	57⅛
St. Louis.							
Lead	4.10	3.35	7.50	3.50	6.00	5.45	6.00
Spelter	6.00	4.60	27.00	5.55	19.25	17.12½	18.62½
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	24.00	23.00	24.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	180½	172	179½
Standard copper, prompts	66¾	49	86⅜	57⅛	91¾	84¾	91¾
Lead	24	17⅞	30¼	18¼	32¾	29¼	32
Spelter	33	21¼	110	28⅛	92	88	91
Silver	27¼d	23¼d	27¼d	22 1/16	27 5/16	26 11/16	27⅛

Comparison Of Security Prices.

Railroads.	Range for 1913. High.	Low.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Closing. Jan. 31 1916.
Atchison, Top. & Santa Fe...	106⅜	90¼	100⅜	89½	111¼	92½	102½
Atch. Top. & Santa Fe, pfd.	102¼	96	101¾	96½	102⅛	96	100
Baltimore & Ohio	106⅜	90⅝	95⅝	67	96	63¾	87
Canadian Pacific	266¾	204	220½	153	194	138	166⅞
Chesapeake & Ohio	80	57⅛	68	40	64¾	35⅝	61½
Chicago, Mil. & St. Paul	116¼	96¾	107⅛	84¾	101⅛	77¾	95¾
Erie R. R.	32½	20¼	32½	20⅛	45⅝	19⅞	35¼
Great Northern, pfd.	132⅝	115½	134¾	111⅝	128⅜	112¾	119¼
Lehigh Valley	168⅜	141¼	156¼	118	83⅜	64⅝	75½
Louisville & Nashville	142¼	126¼	141⅞	125	130¼	104½	124
Missouri, Kansas & Texas ..	29⅛	18⅛	24	8⅜	15¼	4	5½
Missouri Pacific	43⅝	21¼	30	7	18¼	1¾	5
New York Central	109¾	90⅜	96⅝	77	110½	81½	104⅛
N. Y., N. H. & Hartford	129⅞	65⅝	78	49⅝	89	43	66
Northern Pacific	122⅝	101¾	118½	97	119	99⅛	112½
Pennsylvania R. R.	123¾	106	115½	102½	61½	51¾	57½
Reading	171¾	151⅜	172¼	137	85⅝	69⅜	75¾
Rock Island	24⅞	11⅝	16⅝	⅝	1⅛	⅛	½
Southern Pacific	110	83	99½	81	104⅞	81¼	98½
Union Pacific	162¾	137¾	164⅜	112	141½	115¾	131¾
Industrials.							
Am. Beet Sugar	50½	19¾	33½	19	72⅞	33¼	62½
American Can	46⅞	21	35⅞	19¼	68½	25	61⅝
American Can, pfd.	129½	80½	96	80	113½	89	110
Am. Car & Foundry	56⅜	36½	53½	42¾	98	40	65
Am. Cotton Oil	57⅜	33½	46½	32	64	39	51½
Am Locomotive	44½	27	37¼	29¼	74¾	19	63¼
Am. Smelting & Refining	74¾	58½	71⅛	50¼	108⅞	56	96⅝
Brooklyn Rapid Transit	92¾	83¾	94¼	79	93	83¼	86⅛
Chino Copper	47⅝	30⅜	44	31⅝	57⅜	32¾	52
Colo. Fuel & Iron Co.	41½	24½	34½	29½	66½	21¾	42½
Consolidated Gas	142⅜	125⅛	139½	112½	150½	113¾	137
General Electric	187	129¾	150⅝	137½	185½	138	169
Interborough-Metropolitan ..	19⅝	12⅜	16⅜	10¾	25	10⅝	17¾
International Harvester	111½	96	113½	82	114	90	109¼
Lackawanna Steel	49⅞	29⅞	40	26½	94¾	28	81¾
National Lead	56¼	43	52	40	70¾	44	66⅛
Ray Consolidated Copper	22	15	22½	13	27½	15¼	23¼
Republic Iron & Steel	28⅜	17	27	18	57¼	19	49¼
Republic Iron & Steel, pfd...	92¼	72	91¼	75	112⅝	72	108
Sloss-Sheffield	45½	23	35	19½	66⅞	22	55¾
Texas Co.	132½	89	149⅞	112	237	120	192½
U. S. Rubber	69½	51	63	44½	74¾	44	49
U. S. Steel Corporation	69⅛	49⅞	67¼	48	89½	38	80
U. S. Steel Corporation, pfd..	110¾	102½	112¾	103¼	117	102	115½
Utah Copper	60⅝	39⅝	59⅜	45⅜	81¾	48½	77⅛
Va.-Carolina Chem.	43⅞	22	34⅞	17	52	15	45½
Western Union Telegraph ...	75⅛	54⅛	66⅞	53⅜	90	57	87½

While it is impossible to devise a definition of what is "war demand" and what is not that will satisfy everyone, or even a majority, perhaps, it is illuminating to consider the steel which actually leaves the country. The exports of all iron and steel that are reported by weight amounted in November, the last month reported upon, to 363,000 gross tons. The average for the five months ending November was 376,000 tons. Such exports included pig iron, scrap, unfinished steel, etc., as well as ordinary rolled steel and some fabricated products such as welded steel pipe and barb wire. The finished steel involved, in the form in which finished steel is usually returned for statistical purposes, represented an annual rate of about 4,000,000 tons a year. Apart from such direct exports there is finished steel made for manufactures, such as loaded and unloaded shells, railroad rolling stock, automobiles, machine tools, etc. For that steel an estimate of 3,000,000 tons a year would undoubtedly be outside, making 7,000,000 tons altogether, when the current production of finished steel certainly exceeds 28,000,000 tons a year and may be as high as 29,000,000 tons. Thus all the exports direct and indirect represent less than 25% of the steel production, and these exports include material, though not a great deal, which goes to neutral countries, a much smaller tonnage than would normally be shipped to neutral countries, by the way.

In tonnage exports at least the high point was reached as long ago as last August, with 405,853 tons, the three months following showing a smaller volume. There has been no sharp increase, if any, since November. In manufactures of steel there is no reason to believe there has been a large increase, if any. The volume of steel that was directly attributable to the war, though staying within the country, such as steel used to build and equip ammunition factories, was inconsequential, set against a year's production of 29,000,000 tons.

Thus domestic buyers really are taking an enormous quantity of steel, more than ever before. Unless they have been stocking up unduly, or are going to become less prosperous, there is no reason why they should not continue to demand this steel.

Value of Finished Steel Output.

The invoice value of the finished steel now being shipped is more than three times that of the steel that was being shipped in December, 1914. A fairly accurate estimate can be made by using our **composite finished steel,** which is made up by averaging certain prices weighted according to the relative tonnage importance of the different commodities and representing, each in its group, about the average value of the products as they are shipped from the steel mills proper. Some of the products in a group bring more than the base price, others less. Thus hoops, and bars that command an extra, bring on an average more than the base price. Sheets bring a lower price, as the average gauge produced is below the base gauge. In general, the average invoice value would be a trifle higher than our composite, but for comparative purposes it is quite adequate.

In December, 1914, the mills were operating at less than 35 per cent. of capacity, according to common report, which would make their shipments of finished steel at a rate of not over about 10,000,000 gross tons a year, and our composite stood at about $32 a gross ton, making the invoice value of the steel shipped run at the rate of about $320,000,000 a year.

To-day the composite stands at about $49 a gross ton. Shipments of finished steel are at a rate between 28,000,000 and 29,000,000 gross tons a year. If the average invoice price be taken at two-fifths the way from the low level to the present quoted prices, for forward delivery at mill convenience, the average invoice price of steel shipments to-day is equal to about $1,100,000,000 a year, or three and one-half times the rate of 13 months ago. If the mills should work up to the point of receiving on current shipments the full quoted prices of to-day their gross income would be about $1,400,000,000, or more than four times the rate of December a year ago. While prices have advanced fully 50 per cent. production has increased in much greater ratio, and thus the increase in income is due much more to the tonnage than to the price.

Tin Plate Production.

Tin plate production in 1915 undoubtedly made a new record, passing by at least 10 per cent. the record made in 1912, three years earlier. On the basis of the activity of the mills during the year the output can hardly be estimated at less than 1,000,000 gross tons of tin plate and 60,000 tons of terne plate. If the mills increased their output per turn as much as they have in previous years the output will be found to have been still larger, when the official returns are made. The official statistics for 1913 appeared about the middle of the following July, while the 1914 statistics were made public at the beginning of August. Our estimate for 1915 compares with production in previous years as follows starting with the hitherto record year 1912:

Tin and Terne Plate Production.

(Gross tons).

	Tin plate	Terne plate	Total
1912 . . .	877,526	85,445	962,971
1913 . . .	762,583	61,136	823,719
1914 . . .	865,975	65,266	931,241
1915 . . .	1,000,000	60,000	1,060,000

Estimated.

It must be remembered that the tin plate production in 1915 was not entirely in proportion to the consumption of the year, for with the advance that occurred for 1916 buyers were disposed to use their 1915 contracts to cover on some material intended for 1916 consumption. There was considerable of this business in the aggregate, though perhaps no more was made than the mills used to make for stock towards the close of the year. As a rule such activity in the past balanced, the stocks frequently not varying widely from one January 1st to the next.

Another consideration making for a large tin plate output in 1915 was that there was an unprecedented export demand. We estimate the year's exports at fully 150,000 gross tons, against an average in immediately preceding years of about 60,000 tons.

It may easily be that last year's tin plate production was a few per cent. in excess of our estimate given above. Assuming the estimate to be correct, it can be seen that by allowing for the increased exports and the stocks made for consumption in the present year the actual domestic consumption was not particularly heavy, not as large indeed as would be indicated by the production of 1912, the record year up to 1915, as the total gain over 1912 would be only about 100,000 tons.

The stocks accumulated will tend to decrease correspondingly the output this year, but on the other hand there may be a continued heavy export demand. All the indications are that there will be heavier exports this year than last, as the heavy movement out of the country did not begin until after the middle of the year.

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August . .	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October . .	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December.	1,116	821	296	990	728	262			
January . .	1,021	795	226	936	716	220			
February .	914	746	168	897	678	219			
March . . .	1,091	801	290	1,012	720	292			
April	1,038	782	256	1,010	722	288			
May	1,047	800	247	1,040	732	308			
June	1,097	789	308	1,090	730	360			

Price Changes Of Iron and Steel Products From January 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our **composite finished steel.** In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the dates are merely those upon which our quotations were changed. A few other price changes are included.

1915—

Jan. 1	Bars	1.05	to 1.10
" 1	Plates	1.05	to 1.10
" 1	Shapes	1.05	to 1.10
" 11	Wire nails	1.50	to 1.55
Feb. 11	Wire nails	1.55	to 1.60
" 11	Pipe	81%	to 80%
" 15	Galv. sheets	3.00	to 3.25
" 25	Galv. sheets	3.25	to 3.40
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 1	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galv. sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
July 20	Wire nails	1.60	to 1.55
" 4	Plates	1.50	to 1.60
" 4	Shapes	1.50	to 1.60
" 5	Tin plate	3.10	to 3.30
" 9	Galv. sheets	3.70	to 3.80
" 9	Blue ann. sheets	1.70	to 1.80
" 12	Tin plate	3.30	to 3.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
" 31	Bars	1.30	to 1.35
Aug. 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galv. sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%

Nov. 1	Steel pipe	79%	to 78%
" 1	Galv. sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galv. sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 21	Bars	1.25	to 1.30
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Nov. 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galv. sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
" 18	Shapes	1.60	to 1.70
" 18	Galv. sheets	4.00	to 4.25
" 24	Galv. sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galv. sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
1916—			
Jan. 3	Tin plate	3.60	to 3.75
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%	78%	to 77%
" 7	Boiler tubes	68%	to 66%
" 14	Boiler tubes	66%	to 64%
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
July, 1914 ..	72,015	54,885	+ 17,130
August	51,231	54,112	— 2,881
September .	44,624	34,757	+ 9,867
October ...	45,241	39,410	+ 5,831
November .	35,325	40,748	— 5,423
December ..	27,458	42,525	— 15,067
January, 1915	20,684	31,556	— 10,872
February ..	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 ..	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ..	31,096	33,061	— 1,965
October ...	31,215	26,338	+ 4,877
November .	29,297	26,005	+ 3,292
December ..	23,173	23,743	— 570

United States citizens arrived and departed, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915..	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September .	9,054	8,188	+ 866
October ...	8,991	8,329	+ 662
November .	8,364	9,166	— 802
December ..	8,458	9,349	— 891

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,237; July, 1915, +14,994; August, 1915, —15,128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461.

COMPOSITE STEEL.

Computation for February 1, 1916.

Pounds.	Group.	Price.	Extension.
2½	Bars	1.90	4.750
1½	Plates	2.00	3.000
1½	Shapes	1.90	2.850
1½	Pipe (¾-3)	2.35	3.525
1½	Wire nails	2.20	3.300
1	Sheets (28 bl.)	2.60	2.600
½	Tin plates	3.75	1.875
10 pounds			21.900
	One pound		**2.1900**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	.....
Mar.	1.4790	1.7646	1.5638	1.5098	.....
April	1.5266	1.7742	1.5337	1.5357	..
May	1.5590	1.7786	1.5078	1.5381	....
June	1.5794	1.7719	1.4750	1.5812	....
July	1.6188	1.7600	1.4805	1.5692	.....
Aug.	1.6781	1.7400	1.5241	1.6059	.....
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet. Pitts.	No. 1 R. R. Wrought. Pitts.	No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1914—						
May	11.75	9.10	11.75	12.25	10.60	10.00
June	11.75	9.10	11.75	12.25	10.50	9.80
July	11.75	8.50	11.75	11.50	10.60	9.75
Aug.	11.50	8.50	11.50	11.25	10.75	9.75
Sep.	11.25	8.70	10.50	11.25	10.75	9.25
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1916—						
Jan.	11.40	9.20	10.75	11.25	10.50	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60

COMPOSITE PIG IRON.

Computation for February 1, 1916.

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.00)	36.00
One ton No. 2 foundry, valley	18.50
One ton No. 2 foundry, Philadelphia	19.50
One ton No. 2 foundry, Buffalo	18.25
One ton No. 2 foundry, Cleveland	18.80
One ton No. 2 foundry, Chicago	19.00
Two tons No. 2 Southern foundry, Cincinnati (17.90)	35.80
Total, ten tons	186.85
One ton	**18.685**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.420	17.391	13.492	13.070	18.669
Feb.	13.427	17.140	13.721	13.079	.....
Mar.	13.581	16.775	13.843	12.971	...
April	13.779	16.363	13.850	12.914	...
May	13.917	15.682	13.808	13.206	.....
June	14.005	14.968	13.606	13.047	.....
July	14.288	14.578	13.520	13.125	.....
Aug.	14.669	14.565	13.516	14.082	.....
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	...
Dec.	17.475	13.838	13.073	17.987	...
Year	14.823	15.418	13.520	14.150	...

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet bars. Pitts.	Rods. Pitts.	— Iron bars, deliv. — Phila.	Pitts.	Ch'go.
1914—						
Sep.	20.75	21.75	26.00	1.18	1.20	1.07
Oct.	20.00	20.70	26.00	1.14	1.20	1.01
Nov.	19.25	19.75	25.00	1.13	1.20	.96
Dec.	18.75	19.25	24.40	1.12	1.20	.91
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79

† Premium for open-hearth.

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1910.	1911.	1912.	1913.	1914.	1915.
January	$14,513,394	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421
February	13,949,082	18,690,792	21,801,570	24,089,871	16,520,260	16,470,751
March	17,253,503	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505
April	16,529,260	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649
May	17,658,042	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612
June	16,503,204	20,310,053	24,795,802	25,228,346	18,927,958	31,757,103
July	16,108,102	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575
August	17,628,537	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822
September	16,776,178	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180
October	17,452,085	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741
November	18,594,806	20,823,061	26,406,425	20,142,141	15,689,401	
December	18,300,710	22,186,996	23,750,864	22,115,701	14,939,613	
Totals	$201,271,903	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$294,822,223

EXPORTS OF TONNAGE LINES— Gross tons.

	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
January	74,353	70,109	118,681	152,362	151,575	249,493	118,770	139,791
February	81,773	84,837	110,224	150,919	204,969	241,888	121,206	144,366
March	96,681	94,519	124,980	216,360	218,219	257,519	159,998	174,315
April	93,285	100,911	117,921	228,149	267,313	259,689	161,952	223,240
May	64,041	109,808	135,306	178,589	307,656	242,353	139,107	263,649
June	69,770	114,724	120,601	174,247	273,188	243,108	144,539	355,402
July	86,796	100,850	127,578	162,855	272,778	237,159	114,790	378,897
August	86,244	105,690	131,391	177,902	282,645	209,856	86,599	405,853
September	76,732	97,641	119,155	181,150	248,613	213,057	96,476	381,917
October	85,766	110,821	129,828	186,457	251,411	220,550	147,293	350,955
November	71,130	116,105	155,138	187,554	233,342	175,961	140,731	363,000
December	77,659	137,806	150,102	190,854	235,959	181,715	117,754	
Totals	961,242	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,503	3,181,383

IRON ORE IMPORTS.

	1912.	1913.	1914.	1915.
Jan.	154,118	175,463	101,804	75,286
Feb.	129,693	188,734	112,574	78,773
Mar.	157,469	164,865	68,549	88,402
April	178,502	174,162	111,812	91,561
May	194,482	191,860	125,659	98,974
June	180,122	241,069	188,647	118,575
July	185,677	272,017	141,838	119,468
Aug.	178,828	213,139	134,913	126,806
Sept.	180,571	295,424	109,176	173,253
Oct.	202,125	274,418	114,341	
Nov.	163,017	179,727	90,222	
Dec.	199,982	223,892	51,053	
Totals	2,104,576	2,594,770	1,351,368	971,098

IRON AND STEEL IMPORTS.

	1911.	1912.	1913.	1914.	1915.
Jan.	33,071	20,008	21,740	17,776	10,568
Feb.	20,812	11,622	25,505	14,757	7,506
Mar.	23,533	15,466	27,467	27,829	8,025
April	22,392	12,481	25,742	30,585	16,565
May	23,347	15,949	28,728	28,173	28,916
June	29,399	21,407	36,597	23,076	32,200
July	15,782	17,882	36,694	25,282	20,858
Aug.	10,944	20,571	18,740	28,768	27,556
Sept.	14,039	18,740	19,941	38,420	23,344
Oct.	21,035	25,559	20,840	22,754	34,319
Nov.	13,880	24,154	25,809	24,165	37,130
Dec.	19,665	21,231	26,454	9,493	
Total	256,903	225,072	317,260	290,394	246,987

CAR BUYING.

Freight cars ordered:		
First half 1913	114,000	
Second half 1913	33,000	
Year 1913		147,000
First half 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
1915—		
January	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,210	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.	
March, 1914	28,000,000
April	28,000,000
May	25,000,000
June	23,650,000
July	23,350,000
August	23,600,000
September	23,200,000
October	21,200,000
November	18,700,000
December	18,100,000
January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
On February 1st	39,000,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1902	989,316,870	1,360,685,933	391,369,063
1903	995,494,327	1,484,753,083	489,258,756
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	*2,484,018,292	691,421,812
1914	*1,789,276,001	2,113,624,059	324,348,049
1915	1,772,309,538	*3,550,915,393	*1,778,605,855
1913—			
June	131,245,877	163,404,916	32,159,039
July	139,061,770	160,990,778	21,929,008
Aug.	137,651,553	187,909,020	50,257,467
Sept.	171,084,843	218,240,001	47,155,158
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	*184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
April	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,265,267	267,801,370	145,536,103
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,746,117	134,170,011
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,841,665	*359,301,274	*187,459,609

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
	1915.	1916.	1915.	1916.
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60		12.50	
Mar. ..	13.60		12.50	
April ..	13.60		12.50	
May ..	13.659		12.65	
June ..	13.75		12.724	
July ..	13.991		12.959	
Aug. ..	15.064		14.364	
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

BAR IRON AVERAGES.

Average realized prices on shipments of base sizes of common iron bars by the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and Highland Iron & Steel Company, as disclosed by wage adjustments of Amalgamated Association of Iron, Steel and Tin Workers, prices realized in bi-monthly periods, governing wage rates for succeeding two months.

	1913.	1914.	1915.
January-February.	1.4831	1.1590	1.024
March-April	1.5430	1.176	1.087
May-June	1.5272	1.1257	*1.10
July-August	1.5029	1.0928	*1.15
September-October	1.3931	1.0847	*1.20
November-Dec'ber	1.2030	1.037	*1.30
Year's average	1.4421	1.1125	1.14

* Settlement basis.

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1909	62,593	9,327
1910	66,640	12,459
1911	14,098	61,466
1912	2,053	81,694
1913	20,680	57,812
1914	15,411	59,549
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
Eleven months	2,290	137,569

British tin plate exports have been as follows, in gross tons:

1913	494,921
1914	435,497
January 1915	29,216
February	25,101
March	36,170
April	40,135
May	33,727
June	33,986
July	39,528
August	22,572
September	20,002
October	31,968
November	25,556
December	30,641
Year	368,602

BRITISH IRON AND STEEL EXPORTS.

1914—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	74,617	43,133	47,237	385,301
Aug. ..	28,342	22,763	21,414	211,605
Sept. ..	37,793	39,185	23,440	228,992
Oct. ..	47,188	37,005	26,950	263,834
Nov. ...	49,666	16,181	30,942	240,608
Dec. ..	31,705	16,315	30,254	212,667
Year ..	780,763	433,507	435,392	3,972,348
1915—				
Jan. ..	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	25,101	198,804
Mar. ..	20,172	17,572	36,170	239,342
April ..	35,209	21,602	40,135	264,244
May ..	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	33,224	39,528	351,984
Aug. ...	73,383	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ...	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,350,299

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boiles, tools, etc.

Tin in January.

After closing on the last day of the year at 40.50c spot New York for Straits tin, the first day of the new year found the market at 42c and excited over news that the Ken Kon Maru" en route from the East Indies had been torpedoed and sunk in the Mediterranean, and a situation developed where for several days sellers were declining to quote on any deliveries, and only a small business being done on bids. Consumers, however, kept wonderfully cool, although on the following day as the market advanced sharply in London there was a further advance here, no spot being available under 45c and sellers declining to quote future deliveries. A great uncertainty existed for a few days as to whether the steamer sunk was the "Ken Kon Maru" bringing about 500 tons of tin, or the "Kan Kokou Maru" which had no tin aboard, and the strained condition here continued until January 7th when on an easier London market, and no confirmation that any tin had really been lost, the market declined to 41.75c and a period of stagnation started in which lasted more or less during the entire month.

Opening at 42c the highest point touched the following day was 45c from which the market declined on January 18th to 40⅞c. Later recovering to 42¼c on the 24th and closing for the month at 41.75c, the average for the month being 41.88c.

Among the features to be noted, are that the American trade is beginning to get immune to the influences of reports of transportation and British Government restriction or other matters appertaining to the war. At first they caused panicky fears and excitement but we have learnt to await confirmation before acting on these reports. Also they have proved often only rumors, and even when they have been true we have found them not serious in their effect on our supply. But another reason is that most consumers are carrying safety stocks against unexpected loss of cargo or delayed arrivals, and this partly explains why we have in the past twelve months taken into our deliveries to consumers over 10,000 tons more than in the previous twelve months. Consumption has increased but not to that extent.

The fears of there not being enough tin forthcoming for our requirements have entirely disappeared. The falling off in European consumption by reason of the Teutonic nations being cut off and poor trade in England, France, etc. (for tin does not enter into war munitions) has resulted in an increase of visible supply in stocks in New York, London and afloat of over 3,000 tons for the past twelve months, viz. February 1, 1916, 17,041 tons as against 13,901 tons February 1, 1915. But that is not all. There has been a very large accumulation of Bolivian ores in Liverpool, which if smelted would reach nearly 12,000 tons pure, which does not appear in the statistics; also an unknown stock of Banca tin at Batavia, held there by the Dutch Government by reason of the suspension of shipments to Holland since the early months of the war and which must be at least 5,000 tons; also not appearing in the statistics. It can then be seen that statistically, tin is not in a strong position, and if the fear of something unexpected happening were entirely removed present prices might prove high.

TIN PRICES IN JANUARY.

	New York.	London					
Day.	Cents.	£	s	d	£	s	d
3	42.00	171	0	0	172	0	0
4	45.00	174	0	0	175	0	0
5	44.75	173	15	0	174	15	0
6	42.50	175	5	0	175	15	0
7	41.75	173	10	0	174	0	0
10	41.50	175	0	0	175	15	0
11	41.37½	173	5	0	174	10	0
12	41.00	173	10	0	174	10	0
13	41.00	174	0	0	175	5	0
14	41.00	173	10	0	175	0	0
17	41.00	173	15	0	174	15	0
18	40.87½	173	10	0	174	10	0
19	41.12½	175	0	0	175	10	0
20	41.50	177	5	0	177	10	0
21	41.87½	178	15	0	179	5	0
24	42.25	180	0	0	180	10	0
25	42.12½	179	0	0	179	10	0
26	41.87½	178	5	0	179	0	0
27	41.75	177	10	0	178	5	0
28	41.50	178	5	0	179	5	0
31	41.75	179	0	0	179	10	0
High	45.00	180	0	0	180	10	0
Low	40.87½	171	0	0	172	0	0
Average	41.88	175	11	5	176	7	5

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915.	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	.....
Mar.	15,694	11,132	16,989	15,467	.....
April	11,893	9,822	15,447	15,785	.....
May	14,345	13,710	17,862	14,646	.....
June	12,920	11,101	16,027	15,927	.....
July	13,346	12,063	14,167	16,084	.....
Aug.	11,285	11,261	14,452	15,127	.....
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915.	1916.
Jan.	4,018	6,030	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	.....
Mar.	5,150	4,810	4,120	4,970	.....
April	4,290	4,400	4,930	5,270	.....
May	5,760	6,160	6,900	6,759	.....
June	4,290	4,280	5,870	6,665	.....
July	4,580	4,770	4,975	5,606	.....
Aug.	5,210	6,030	3,315	4,712	.....
Sept.	5,430	5,160	4,973	5,296	.....
Oct.	4,450	5,020	4,610	4,441	.....
Nov.	5,600	5,560	5,155	6,713	.....
Dec.	4,980	5,110	6,435	5,301	.....
Total	59,018	62,550	63,093	66,517	.....
Av'ge	4,918	5,213	5,258	5,543	.....

CONSUMPTION IN THE U .S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	.....
Mar.	4,000	5,900	4,450	3,200	.....
April	5,400	3,450	4,300	3,200	.....
May	4,250	3,350	3,800	5,600	.....
June	2,850	3,800	3,650	3,900	.....
July	5,150	3,900	3,900	5,300	.....
Aug.	4,300	3,600	2,900	4,500	.....
Sept.	3,600	3,100	3,600	4,300	.....
Oct.	3,850	3,700	3,700	4,900	.....
Nov.	4,300	2,800	2,600	2,975	.....
Dec.	4,050	3,100	1,900	5,200	.....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4,125	3,658	3,475	4,062	.....

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	Jan. 1916.	Dec. 1915.	Jan. 1915.
Straits shipments			
To Gr. Britain..	1,540	777	2,985
" Continent ..	350	959	295
" U. S.	4,205	3,565	1,920
Total from Straits	6,095	5,301	5,200
Australian shipments			
To Gr. Britain ..	324	245	100
" U. S.	nil	nil	nil
Total Australian	324	245	100
Consumption			
London deliveries	1,377	1,189	3,104
Holland deliveries	57	105	34
U. S.	4,452	5,200	2,300
Total	5,886	6,494	5,438
Stocks at close of month			
In London—			
Straits, Australian	1,165	2,221	3,308
Other kinds	1,940	1,682	375
In Holland	.....	.....	.....
In U. S.	2,401	1,371	1,771
Total	5,506	5,274	5,454
Afloat, close of month			
Straits to London.	2,129	1,378	3,287
To U. S.	8,315	8,125	5,160
Banca to Europe..	1,091	1,439	.....
Total	11,535	10,942	8,447
	Jan. 31,	Dec. 31,	Jan. 31,
Total visible supply	1916. 17,041	1915. 16,216	1915. 13,901

STRAITS TIN PRICES IN NEW YORK.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	.....
Mar.	42.86	46.88	38.08	48.93½	.....
Apr.	44.02	49.12	36.10	47.98	.....
May	46.12	49.14	33.30	38.78	.....
June	47.77	44.93	30.65	40.37	.....
July	44.75	40.39	31.75	37.50	.....
Aug.	45.87	41.72	50.59½	34.39	.....
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

The average price for the past five years has been:

1911	42.68c
1912	46.43c
1913	44.32c
1914	35.70c
1915	38.66c

But we are in war times, and anything may happen at any time in loss of cargoes, embargoes, and government restrictions and the only safe policy of our consumers would seem to be to take advantage of present prices to keep well booked ahead. Only in this way can they protect themselves in excited periods and high prices that for a while are almost certain to come up unexpectedly while the war lasts—of getting permits. Early in the month it was given out that one-half of all the tin shipped from the East Indies would have to be sent via London and on arrival in London might be retained there by the government if they did not consider that their interests were fully protected by the amount of tin held in the British Isles. Instead of anything of the kind taking place we find that the shipments from the Straits were above normal, a little over 6,000 tons, and that more than two-thirds of that amount has been shipped direct from the East Indies to America It is still reported however that a change will be seen in the months to come and that the British Government is only going to issue permits of direct shipments to America of one-half of the total shipments from the Straits and that the balance of America's requirements must come via London.

An item of interest during the month has been the arrival of the first cargo of tin ore from Bolivia for the new tin smelting and refining plant that was erected by the American Smelting & Refining Company at Perth Amboy. The tin arrived via the Straits of Magellan on account of the Suez Canal being closed This plant expects to be producing tin in March and to work up to an output of 500 tons per month.

Lead in January.

Lead was active and strong with large contracts placed for domestic and foreign shipment at the beginning of the year. The strength of the market was emphasized January 4th, when the American Smelting & Refining Company advanced the price $5 per ton to 5.75c New York and 5.67½c at East St. Louis. On January 7th, another advance of $3 per ton established the Trust price at 5.90c, at New York and 5.67½c at East St. Louis. On January 7th, another advance of $3 per ton established the Trust price at 5.90c at New York and 5.82½c at East St. Louis. The independent companies soon followed the action of the American Smelting & Refining Company. Nearly all of the producing interests were sold far into the future and even the current production was applied on contracts leaving a light supply of spot metal to meet demand of consumers.

Not a few of the domestic melters for several months had been buying from hand-to-mouth in anticipation of lower prices but miscalculations placed them in a serious position. Efforts of such consumers to secure enough metal for current requirements were responsible for much of the strength of the market. Export demand, however, was also active and some large sales were reported to have been made for shipment to Europe and to the Far East. Even Japan was reported to be in the market for 500 tons.

Mail advices from London, reported the sinking of a Japanese line steamship in the Mediterranean with a cargo of lead for Vladivostock, foreshadowing renewal of buying by Russia. English dealers found much difficulty in obtaining lead from either Australia or Spain while the demand from English consumers continued active. Consequently there was more buying here on January 5th, the strength of the London market expressed in a further advance of 15s, bringing spot to £31 15s. The advance from Christmas had been £2 15s, equivalent to ½c per pound. Upon the announcement of another rise in the American market on January 7th, London advanced to £32 15s but there was a reaction on January 10th, to £32, equivalent to 6.62½c per pound, leaving London above the New York parity.

The National Lead Company, following

the advance by the Trust on January 7th, raised the price of all manufactured products ¼c per pound; but, while lead continued strong in the domestic market with the demand taking up all the metal available, there was a flurry at London, partially due to the attitude of the British Government in attributing the sharp rise in prices to speculative operations that were considered inimicable to the interests of the English people. The British munitions department subsequently prohibited dealing in lead except under permit with the hope of eliminating undesirable and unwarranted speculation. The effect of this action was seen in the break in the English market to £29 5s for spot and £28 10s for futures. This was the lowest price at London since December 27th, when the Trust price at New York was 5.40c per pound.

The domestic market also was unsettled with second hands eager to sell at concessions from the Trust price. Several days of dulness followed, but on January 17th, the London market was stronger and New York, sympathetically firmer. Reports of an inquiry for 10,000 tons for Russia, was reflected in an advance in the foreign market. The indication is that some large export contracts were quietly closed, followed by an unexpected advance in the Trust price, on January 21st, of $4 per ton to 6.10c at New York and 6.02½c at East St. Louis. The interest of domestic consumers was stimulated by reports of larger foreign sales.

The largest producing interests claimed that their output is sold for months ahead and that they had little if any metal to offer. Occasionally, a few round lots were offered by dealers which were quickly taken up at full prices. Weather conditions tended to restrict production and during the last ten days of the month both the foreign and home markets continued strong, but there was little buying for any account. Second hands, however, offered future deliveries at concessions and some sporadic sales were made. On January 26th, the London market had recovered most of its previous decline and a further advance was established. London reported that lead received from abroad was taken up with avidity by consumers, the extent of the English demand being a great surprise to the trade. The increased British requirements was attributed to the energy put into the manufacture of munitions. Much of the Australian lead was shipped directly to the Far East making London more dependent upon the United States.

During the last few days of the month the domestic market was lifeless but there was small disposition to shade the Trust price on nearby positions. Some of the larger independent producers refused to offer lead for any delivery. Consumers, however, had ample supplies to meet current needs. Selling interests pointed to the strength of the foreign situation as supporting their contention that another advance was done when the month closed.

It is an interesting fact that the domestic market steadily advanced from October 21, 1915 to January 21, 1916. During that time the Trust price was advanced $32 per ton equivalent to 1.60c per pound. Renewed foreign buying is expected at any moment to cause another advance in the market.

LEAD PRICES IN JANUARY.

Day.	New York.* Cents.	St. Louis. Cents.	London. £	s	d
3	5.52½	5.45	30	7	6
4	5.75	5.67½	31	0	0
5	5.75	5.67½	31	15	0
6	5.75	5.67½	31	15	0
7	5.90	5.82½	32	15	0
10	5.87½	5.77½	32	0	0
11	5.85	5.75	31	0	0
12	5.90	5.70	29	5	0
13	5.80	5.70	29	5	0
14	5.80	5.70	29	5	0
17	5.82½	5.72½	29	10	0
18	5.82½	5.72½	29	17	6
19	5.82½	5.75	30	15	0
20	5.87½	5.80	31	15	0
21	6.05	5.97½	31	5	0
24	6.10	5.97½	31	15	0
25	6.10	6.00	31	17	6
26	6.10	6.00	32	5	0
27	6.10	6.00	32	5	0
28	6.15	6.00	32	2	6
31	6.15	6.00	32	0	0
High	6.20	6.00	32	15	0
Low	5.52½	5.45	29	5	0
Average	5.90½	5.80	31	2	7

* Outside market.

Copper in January.

In January the commercial strength of copper was emphasized by an advance of 3c per pound at New York and an equivalent rise of £14 at London for American Electrolytic.

The statistical position of the industry, according to trade reports, was much stronger than seemed possible at the close of the year. Those who claim to be in touch with the producing interests, declared that surplus stocks carried at the refineries at the beginning of 1916 were less than 75,000 tons; in fact, the surplus was said to be less than 150,000,000 pounds. It was believed, however, that more than 50,000,000 pounds was being carried in warehouse on speculative account making 200,000,000 pounds available for quick shipment. The course of the market, however, failed to demonstrate that there was any appreciable amount of copper available for delivery over the first two months of the year.

According to the Geological Survey the output of the refineries in 1915 was 1,647,000,000 pounds, exceeding the previous maximum production in 1913, slightly; but details of the secondary production may make the increase in 1915 more apparent. Stocks at the beginning of 1915, according to government returns, were 173,000,000 pounds, making the total available supply in 1915, 1,820,000 pounds. The exports, according to Custom House returns, in 1915, were slightly less than 620,000,000 pounds, which deducted from the available supply leaves 1,200,000,000 pounds. Assuming that the estimate of stocks, 200,000,000 pounds, on the first of the year, were correct, the inference is that 1,000,000,000 lbs. were delivered into domestic consumptive channels last year. It seems almost incredible that this amount of copper was melted in 1915, when it is recalled that during the first quarter of the year the industry was limping along at little more than a 50% rate.

It was confidently asserted that by selling interests that deliveries of domestic and foreign consumers in December were in excess of 200,000,000 pounds. The exports in December, according to reports made in the last ten days, were 42,426 tons, equivalent to 95,024,240 pounds. The December exports were exceeded only in March 1913. Indeed, revised reports may show that the December foreign shipments were never exceeded. The total deliveries in December were also record-breaking. The previous monthly maximum deliveries were 64,053,000 pounds in April 1913.

It is estimated that the output of the refineries in January were 167,000,000 pounds. Deliveries into domestic consumption were checked by the railroad embargoes on freight shipments into New England. The exports, with Southern and Pacific ports estimated, were 23,000 tons equivalent to 51,520,000 pounds. The deliveries into domestic consumption were considerably less than 100,000,000 pounds, because of the restriction on rail shipments. The indication, thus, is that there was an accumulation of 25,000,000 pounds in producers' hands in January. Judging from the course of the market, however, the surplus available had small influence upon the policy of the producing interests.

The selling campaign throughout the month was marked by more or less vigor. Manufacturers of war munitions placed some additional heavy contracts for March, April and May deliveries. Other domestic consumers were inclined to be conservative until late in the month when the upward tendency of prices was more apparent, they threw off reserve and purchased liberally for April, May and June shipment. Export purchases were also fair in volume. The result was that prices were established at practically the highest level ever attained in the industry.

One of the most startling developments of the month was the effort by speculators to increase excitement by reports of a corner in spot metal with sales at all sorts of prices ranging from 26c to 30c per pound. The rumors for the time being defeated their own purpose; the actual market at that time being not over 25c per pound. At the close of the month Electrolytic sold at 25½c for March, April and May delivery and slightly higher prices were asked for nearby shipments by producers.

It is difficult to reconcile reports of large sales for future delivery at prices from ¼c to ½c higher than offerings by second

LAKE COPPER PRICES.

Average monthly prices of **Lake Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	.....
Mar.	14.87	14.96	14.72	15.11	.....
Apr.	15.98	15.55	14.68	17.43	.....
May	16.27	15.73	14.44	18.81	.....
June	17.43	15.08	14.15	19.92	.....
July	17.37	14.77	13.73	19.42	.....
Aug.	17.61	15.79	12.68	17.47	.....
Sept.	17.69	16.72	12.43½	17.76	.....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.36	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av..	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Average monthly prices of **Electrolytic Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	.....
Mar.	14.78	14.92½	14.33½	14.96	.....
Apr.	15.85	15.48	14.34	17.09	.....
May	16.16	15.63	14.13	18.60	.....
June	17.29	14.85	13.81	19.71	.....
July	17.35	14.57	13.49	19.08	.....
Aug.	17.60	15.68	12.41½	17.22	.....
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av..	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Average monthly prices of **Casting Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	.....
Mar.	14.53	14.76	14.18	14.34	.....
Apr.	15.72½	15.33	14.18	16.48	.....
May	16.01	15.45½	14.00	17.41	.....
June	17.08	14.72	13.65	18.74½	.....
July	17.09	14.40½	13.34½	17.76½	.....
Aug.	17.35	15.50	12.27	16.46	.....
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av..	16.29	15.33	13.18	16.76	...

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since March 27, 1915, are given in the following table together with the price of Lake Copper on the same dates:

1915—	Sheet Copper.	Lake Copper.
March 27	20.75	15.75
April 8	21.00	16.50
April 13	21.25	16.62½
April 14	21.50	16.75
April 17	22.00	17.00
April 19	22.50	17.62½
April 22	23.00	18.00
April 28	24.00	18.93¾
June 8	24.50	19.62½
June 9	25.00	19.87½
July 27	24.50	18.75
July 30	24.00	18.75
August 18	23.00	16.75
November 3	23.25	18.06¼
November 15	23.50	18.62½
November 16	23.75	18.75
November 17	24.00	18.87½
November 18	24.25	19.00
November 22	24.50	19.87½
November 23	25.00	19.87½
December 22	25.50	20.50
December 23	26.00	20.75
December 24	27.00	21.50
December 30	27.50	22.37½
1916—		
January 3	29.00	23.25
January 5	30.00	23.50
January 18	30.50	23.87½
January 24	31.50	25.25
January 31	32.00	25.25

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	21,863
February .	26,792	34,634	15,583	.....
March ...	42,428	46,504	30,148	.....
April	33,274	35,079	18,738	.....
May	38,601	32,077	28,889	.....
June	28,015	35,182	16,976	.....
July	29,596	34,145	17,708	.....
August ..	35,072	16,509	17,551	.....
September	34,356	19,402	14,877	.....
October .	29,239	23,514	24,087	.....
November	30,653	24,999	23,168	.....
December	30,653	22,166	*32,936	...
Total ..	382,810	360,229	†266,854	....

* Includes only exports from Atlantic ports.
† Approximate.

hands for nearby shipments. The explanation offered was that large consuming interests had their requirements well covered for the first quarter of the year, while only small buyers needed metal for January and February shipment.

One of the most interesting developments of the month was the action taken by the munitions department of the British government limiting the sale of Electrolytic copper in London to 50 tons at one time and at a maximum price of £100, without permission from the government. It is understood that the British authorities believe that the Allied governments are being exploited by speculators in copper and other metals. The English attitude had a temporary retarding influence upon the market but the price of Electrolytic at London has advanced £6 since the limitation of the buying price at London.

Another feature, worthy of note, is that Standard copper at London during the month advanced £4 10s to £5, while Electro advanced £14. There was thus a margin of from £25 to £30 between Standard and Electrolytic or Best Selected. The result was the withdrawal of considerable Standard copper from warehouses to be converted into higher grade metal.

The month closed upon a very strong but quiet market with producing interest apparently anticipating another buying movement with higher prices.

COPPER PRICES IN JANUARY.

	New York			London.
	Lake.	Electro.	Casting.	Standard.
Day.	Cents.	Cents.	Cents.	£ s d
3	23.25	23.25	22.25	86 15 0
4	23.25	23.25	22.25	87 12 6
5	23.50	23.50	22.62½	88 15 0
6	23.75	23.75	22.75	91 0 0
7	23.50	23.50	22.50	87 10 0
10	23.25	23.25	22.25	86 0 0
11	23.25	23.25	22.25	84 15 0
12	23.25	23.25	22.25	84 17 6
13	23.50	23.50	22.50	87 0 0
14	23.50	23.50	22.50	85 5 0
17	23.62½	23.62½	22.62½	85 15 0
18	23.87½	23.87½	22.87½	85 15 0
19	24.12½	24.12½	23.12½	85 15 0
20	24.25	24.25	23.25	87 15 0
21	24.75	24.75	23.75	89 0 0
24	25.25	25.25	24.12½	91 0 0
25	25.25	25.25	24.12½	91 5 0
26	25.25	25.25	24.12½	90 5 0
27	25.25	25.25	24.12½	89 15 0
28	25.25	25.25	24.12½	91 5 0
31	25.25	25.25	24.00	91 15 0
High .	25.50	25.50	24.25	91 15 0
Low	23.00	23.00	22.00	84 15 0
Av'ge	24.10	24.10	23.06½	88 0 9

LEAD (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.92½	3.99½	3.57	5.80
Feb.	4.06	3.82		3.95	3.72	
Mar.	3.97	4.03		3.80	3.98	
Apr.	3.82	4.19		3.70	4.11	
May	3.90	4.23½		3.81	4.16	
June	3.90	5.86		3.80	5.76	
July	3.90	5.74		3.75	5.52	
Aug.	3.90	4.75		3.73½	4.59	
Sep.	3.86	4.62		3.67	4.53	
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 10, 1915, have been as follows:

June 11, 1915	Advanced	.25c to 6.50
June 12	"	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	"	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	.10c to 5.00
November 10	"	.15c to 5.15
November 15	"	.10c to 5.25
December 14	"	.15c to 5.40
December 31	"	.10c to 5.50
January 4, 1916	"	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10

Spelter in January.

Spelter gained strength in January notwithstanding the enormous output, present and prospective. The net result of the fluctuations in prices was an advance of 1¼c to 2c per pound at East St. Louis, and a rise of £1 in spot and £5 on future at London. The highest prices of the month, touched on January 24th, however, were not fully maintained.

During the first ten days of January the domestic market was relatively quiet and the London market receded £2 on the spot position. In the next ten days better demand was developed for January, February, and March deliveries with a stronger tone prevailing and some advance in prices. The rise was attributed partially to the severe weather, accompanied by storm and floods in the zinc ore districts, especially in Oklahoma and in the Joplin districts. Property was damaged, wire service was prostrated. Much difficulty was experienced in obtaining fuel and pressure in the natural gas fields was too low to permit some plants to operate. At the same time, there was a sudden increase in the demand for spelter and some heavy buying was done between January 14th and January 20th.

The embargo on freight shipments into New England was responsible for the active and urgent demand developed for nearby shipments. On some days the market was excited and feverish. Manufacturers of war munitions, hyper-sensitive because of past experience, came into the market for round tonnages without special regard to prices. The demand was mainly for first quarter shipment but there were also large purchases over the second quarter and some contracts were closed for shipments over the entire year.

Although manufacturers of brass had large spelter shipments in transit there was no certainty as to when supplies would be received at the New England plants because of the traffic congestion on many of the Eastern roads. Consequently, new orders were placed for prompt shipment, the metal to be accumulated at New York and shipped by water to New England as required. For a few days there was a scramble even for small lots of spelter which were shipped by water to Bridgeport and then by trolley to the works that were pressed for material. The heavy demand from domestic consumers culminated about January 24th, but it is significant that galvanizers, who were operating between only 50% to 60% of capacity, made few purchases. Some large inquiries also came from dealers but resulted in only moderate transactions.

The London market after receding from £90 to £88 had advanced to £92 for spot while future positions had advanced from £78 to £83, but on January 18th, three months spelter had sold at £73. At London £92 is equivalent to 19.55c per pound, but with a freight rate of $28 per ton, equivalent to 1¼c per pound, London was too low to invite exports from New York market.

Large smelting interests had little or no spot spelter to offer for sale but made heavy deliveries on lower priced contracts. Some resales were made by dealers to take advantage of the rise in the market.

On January 25th a few large sales of special brands were made for export and the prices of spot spelter at St. Louis was advanced to 19¼c. Some large contracts for the second quarter were also closed with domestic consumers about this time.

During the last few days of the month there was a sudden and sharp falling off in buying and with freer offerings by producers and dealers, prices receded from ½c to ¾c on all positions. At the close of the month spot was held at 18½c to 18¾c, February at 18¼c to 18½c, March at 17½c to 17¾c and second quarters at 15½c to 15¾c. Sales of second quarter had been made at 14c at the beginning of the month and at 16c on January 24th.

Several large inquiries for export, prior to May, for England, France and other European countries, marked the close of the month. Russia also purchased more in this country, although she is now receiving some supplies from Japan. The zinc ores being concentrated in Japan, are derived partially from Chosen, the coast province of Siberia, also from Australia and from Japanese mines.

It will be recalled that at the close of 1915, the United States Government re-

ported a production of approximately 490,000 tons of primary spelter from domestic and foreign ores and that the productive capacity at the beginning of the year was in excess of 715,000 tons. Some trade authorities, however, estimate that nearly 500,000 tons of primary spelter was produced in the United States last year. The difference being accounted for by a transfer of some of the "dross and scrap smelters" to the list of "ore smelters." The same interests estimate the total prospective capacity at nearly 800,000 tons.

The smelters in the United States with 155,000 retorts, it is estimated have a productive capacity of 650,000 tons a year. In addition, 23,234 retorts with a capacity of 97,500 tons of spelter are building. The Anaconda Copper Co. is to build a new zinc concentrator at the Washoe smelter which will have a capacity of 2,000 tons of ore per day. The new plant is expected to be in operation July first and the concentrates will be sent to the electrolytic zinc refinery now under construction at Great Falls; the latter plant is expected to be in operation September first. The Anaconda production will be at the rate of 35,000 tons a year. Electrolytic spelter will also be produced at the rate of 12,000 tons a year by the Trail plant which will be a factor in the market during the current month. The plant of the United States Steel Corporation at Donora is producing at present at rate of 40 tons per day and by September is expected to reach their proposed full capacity of 40,000 tons per annum. It is estimated that zinc ore producers to-day are showing a profit of 100% on ore sold at $100 per ton. In turn the smelting plants, it is estimated, are reaping a profit of from $60 to $80 per ton on the metal sold to-day for delivery during the balance of the first quarter and through the second quarter of the year. In ordinary times a margin of from $16 to $17 per ton is considered satisfactory.

SPELTER PRICES IN JANUARY.

Day.	New York.* Cents.	St. Louis. Cents.	London. £	s	d
3	17.42½	17.25	90	0	0
4	17.40	17.18¾	90	0	0
5	17.30	17.12½	88	0	0
6	17.30	17.12½	90	0	0
7	17.42½	17.25	90	0	0
10	17.42½	17.25	88	0	0
11	17.42½	17.25	90	0	0
12	17.42½	17.25	89	0	0
13	17.55	17.37½	90	0	0
14	17.92½	17.75	88	0	0
17	18.42½	18.25	88	0	0
18	18.42½	18.25	88	0	0
19	18.55	18.37½	88	0	0
20	18.80	18.62½	88	0	0
21	19.05	18.87½	90	0	0
24	19.17½	19.00	92	0	0
25	19.30	19.12½	92	0	0
26	19.17½	19.00	92	0	0
27	18.92½	18.75	91	0	0
28	18.67½	18.50	91	0	0
31	18.80	18.62½	91	0	0
High	19.42½	19.25	92	0	0
Low	17.30	17.12½	88	0	0
Average	18.18½	18.01	89	14	3

* Prompt western shipment.

SPELTER (Monthly Averages.)

	New York 1914.	New York 1915.	New York 1916.	St. Louis 1914.	St. Louis 1915.	St. Louis 1916.
Jan.	5.33	6.52	*	5.14	6.33	18.01
Feb.	5.46	8.86		5.27	8.61	
Mar.	5.35	10.12½		5.15	9.80	
Apr.	5.22	11.51		5.03	11.22	
May	5.16	15.82½		4.96	15.52	
June	5.12	22.63		4.93	22.14	
July	5.03	20.80		4.84	20.53	
Aug.	5.63	14.45		5.45	14.19	
Sep.	5.52	14.49		5.33	14.10	
Oct.	4.99½	*		4.81	13.89	
Nov.	5.15	*		4.97	16.87½	
Dec.	5.67	*		5.49	16.72	
Av.	5.30	†13.91		5.11½	14.16	

* Market nominal. † First nine months.

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	
Mar.	7.17	6.56	5.59	12.15	
April	7.07	6.08	5.50	13.85	
May	7.13	5.77	5.38	20.55	
June	7.25	5.50	5.37	25.60	
July	7.46	5.61	5.26	24.90	
Aug.	7.34	5.99	5.66	19.30	
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

Antimony In January.

Antimony was spasmodically active in January and prices fluctuated within a range of 1c to 2c per pound. The needs of manufacturers of war munitions and the movements of antimony-laden vessels afloat from the Orient, were the main causes for the changes in the market throughout the month. There was almost a famine in spot supplies when the month opened but relief was anticipated from the discharge of a steamship at dock and one due to arrive in a few days. There was a good demand for future positions and sales were made of January shipments from China at 33c. Some business was also transacted in February shipments at ¼c to ½c per pound less. November shipments from China and Japan were in demand at 34½c in bond, at New York.

Dealers were anxious to purchase January and February deliveries but importers, unwilling to take the risk of transportation would sell only from shipments from the Far East. A quiet period for a few days was followed by freer offerings of American 99% metal at 36c for March delivery and importations at 34c in bond available in March. With the arrival of a steamship on January 11th, there were freer offerings, at concessions, in round lots of spot at 41½c to 42c. January sold at 40½c to 41c and steamships due in early February at 35c in bond. January shipments from China and Japan receded to 33c to 33¼c.

An unsettled feeling developed on January 11th, from the injudicious offering of supplies by importers on an unwilling market; but a few days of dulness were followed by smaller offerings and a stronger tone for spot and nearby positions while futures continued dull, weak and irregular. Sales of 100 ton lots ex ship, due in February, were made at 34c in bond while American metal sold at 34½c for February and March shipment from the Pacific coast.

It is interesting to note that the British government, in complete control of prices of all metals in England, reduced the price of antimony from £100 to £95, equivalent to 19⅞c per pound early in January. This action, of course, had no bearing upon the trend of prices in the United States.

A good demand was developed about January 18th for antimony cargoes to arrive in early February at 34¼c to 34⅜c per pound in bond, for 25 ton lots, freight congestion on the eastern railroads, causing delay in deliveries from the Pacific coast, made buyers reluctant to purchase for February shipment from San Francisco, and spot metal at New York was firmer at 43½c and January at 42c. On January 20th, guaranteed February deliveries sold at 38½c and March at 37½c, free of duty. More interest was also taken in cargoes afloat from the Orient. After several quiet days holders were more anxious to sell January and February deliveries at concessions but spot continued strong at 42½c to 43c. It should be noted that because of the very high prices dealers are carrying unusually light stocks for the jobbing trade. It is estimated that only one-quarter of ordinary supplies are carried in store. From January 25th to January 28th, the market was quiet for nearby positions and futures were neglected with buyers holding off, but, on the closing day of the month, there was an active demand for future deliveries and heavy sales of all positions were made for shipment from the Far East up to March. Spot was also active and stronger with sales at 43c to 43½c per pound.

CHINESE and JAPANESE ANTIMONY.

Average monthly price of Chinese and Japanese (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	.....
Mar.	6.78	7.91	5.94½	20.93½	.....
Apr.	6.87	7.82	5.82	23.97	.....
May	6.98	7.75	5.78	34.71	.....
June	7.07	7.62	5.62½	36.53½	.....
July	7.37	7.55	5.44	35.98	.....
Aug.	7.58	7.48	13.05	32.57	.....
Sept.	8.00	7.31	9.79½	28.50	.....
Oct.	9.11	6.46	11.64	30.96	.....
Nov.	9.11	6.28	14.14	37.88	.....
Dec.	9.05	6.05	13.15	39.36½	.....
Av..	7.63	7.43	8.53½	29.52	.....

Aluminum In January.

Aluminum was but slightly changed in January; commercially and statistically there were few developments of importance. Early in the month a strong tone prevailed but buying was of small proportions. No. 1 Virgin was held at 54½c for spot but there was no pressure to sell, while future positions were less strong during the first ten days. There was some evidence of a more ample supply toward the middle of the month and a slightly easier feeling prevailed for future positions while spot was held at 55c and there were few buyers over 53c per pound.

There was evidence, however, that consumption continued at the maximum rate and large profits were being made by producing interests. One of the most significant developments was the preparations for increasing output both at home and abroad. The United Smelting & Aluminum Company, that had about completed a plant at New Haven, found orders so heavy that it secured more land adjoining the new plant and projected plans for new buildings to largely increase capacity.

The Aluminum Company of America continued to push construction at its new plants in the South but neither the works at Baden, North Carolina, nor the concentrating plant at Marysville, Tenn., is expected in operation before the end of the year. It is estimated that about $20,000,000 will be expended in developments in the South during the next two years.

In Europe, the principal new development was the organization of a Scandinavian Company to construct a hydro-electric plant and smelter at Hoyanfjord, Norway, having a capacity to produce 4,000 tons of aluminum per year. Bauxite, beds in Southern France were secured where the concentrates will be produced and subsequently shipped to Norway.

The Munitions Department of the British Government continued to exercise control over the aluminum industry in Great Britain, allowing no sales, purchases or exports, except by special permit from the government and the maximum price was reduced to £155. Some odd lots in second hands, however, were allowed to be sold as high as £220. At the same time, Italy secured supplies from the United States, paying at the equivalent of £250.

A strike at the Niagara Falls Works of the Aluminum Company of America, was of short duration and its effect upon the market was not apparent. Aluminum sheets were sold as high as 60c per pound for delivery in three to four weeks, in the open market, but the Aluminum Company of America is reported to have made sales of sheets at 50c per pound.

During the second half of the month the market was quiet but steady with ingots held at 55c and buyers at 53c to 54c for early shipment.

ALUMINUM, SILVER and ANTIMONY PRICES IN JANUARY.

	Aluminum.	— Silver —		Antimony*
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents.
3 ..	55.00	55⅞	26 1/8	41.00
4 ..	55.00	56⅛	26¾	41.50
5 ..	55.00	56½	26⅞	42.75
6 ..	55.00	56⅝	26⅞	43.00
7 ..	55.00	56⅝	26 1/8	42.50
8 ..	.....	56¼	26 1/16	.....
10 ..	55.00	56½	26⅞	41.75
11 ..	55.00	56¾	26 1/8	41.50
12 ..	54.00	57	27	41.50
13 ..	5400	56⅞	27	41.50
14 ..	54.00	57	27 1/16	42.25
15 ..	.....	56⅞	27	.....
17 ..	54.00	56⅜	26¾	42.25
18 ..	54.00	56⅝	26⅞	42.25
19 ..	54.00	56⅝	26⅞	42.25
20 ..	54.00	56¾	26 1/8	42.25
21 ..	54.00	56⅞	27	42.25
22 ..	.....	57¼	27 3/16	.....
24 ..	54.00	57⅝	27 1/16	42.75
25 ..	54.00	57⅜	27¼	42.75
26 ..	54.00	57	27 1/16	42.75
27 ..	54.00	56¾	26 1/8	42.75
28 ..	54.00	57⅛	27⅛	42.75
29 ..	.....	56⅞	27	.....
31 ..	54.00	57⅛	27⅛	43.25
High	56.00	57⅝	27 1/16	43.50
Low.	53.00	55⅞	26 1/8	41.00
Av...	54.33	56.77½	26.96½	42.26

The Steel and Metal DIGEST

VOL. VI. NEW YORK, MARCH, 1916. NO. 3.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer.
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

BUSINESS SITUATION AND OUTLOOK.

We think when the economic history of the war is written, it will show that January and February of this year marked high tide in the sensational business developments of this country that accompanied the great war, and which from our being the only neutral able to furnish those requirements of food, ammunition and the commodities required by the warring nations, resulted in a flood of wealth and the greatest and a year of the most intense commercial activity perhaps any country in the annals of the past has ever experienced. The enormous orders still on our books, and the momentum we have reached, may carry us along at a heavy rate for months to come, but we believe we have reached and passed the apex of war orders. Even if the needs of those who have been our customers increases, they have arranged their affairs so that they will be able to provide for more at home, and buy less from us than at the rate they have during the past six months. We are not considering what might happen with an end of the war, but taking it for granted it is to continue for a year or more to come.

The unpreparedness of the Allies was not confined to their military affairs. They were unprepared in war supplies, and the means of producing them and therefore had to come in a sudden flood to the only country that could begin to supply their necessities. A change in this direction is taking place, and will grow with every month. In no field of

commodities has there been a greater war demand than in metals if we omit explosives, etc. There may be as great a demand for the raw material, but these materials will be more largely put into the manufactured commodities that are made abroad, and less here.

Meanwhile we have been forced into an unsound condition on volume of facilities to produce and the wages paid for producing. We have enormously increased our cost of manufacture and placed it on a basis that only extraordinary demands almost greater than we can supply has justified. It was inevitable, but so also is the aftermath. That may be some way off yet but we believe it will begin to be felt this summer.

To come to the metal trade. While the war lasts one realizes the danger of predictions, as there are so many unexpected developments that may take place, but we venture the opinion that we have reached and passed, as we said before, the apex of foreign war orders, and therefore have perhaps reached the apex of advances in the metals that have been so extraordinarily advanced by this demand, namely copper, spelter, lead and antimony, also iron and steel. There is of course an "if" to this opinion, and that is if we do not become involved in the war. Should this take place there would be sensational activity for home war requirements, that would bring an additional sudden flood of orders from our government, but there would also be great disturbance in our home business and the demand for home peace requirements would fall off sharply, and we are inclined to think would more than offset the war demand for metals. Furthermore prices are at such a sensationally high basis, and production at considerably above the highest on record, that any change from demand able to keep up every ounce of supply, would result in a price reaction, how serious if the supply continued more than the demand we are afraid to suggest. We fail to see how we can increase our consumption this summer since every available plant is at work, and it takes time to build new ones, and when they may not be needed.

We believe there is each day a growth in the number of clear, cool headed men who have made up their minds that they are satisfied with what they have made on the war boom, and whose motto is now "Safety first" in future operations, and a safe deposit for their profits, and certainly not prepared to risk increasing them by taking the risks that up to now have proved safe and profitable. Purchasing agents are being warned to talk nothing that would cast discredit on maintainance or even further advances, but to buy nothing they have not booked orders for, and where they have surplus stocks to quietly reduce them without hurting the market. What individual in any company having the buying end of the business could look his partners or employers in the face, should a decline come and it was shown that he had heavily committed them to receive goods against which they had no orders at eight times normal prices in case of antimony, four times normal prices in spelter, double normal prices in copper, double normal prices in lead, three and one-half times normal prices in aluminum, and perhaps as serious in its consequence at double normal price on iron and steel and their products. Of course there is going to be some day just such disasters to many. There are a growing few that are thoroughly awake to the certainty and determined that nothing shall tempt them into it. But there is another danger, the danger of the customer you have sold futures to being able to take and pay for the goods should prices collapse. Is there sufficient thought being given to the state of order books, when although virtually everything is sold cash on delivery, the difference in price may be more than the entire ordinary invoice value of the material in normal times. Of course if big profits had not been made by almost everyone, the chance of a collapse of present prices would be positively alarming. This will come some day. It is a wise man who pastes it up before him and keeps it there. The ice is going to get weaker the longer present prices last, and the weight of our stimulated production will be harder to bear. We do not care if we are criticised for preaching extremely conservatism, and the chorus of voices one

hears now-a-days on very side that we are wound up, especially in iron and steel, to go with increasing momentum, only made us more certain that the opinion is too unanimous to be safe and that those preaching higher prices and increasing consumption have prepared themselves to meet it. Hence the old adage—majorities are invariably wrong in business opinions. It is going again to be proved that the pauper iron trade of a year ago, now a prince beyond all past experiences, will become the pauper again.

We are facing some sensational changes from present prices and conditions with the end of the war. We have largely taken up the vacuum of 1913 and 1914 in our home requirements. Present prices are sure to decrease home consumption although we see no signs of it yet. There must be a readjustment from war insanity to normal peace conditions. But when peace comes it won't even then be normal conditions, but abnormal, because there will be

1st. An abnormal price platform to be lowered and adjusted.

2nd. An abnormal production to be lowered and adjusted.

3rd. A changed tariff policy of England. We will have to face much higher tariffs for our goods.

4th. An extraordinary period of economy to pay their war debts by our foreign customers.

We do not expect our warning to be heeded by a few. We have not forgotten how optimistic we were thought by our readers when about a year ago we were predicting with iron output 25% of normal that we would at this time not be able to fill the demands to be made in this industry. We are quite ready to be considered pessimistic in saying that present conditions of affairs cannot last, war or no war.

One reason why the edge is off our stock market, and why reactions are taking place there is that the clever men in Wall St. realize that from now on we are about the only country the warring nations can turn to for loans, or a market for our securities that they may hold and which is a good lot in England's case. We are like the boy playing marbles who has won all the others had, and if the game is to be continued he must lend some of them to the others. When you get to that point the security may be good, but it is not like the hard cash, it does not create the bulging of the pocket, and the American pocket-book must now contain promises to pay instead of hard cash. We have won nearly all the marbles.

PIG IRON STATISTICS FOR AN INTERESTING YEAR.

While the official statistics of pig iron production in 1915 do not show the interesting fact that the year closed with production at a rate double the opening rate, they still show some very interesting things about the year. The production in the first half of the year, 12,233,791 gross tons, was less than the production in the first half of 1906, nine years earlier, while the production in the second half, 17,682,422 tons, broke all previous records for a half year. The production for the year, 29,916,213 tons, fell a million tons short of the record for a calendar year, made in 1913, but with that exception was the largest tonnage on record for a calendar year.

Bearing in mind that the total production in 1915 yielded to but one year in magnitude, it is interesting to examine the production by grades. The production of basic, 13,093,214 tons, was the largest on record, as was the production of ferromanganese. In Bessemer no less than seven of the preceding years showed larger production. In foundry iron there were five years preceding with larger production.

The production of Bessemer steel ingots and castings in 1915 can be estimated very closely from the Bessemer pig iron production, at about 9,500,000 gross tons. The maximum Bessemer steel production was in 1906, 12,275,830 tons. Within a short time after 1906 it became very probable that as much Bessemer steel would never again be made in a calendar year, but the demand for steel of all descriptions is now so strong, and steel works have such a way of breaking their production records when pushed, that we think there is a distinct possibility of this year breaking the 1906 record in Bessemer steel production, even though on account of the abandonment of a few converters and the diversion of some others to the duplex process the

(Continued on page 131.)

Business Trends.

STOCK MARKET NERVOUS AND UNSETTLED.

The improvement in the position of stock values which set in at the opening of February as a result of the better outlook for a final settlement with Germany of the submarine question was carried further during the first half of the month but really important developments in the situation were lacking. Under the lead of the copper shares the industrial stock list showed a fairly general advance while railroad stocks continued to be neglected, speculation in them being at a standstill, largely as a result of forebodings concerning the railway labor outlook. While there were occasional spurts of activity, business in the aggregate was in reduced volume and it was clearly apparent that outside interest had abated.

About the middle of the month the market became very depressed over the prospect of fresh complications with Germany growing out of the latest announcements as to its submarine policy and a considerable part of the gains noted early in the month were lost. Then, too, the proposed increase of both British and Canadian war taxation upon corporations had an unfavorable effect, and as a result stock prices tended to decline under liquidation, the downward progress of quotations being only checked by covering of shorts. Later on a calmer feeling asserted itself, and at the close the market tended to regain ground though the dealings remained for the most part professional in origin and character.

The month's developments in stocks show clearly that the market for securities will continue nervous until our international position becomes clearly defined. Home conditions are satisfactory and justify ample confidence, but the possibilities of foreign complications are constantly present and must continue to remain the controlling factor in all financial operations which can be conducted only upon a day to day basis.

COMMODITY PRICES REACH NEW HIGH POINT.

There is no better evidence of the prosperous condition of the country than the persistent advance in commodity prices. During the last five months the upturn in the leading articles of consumption has continued unchecked, the high prices being due to the great uplift in domestic trade and influences arising from the war in Europe. The enhanced purchasing power of the masses is reflected in sustained buying of the staple necessities, and disproportion between supply and demand has had a strengthening effect on numerous commodities, while speculative influences have accelerated the rise in some quarters.

Indeed all of the influences at work seem to point toward higher prices so long as Europe wages war and it is not at all surprising to find that the latest index numbers are the highest on record.

The following table gives both Dun's and Bradstreet's index prices on the first of each month since January 1st, 1915:

	Dun's		Bradstreet's.	
	1915.	1916.	1915.	1916.
Jan. ..	$124,168	$137,666	$ 9,143	$10,916
Feb. ..	125,662	142,260	9,662	11,141
Mar. .	124,158	.....	9,620	.....
Apr. .	125,090	.....	9,775	.....
May .	126,649	.....	9,798	.....
June .	125,992	.....	9,743	.....
July .	124,958	.....	9,870	.....
Aug. .	125,079	.....	9,821	.....
Sept. .	124,684	.....	9,803	.....
Oct. .	126,663	.....	9,977	.....
Nov. .	130,467	.....	10,377	.....
Dec. .	133,146	.....	10,647	.....
Year .	125,559	.....	9,853	.....

RECORD IMPORTS IN JANUARY.

Reports of the foreign trade of the United States for the month of January show a decline in exports of $17,364,000. Imports increased, amounting to $184,192,299, a shade larger than in December, 1913, the hitherto record month. For seven months ending with January, the grand total of export values reached $2,181,312,322. The grand total of imports for the seven months ending with January last, was $1,096,484,767.

Our foreign trade in January and for the seven months ending January 31st compare as follows:

January	1915.	1916.
Exports	$267,879,313	$335,535,303
Imports	122,148,317	184,192,299
Excess of exports	$145,730,996	$151,343,004

Seven months ended January 31st:

	1915.	1916.
Exports	$1,334,660,148	$2,181,312,322
Imports	930,508,236	1,096,979,173
Ex. of exports	$404,151,912	$1,084,333,149

Business Trends.

MANY NEW ENTERPRISES.

Activity on the part of promoters of new enterprises is now more marked than at any previous time in years. No better index of this is afforded than the showing made by the incorporations for February, when papers filed for new companies in the Eastern States with a capital of $1,000,000 or over represented $365,995,300. This shows the remarkable increase of almost 580% over the returns for February a year ago. Compared with January of this year an increase of over 30% is recorded.

In large part the increase was due to the incorporation of the $150,000,000 Pan-American Petroleum & Transportation Company, which is the much talked of oil combination, with Mexican Petroleum as the nucleus; the re-incorporation of the $60,000,000 American Woolen Company, and the $34,245,300 United Drug Company, representing the Riker-Hegeman and the United Drug merger.

The grand total of all companies incorporated with a capital of $100,000 or over, covering all States, including those of the East, aggregates $420,608,500. This compares with $91,720,000 a year ago.

Following are the comparative figures as specially compiled by The Journal of Commerce and Commercial Bulletin of companies incorporated in the Eastern States during the last three years with an authorized capital of $1,000,000 or more:

	1916	1915	1914
Jan.	$270,995,000	$51,150,000	$120,050,000
Feb.	365,995,300	53,950,000	51,575,000
Totals	$636,990,300	$105,100,000	$171,625,000

	1916.	1915.	1914.
March	70,050,000	57,700,000	
April	32,200,000	136,185,000	
May	78,950,000	62,700,000	
June	181,247,100	70,050,000	
July	71,100,000	68,700,000	
Aug.	67,100,000	50,600,000	
Sept.	286,625,000	54,800,000	
Oct.	208,695,000	35,487,500	
Nov.	190,075,000	81,650,000	
Dec.	135,125,000	105,450,000	
Year	$1,426,267,100	$894,947,500	

BANK EXCHANGES CONTINUE HEAVY.

Bank clearings for February aggregated $18,130,396,007, the heaviest total ever reported for that month, and a sum that has been exceeded by but four other months; that is, by January, December, November and October last. The total for New York $11,106,737,277, is within $700,000,000 of the grand total for the entire country in February of last year. While the grand total for the month just passed reveals a decrease of 9.2% from January, it nevertheless exhibits an increase over every other February, the ratio of gain over that month last year being 53%, and contrast with the like time in the two preceding years discloses advances of 42% and 34%, respectively. The showing for February, when contrasted with the low level of August, 1914, reveals an uplift of 86%.

Following are the aggregate of clearings monthly at all cities, compared with the like periods in four preceding years; compiled by "Bradstreets":

(Six figures omitted.)

	1916	1915	1914	1913	1912
Jan.	$19,957	$13,389	$16,100	$16,090	$14,977
Feb.	18,130	11,829	12,770	13,481	12,788
Mar	.....	13,733	14,148	13,985	14,330
1st q'r	.....	38,951	43,018	43,556	42,005
April	.....	14,900	14,791	14,153	14,855
May	.....	14,516	13,061	13,980	14,708
June	.....	14,011	13,841	13,580	13,519
2d q'r	.....	43,427	41,693	41,713	43,082
July	.....	14,812	14,385	13,422	13,487
Aug.	.....	14,170	9,840	12,260	13,097
Sept.	.....	15,289	9,927	13,293	12,956
3d q'r	.....	44,271	34,152	38,975	39,900
Oct.	.....	20,050	11,624	15,551	17,002
Nov.	.....	19,249	10,982	13,742	15,228
Dec.	.....	20,167	12,540	14,537	15,217
4th qr	.....	59,466	35,146	43,830	47,447
Gd. total	..	186,115	154,009	168,074	172,524

Trade Commission To Help.

Its Vice Chairman Urges Co-operation and Mobolization of Industries—Germany Has Trimmed Our Copper Producers—Associations of Producers a Great Aid—Don't Neglect Depreciation Costs When Naming Selling Prices.

Before the annual meeting in Cleveland, of the American Pig Iron Association on February 18th, Hon. Edward N. Hurley, Vice Chairman of the Federal Trade Commission, delivered a stirring address, commending the co-operative work of associations of producers, urging the mobilization of our industries, pointing out that mining and manufacturing corporations are trustees for the people and should not let foreigners have their products too cheap and warning against loose methods of accounting, whereby costs of production appear lower than they really are. The following important extracts are reprinted.

Mobilize Industries by Organization.

All of us are talking a great deal these days about mobilizing American resources. Mobilizing means simply effective organization to achieve a common purpose. The American Pig Iron Association is an instrument for mobilizing industry. Associations such as this exist for this very purpose. They constitute a most potent influence for improving the condition under which business is done. They are the outward expression of the spirit of co-operation and of self-help and it is in that spirit that all of us must approach the task of bettering business conditions.

A demand for better things is typical of our American business. It is found in Cleveland; it is present in Washington; it lies in the heart of the activities of this association. It is the basis of the work of the federal trade commission.

Remember Depreciation Expense.

In analyzing the data for the larger and more successful corporations of the country a striking fact developed in tabulating the data for these large and successful corporations, comprising those doing a business of $100,000 a year or over. We found that out of a total of 60,000, 30,000 charged off no depreciation whatever. Some of them may have included this in other items, but the large majority appear clearly to have made no allowance whatever for depreciation. Does this not demonstrate the need of a most thorough study of our industries as a basis for remedying these conditions? Does it not also show the necessity for better accounting methods and business practice?

There is no question but that the business of the country requires some re-adjustment in a helpful way. There is no one remedy that will give relief to all of our ills. What will help one industry may injure or kill another, but I believe that there are a few fundamental principles upon which may be based the diagnosis and treatment of ailments of industry and commerce. If the patient does not become nervous and lose confidence in his doctor, he will be able to do as much for himself as is done for him by others.

German Associations.

In Germany every important industry is organized into trade associations, and 85% of the manufacturers engaged in those industries are represented in their respective trade organizations. Germany's success as a commercial and industrial world power is due very largely to the policy of organizing and co-operating, of the working together of its captains of industry, of establishing communities of interest between the small and big business men for the mutual purpose of promoting trade at home and abroad. The old adage "in unity there is strength" has proved to be the backbone of Germany's industrial and commercial achievements, efficiency and strength. More than 600 independent associations of manufacturers, producers and merchants exist in Germany to-day, and beside, the entire industrial system of that country is honeycombed with about 5,000 subsidiary business organizations.

We are confronted by the fact that when we buy abroad we are at the mercy of the foreign seller and when we sell abroad we are at the mercy of the foreign buyer. The reason is that the European industries are organized scientifically to capture foreign trade while we in America have suffered the consequences of this one-sided organization.

Our method of disposing of our natural products containing our valuable raw materials and constituting the chief wealth of our country should be stopped by the adoption of some practical, reasonable business method. For every dollar's worth of additional wealth that we receive for these products the people of the United States profit and when we do not receive a fair price for the products that we ship abroad, we are impoverishing our people and our country is that much poorer.

Our buyers seeking raw and finished materials in foreign countries, who formerly had a free competitive field from which to receive goods, now find that the great manufacturing industries have been formed into combinations or cartels and instead of receiving goods from several concerns, the American buyers now have to do business with central selling agencies which represent a whole industry, but when the foreign buyer seeks material, he finds our unsystematized market much to his own satisfaction.

English Beat Down Our Coal Prices.

I want to emphasize the fact that the owners of our vast natural resources are the trustees of the American people. When they sell their product at ridiculously low prices they are violating their trust, since the ruinous trade spells a waste that brings nothing in exchange. We do not export much coal, but we sell a great deal to foreign ship-owners to bunker their vessels in our ports. At Newport News some of the finest coal in the world goes into foreign bunkers and the price is set a year ahead by a combination of English brokers. In the face of rising labor costs because certain operators were induced to make low bids, the price this year was forced down 20 cents a ton. With freight and other charges deducted, the net prices at the mines are 6 or 7 cents lower than our domestic price and this advantage will be handed to foreign ship-owners on nearly 2,000,000 tons of West Virginia coal this year.

Germans Trim Our Copper Producers.

At Frankfort-on-the-Main, Germany, there is a combination—a family affair—which in normal times controls the world market for copper and other metals. It has frequently depressed the price of American lake copper despite the fact that this country produces two-thirds of the world's supply of that material. The trick if performed by dealing with our producers as individuals and playing one against the other.

We are selling the best we have as fast as we can at European prices.

After the war—what? Shall we grow and expand while the growing is good or calmly await the time when peace in Europe will be followed immediately by keen competition, not only in foreign markets but in our domestic market as well? Have we taken an adequate inventory of our business resources? Are these resources being developed to the best advantage? Are our associations doing all they can? Are we diligent in standardizing our methods and processes? In short, are we mobilizing our industries?

Let us seek better organization and greater efficiency at home. Let us push our trade abroad. Let us develop our industries so strongly that no foreign competition can dislodge it. Industrial preparedness must be our watchword.

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Pig Iron Production, 1915.

Second Largest Year in History—Basic Iron Breaks Record.

Production of pig iron in 1915 is officially reported by the Bureau of Statistics of the American Iron and Steel Institute at 29,916,213 gross tons, thus conforming closely with estimates previously made. The production was a million tons short of that of 1913 and was otherwise the largest production on record. Production in the second half of the year was 17,682,422 tons, or at the rate of nearly 35,400,000 tons a year, breaking the former half year record, 16,488,602 tons in the first half of 1913, by 7.3%. The production of ferromanganese broke its former record, made in 1912, by 3.0%. The production by grades was as follows:

Production of Pig Iron by Grades, 1914-1915, Showing Increase or Decrease by Grades.

Grades	1915	Per cent.	1914	Per cent.	Increase.	Per cent.
Basic	13,093,214	43.77	9,670,687	41.45	3,422,527	35.39
Bessemer	10,523,306	35.17	7,859,127	33.68	2,664,179	33.90
Foundry	4,864,348	16.26	4,533,254	19.43	331,094	7.30
Malleable	829,921	2.77	671,771	2.88	158,150	23.54
Forge	316,214	1.06	361,651	1.55	*45,437	*12.56
Spiegeleisen	97,885	.33	79,935	.34	17,950	22.46
Ferromanganese	129,072	.43	106,083	.46	22,989	21.67
All other	62,253	.21	49,736	.21	12,517	25.17
Total	29,916,213	100.00	23,332,244	100.00	6,583,969	28.22

* Decrease.

The production of pig iron for sale was as follows:

	1913.	1914.	1915.
Bessemer	1,203,680	527,905	871,730
Basic	1,909,279	1,479,721	1,747,265
Forge	238,361	196,058	174,355
Foundry	5,084,932	4,393,089	4,801,711
Malleable	989,241	671,771	829,921
All other	98,372	94,436	158,025
Total	9,523,885	7,362,980	8,583,007

Half Yearly Production, 1915.

	First Half.	Second Half.	Year.
Bessemer and low phosphorus	4,238,587	6,284,719	10,523,306
Basic	5,259,614	7,833,600	13,093,214
Foundry	2,207,375	2,656,973	4,864,348
Malleable	278,512	551,409	829,921
Forge	138,789	177,425	316,214
Ferromanganese and spiegel	90,310	136,647	226,957
All other	20,604	41,649	62,253
Total	12,233,791	17,682,422	29,916,213

All Descriptions of Pig Iron.

States.	Number of stacks. In blast June 30, 1915.	Dec. 31, 1915. In.	Out.	Total.	Tons produced. First half of 1915.	Second half of 1915.	Total, 1915.
Massachusetts	0	0	2	2			
Connecticut	1	1	2	3	3,087	4,715	7,802

States.	Number of stacks. In blast June 30, 1915.	Dec. 31, 1915. In.	Out.	Total.	Tons Produced. First half of 1915.	Second half of 1915.	Total, 1915.
New York	16	18	9	27			
New Jersey	1	1	4	5	921,566	1,183,214	2,104,780
Pennsylvania	96	125	31	156	5,199,421	7,591,247	12,790,668
Maryland	2	3	2	5	85,673	165,875	251,548
Virginia	5	7	15	22	105,244	146,102	251,346
Georgia	0	0	4	4			
Texas	0	0	2	2	.....	.....	.....
Alabama	20	27	20	47	868,341	1,181,112	2,049,453
West Virginia	1	3	1	4			
Kentucky	1	3	3	6	79,228	211,812	291,040
Mississippi	0	0	1	1			
Tennessee	5	6	12	18	82,992	94,737	177,729
Ohio	50	62	12	74	2,964,211	3,948,751	6,912,962
Illinois	12	21	5	26	801,951	1,645,269	2,447,220
Indiana	10	10	0	10			
Michigan	8	11	3	14	854,375	1,132,403	1,986,778
Wisconsin	4	7	1	8			
Minnesota	1	2	0	2	130,514	242,452	372,966
Missouri	1	1	1	2			
Colorado	2	2	4	6			
Oregon	0	0	1	1			
California	0	0	0	0	137,188	134,733	271,921
Total	236	310	135	445	12,233,791	17,682,422	29,916,213
Anthracite and Mixed Anthracite and Coke Pig Iron.							
New York	0	0	3	3			
Pennsylvania	2	4	8	12	42,487	42,266	84,753
Total	2	4	11	15	42,487	42,266	84,753
Charcoal Pig Iron.							
Massachusetts	0	0	2	2			
Connecticut	1	1	2	3			
New York	0	0	1	1			
New Jersey	0	0	0	0	3,087	4,715	7,802
Pennsylvania	3	3	2	5	1,814	1,764	3,578
Maryland	0	0	1	1			
Virginia	0	0	2	2	95	309	404
Alabama	2	1	3	4	14,896	12,058	26,954
Georgia	0	0	2	2			
Texas	0	0	1	1			
Kentucky	0	0	1	1	204	662	866
Tennessee	0	0	1	1			
Mississippi	0	0	1	1			
Ohio	1	0	1	1			
Michigan	6	9	2	11	98,856	118,946	217,802
Wisconsin	1	2	0	3			
Missouri	1	1	0	1			
Oregon	0	0	1	1			
California	0	0	0	0	10,544	28,202	38,746
Total	15	17	23	40	129,496	166,656	296,152

The Manganese Situation.

The sharp advance in the past month in ferromanganese for prompt shipment has aroused an interest in this alloy which might well have been exhibited months ago. Evidence is furnished by events that many consumers have been remiss. Ever since the war started there has been grave danger of a shortage in manganese ore or ferromanganese. It was the plain business duty of consumers to fortify themselves. Evidently many of them did not do so. There has been no important development in the past few weeks, no fresh blockade or anything that would suddenly alter the situation for a group of consumers with reserve stores. The market has advanced suddenly, not gradually. If there had been well distributed reserves, and current supplies had begun to arrive at a diminished rate, the market would have advanced gradually rather than suddenly.

In some quarters there is a disposition to study statistics bearing on ferromanganese. We doubt whether the statistics are illuminating at this time. There are figures available as to British imports of manganese ore. United States imports of ore and of alloys, and United States production of ferromanganese, all practically complete to January 1, 1916, but the showing such figures would make in ordinary circumstances is largely vitiated by two circumstances. The first of these circumstances is that at times there have been large stocks of ore or alloy. In a careful study of this point, in issue for March, 1915, it was developed that there were considerable— abnormally large— stocks of manganese ore in United States on January 1, 1913, and the analysis then given, with the addition of some data that had to be estimated at that time, shows that on January 1, 1915, there were stocks of ore or alloy in the United States to the extent of 20,000 tons of ferromanganese more than whatever stocks existed January 1, 1913, so that the stocks really were large at the beginning of 1915. Statistics of how much ore and alloy was imported in 1915 would therefore not be particularly illuminating. The same observation can be made with respect to the British supplies, for their ore imports have varied vastly more widely than their consumptive requirements.

The second circumstance is that we do not know the actual consumptive requirements. All we know is, approximately, the rate of production of steel and the amount of ferromanganese that has hitherto been in making it, for instance, when the price was $38, Baltimore. There is every reason to believe that great changes have been made in practice, by reason of the scarcity of ferromanganese. Those who have made the changes are naturally silent. There does not seem to be any public information to speak of with respect to this matter. We were rather surprised recently to see, in what seemed to be an exhaustive presentation of manganese statistics in which might be considered an authoritative quarter the statement that ferromanganese is not needed for the production of Bessemer steel. We doubt that statement, being unable to see why the open-hearth process cannot go farther than the Bessemer in this respect. It is well known, of course, that ferromanganese has never been used in making Bessemer rail steel, but that has nothing to do with the case, for in 1914 less than 7% of the Bessemer steel produced went into rails.

Therefore, so far as the American statistics are concerned we think the ground is fairly well covered by a statement that to January 1, 1916, the imports of ore and alloy have seemed amply sufficient for requirements, probably involving very considerable stocks in the hands of some consumers. The British imports of manganese ore may possibly be of some slight value. They are as follows, in gross tons:

1911	358,915
1912	387,738
1913	601,177
1914	479,435
1915	377,324

Topical Talks On Iron.

XXXIV. Thin-Lined Blast Furnaces.

It is rather a curious thing that the blast furnace, which performs what appears to be a relatively simple function, and has been in use such a long time, has changed and is changing so much in design and operation. The first blast furnace of record was built in 1340 Marche les Dames, Belgium, but its general introduction was rather slow. It was called a "high furnace," distinguishing it from the "low furnace," or Catalan forge, and the motive in its adoption was to utilize the enormous amount of waste heat in the Catalan process. As the first "high furnace" was built more than four centuries before the invention of the steam engine, it can be seen that it was a very long time before anything at all resembling in equipment the modern blast furnace was developed. In these times, a period of ten or twenty years works quite a revolution in blast furnace construction and operation, hence it is perfectly correct, at long range, to say that the blast furnace is now changing much more rapidly, in point of time, than it did in its early years. In the past twenty years or so, for instance, we have the automatic skip hoist, a great enlargement in the bosh diameter, a great increase in the volume of air blown, the gas blowing engine, using the gas produced by the furnace itself, the dry air blast and the thin-lined furnace.

What different blast furnace managers may have quite positive individual opinions it is probably correct to say that the thin-lined blast furnace is still on trial. It is not positively shown that it is worth while. After several years' trial abroad, it was introduced in the United States, first at one of the Lucy furnaces, in Pittsburgh, under the management of Mr. James Scott. Other furnaces with the thin-lined construction were built or rebuilt by the Illinois Steel Company, American Steel & Wire Company at Cleveland, Detroit Iron & Steel Company, Tennessee Coal, Iron & Railroad Company, Warwick Iron Company and others. At the Port Henry furnace a compromise was adopted, the upper half being of the ordinary type of wall and the lower half thin.

The motive of the thin-lined construction is to preserve the lines of the furnace and greatly reduce the wear. The ordinary construction involves walls of fire brick ranging from two to five feet in thickness. The wear of the lining depends largely upon its temperature and by making the lining very thin and providing water cooling on the outside the brick is kept at a lower temperature and preserved. The water cooling is furnished in various ways, by annular troughs around the stack, water passing from one trough to the one below, by spiral troughs and in other ways. The design of the water circulation presents engineering problems of considerable importance.

Thin-lined furnaces have in many cases given great satisfaction, showing more regularity in operation, lower costs, and less time and expense involved in re-lining. There are, however, certain drawbacks to the adoption of this construction, making it a matter of individual choice as to each furnace whether the construction should be adopted. For instance, there is some difference of opinion as to the precise lines the interior of the furnace should follow, and there is also some occasion to change the lines somewhat in case there is a change in the coke or ore available. With the regular construction the fire brick wall inside the steel shell is so thick that considerable variations can be made in the interior lines, when relining, with no additional expense. If the thin-lining principle be adopted, the interior lines must be fixed in advance and cannot thereafter be changed without substituting a new shell as well. In this respect in particular, the adoption of the thin wall construction is one for individual choice, it being necessary for the furnace manager to have confidence that he will have no desire to change the lines of the furnace for many years. Another point sometimes suggested, is that while on the one hand the thick lining may be objectionable in that the wear of the lining changes the interior lines of the furnace, on the other hand the furnace may indeed wear itself to the best lines, and then perform better. The lines cannot be examined from time to time to see precisely what is the contour at the time the furnace is working

best. It is well established that as a rule the furnace produces its largest weekly tonnage towards the end of the life of its lining. Provided the lines of the furnace at the time of maximum production were known precisely, all that would be necessary would be to rebuild the furnace to those lines, with water cooling, if necessary, to preserve those lines, but unfortunately the case is complicated by this and other considerations, and the thin-lined furnace is still on trial, promising good results where conditions chance to be favorable and not so good results in other cases. There would be many more thin-lined furnaces to-day if it were certain that favorable experience with the type at one stack would be duplicated at another stack.

Steel Plants.

IV. The Atlantic Steel Company.

The Atlantic Steel Company presents an interesting case of a steel mill quite without neighbors, and a steel mill that was built originally to supply a local demand for one particular product, afterwards finding such demand developed that it could diversify its product. The Atlanta Steel Hoop Company was formed in 1900 and completed its plant in May, 1901, the plant comprising merely three heating furnaces and an 8-inch train of rolls, making cotton ties chiefly, though of course a tonnage of hoops and bands was also rolled. For cotton ties there was of course a large demand. In the course of a short time it appeared feasible to enlarge the list of products and an 18-inch mill was installed, making light rails and some other products.

In 1903 it was decided to add a steel making department and engage also in the manufacture of wire, two 35-ton basic open-hearth furnaces being installed, together with a rod mill of six stands of continuous and six stands of Belgian rolls, 14 wire drawing blocks and 40 nail machines. On January 1, 1907, there was a reorganization whereby the properties were acquired by the Atlanta Steel Company, and in 1915 the name was changed to the Atlantic Steel Company.

Early in 1914 another batch of improvements was completed. Small billets had previously been made on the blooming mill, this practice being replaced by the installation of a Morgan six-stand continuous billet mill, to receive 4-inch billets from the blooming mill and reduce them to small billets, down to 1½-inch. There is cheap hydro-electric power available in Atlanta, and accordingly the new billet mill is driven by a geared electric motor. The improvement practically doubled the billet rolling capacity of the plant and for a time the blooming and billet mills had occasion to operate single turn only. In 1915 a 40-ton open-hearth furnace was added to the two 35-ton furnaces originally installed, whereby the plant has been balanced and the finished steel output is greatly increased. From an original basis of 12,000 tons annually of finished steel, made from purchased billets, the plant has grown to a capacity of 50,000 to 60,000 tons of finished steel, made from the pig iron.

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The Iron and Steel Situation.

Steel plants are running at their fullest capacity, as they have been doing for six months, and have been producing fully as large a tonnage as at any time, despite the fact that February weather is usually unfavorable. All the blast furnaces that are fit for at all economical operation are in blast, producing pig iron at the rate of at least 39,000,000 tons a year. The rest of the world is producing pig iron at a rate between 30,000,000 and 35,000,000 tons. The best previous records were made in 1913, 31,000,000 tons for the United States and 78,000,000 tons for the world.

Definite orders and specifications on the books of steel mills represent an average of three months or more of production, while definite contract obligations, certain to be specified against, barring accidents, would carry the mills to some time in September. As a matter of fact the tonnage is quite unequally divided among the different finishing branches, and mention of September indicates merely an average date. The mills have made more or less specific promises to regular customers that they will be taken care of in the second half of the year as well as possible, and the total obligations of one sort or another represent a larger tonnage than can be produced up to the end of the year.

The blast furnaces on an average have sold a tonnage fully equal to their prospective output to July 1st, possibly to August 1st.

Producers of steel are very reserved about selling, or rather about accepting open contract obligations. The large interests all express a willingness to book specific orders when the buyer is in position to show that the steel will be accepted irrespective of developments that may occur. Even with specific orders the delivery promises are rather indefinite and in the case of bars and plates usually refer to September or a later month.

Buyers of steel are in what appears to be a panic. Almost universally they are afraid they will not be given deliveries as needed in second half, and are urging mills to give them better protection for the future, as well as to increase current shipments. The mental condition is such that assertions made as to requirements cannot be accepted with implicit confidence, the situation being such that buyers may easily be overstating their prospects. In this possibility lies one of the uncertainties, and the only serious suggestion that the situation may perhaps not be altogether as strong as appears on the surface.

The Trends.

The curve representing the average of steel prices, for delivery at mill convenience, has been trending more and more sharply upwards, curving upwards in such manner as to show, if it were plotted, a trend that cannot possibly be maintained for many months. There is no absolute reason why steel prices may not continue to advance, not merely for a few months, but for years, for decades, until the end of the world, but what they cannot do is to continue to advance each month by a larger amount than in the preceding month. Up to this date that is what they have done. The advance started with January 1, 1915. In nine months prices had advanced by between $5 and $6 a net ton. In the next three months they advanced more than they had in the previous nine months, and in the next two months, January and February of this year, they advanced practically as much as in the preceding three, while finally it is to be observed they advanced more in February than in January. The monthly advance cannot continue to increase indefinitely. The trend, however, is for prices to advance as they have been doing.

The trend as to actual consumption appears to be upward rather than downward. Jobbers and manufacturing consumers appear to have smaller stocks than two or three months ago, while the advent of spring, now near at hand, promises to increase consumption, if the material can be secured.

It would appear that the disposition to consume steel, if it could be had at the average prices of the last quarter of last year, or at the average prices of the past ten years, is increasing, but much work is being indefinitely postponed by reason of high prices and uncertainty in delivery promises. As the mill position seems to strengthen from week to week, with obligations on books increasing, and buying even at the very high prices, the demand that

is expressed seems to be equal to, or to exceed, the productive capacity, so that the underlying demand, the expressed demand plus the latent demand, is far in excess of the productive capacity. Requirements that are not expressed, by being matched with actual orders, are not as a rule being met by the use of other material than steel; they are rather simply postponed. It depends upon the manner in which the steel market is let down from the point to which it is soaring, whether these deferred projects will come to life from time to time as prices decline, whether they will act as a support to the steel market and retard, finally arrest the decline that will start some time in the future, as the covering of shorts in the stock market eventually steadies it. In all its history the steel market has presented no clear case of such a phenomenon, as prices once started downward always went the limit, plunging the industry into a longer or shorter depression, but because the phenomenon has never before been witnessed is no argument that it will not be witnessed this time. Many unprecedented things have already occurred. This whole present movement in steel is unprecedented.

Export Movements and Conditions.

The iron and steel export movement cannot be studied as closely as formerly, by reason of the fact that the exports of manufactures, including cars and locomotives, loaded and unloaded shells, and some other items, not returned by weight, and the aggregate value of which furnishes little clue to the weight of steel involved in their manufacture, have been increasing, while the exports that are returned by weight have tended rather to decrease. The tonnage exports reached their maximum last August, with 405,853 gross tons, dropping somewhat in September, and ranging between 350,000 and 363,000 tons in the next three months. There are no statistics as yet for January of this year. Deducting scrap, pig iron, etc., the tonnage exports may be taken as representing about 3,500,000 tons of finished steel a year. The value of all iron and steel exports increased almost continuously after August, as did most of the manufactures representing steel consumption, but not included in the government returns under the iron and steel heading, these other manufactures comprising such items as loaded shells, automobiles, freight cars, agricultural implements, etc.

It seems to be a fairly large estimate to take the finished steel involved in the production of goods not returned by weight as equal to the finished steel exported in tonnage form, and this would give us 7,000,000 tons of finished steel a year, involved in direct and indirect exports, or not over 25% of the production, which is 28,000,-

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer, Valley			Basic,	No. 2X fdy,		No. 2 fdy		Ferro-	Furnace
1915—	Basic Valley	Basic Valley	Basic Valley	Phila.	Phila.	Buffalo.	Cleveland.	Chicago.	Birmingham.	manganese.*	coke†
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. .	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. .	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. .	15.12	13.98	13.71	14.83	14.91	13.85	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. .	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. .	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916—											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. .	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

000 or 29,000,000 tons a year at the present time.

The exports are chiefly to the allies. Exports of the United States to neutral countries probably involve less than 2,000,000 tons of finished steel a year. The only other exporting country, the United Kingdom, is sending to its colonies and neutral countries about 2,500,000 tons a year, so that the neutral countries and British colonies are receiving not much more than 4,500,000 tons a year, if as much, when before the war they took, from the various iron producing countries, as much as 10,000,000 tons in a year.

The export demand appears insistent, some very high prices being bid f.o.b. shipping port, in the face of extremely high ocean rates. So little export business has been accepted of late that it does not follow that these high prices would be bid on really large tonnages. If the mills would take on a few hundred thousand tons of export business with neutral countries the pressure, as expressed in high bids, might be very considerably reduced, and even at relatively low prices sales might rather promptly exhaust the buying power.

The Future.

Both producers and consumers are beset by the greatest difficulties. They are sailing forth on a sea absolutely uncharted by precedents and with no compass or other guide. To mention the difficulties is much easier than to suggest any of the ways in which they may ultimately be resolved. Manufacturing consumers do not know whether they will secure the deliveries they now think they should have, nor do they know how much, if any, the higher prices they must charge for their products will reduce the purchases. In the case of some manufactures there is no established practice of changing prices according to changes in the cost of raw materials. The steel mills are confronted with many uncertainties. Of perhaps the least real concern is the course of prices and the volume of buying. There is already a large tonnage of business on books, and the producing and shipping of the tonnage is of more vital concern than the booking of the tonnage that is to be produced later. Labor is already scant at the mills, the situation growing worse weekly, and with spring near at hand, when a demand for additional labor for outdoor work is to be expected. Railroad embargoes are numerous, with car shortages at many points, and conditions in this respect promising to grow worse. It is much more likely that the mills will be called upon to produce and ship, to January 1, 1917, a tonnage equal to their full capacity under favorable conditions, than it is that they will be physically able to produce and ship the material. For the remainder of the year the situation as to producing and shipping is much more important than the situation as to the market.

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved —— Sheets ——						Comp.
						Wire	Steel			Blue	Tin	Fin.
1915—	Shapes,	Plates,	Bars,	Pipe,	Wire.	Nails.	Skelp.	Black.	Galv.	Annld.	plate.	steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3.60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.76	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5692
August	1.30	1.26	1.30	79	1.43	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916—												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988

Pig Iron Statistics.

The Bureau of Statistics of the American Iron and Steel Institute presents the official statistics of pig iron production in the United States in 1915, all figures referring to gross tons of 2,240 pounds.

Production by States.

	Number of stacks, Dec. 31, 1915. In. June 30.	In.	Out.	Total.	Production, 1915.
Massachusetts	0	0	2	2	7,802
Connecticut	1	1	2	3	
New York	16	18	9	27	2,104,780
New Jersey	1	1	4	5	
Pennsylvania	96	125	31	156	12,790,668
Maryland	2	3	2	5	251,548
Virginia	5	7	15	22	251,346
Georgia	0	0	4	4	
Texas	0	0	2	2	
Alabama	20	27	20	47	2,049,453
West Virginia	1	3	1	4	
Kentucky	1	3	3	6	291,040
Mississippi	0	0	1	1	
Tennessee	5	6	12	18	177,729
Ohio	50	62	12	74	6,912,962
Illinois	12	21	5	26	2,447,220
Indiana	10	10	0	10	1,986,778
Michigan	8	11	3	14	
Wisconsin	4	7	1	8	372,966
Minnesota	1	2	0	2	
Missouri	1	1	1	2	
Colorado	2	2	4	6	
Oregon	0	0	1	1	271,921
California	0	0	0	0	
Total	236	310	135	445	29,916,213

Half-Yearly Production by Fuels, 1915.

Bituminous is included with coke. Anthracite includes mixed coke and anthracite. Production in electric furnaces is included, according to whether coke or charcoal is used in connection with the current.

	1st half.	2nd half.	Year.
Coke	12,061,808	17,473,500	29,535,308
Anthracite	42,487	42,266	84,753
Charcoal	129,496	166,656	296,152
Totals	12,233,791	17,682,422	29,916,213

At the close of the year there were 390 coke furnaces, with 289 in blast, 15 anthracite furnaces, with four in blast and 40 charcoal stacks, with 17 in blast.

Of the 1915 production of charcoal pig iron, 5,302 tons was by cold blast and 290,850 tons by hot and warm blast including pig iron made with charcoal and electricity.

Merchant Iron.

	1914.	1915.
For sale	7,362,980	8,583,007
For consumption	15,969,264	21,333,206
Totals	23,332,244	29,916,213

	1915.
Bessemer	871,730
Basic	1,747,265
Foundry	4,801,711
Malleable	829,921
Forge	174,355
All other	158,025
Total	8,583,007

Delivered Condition of Basic Pig Iron.

	1914.	1915.
Sand cast, machine cast, chill cast, etc.	2,391,440	3,064,484
Molten	6,436,146	9,648,769
Totals	9,670,687	13,093,214

Delivered Condition of Bessemer and Low-Phosphorus Pig Iron.

	1914.	1915.
Sand cast, machine cast, chill cast, etc.	2,391,440	3,064,484
Molten	5,467,687	7,458,822
Totals	7,859,127	10,523,306

Delivered Condition of All Pig Iron.

	1914.	1915.
Molten	11,911,247	17,108,891
Sand cast	4,814,959	5,076,469
Machine cast	5,854,661	6,969,108
Chill cast	738,018	740,413
Direct castings	13,359	21,332
Totals	23,332,244	29,916,213

Production by Grades.

Grades—	1914.	1915.
Bess. and low phos.	7,859,127	10,523,306
Basic (mineral fuel)	9,670,687	13,093,214
F'dy and ferrosilicon	4,533,254	4,864,348
Malleable	671,771	829,921
Forge pig iron	361,651	316,214
Spiegeleisen	79,935	97,885
Ferromanganese	106,083	129,072
White, mottled, direct castings, etc.	49,736	62,253
Totals	23,332,244	29,916,213

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1909:

Quarter.	1915.	1914.	1913.
1st	$12,457,809	$17,994,382	$34,426,802
2nd	27,950,055	20,457,596	41,219,813
3rd	38,710,644	22,276,002	38,450,400
4th	51,232,788	10,935,635	23,084,330
Year	130,351,296	71,663,615	137,181,345

	1912.	1911.	1910.
1st	$17,826,973	$23,519,203	$37,616,877
2nd	25,102,266	28,108,520	40,170,961
3rd	30,063,513	29,522,725	37,365,187
4th	35,181,922	23,155,018	25,901,730
Year	108,174,673	104,305,466	141,054,755

Unfilled Orders.

(At end of the Quarter):

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	8,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,333	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

	Shipments.	Bookings.	Difference.	Difference.
	%	%	%	Tons.
February ...	67	105	+38	+412,764
March	72	40	—32	—372,615
April	67	35	—32	—376,757
May	62	37	—25	—278,908
June	63	66	+ 3	+ 34,697
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September ..	62	24	—38	—425,664
October	55	28	—27	—326,570
November ..	45	32	—13	—136,505
December ..	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February ...	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September ..	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037
December .	102	152	+50	+615,731
January 1916	102	112	+10	+116,547

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January ..	1,021	795	226	936	716	220			
February .	914	746	168	897	678	219			
March ...	1,091	801	290	1,012	720	292			
April	1,038	782	256	1,010	722	288			
May	1,047	800	247	1,040	732	308			
June	1,097	789	308	1,090	730	360			

Price Changes Of Iron and Steel Products From January 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our **composite finished steel.** In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the dates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
Jan. 1	Bars	1.05	to 1.10
" 1	Plates	1.05	to 1.10
" 1	Shapes	1.05	to 1.10
" 11	Wire nails	1.50	to 1.55
Feb. 11	Wire nails	1.55	to 1.60
" 11	Pipe	81%	to 80%
" 15	Galv. sheets	3.00	to 3.25
" 25	Galv. sheets	3.25	to 3.40
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 1	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galv. sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
July 4	Plates	1.50	to 1.60
" 4	Shapes	1.50	to 1.60
" 5	Tin plate	3.10	to 3.30
" 9	Galv. sheets	3.70	to 3.80
" 9	Blue ann. sheets	1.70	to 1.80
" 21	Bars	1.25	to 1.30
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
" 31	Bars	1.30	to 1.35
Aug. 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galv. sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%

Nov. 1	Galv. sheets	3.50	to 3.60
" 4	Black sheets	3.10	to 3.20
" 4	Galv. sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galv. sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
" 18	Shapes	1.60	to 1.70
" 18	Galv. sheets	4.00	to 4.25
" 24	Galv. sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galv. sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
1916—			
Jan. 3	Tin plate	3.60	to 3.75
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%	78%	to 77%
" 7	Boiler tubes	68%	to 66%
" 14	Boiler tubes	66%	to 64%
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00
" 14	Wire nails	2.20	to 2.30
" 15	Pipe	76%	to 75%
" 21	Bars	2.00	to 2.25
" 21	Plates	2.10	to 2.35
" 21	Shapes	2.00	to 2.25
" 21	Tin plate	3.75	to 4.00
" 29	Pipe	75%	to 74%
" 29	Boiler tubes	64%	to 63%
Mar. 1	Wire nails	2.30	to 2.40

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
July, 1914 ..	72,015	54,885	+ 17,130
August	51,231	54,112	— 2,881
September .	44,624	34,757	+ 9,867
October ...	45,241	39,410	+ 5,831
November .	35,325	40,748	— 5,423
December ..	27,458	42,525	— 15,067
January, 1915	20,684	31,556	— 10,872
February ..	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 ..	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ..	31,096	33,061	— 1,965
October ...	31,215	26,338	+ 4,877
November .	29,297	26,005	+ 3,292
December ..	23,173	23,743	— 570
January, 1916	17,293	4,015	+ 7,303

United States citizens arrived and departed, with change thereby effected in United States population:

	Arrived.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915..	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September .	9,054	8,188	+ 866
October ...	8,991	8,329	+ 662
November .	8,364	9,166	— 802
December ..	8,458	9,349	— 891
Jan. 1916 ..	8,257	9,469	— 1,212

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,-237; July, 1915, +14,994; August, 1915, —15,-128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461; January, 1916, +6,091; seven months, +11,326.

Comparison Of Metal Prices.

Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing, Feb. 29. 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	20.00	20.50
Basic, valley	13.25	12.50	18.00	12.50	18.50	17.75	18.50
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.50	18.50
No. 2X fdy. Philadelphia.	1500	14.20	19.50	14.00	19.75	19.50	19.75
No. 2 foundry, Cleveland .	14.25	13.25	18.80	13.00	18.80	18.80	18.80
No. 2X foundry, Buffalo..	13.75	12.25	18.00	11.75	18.00	18.00	18.00
No. 2 foundry, Chicago ..	14.75	13.00	18.50	13.00	18.50	18.50	18.50
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.50	15.00
Scrap Iron and Steel.							
Melting steel, Pittsburgh.	12.00	9.75	18.00	11.00	18.00	17.25	17.75
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	15.75	15.25	15.75
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	18.50	17.50	18.50
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	15.50	15.00	15.50
Heavy steel scrap, Phila...	11.25	9.00	16.25	9.50	16.50	16.00	16.25
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.40	1.90	2.40
Iron bars, Philadelphia ...	1.27½	1.12½	2.06	1.12½	2.41	2.06	2.41
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.25	1.85	2.25
Tank plates, Pittsburgh ..	1.20	1.05	1.80	1.10	2.35	1.85	2.35
Structural shapes, Pitts. ..	1.25	1.05	1.80	1.10	2.25	1.85	2.25
Grooved steel skelp, Pitts..	1.20	1.12½	1.75	1.12½	2.00	1.75	2.00
Black sheets, Pittsburgh..	1.95	1.80	2.60	1.70	2.60	2.60	2.60
Galv. sheets, Pittsburgh ..	3.00	2.75	5.00	2.65	4.85	4.75	4.85
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	4.00	3.75	4.00
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.40	2.10	2.40
Steel pipe, Pittsburgh	79½%	81%	79%	81%	74%	78%	74%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	3.50
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.75	4.00
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	50.00	40.87½	48.00
Lake copper	15.50	11.30	23.00	13.00	28.50	23.00	28.37½
Electrolytic copper	14.87½	11.10	23.00	12.80	28.50	23.00	28.37½
Casting copper	14.65	11.00	22.00	12.70	27.00	22.00	26.87½
Sheet copper	20.25	16.50	27.50	18.75	35.00	28.00	35.00
Lead (Trust price)	4.15	3.50	7.00	3.70	6.30	5.50	6.30
Spelter	6.20	4.75	27.50	5.70	21.17½	17.30	20.67½
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	41.00	44.50
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	63.00	53.00	62.00
Silver	59¼	47⅝	56½	46¼	57⅝	55⅞	56⅝
St. Louis.							
Lead	4.10	3.35	7.50	3.50	6.37½	5.45	6.35
Spelter	6.00	4.60	27.00	5.55	21.00	17.12½	20.50
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.00	23.00	25.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	188	172	188
Standard copper, prompts ..	66¾	49	86⅜	57⅛	108	84¾	105½
Lead	24	17⅞	30¼	18¼	33⅛	29¼	33⅜
Spelter	33	21¼	110	28⅛	110	88	110
Silver	27¼d	23¼d	27¼d	22 7/16d	27 5/16d	26 11/16d	26 13/16d

Comparison Of Security Prices.

Railroads.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing. Feb. 29. 1916.
Atchison, Top. & Sante Fe...	100⅜	89½	111¼	92½	108½	101⅞	103
Atch. Top. & Santa Fe,. pfd.	101¾	96½	102⅛	96	102	97⅞	101½
Baltimore & Ohio	95⅝	67	96	63¾	96	85	85⅝
Canadian Pacific	220½	153	194	138	183¾	162½	167
Chesapeake & Ohio	68	40	64¾	35⅝	66⅞	60⅛	61
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¾	102½	92¼	93¾
Erie R. R.	32½	20⅛	45⅝	19⅞	43⅝	35	35¾
Great Northern, pfd.	134¾	111⅝	128⅜	112¾	127½	119⅛	120½
Lehigh Valley	156¼	118	83⅜	64⅝	83	74½	77¾
Louisville & Nashville	141⅞	125	130¼	104½	130⅝	121⅛	121¾
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	7¼	4⅞	5
Missouri Pacific	30	7	18¼	1¾	6⅝	4	4¾
New York Central	96⅝	77	110½	81½	111½	101¾	103⅛
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	65⅛	67⅛
Northern Pacific	118½	97	119	99⅛	118⅞	111⅜	112
Pennsylvania R. R.	115½	102½	61½	51¾	59¾	55⅝	56⅞
Reading	172¼	137	85⅝	69⅜	84½	75⅛	83
Rock Island	16⅝	⅝	1⅛	⅛	⅞	⅜	¾
Southern Pacific	99½	81	104⅛	81¼	104⅛	96⅞	97⅛
Union Pacific	164⅜	112	141½	115¾	140¼	130¼	133¼
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¼	71¾	61¾	65½
American	35⅛	19¼	68½	25	64¾	56⅛	58⅛
American Can, pfd.	96	80	113½	89	113⅞	109½	110
Am. Car & Foundry	53½	42¼	98	40	78	63¾	66
Am. Cotton Oil	46½	32	64	39	57½	51¼	52
Am. Locomotive	37¼	29¼	74¾	19	71⅜	60¾	67⅞
Am. Smelting & Refining	71⅝	50¼	108⅞	56	113⅜	95⅛	97½
Brooklyn Rapid Transit	94¼	79	93	83¼	88	84¾	85¾
Chino Copper	44	31⅝	57⅜	32¾	60	51¾	55¾
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	53	39⅝	41
Consolidated Gas	139½	112½	150½	113¾	144¾	130½	131¾
General Electric	150⅝	137½	185½	138	178½	165	167¼
Interborough-Metropolitan ..	16⅜	10¾	25	10⅝	20½	17	18
International Harvester	113½	82	114	90	112⅜	108½	109
Lackawanna Steel	40	26½	94¾	28	86	72¾	74¼
National Lead	52	40	70¾	44	73⅞	64⅞	66
Ray Consolidated Copper	22½	15	27½	15¼	26	22¾	24⅝
Republic Iron & Steel	27	18	57¼	19	55¼	48¼	49½
Republic Iron & Steel, pfd...	91¼	75	112⅝	72	111½	108	110
Sloss-Sheffield	35	19½	66⅞	22	63¼	53¼	55
Texas Co.	149⅞	112	237	120	235½	190	198⅛
U. S. Rubber	63	44½	74¾	44	58½	47¾	49⅞
U. S. Steel Corporation	67¼	48	89½	38	89	79¾	82¾
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	118½	115½	116½
Utah Copper	59⅜	45⅜	81¾	48½	86¾	77	83⅜
Va.-Carolina Chem.	34⅞	17	52	15	51	42	44½
Western Union Telegraph ...	66⅞	53⅜	90	57	92	87	87¾

COMPOSITE STEEL.

Computation for March 1, 1916.

Pounds.	Group.	Price.	Extension.
2½	Bars	2.25	5.625
1½	Plates	2.35	3.525
1½	Shapes	2.25	3.375
1½	Pipe (¾-3)	2.55	3.825
1½	Wire nails	2.40	3.600
1	Sheets (28 bl.)	2.60	2.600
½	Tin plates	4.00	2.000
10 pounds			24.550
	One pound		**2.4550**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	.....
April	1.5206	1.7742	1.5337	1.5357	.....
May	1.5590	1.7786	1.5078	1.5381	.....
June	1.5794	1.7719	1.4750	1.5312	.....
July	1.6188	1.7600	1.4805	1.5692	.....
Aug.	1.6784	1.7400	1.5241	1.6059	.....
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet. Pitts.	No. 1 R. R. Wrought. Pitts.	No. 1 Cast. Pitts.	Heavy Steel. Phila.	Melt'g. Ch'go.
1914—						
May	11.75	9.10	11.75	12.25	10.60	10.00
June	11.75	9.10	11.75	12.25	10.50	9.80
July	11.75	8.50	11.75	11.50	10.60	9.75
Aug.	11.50	8.50	11.50	11.25	10.75	9.75
Sep.	11.25	8.70	10.50	11.25	10.75	9.25
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1916—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75

COMPOSITE PIG IRON.

Computation for March 1, 1916.

One ton Bessemer, valley	$20.50
Two tons basic, valley (18.50)	37.00
One ton No. 2 foundry, valley	18.50
One ton No. 2 foundry, Philadelphia	19.75
One ton No. 2 foundry, Buffalo	18.25
One ton No. 2 foundry, Cleveland	18.80
One ton No. 2 foundry, Chicago	19.00
Two tons No. 2 Southern foundry, Cincinnati (17.90)	35.80
Total, ten tons	187.60
One ton	**18.760**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.420	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	.....
April	13.779	16.363	13.850	12.914	.....
May	13.917	15.682	13.808	13.206	.....
June	14.005	14.968	13.606	13.047	.....
July	14.288	14.578	13.520	13.125	.....
Aug.	14.669	14.565	13.516	14.082	.....
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet bars. Pitts.	Rods. Pitts.	Iron bars, Phila.	Iron bars, deliv. Pitts.	Iron bars, deliv. Ch'go.
1914—						
Sep.	20.75	21.75	26.00	1.18	1.20	1.07
Oct.	20.00	20.70	26.00	1.14	1.20	1.01
Nov.	19.25	19.75	25.00	1.13	1.20	.96
Dec.	18.75	19.25	24.40	1.12	1.20	.91
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92

† Premium for open-hearth.

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1910.	1911.	1912.	1913.	1914.	1915.
January	$14,513,394	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421
February	13,949,082	18,690,792	21,801,570	24,089,871	16,520,260	16,470,751
March	17,253,503	22,591,991	24,474,799	27,221,210	20,551,127	20,985,505
April	16,529,260	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649
May	17,658,042	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612
June	16,503,204	20,310,053	24,795,802	25,228,346	18,927,958	31,757,103
July	16,108,102	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575
August	17,628,537	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822
September ...	16,776,178	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180
October	17,452,085	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741
November ...	18,594,806	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220
December ...	18,300,710	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277
Totals ...	$201,271,903	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720

EXPORTS OF TONNAGE LINES— Gross tons.

	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.
January	74,353	70,109	118,681	152,362	151,575	249,493	118,770	139,791
February	81,779	84,837	110,224	150,919	204,969	241,888	121,206	144,366
March	96,681	94,519	124,980	216,360	218,219	257,519	159,998	174,313
April	93,285	100,911	117,921	228,149	267,313	259,689	161,952	223,240
May	64,041	109,808	135,306	178,589	307,656	242,353	139,107	263,649
June	69,770	114,724	120,601	174,247	273,188	243,108	144,539	355,402
July	86,796	100,850	127,578	162,855	272,778	237,159	114,790	378,897
August	86,244	105,690	131,391	177,902	282,645	209,856	86,599	405,853
September	76,732	97,641	119,155	181,150	248,613	213,057	96,476	381,917
October	85,766	110,821	129,828	186,457	251,411	220,550	147,293	350,955
November	71,130	116,105	155,138	187,554	233,342	175,961	140,731	362,766
December	77,659	137,806	150,102	190,854	235,959	181,715	117,827	353,840
Totals	961,242	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432

IRON ORE IMPORTS.

	1912.	1913.	1914.	1915.
Jan. ..	154,118	175,463	101,804	75,286
Feb. ..	129,693	188,734	112,574	78,773
Mar. .	157,469	164,865	68,549	88,402
April .	178,502	174,162	111,812	91,561
May ..	194,482	191,860	125,659	98,974
June ..	180,122	241,069	188,647	118,575
July ..	185,677	272,017	141,838	119,468
Aug. ..	178,828	213,139	134,913	126,806
Sept. .	180,571	295,424	109,176	173,253
Oct. ..	202,125	274,418	114,341	138,318
Nov. .	163,017	179,727	90,222	113,544
Dec. ..	199,982	223,892	51,053	118,321
Totals	2,104,576	2,594,770	1,350,588	1,341,281

IRON AND STEEL IMPORTS.

	1911.	1912.	1913.	1914.	1915.
Jan.	33,071	20,008	21,740	17,776	10,568
Feb.	20,812	11,622	25,505	14,757	7,506
Mar.	23,533	15,466	27,467	27,829	8,025
April	22,392	12,481	25,742	30,585	16,565
May	23,347	15,949	28,728	28,173	28,916
June	29,399	21,407	36,597	23,076	32,200
July	15,782	17,882	36,694	25,282	20,858
Aug.	10,944	20,571	18,740	28,768	27,556
Sept.	14,039	18,740	19,941	38,420	23,344
Oct.	21,035	25,559	20,840	22,754	34,319
Nov.	13,880	24,154	25,809	24,165	37,131
Dec.	19,665	21,231	26,454	9,493	35,455
Total	256,903	225,072	317,260	289,778	282,443

CAR BUYING.

Freight cars ordered:		
First half 1913	114,000	
Second half 1913	33,000	
Year 1913		147,000
First half 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
1915—		
January	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,210	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.	
May 1914	25,000,000
June	23,650,000
July	23,350,000
August	23,600,000
September	23,200,000
October	21,200,000
November	18,700,000
December	18,100,000
January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
On February 1st	39,000,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1902	989,316,870	1,360,685,933	391,369,063
1903	995,494,327	1,484,753,083	489,258,756
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	*2,484,018,292	691,421,812
1914	*1,789,276,001	2,113,624,059	324,348,049
1915	1,772,309,538	*3,550,915,393	*1,778,605,855
1913—			
June	131,245,877	163,404,916	32,159,039
July	139,061,770	160,990,778	21,929,008
Aug.	137,651,553	187,909,020	50,257,467
Sept.	171,084,843	218,240,001	47,155,158
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
April	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,265,267	267,801,370	145,536,103
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,746,117	134,170,011
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,841,665	*359,301,274	*187,459,609
1916—			
Jan.	*184,192,299	335,535,303	151,343,004

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
	1915.	1916.	1915.	1916.
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. .	13.60	20.2136	12.50	17.984
Mar. ..	13.60		12.50	
April ..	13.60		12.50	
May ..	13.659		12.65	
June ..	13.75		12.724	
July ..	13.991		12.959	
Aug. ..	15.064		14.364	
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

BAR IRON AVERAGES.

Average realized prices on shipments of base sizes of common iron bars by the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and Highland Iron & Steel Company, as disclosed by wage adjustments of Amalgamated Association of Iron, Steel and Tin Workers, prices realized in bimonthly periods, governing wage rates for succeeding two months.

	1913.	1914.	1915.
January-February.	1.4831	1.1590	1.024
March-April	1.5430	1.176	1.087
May-June	1.5272	1.1257	*1.10
July-August	1.5029	1.0928	*1.15
September-October	1.3931	1.0847	*1.20
November-Dec'ber	1.2030	1.037	*1.30
Year's average	1.4421	1.1125	1.14

* Settlement basis.

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1909	62,593	9,327
1910	66,640	12,459
1911	14,098	61,466
1912	2,053	81,694
1913	20,680	57,812
1914	15,411	59,549
1915	2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
December	61	16,972

British tin plate exports have been as follows, in gross tons:

1913	494,921
1914	435,497
1915	368,602
January 1916	26,271

BRITISH IRON AND STEEL EXPORTS.

1914—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	74,617	43,133	47,237	385,301
Aug. ..	28,342	22,763	21,414	211,605
Sept. ..	37,793	39,185	23,440	228,992
Oct. ..	47,188	37,005	26,950	263,834
Nov. ...	49,666	16,181	30,942	240,608
Dec. ..	31,705	16,315	30,254	212,667
Year ..	780,763	433,507	435,392	3,972,348
1915—				
Jan. ..	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	25,101	198,804
Mar. ..	20,172	17,572	36,170	239,342
April ..	35,209	21,602	40,135	264,244
May ..	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	63,224	39,528	351,984
Aug. ...	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ...	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boiles, tools, etc.

Tin in February.

There were many interesting episodes in the merchandising of tin in February with some dramatic developments toward the close of the month. A strong tone prevailed in the main, although there were frequent re-actions and the net result of the fluctuations in prices was an advance of 5c to 6c per pound on nearby positions and 3c to 4c per pound on future deliveries in New York. The foreign markets also were strong and higher with a net advance of £10 10s on spot Straits tin and a rise of £8 5s to £8 10s on standard tin at London. The Singapore market shadowed London more or less closely with a net advance of £9 5s for spot metal.

Apparently, there was small interest taken by the majority of consumers when the month opened but some of the largest melters were attracted by the low limits from the Far East for late future deliveries. Consumption throughout the United States was unusually heavy and with the tin plate mills was record-breaking, but the larger supplies were ample to meet current requirements. The trade, however lived in constant expectancy of startling new phases resulting from the war. A sudden change in market prices is always a possibility in tin but recently American consumers have been less inclined to act precipitously upon sensational reports concerning tin-laden ships passing through the war zone. One specific instance may be mentioned of the Takata Maru in collision with the Silver Bell off Cape Race early in the month; both these vessels were reported to have been sunken with their cargoes, including 50 tons of tin, but the metal was subsequently safely landed in New York. The Appam incident is an illustration also, of what may happen to almost any merchant ship in the Atlantic. For this reason a much larger proportion of the tin destined to American consumers is coming by way of the Pacific.

According to foreign advices there were some fair sales at the Straits prior to the Chinese New Year holidays when the output of the mines was reduced. These sales included some Banca and Billiton as well as Straits, purchases being made by Russia for early shipment to Vladivostock.

During the first week of the month there were only fractional changes in prices and buying of all positions was very light. Foreign limits of 40c for June and July shipments from the Straits became increasingly interesting to large consumers and, about the tenth of the month, when July and August had dropped to 39¾c, a large volume of business was developed with liberal purchases of all future deliveries from March to August, inclusive. The buying continued for several days with interest extending to spot and ex steamships at dock. Buying, apparently, was well timed as sellers were inclined to meet the views of buyers and purchases were made without unduly exciting the market. The increased buying both before and after the February 12th holiday, developed higher prices both at London and the Straits; upward of 600 tons were bought in Singapore for American account influencing prices at that point. It is estimated that between the tenth and

TIN PRICES IN FEBRUARY.

Day.	New York. Cents.	London £ s d	London £ s d
1	41.80	179 10 0	180 5 0
2	41.25	178 15 0	179 10 0
3	41.25	178 5 0	178 15 0
4	41.62½	180 0 0	180 5 0
7	41.50	179 15 0	179 15 0
8	41.25	179 10 0	179 5 0
9	41.25	179 15 0	179 10 0
10	41.25	179 10 0	179 10 0
11	41.25	180 0 0	179 15 0
14	41.75	181 0 0	180 15 0
15	42.25	182 10 0	182 10 0
16	42.12½	182 0 0	182 0 0
17	42.00	181 0 0	181 0 0
18	42.00	180 0 0	180 0 0
21	42.25	180 5 0	180 5 0
22	....	180 0 0	180 5 0
23	42.62½	181 5 0	181 10 0
24	43.25	182 0 0	182 15 0
25	44.00	184 0 0	184 15 0
28	50.00	186 5 0	186 15 0
29	48.00	188 0 0	188 10 0
High ...	50.00	188 0 9	188 10 0
Low	41.25	178 5 0	178 15 0
Average .	42.634	181 2 3	181 6 2

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915.	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	.....
April	11,893	9,822	15,447	15,785	.....
May	14,345	13,710	17,862	14,646	.....
June	12,920	11,101	16,027	15,927	.....
July	13,346	12,063	14,167	16,084	.....
Aug.,	11,285	11,261	14,452	15,127	.....
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915.	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	.....
April	4,290	4,400	4,930	5,270	.....
May	5,760	6,160	6,900	6,759	.....
June	4,290	4,280	5,870	6,665	.....
July	4,580	4,770	4,975	5,606	.....
Aug.	5,210	6,030	3,315	4,712	.....
Sept.	5,430	5,160	4,973	5,296	.....
Oct.	4,450	5,020	4,610	4,441	.....
Nov.	5,600	5,560	5,155	6,713	.....
Dec.	4,980	5,110	6,435	5,301	.....
Total	59,018	62,550	63,093	66,517	.....
Av'ge	4,918	5,213	5,258	5,543	.....

CONSUMPTION IN THE U .S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	.....
April	5,400	3,450	4,300	3,200	.....
May	4,250	3,350	3,800	5,600	.....
June	2,850	3,800	3,650	3,900	.....
July	5,150	3,900	3,900	5,300	.....
Aug.	4,300	3,600	2,900	4,500	.....
Sept.	3,600	3,100	3,600	4,300	.....
Oct.	3,850	3,700	3,700	4,900	.....
Nov.	4,300	2,800	2,600	2,975	.....
Dec.	4,050	3,100	1,900	5,200	.....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4,125	3,658	3,475	4,062	.....

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	Feb. 1916.	Jan. 1916.	Feb. 1915.
Straits shipments			
To Gr. Britain..	3,015	1,540	3,254
" Continent ..	1,145	350	625
" U. S.	2,090	4,205	1,705
Total from Straits	6,250	6,095	5,584
Australian shipments			
To Gr. Britain ..	316	324	377
" U. S.	nil	nil	nil
Total Australian	316	324	377
Consumption			
London deliveries	1,183	1,377	3,378
Holland deliveries		57	27
U. S.	6,388	4,452	3,375
Total	7,571	5,886	6,780
Stocks at close of month			
In London—			
Straits, Australian	974	1,165	1,721
Other kinds	1,607	1,940	272
In Holland	17	.....	.....
In U S.	1,308	2,401	2,046
Total	3,906	5,506	4,039
Afloat, close of month			
Straits to London.	4,645	2,129	5,217
" to U. S. ..	6,703	8,315	3,365
Banca to Europe..	1,257	1,091	1,927
Total	12.605	11,535	10,509
	Feb. 29, 1916.	Jan. 31, 1916.	Feb. 28, 1915.
Total visible supply	16,511	17,041	14,548

STRAITS TIN PRICES IN NEW YORK.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	48.93½	.....
Apr.	44.02	49.12	36.10	47.98	.....
May	46.12	49.14	33.30	38.78	.....
June	47.77	44.93	30.65	40.37	.....
July	44.75	40.39	31.75	37.50	.....
Aug.	45.87	41.72	50.59½	34.39	.....
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

fifteenth of February, American buyers purchased between 2,500 and 3,000 tons here and abroad, causing an advance of from 1 to 1¼c per pound on the various positions.

During this period there were reports of more or less difficulty of securing permits for direct shipment from the Straits to the United States; however, nearly two-thirds of the tin shipped in January came by way of the Capes or by the Pacific Ocean to escape the heavy war insurance charged by way of London—now about 5% for ships coming through the danger zone. With a lull in buying an easier tone was developed here and at London.

On the 16th instant the partial destruction of the s. s. Bolton Castle by fire at docks in Brooklyn, while loading ammunition, is an illustration of the constant danger to which tin-carrying ships are exposed, but this vessel had discharged its cargo before the mishap. There was a sharp drop in prices on February 18th, at Singapore, and a moderate recession at London, but the re-action failed to stimulate buying here. The large consumers whose purchases had caused the previous advance in the market and who later withdrew, were much impressed by the failure of the market to hold the advance and consequently lacked courage to again inaugurate a buying movement, anticipating a further decline.

On February 21st. an interesting cable from London announced the purchase of some Banca tin by France and 300 tons Straits tin by the U. S. Government for the Navy Department. It was subsequently learned that this tin was contracted for in London by the American Embassy through Bolling & Lowe at £183 f.a.s. Singapore for March and April shipment. The American Government will utilize U. S. colliers, on their return trips from the Phillipines. The tin will be brought to New York and be distributed from here. If this tin were carried by merchant vessels the freight rate would be about £8 and the war and marine insurance about £3 to £4 additional. Thus the Government will make a large saving by utilizing its own ships. It is understood that the tin will cover the requirements of the Government for the balance of the calendar year.

An effort to sell future deliveries at concession of from ¼c to ⅜c per pound under foreign limits, prior to Washington's birthday, failed to bring any important increase in business. The advance abroad, during the holiday here, apparently was made to impress American consumers and to develop more interest at rising prices. Sales were not large but there was a better demand for March to July in 25 ton lots. Importers and dealers were holding nearby positions more firmly because of the relatively small tonnages to arrive in the United States during March but there was a fair business done in July and August deliveries at 40¾c. Large importers however, were not inclined to sell any deliveries before June. It is understood that about 2,000 tons to make March delivery, are coming by way of the Pacific coast as the saving in ocean freight more than offsets the extra overland rail freight. Much of this tin from the Pacific coast will go direct to Pittsburgh.

On February 25th, there was a sudden and sharp rise in the foreign markets and a stronger tone here, with light offerings of March, April and May positions by dealers and importers, but consumers held aloof. Spot tin at New York was especially strong and difficult to buy even at 40c. On February 26th, there were large sales in the East Indies, estimated at 650 tons, followed by an advance of £2 15s at Singapore. These transactions were somewhat mysterious. American consumers did not buy but apparently operators were preparing for the extraordinary situation that developed during the closing days of the month. The difficulty of securing tin from London, which had previously been purchased by American interests, indicated an inadequate supply to meet February contracts, consequently several buyers were forced into the open market to secure spot tin and, as the supply was concentrated in a few hands, the stringency was expressed in a sharp rise on spot which was little less than a squeezing of the short interests.

On February 28th, sales were made early in the day at 45c but on call at the Metal Exchange, 50c was bid. In the afternoon, however, there were offerings at 48c in the open market. About 800 tons of the stocks in store at the close of the month—1,300 tons—were held by consumers. In ordinary times re-sales would have been made by consuming interests, thus readjusting the forced advance, but, under the agreement now in force between the British authorities and American consumers, no tin purchased

for consumption can be re-sold. A little over 500 tons of tin in stock at New York, and output is controlled by several large importers and dealers which they refuse to sell even for March delivery—except at exceptionally high prices—claiming that the metal was needed to meet March obligations and that the light prospective arrivals in March would not allow the replacing of tin sold, in time to meet contracts. The excitement which was evident for a few days was confined almost entirely to operators, consumers remaining aloof and awaiting developments.

At the close of the month spot tin was held at 48c, March was difficult to buy under 46c, April was nominally held at 44⅛c, May at 43½c, June at 43⅛c and later positions at 42 to 42½c per pound.

Lead in February.

Lead was active and strong throughout February with large domestic and foreign contracts placed at higher prices. The Trust price was advanced 20 points on spot but the outside market rose 40 points, the Trust price being 6.30c against sales in the open market at 6.50c at the close of the month. On the first of February the Trust and outside prices were each 6.10c for prompt shipment.

It is a significant fact, that while the price made by the American Smelting & Refining Company does not affect current buying outside of its own obligations, it does have a far-reaching influence by governing contracts for metal and for ore made on a sliding scale basis. It was painfully evident throughout the month that the largest interests announced advances in prices very reluctantly and even grudgingly. The foreign market too, for several days, early in the month, failed to reflect the strength and activity existing in the United States; even late advances were made hesitatingly, but the result of the month's fluctuations was a rise of £1 7s 6d on spot and an advance of £2 2s 6d on future deliveries.

The month opened with the foundation of the market firmly established, as producers were well booked, heavy deliveries were being made to home consumers, little metal was available from second hands, and a good demand from foreign consumers was evident. During the first week, although the English market receded somewhat, slight premiums were obtained here on both domestic and foreign sales in the open market. Subsequently London responded, followed by additional large buying in the United States for both domestic and foreign shipment covering prompt and future deliveries.

On February 9th, the American Smelting & Refining Company advanced its price $3 per ton; that is, from 6.10c to 6.25c New York, for shipments from the West in 50 ton lots; the East St. Louis price was advanced to 6.17½c per pound for spot. The recognized strength in the refined metal was quickly followed by an advance in the price of ore in the Joplin district to $84 per ton for 80% ore. Further liberal transactions in pig lead, especially for export, led to another advance of $1 per ton on February 16th, by the American Smelting & Refining Company to 6.30c for prompt shipment from the West and 6.22½c at East St Louis. The English market, however, continued relatively easy for several days but without in any way jeopardizing the increasing strength in the domestic industry.

As was to be expected, the rising market for the metal caused another advance of $2 per ton on lead ore in the mining districts. In fact, some sales were made as high as $88 which was an advance of $4 per ton. All of the small lots of ore available were eagerly absorbed. Indeed, it was the strongest market experienced in the ore districts for many years. Most of the mine output was under contract and it was difficult, if not almost impossible, to obtain round tonnages at any price.

The domestic market for pig lead continued very strong with premiums of from 5 to 10 points made for prompt shipment to home consumers while on the 25th of the month large export sales were made at 6.50c per pound for shipments to the Far East as well as to Europe. London reported a scarcity of spot metal with the English export trade almost suspended due to the difficulty of securing permits to make foreign shipments as well as to the inadequate supply. During the last two days of the month

the American Smelting & Refining Company refused to make sales at its nominal asking price of 6.30c but additional contracts were made in the open market at 6.50c for prompt shipment and for March delivery. London responded by another advance on all positions, and the close was strong here, as well as abroad, with the tendency toward still higher prices.

The annual report of the St. Joseph Lead Company, made February 23rd, clearly reflects the prosperity enjoyed by the lead producers last year, the net profit being $4,283,425. The revival in the industry about the middle of March 1915 was reflected in a resumption of productive activities previously suspended. Curtailment of output had been necessary during the fourth quarter of 1914, but the smelter has been run to the limit of capacity since last June and the desilverizing plant, which was finished early in the year, was put into operation, last December.

Since March 1st large sales at still higher prices have been made for export and for domestic consumption.

LEAD PRICES IN FEBRUARY.

Day.	New York.* Cents.	St. Louis. Cents.	London. £	s	d
1	6.15	6.00	31	15	0
2	6.15	6.00	31	10	0
3	6.15	6.02½	31	0	0
4	6.15	....	31	0	0
7	6.15	6.02½	31	5	0
8	6.15	6.02½	32	0	0
9	6.25	6.17½	31	15	0
10	6.25	6.15	32	0	0
11	6.25	6.15	32	2	6
14	6.25	6.17½	32	2	6
15	6.25	6.17½	32	5	0
16	6.30	6.22½	32	2	6
17	6.30	6.22½	32	0	0
18	6.30	6.22½	32	0	0
21	6.30	6.22½	32	0	0
22	....	....	32	0	0
23	6.32½	6.25	32	5	0
24	6.35	6.27½	32	5	0
25	6.45	6.32½	32	7	6
28	6.45	6.32½	32	17	6
29	6.50	6.35	33	2	6
High	6.55	6.37½	33	2	6
Low	6.10	6.00	31	0	0
Average	6.271	6.167	31	19	9

* Outside market.

LEAD (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.92½	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03		3.80	3.98	
Apr.	3.82	4.19		3.70	4.11	
May	3.90	4.23½		3.81	4.16	
June	3.90	5.86		3.80	5.76	
July	3.90	5.74		3.75	5.52	
Aug.	3.90	4.75		3.73½	4.59	
Sep.	3.86	4.62		3.67	4.53	
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 10, 1915, have been as follows:

June 11, 1915		6.50
June 12	Advanced	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	"	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	.10c to 5.00
November 10	"	.15c to 5.15
November 15	"	.10c to 5.25
December 14	"	.15c to 5.40
December 31	"	.10c to 5.50
January 4, 1916	"	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	.05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60

Copper in February.

Copper continued phenomenally strong throughout February, although there was a reaction at London late in the month—the first since the middle of December—with an easier undercurrent on nearby positions in this country. The net advance in price at New York was 2c to 2½c per pound while the net result of fluctuations at London, was a rise of £10 10s on spot Electrolytic. Standard, was more or less erratic with violent fluctuations but the net result was an advance of £10 10s on spot, and £9 10s on futures.

The prices prevailing for copper to-day are the highest since 1873; that is, during a period of 43 years. Prior to 1873, Lake copper which was then the standard, sold at various times between 27c and 55c per pound. The highest price ever recorded was 55c in 1864; the next highest price was 50½c in 1865; 42c was the top price touched in 1866, 44c was the maximum in 1872 and 35c was the pinnacle in 1875. Previous to 1883, interest was almost entirely centered in Lake copper as from 67 to 95% of the production was in the Lake Superior region. Electrolytic copper is the standard to-day, and has steadily gained in favor since 1883 when Montana and Arizona first became factors in the production of copper ore.

Buying of refined copper in February was largely confined to May and June deliveries although early in the month considerable April Electrolytic was sold to domestic consumers and later, some liberal contracts for third quarter delivery were closed. A few important orders, mainly for export, were also taken for shipment over the last three months of the year; one contract for 12,000,000 pounds was reported as high as 26½c late in the month. Sales of April, May and June, ranged from 25½c to 27½c; July, August and September from 25c to 27c and October, November and December from 24c to 26½c, the outside prices prevailing at the close of the month. For nearby delivery, business was of much smaller volume, necessarily, as such requirements of consumers were well covered during January while producing interests, generally, reported capacity sold, through April and May. Toward the close of the month, however, the higher prices prevailing brought out larger offerings of February and March deliveries with second hands shading producers' prices from ¼c to ¾c per pound; the large selling interests also found some surplus for February and March delivery at 28c to 28½c per pound.

The total production of the refineries in February is estimated at 75,000 tons, equivalent to 168,000,000 pounds. The heavy snows in the Lake region during January and early February curtailed output somewhat. The high prices, however, naturally stimulate output wherever possible. Alaska is now yielding 9,000,000 pounds to 10,000,000 pounds per month while the output in the porphyry districts, is at the rate of 500,000,000 pounds a year. Refining capacity is also being increased liberally. The Anaconda improvements are rich in promise and the refinery at Great Falls is already producing at the rate of 15,000,000 pounds per month. The American Smelting & Refining Company will have its Tacoma refinery in full operation in March. One of the principal activities of this company is the extension of its Baltimore plant. According to official reports the American Smelting & Refining Company will have a total refining capacity of 1,000,000,000 pounds by the middle of the summer.

On the other hand, consumers are also increasing capacity enormously. Brass founders have been especially active in making improvements while one rolling mill has added a brass department capable of casting 1,000,000 pounds of brass per day. Melting of copper by domestic consumers, according to some estimates, has varied from 100,000,000 pounds to 125,000,000 pounds per month. The strike at the Ansonia works of the American Brass Company, which continued for ten days, cut down production somewhat in February. The freight embargo declared by the New Haven Railroad intermittently, and frequent embargoes against the New Haven by connecting lines, also had some influence in checking manufacturing operations in New England. Heavy movements by

LAKE COPPER PRICES.

Monthly average prices of **Lake Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	.....
Apr.	15.98	15.55	14.68	17.43	.....
May	16.27	15.73	14.44	18.81	.....
June	17.43	15.08	14.15	19.92	.....
July	17.37	14.77	13.73	19.42	.....
Aug.	17.61	15.79	12.68	17.47	.....
Sept.	17.69	16.72	12.43½	17.76	.....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av..	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Monthly average prices of **Electrolytic Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	.....
Apr.	15.85	15.48	14.34	17.09	.....
May	16.16	15.63	14.13	18.60	.....
June	17.29	14.85	13.81	19.71	.....
July	17.35	14.57	13.49	19.08	.....
Aug.	17.60	15.68	12.41½	17.22	.....
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av..	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Monthly average prices of **Casting Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	.....
Apr.	15.72½	15.33	14.18	16.48	.....
May	16.01	15.45½	14.00	17.41	.....
June	17.08	14.72	13.65	18.74½	.....
July	17.09	14.40½	13.34½	17.76½	.....
Aug.	17.35	15.50	12.27	16.46	.....
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av..	16.29	15.33	13.18	16.76	.....

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since April 22, 1915, are given in the following table together with the price of Lake Copper on the same dates:

1915—	Sheet Copper.	Lake Copper.
April 22	23.00	18.00
April 28	24.00	18.93¾
June 8	24.50	19.62½
June 9	25.00	19.87½
July 27	24.50	18.75
July 30	24.00	18.75
August 18	23.00	16.75
November 3	23.25	18.06¼
November 15	23.50	18.62½
November 16	23.75	18.75
November 17	24.00	18.87½
November 18	24.25	19.00
November 22	24.50	19.87½
November 23	25.00	19.87½
December 22	25.50	20.50
December 23	26.00	20.75
December 24	27.00	21.50
December 30	27.50	22.37½
1916—		
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	22,132
February .	26,792	34,634	15,583	*20,548
March ...	42,428	46,504	30,148	.....
April	33,274	35,079	18,738	.....
May	38,601	32,077	28,889	.....
June	28,015	35,182	16,976	.....
July	29,596	34,145	17,708	.....
August ..	35,072	16,509	17,551	.....
September	34,356	19,402	14,877	.....
October .	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December	30,653	22,166	36,786	.....
Total ..	382,810	360,229	270,704	.....

* Includes only exports from Atlantic ports.
† Approximate.

water, however, relieved the situation decidedly.

It is estimated that deliveries of refined metal into domestic consumption during February were between 100,000,000 and 115,000,000 pounds. Exports during the month, estimating shipments from Southern and Pacific ports, were about 47,000,000 pounds making total deliveries about 158,000,000 pounds and indicating that surplus stocks in the hands of producers were increased about 10,000,000 pounds. The result of these various developments was an easier undercurrent, as previously noted, at the close of the month, with concessions made in prices for late, as well as for nearby deliveries.

It is a point of some interest that Australia is also building a refinery with a capacity of 24,000 tons.

It is notable that there were fewer contracts for war munitions placed in February as compared with the three preceding months but the brass founders, electrical equipment manufacturers and wire drawers have their capacity sold for three to six months and most of the orders for finished products have been covered by contracts for unwrought copper. Domestic consumers of wire, plates, shapes and castings placed heavy orders with manufacturers early in the month. Recently, some export orders were taken for wire and domestic buyers gave evidence of greater interest in electrical equipment when the month closed.

The industry is benefitting from enormous profits resulting from the relatively low cost of production and from the record-breaking prices received for copper in various stages of manufacture. According to some estimates, copper producers' profits during the current year will be $400,000,000. This seems a modest return, under present conditions, when the net earnings of the companies are at the rate of nearly $500,000,000 annually.

COPPER PRICES IN FEBRUARY.

	New York			London.
	Lake.	Electro.	Casting.	Standard.
Day.	Cents.	Cents.	Cents.	£ s d
1	25.50	25.50	24.25	94 10 0
2	25.75	25.75	24.37½	94 10 0
3	25.87½	26.12½	24.62½	95 0 0
4	26.00	26.25	24.87½	96 0 0
7	26.37½	26.37½	25.00	97 10 0
8	27.00	27.00	25.00	101 10 0
9	27.00	27.00	25.37½	100 0 0
10	27.50	27.50	26.00	104 10 0
11	27.50	27.50	26.00	103 10 0
14	28.00	28.00	26.50	106 0 0
15	28.25	28.25	26.75	106 10 0
16	28.25	28.25	26.75	104 10 0
17	28.25	28.25	26.87½	106 10 0
18	28.25	28.25	26.87½	108 0 0
21	28.25	28.25	26.87½	108 0 0
22	.....	.....	.....	107 0 0
23	28.25	28.25	26.87½	106 10 0
24	28.25	28.25	26.87½	103 5 0
25	28.00	28.00	26.75	102 5 0
28	28.12½	28.12½	26.87½	105 0 0
29	28.37½	28.37½	26.87½	105 10 0
High .	28.50	28.50	27.00	108 0 0
Low .	25.25	25.25	24.12½	94 10 0
Av'ge.	27.437	27.462	26.031	102 13 4

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	
April	7.07	6.08	5.50	13.85	
May	7.13	5.77	5.38	20.55	
June	7.25	5.50	5.37	25.60	
July	7.46	5.61	5.26	24.90	
Aug.	7.34	5.99	5.66	19.30	
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc Aug. 23rd, 1915 together with the price of spelter ruling on the same day.

1915—	Sheet Zinc.	Spelter St. Louis.
August 23	15.00	12.00
August 24	16.00	12.75
November 4	16.50	15.12½
November 9	17.00	15.87½
November 11	17.50	16.12½
November 12	18.00	16.31¼
November 17	19.00	17.25
November 18	20.00	17.37½
November 22	21.00	18.75
November 23	22.00	18.75
December 31	23.00	17.25
1916—		
January 26	24.00	19.00
February 17	25.00	20.87½

Spelter in February.

February dawned upon a quiet but steady domestic market for spelter. Later, activity developed with large sales at higher prices, accompanied by some excitement late in the month. The net result of the February movements was an advance of 2c per pound on spot and 2¼c on March, and second quarter positions. The London market also was strong and higher with the establishment of a record-breaking spot price at the close of the month.

On February 1st spot and nearby shipments from the West sold at 18½c, February at 18¼c, March at 18½c, and second quarter at 15½c East St. Louis. There was some evidence that producers had caught up with contract obligations and were readier sellers of February and March deliveries, the demand being mainly confined to such positions, but dealers, selling in competition with producing interests, kept the market from rising perceptibly. Consumption continued at an enormous rate, the heaviest melting being by the brass works. It was evident that consumptive requirements taking up the increased production which developed a stronger undertone. In fact, the consumptive and speculative demand exceeded all expectations, so that the flood of zinc that was expected to submerge the market, failed of realization.

By the seventh of the month, large sales on domestic account had taken up most of the February and March offerings and the demand was extended into April. Up to this time, 75% of the inquiries were for prompt shipment from the West and for February and March deliveries, and the large business transacted had carried prices up ¼c to ½c per pound. Within the next day or two, several large contracts were placed at St. Louis for export over the second quarter, as well as for March shipment. There were also reports of contracts closed for shipment over the second half of the year at about 13½c.

The London market during the first week of February receded £1 on spot which was then quoted at £89 equivalent to 18.95c, while the three months position advanced £2 to £84, equivalent to 17.87½c.

There was an especially good demand for the "brass special" but small inquiry for the high grade spelter, and scarcely any demand for metal for galvanizing. Large manufacturers of war munitions, however, on February 9th were well represented in the market for shipments over the second and third quarters of the year. Dealers also bought heavily of these positions resulting in a further sharp advance in the market. London, while irregular, was also strong and higher with a general tendency toward a still higher level. By the end of the second week, spot spelter at St. Louis had advanced to 20c per pound with light offerings and an active demand for February and March, but with less inquiry in futures.

It is interesting to note that production in January and February was steadily increased in other countries as well as in the United States. The larger output was especially notable in Australia, France and in Spain. Japan also was a factor, having purchased, about the middle of January, 20,000 tons of Australian concentrates for shipment over six months. In Holland, however, production was reduced because of the scarcity of raw material. The output in Great Britain was, and still is in excess of the production in normal times but was not up to expectations or to the amount deemed desirable under present needs and stress. Consequently, Great Britain is still compelled to depend largely upon the United States.

The English galvanizers, as in the United States, are making minor purchases but the war demand is heavy, especially from the brass founders who are working at high pressure. The difficulty of ocean transportation, delay in shipments and great expense, due to high freight rates and war risks, while militating against purchases in this country, are not insurmountable.

On February 15th, London was greatly excited, expressed in an advance of £6 on spot and £3 on futures. The American market also was active, strong and sympathetically higher, the rise being ¼c to ⅝c per pound with large sales for second quarter delivery and heavy buying for delivery in six to nine months by domestic manufacturers of war munitions. On the following day there was a good demand

for spot, February and April but less interest in future positions. Spot had then reached 21c, March 20⅜c and second quarter 19c, but the higher prices brought out freer offerings, by producers, for future delivery.

On February 18th manufacturers of sheet zinc advanced prices one cent per pound to 25c, this was the first change in the price of sheets since January 26th. Large foreign spelter orders about this time excited the St. Louis market, with sales of second quarter delivery at 18c to 18¼c.

On February 21st, the market was again strong and higher, even the galvanizers made some purchases, but foreign orders were the main support of the market. Producers during the next few days were more anxious to sell for deliveries over the third and fourth quarters of the year, but buyers confined their inquiries mostly to shipments for this side of June. Some sales, however, were made for third quarter at 16½c while spot and February remained firm, close to 21c. From February 23rd to 28th, there was a lull in domestic buying and some recession in prices but the foreign market continued strong. By February 25th, London had advanced to £108 which was a rise of £18 since the beginning of the month and within £2 of the highest point touched 1915. The New York market was very dull and foreign business was being done only by exporters who had previously secured ocean freight room.

Toward the close of the month, the market was unsettled by offerings of high grades for re-sale, by consumers, at all sorts of prices.

Intermediate, and "brass special" grades also while still scarce were available from producers and dealers for May and later delivery—intermediate grades at 6c to 8c and "brass special" at 3c to 4c per pound premium over the price prevailing for prime western spelter.

On February 28th, a stronger tone was developed and the previously cheaper offerings were withdrawn, confidence being re-established by foreign advices. On the last day of the month London advanced to £110 for spot, the highest price ever quoted, up to that time, at London. The English spot market was then 3c per pound over the spot price at St. Louis but futures receded £1 to £95.

A feature of some interest in February was the sale by the Anaconda Copper Company of the prospective output of the new electrolytic zinc plant at Seneca for a year at a profit of $4,000,000. This plant is now in partial operation and when completed will have a capacity of 70,000,000 pounds annually.

SPELTER PRICES IN FEBRUARY.

Day.	New York.* Cents.	St. Louis. Cents.	London. £	s	d
1	18.80	18.62½	90	0	0
2	18.80	18.62½	90	0	0
3	18.92½	18.75	88	0	0
4	18.92½	18.75	88	0	0
7	19.05	18.87½	89	0	0
8	19.30	19.12½	89	0	0
9	19.55	19.37½	91	0	0
10	19.80	19.62½	92	0	0
11	19.92½	19.75	93	0	0
14	20.17½	20.00	93	0	0
15	20.67½	20.50	99	0	0
16	20.92½	20.75	100	0	0
17	21.05	20.87½	102	0	0
18	21.05	20.87½	103	0	0
21	21.05	20.87½	103	0	0
22	.....	.....	105	0	0
23	21.05	20.87½	105	0	0
24	20.92½	20.75	106	0	0
25	20.55	20.37½	108	0	0
28	20.67½	20.50	109	0	0
29	20.67½	20.50	110	0	0
High	21.17½	21.00	110	0	0
Low	18.67½	18.50	88	0	0
Average ...	20.094	19.919	97	15	3

* Prompt western shipment.

SPELTER (Monthly Averages.)

	New York			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	5.33	6.52	18.18	5.14	6.33	18.01
Feb.	5.46	8.86½	20.09	8.62	19.92	
Mar.	5.35	10.12½		5.15	9.80	
Apr.	5.22	11.51		5.03	11.22	
May	5.16	15.82½		4.96	15.52½	
June	5.12	22.62½		4.93	22.14	
July	5.03	20.80		4.84	20.53	
Aug.	5.63	14.45		5.45	14.19	
Sep.	5.52	14.49		5.33	14.10½	
Oct.	4.99½	14.07		4.81	13.89	
Nov.	5.15	17.04		4.97	16.87½	
Dec.	5.67	16.91		5.49	16.72	
Av.	5.30	14.44		5.11½	14.16	

Joplin Zinc And Lead Ore Markets.

Influenced to a great extent by the weather conditions, local production and deliveries fell below what had been anticipated, although the record was held up as far as deliveries were concerned by drawing upon the surplus stocks of the district. Higher prices were responsible for the movement of the surplus stocks, the average being over ten dollars per ton higher in February than in January upon blende ores with little or no change in calamine ores. The market was a steadily ascending one for the first three weeks of the months, after which there was a spectacular drop ten dollars per ton just when the mine operators had predicted from the conditions of the spelter market and the depletion of the surplus stocks that there was certain to be another advance. The month opened up with ore at $90 to $118.50, the next week it had risen to as much as $125, then went up to $130, and dropped back to $120 for the closing week. The average base for the month was better than $110.

With such price conditions prevailing, every operator strained every effort to bring up his production to the maximum but was greatly hindered in doing this by the bad weather, bad roads and lack of fuel, especially during the first two weeks of the month. The last two weeks of the month showed some improvement until the last few days, when there was a return to the bad weather.

Actual shipments of zinc blende ores reached 27,465 tons, or an average of 6,866 tons per week. The average settlement upon these ores was $108.98. Calamine ores reached a total of 2,860 tons, or an average of 715 tons at an average price of $75.82. This compared with an average weekly shipment of 6,599 tons of blende and 336 tons of calamine in January. The stocks of ore in bins at the close of January were 4,650 tons, while at the close of February they were estimated at only 3,000 tons.

Lead ore sales also increased to an average weekly tonnage of 1,055 tons as against 945 tons the previous month. The average settlement price also mounted upward to $84.04 as against $75.68 for January. The month showed practically the same advance in lead ore prices as that shown for zinc ore prices, the net advance being close to ten dollars per ton upon top grades. The market also closed stronger at the month end than did the zinc ore market. The market at the end of the month was very strong at $89, while the previous month saw only $81 as a maximum and as low as $70. The advance in lead has been one of the features that has put new life into some portion of the district where lead is quite an adjunct of the ores being mined. Its presence in the zinc ore concentrates is very undesirable and the penalties this year have been such as to make the premiums upon ores free from it, so great that everyone has striven to eradicate all lead in the zinc concentrates and have correspondingly decreased the grade of the lead concentrates by throwing considerable zinc into them. The higher base prices paid for lead will therefore help materially in the losses sustained previously by penalization on account of zinc. This has resulted in a decrease of ore surplus from 1,435 in January to 1,100 in February.

The formation of a number of zinc mining corporations much upon the order of syndicates in the district has resulted in a large number of sales of mining properties the last month. Three different groups so far have appeared and have taken over mining properties. These have been the Johnson and Gibson interests that have acquired the A. W. C. group of mines and will probably take over others the coming month; the Kenefick Zinc Corporation which took over the Muskingum, Samson Electrical and Media mines; and the R. R. Conklin interests that have acquired the Bradley mines at Joplin and the Tom C mine at Prosperity and plans the early acquirement of large number of other properties. The month saw the transfer of approximately $1,500,000 worth of properties.

Antimony In February.

Antimony at the beginning of February was strong but less active. Importers, confident in the strength of their position, were holding for higher prices and consumers found it difficult to obtain spot metal under 43½c and February under 41c per pound. Although they were reluctant to pay these prices for foreign material American antimony was not available before shipment in April. Shipments from the Orient in January were held at 34c to 35c, February shipments at 32½c to 33½c and March shipments at 32c to 33c per pound. Nearby positions continued to gain in strength and within two days February delivery was advanced ½c per pound to 41½c to 42c. On the 4th inst. cables from the Far East were stronger and higher, encouraging purchases here and resulting, February 7th, in liberal sales of February and March shipments from the Orient at 33½c in bond.

Jobbers of antimony, about February 9th, were all at sea when it was learned that the British Consul at New York would not release imported antimony until satisfied that the metal would go directly into consumption; compelling importers to furnish consumers names as well as requiring a guarantee from both importer and consumer that the antimony would not be re-exported. It has been the practice for many years of some large consumers in this country to re-sell antimony they owned, but this method will no longer be permitted while the British government exercises control over the supply which it is possible to do, while the importations from China are in ships sailing under the British flag or while the metal from Japan is under the joint control of the Japanese and English governments. Subsequently, it was arranged that jobbers may carry stocks of antimony in public stores, subject to the order of the British Consul, to be released when the jobber furnishes the consumer's name and each jobber and consumer has signed the regular guarantee to the satisfaction of the British authorities.

The higher prices prevailing for spot and nearby deliveries developed a more active demand for future positions resulting in a large amount of business, about the 10th of the month, for February, March and April shipments from the Far East. In the face of large cargoes on the s.s. St. Bede, and Inverclyde, then at Boston, it was surprising how few offerings were made for February and March delivery. Subsequently, it was learned that seven-eighths of the 840 tons on these two vessels were delivered directly to consumers on contracts but some small sales of spot were made at 43½c to 44c and additional sales of March shipments from the Orient at 34c in bond.

Manufacturers of war munitions and other large consumers came into the market in force about February 15th when large sales were made by importers from cargoes afloat from the Far East at further advances in prices. A more active demand also was experienced for early delivery and for March arrival. Buying continued more or less heavy for all positions for several days.

It became evident about February 23rd, that large deliveries were being made directly to consumers and that the supply in dealers hands was smaller than at the beginning of the month notwithstanding the large arrivals. This fact gave added strength to the market and it was pointed out that purchases of January-February shipments from the Far East would not make deliveries in New York before May. Toward the close of the month some sales of American antimony were made at 41½c to 42c for March delivery and there was renewed buying of March shipments from Japan at 34c in bond eqiuvalent to 37½c duty paid delivered in New York. The market closed strong February 29th at 44c to 44½c for spot and with fewer offerings of February, March and April shipments from the East at 34c in bond.

The United States government during the month, reported importations of antimony in 1915, aggregated 17,484,030 pounds against 13,070,381 pounds in 1914 an increase of nearly 36%. The importation of antimony contents of crude ore, in 1915 were 3,374,012 pounds against importations in 1914 of 1,986,082 pounds, an increase of about 69%.

Aluminum In February.

The supply of aluminum available in the open market in February was entirely inadequate to meet the demand either for export or for domestic consumption and the result was an advance of from 7c to 8c per pound on No. 1 Virgin during the month.

Early in February some large inquiries for several hundred ton lots attracted attention but there was very little spot metal offered. The domestic demand was confined largely to small lots which were quotable 1c to 2c per pound under the nominal prices for carload lots. In fact, the stocks were scarcely sufficient to take care of the jobbing trade.

About February 4th, the demand becoming more pressing for five ton lots, the price for spot was advanced about 1c per pound; whereas buyers bid only 53c for No. 1 Virgin on the first of the month before the close of the week they were bidding 54c with holders asking 56c. During the next few days when buyers bid higher prices, sellers withdrew from the market on spot and asked 2c to 3c higher for future deliveries.

By the middle of the month the price had advanced to 57c with little available at even 2c to 3c per pound higher. The demand became more active and urgent by the 20th, when some sales were made for export at 59c and small lots for domestic shipment were held at 60c per pound. On the 25th of February, bids of 60c per pound were refused for No. 1 Virgin, but bids were solicited for 98% to 99% remelted metal for delivery in New York late in March or early in April in 25 ton lots. This metal could have been sold at about 57c, but producers were not inclined to entertain bids under 58c. No. 12 alloy, remelted, was salable at about 48c per pound.

Toward the close of the month some fair size sales of No. 1 Virgin were made at 61c for immediate delivery and holders advanced their asking price to 62c. On the closing day of the month, sales of carload lots were reported as high as 62c and small lots at 63c. Later in the day, carload lots were held at 63c while spot, April and May deliveries, were available at 62c per pound.

In some European countries the price of aluminum has advanced even more rapidly than in the United States. In Sweden,

ALUMINUM, SILVER and ANTIMONY PRICES IN FEBRUARY.

	Aluminum.	— Silver —		Antimony*
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents.
1 ..	54.00	56⅞	27	43.75
2 ..	54.00	56⅞	27	43.75
3 ..	54.00	56¾	26.93¾	43.75
4 ..	55.00	57	27.06¼	43.75
7 ..	55.00	56¾	27.06¼	43.75
8 ..	55.00	56⅝	27	43.75
9 ..	56.50	56⅝	27	43.50
10 ..	56.50	56⅝	27	43.50
11 ..	56.50	56⅝	27	43.50
12 ..	.....	....	26.93¾	.....
14 ..	57.00	56⅝	26.87½	44.00
15 ..	58.00	56½	26.81¼	44.00
16 ..	58.50	56¾	26.93¾	44.00
17 ..	58.50	56⅝	26.87½	44.00
18 ..	59.00	56⅝	26.87½	44.00
19 ..	.....	56⅝	26.87½	.....
21 ..	59.00	56¾	26.93¾	44.00
22 ..	.....	....	27	.....
23 ..	59.00	57	27.06¼	44.00
24 ..	60.50	57	27.06¼	44.00
25 ..	61.00	57	27.06¼	44.00
26 ..	.....	56⅞	27	.....
28 ..	61.00	56⅝	26.93¾	44.00
29 ..	62.00	56⅝	26.93¾	44.50
High	63.00	57	27.12½	45.00
Low	53.00	56½	26.81¼	43.00
Av...	57.50	56.755	26.975	43.875

CHINESE and JAPANESE ANTIMONY.

Average monthly price of **Chinese** and **Japanese** (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	.....
Apr.	6.87	7.82	5.82	23.97	.....
May	6.98	7.75	5.78	34.71	.....
June	7.07	7.62	5.62½	36.53½	.....
July	7.37	7.55	5.44	35.98	.....
Aug.	7.58	7.48	13.05	32.57	...
Sept.	8.00	7.31	9.79½	28.50	.....
Oct.	9.11	6.46	11.64	30.96	....
Nov.	9.11	6.28	14.14	37.88	.....
Dec.	9.05	6.05	13.15	39.36½	.....
Av..	7.63	7.43	8.53½	29.52	.....

aluminum was quoted as high as $1.25 per pound, due to the English embargo against shipments to Scandinavia. This, of course, has no bearing upon the price of the metal in this country, but is an interesting sidelight upon the market.

The imports of aluminum into the United States during 1915, according to the United States Government report available in February, were 8,534,834 pounds, which were about one-half of the imports of 1914 and about 63% less than the imports in 1913. On the other hand, the exportation of metallic aluminum and its manufactures in 1915, from the standpoint of value, were nearly three times as large as the exports in 1914, the value of the 1915 exports being placed at $3,682,117. These changes, of course, were brought about by the extraordinary conditions abroad, incidental to the war.

PIG IRON STATISTICS FOR AN INTERESTING YEAR.

(Continued from page 95.)

nominal vessel capacity is smaller now than in 1906.

The production of acid open-hearth steel in 1915 can hardly be estimated at all. At the pace the iron and steel industry in general was going one would expect it to be about 1,200,000 tons, but a portion of the war steel demand was for acid open-hearth, and quite a number of open-hearth furnaces had their linings changed from basic to acid. This occurred rather late in the year, and so may not have affected the production very much, still it would not surprise us to see more than 1,500,000 tons of acid open-hearth steel reported for the year, against a previous record of 1,255,305 tons, made in 1913.

The production of basic open-hearth steel ingots and castings in 1915 can be estimated roughly at 21,000,000 tons, or over half a million tons in excess of the best previous record, made in 1913.

Adding these estimates and making an allowance for crucible and miscellaneous steel, it appears that the production of steel ingots and castings in 1915 was over rather than under 31,000,000 gross tons, and if the production was only half a million tons over, a new calendar year record was made for steel production, even though pig iron fell 3% short of making a new record.

War Exports.

The following table, which appeared in recent issue of The Annalist, illustrates the enormous increase in our outbound trade in articles of war. There is given below a table of twenty of the principal classes of commodities, the exports of which were largely utilized for war purposes:

Article.	1915.	1914.	1913.
Horses and mules	$118,653,095	$ 19,136,817	$ 5,015,298
Brass and manufactures	54,813,315	6,766,911	7,945,417
Aeroplanes and parts	5,418,596	399,496	86,931
Automobiles and parts	111,180,139	34,171,568	33,300,567
Acids and chemicals	49,984,594	12,056,174	9,250,813
Miscellaneous iron and steel	62,012,371	16,012,371	19,597,063
Bars or rods of steel	31,118,506	6,422,586	9,370,145
Metal-working machinery	42,037,779	14,841,380	15,558,212
Firearms	12,166,481	5,146,867	3,920,008
Explosives	181,778,033	10,037,587	5,525,071
Medical and surgical instruments and appli..	4,686,549	2,862,971	1,297,411
Rubber boots and shoes	2,704,378	2,019,105	1,290,765
Rubber tires	11,415,698	3,315,116	3,910,688
Wire	25,830,628	8,568,589	9,237,541
Sole leather	26,598,487	14,192,678	7,808,866
Men's boots and shoes	30,599,650	9,580,316	11,018,167
Harness and saddles	18,237,507	3,478,248	751,426
Miscellaneous leather products	18,254,761	2,378,218	1,993,486
Zinc and manufactures	33,504,908	8,571,576	1,101,651
Total	$831,695,000	$180,128,574	$147,979,526

Trade Notes.

The Wolverine Starter Co., Grand Rapids, Mich., has been incorporated with a capital of $10,000, to manufacture mechanical starters for automobiles at the plant of the Wolverine Brass Works.

The Akron Aluminum Co., Akron, Ohio, to manufacture aluminum products. Capital $10,000. Incorporators: W. C. Washburn, George F. Andrews, H. W. Heckman and John Dildine.

The Albany Equipment Corporation, Albany, N. Y., has been formed with $1,000,000 capital, to manufacture copper, brass and other metals. H. M. Scheesinger, H. M. Sparrow and A. H. Goodwin are the officers of the company.

The Specialty Casting Company, Dayton, Ohio, has been incorporated with $10,000 capital stock by George C. Benner, and others. It operates a foundry at 438 Homestead Avenue, but contemplates moving into a new building on East First Street. The capacity of the plant will be doubled.

The Sterling Metal Mfg. Co., has been incorporated with a capital of $25,000 to operate a factory in Huntington, Ind. The head of the concern is Orlando Rex, of Chicago, and the firm will manufacture tableware from a new metal, made by a secret process, and said to have all the qualities of silver, being non-rusting and non-tarnishing.

The Connecticut Alloyed Metals Co., Millbrook, N. Y., has been organized with a capital stock of $15,000 to engage in the manufacture of metals, alloys, and metallic compounds, by Joseph Beihilf, E. Dennes and others.

H. D. Kramm, 917 Fletcher Trust Building, Indianapolis, Ind., has sold his interest in the Pioneer Brass Works and is incorporating a company for the manufacture of malleable aluminum castings and finished pistons. The new company's office will be for the present at 917 Fletcher Trust Building until it completes and equips its plant. The Pioneer Brass Works will continue to manufacture malleable aluminum castings under a royalty.

The Glens Falls Forging & Welding Company, Glens Falls, N. Y., has filed incorporation papers showing a capital stock of $75,000. It will operate a general foundry and manufacture motor vehicle parts, special hardware, etc. J. A. Curley, Glens Falls; C. Hibbard and J. H. Conley, Fort Edward, are the incorporators.

The Penn Foundry & Mfg. Co., Reading, Pa., has been incorporated with a capital stock of $15,000 by Edgar P. Fidler, James L. Mark and George W. Bland. The company has taken over the former Wyomissing foundry at Wyomissing, Pa.

The Crary Tool Company, Milwaukee, has been organized to manufacture chisels, pliers, wrenches and similar back tools. The capital stock is $30,000 and the incorporators are John M. Hoerl, George Haubert, William C. Garent and George E. Garent. A workshop will be established at once on the south side of Milwaukee.

The Waterbury Brass & Bronze Co., Waterbury, Conn., has been incorporated with $10,000 capital to engage in the manufacture of brass and aluminum castings and ingots. Henry L. Silver, Harry W. Even and Edward B. Riley are the incorporators.

American Brass Forging Co., Inc., New York, N. Y., to manufacture sheets, rolls, wire bars, rods, tubes, etc. incorporators: G. W. Coughlan, president & treasurer and F. E. Hallfeld, vice-president and secretary. Brass and bronze foundry, brass machine shop, grinding room, plating, japanning, stamping, tinning, soldering, polishing and lacquering are the departments operated by this company.

The E. H. Myers Mfg. Co., Myerstown, Pa., will be incorporated in the near future to take over the machine shop and gasoline-engine-making plant of F. H. Myers & Bro. The new company will do automobile and general machine shop work and manufacture the engines as before. Data from companies making anything applying to their lines will be appreciated. Charles C. Loose is treasurer.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, APRIL, 1916. NO.4.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer.
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Business Situation and Outlook.

If our foreign trade is to be taken as a measure of our industrial situation and prospect we are in a very sound position. Beyond question our foreign trade is the most important element at this time. We do not need to measure our activity; we are surfeited with it. What we need to scrutinize is the character of the activity, and what is promised for the future. It is the time to look for flaws, for the surface is so bright and promising that no one could ask for more in that respect.

There are times when we have inflation in security values. That is not the case now, except in a proportion of the total issues so small as not to be threatening. Sometimes we have an excess of new construction, whereby too much liquid capital is put into permanent investments, upon which the future does not furnish the adequate return. On account of extremely high prices we have rather a deficiency in new construction, except perhaps that which is based immediately or remotely upon war demand of one sort or another, and as to this exception a prosperous foreign trade may remove much if not all of the danger.

Turning to the important index mentioned, our foreign trade, we have since our summary of a month ago the detailed statement of imports and exports in January and the statement of totals for February. The January trade is to be observed to determine the character of the remarkable foreign business we are doing, while February returns are

noteworthy in that they show the largest aggregates in history.

January, 1914, is found by comparison with other months of the period to have been closely representative of normal times before the war. Comparing the detailed figures for January, 1914, with those now available for January, 1916, we find the following:

Imports:
- Materials for manufacturing greatly increased.
- Crude foodstuffs unchanged.
- Manufactured foodstuffs slightly increased.
- Manufactures for manufacture unchanged.
- Manufactures for consumption greatly decreased.

Exports:
- Materials for manufacturing greatly decreased.
- Crude foodstuffs greatly increased.
- Manufactured foodstuffs greatly increased.
- Manufactures for manufacturing somewhat increased.
- Manufactures for consumption enormously increased.

The above is the picture of a good business. We are importing less manufactures and exporting vastly more. We are exporting more partly manufactured goods and importing no more. We are exporting less crude materials for manufacturing and importing a great deal more, which is perfectly sound business when we export the finished manufactures in so much larger volume. As to foodstuffs we are exporting much more, importing only a negligibly increased amount, and are securing good prices, even though only temporarily, for goods that we can produce every year and are now able to produce currently at the rate at which sold.

We are not importing luxuries. We are not spending our profits abroad in any form. It is a very good and sound business, while it lasts.

Now as to the volume of this business. The January returns were not entirely reassuring, for they showed a new high record for a month's imports, whereas the exports decreased nearly $29,000,000 from December, which held the month's record. As a result the favorable balance of trade decreased $41,000,000 from its record made in December.

The trend of decreased exports and increased imports was not reassuring. Now, however, we have the February figures, and the month wins "hands down" as to making a favorable showing, for although the imports made a new high record, so did the favorable balance. The heavy imports were evidently needed for the conduct of our manufacturing business. The February figures are:

Exports	$409,836,525
Imports	193,935,117
Balance	$215,901,408

Each of the three items constitutes a new record, passing previous records as follows: Exports, $50,000,000; imports, $10,000,000; balance, $28,000,000. From December, 1914, when occurred the first large balance, through last February the total favorable balance in 15 months has been $2,262,000,000, or at the rate of $1,810,000,000 a year, when as an offset to the unseen and unfavorable balance we had had for many years an average merchandise balance of $500,000,000 to $600,000,000 a year. The total of the unseen balance, against us, has probably not changed greatly, though the individual items have changed. This statement, of course, is necessarily a qualified one, for from the present viewpoint we omit from the so-called unseen balance the settlement made as by the Anglo-French external loan, against merchandise exported.

The aggregate of imports and exports in February was $604,000,000. In the best year of foreign trade before the war, 1913, the imports plus exports average $356,000,000. The figures are no index to the volume of the trade, as prices per unit are now high. The net vessel tonnage, the mean between vessels entered and vessels cleared, was 31,267,000 tons in the seven months ended last January, against 33,368,000 tons in the seven months ended January, 1914, quite a prosperous period.

A month ago we undertook to sound a note of warning as to the dangers we must ultimately face. We believe the past month has brought us nearer to those dangers, even though they may still lie far in the future. There is no

question that the number of men who are acting very conservatively as to the future has been considerably augmented in the past month, though it must be remembered that as there had been much buying for future delivery a time would necessarily come when the desire would be largely satisfied and men would settle down to carry out the business undertaken. Nevertheless we are confident the sentiment is growing that it is wise to take what we have and make the best use of it, rather than to expend our energy in looking for still greater things.

The metal and the iron and steel trades have not moved together in the past month. Iron and steel prices have advanced sharply, while in the metals tin and lead advanced and copper and spelter declined. It may be more than an accident that the metals that are so commonly alloyed together moved in harmony, the one pair advaneing, the other deelining. The deelines were somewhat the more pronounneed

In steel products there was a full continuance of the advances that made February such a remarkable month, for in each month finished steel products advanced an average of $5 a ton. At the beginning of April, however, there are signs that the edge is off the steel advance. Pig iron may easily advance further, and even spectacularly. To date pig iron has by no means equaled the advanee in steel.

During the progress of this wonderful business movement the opinions of men as to the future have been in a constant flux, and it is well to recapitulate now and then, as well as to set down what appears to be the latest thought at the time. The first thought upon the outbreak of war was that our trade with neutral countries would be greatly increased. The next was that we could have no prosperity until the war should end, if indeed then. The next thought was that we were being given a temporary prosperity, directly through the filling of "war orders". Then it began to be realized that the profits on the war business were making us prosperous in our dealings with each other. It was the opinion of the great majority, we believe, that prosperity would continue unabated, and prices would continue to rise to the end of the war, or at least would not decline, while notice that the end of the war was at hand would usher in a more or less prolonged period of unsatisfactory conditions.

The latest changes in thought, however, seem to be that we shall more likely than not have some general readjustments in commodity values before the end of the war, unless it is concluded sooner than is now expected, but that furthermore we shall have moderately good business if not very good business for a period of a few years at least after the war ends. There is more disposition to plan what we shall do after the war.

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Business Trends.

THE STOCK MARKET

Foreign relations, both European and Mexican, caused decided uncertainty in the stock market during March and as a result the market showed a depressed tendency with extremely narrow trading. The new submarine policy of Germany to sink armed merchant ships officially began at the opening of the month, and this was accompanied by many wild rumors, causing a sharp break in prices. The reports of German successes around Verdun also were an influencing factor. Mexican guerrillas under the leadership of Villa, raided American border towns, killing many citizens. When the Government ordered 5,000 troops into Mexico to capture the bandits, prices of securities, especially Mexican issues, began to advance. Wild rumors regarding the manner which the Mexican people would take this step caused subsequent unsettlement.

About the middle of the month there was renewed peace talk, causing a break of two to seven points in the war industrial shares. It was reported that the German Chancellor had intimated to our Ambassador at Berlin that the time for peace negotiations to begin was near at hand, and that it would be inadvisable for him to leave his post for the time being.

Later in the month the further reckless sinking of armed and unarmed passenger and merchant ships by German submarines caused further anxiety in diplomatic circles. The matter of breaking off diplomatic relations was discussed by President Wilson at the Cabinet meeting March 28th, and it was then agreed, providing Germany would not give satisfactory explanation, to present the matter to Congress.

Several of the railroad unions made demands for shorter hours and increased compensation upon the carriers. This caused a rather sharp decline in railroad shares in the closing days of the month.

Domestic trade conditions continued very sound, many of the industrial corporations carrying record amounts of cash holdings in their balances. Business was very active, with a noted increase in exports of articles used in peaceful lines.

BUSINESS BOOMING ALL OVER UNITED STATES.

According to a summary published by the Federal Reserve Bulletin at Washington, D. C., business conditions throughout the country continue to improve.

Throughout the district of New York, trade continues on a broad scale, with no apparent signs of a slackening in industrial activity at a time when some contraction is usually experienced. The month has witnessed a steady growth in the volume of business with production considerably below consumption. In spite of the advancing prices, which would ordinarily check the inquiry for merchandise, current demand is very large. Manufacturers are rejecting urgent demands for goods which they are unable to supply either because their plants are booked to capacity or because of inability to obtain raw materials.

In practically all sections of New England and in almost all lines of trade, exceptionally good business is reported. While there is a feeling of caution among manufacturers and the more conservative ones are trying to restrict buying to actual needs, the tendency of the retailer is to buy more freely than he has for some time past.

The principal deterring factors are the embargo on freight, the high cost of raw material, and the shortage of skilled labor. Most important is the embargo on freight. This has become necessary because of the sudden expansion of trade and the lack of railroad and steamship facilities for handling it. It is practically impossible to get some kinds of freight from one section of this district to another, and through freight to New York is indefinitely tied up.

General business throughout the Philadelphia district is good. Complaint of difficulty in obtaining raw materials and satisfactory deliveries is becoming rather general, resulting in heavy advance purchases. Earnings are breaking records in many lines and prospects for the future are considered to be favorable.

Throughout the West and South conditions of trade and industry have not changed materially within the last month, but the prospects are bright for increased business.

Business Trends.

RECORD PIG IRON OUTPUT.

Pig iron production in March, as estimated by the "Iron Age", was 3,337,691 tons, or 107,667 tons a day, against 3,087,212 tons in February, or 106,456 tons a day. Active capacity April 1st was 108,509 tons a day for 317 furnaces, as compared with 107,310 tons a day for 312 furnaces one month previous. Thus, April opened with production at the rate of 39,606,000 tons a year for coke iron. Estimating charcoal iron at 1,000 tons a day, brings the yearly rate within 30,000 of 40,000,000 tons.

It was said in some quarters three months ago that furnaces compelled to go out for relining would thereafter nearly balance those going in. But meanwhile, the active list has grown from 295 to 317—a gain of 22.

The daily average production of coke and anthracite pig iron in the United States by months since January, 1913, is given as follows by the "Iron Age."

	1913.	1914.	1915.	1916.
January ..	90,172	60,808	51,659	102,746
February .	92,369	67,453	59,813	106,456
March ...	89,147	75,738	66,575	107,667
April	91,759	75,665	70,550	.....
May	91,039	67,506	73,015	.....
June	87,619	63,916	79,361	.....
July	82,601	63,150	82,691	.....
August ...	82,057	64,363	89,666	.....
September	83,531	62,753	95,085	.....
October ..	82,133	57,316	100,822	.....
November	74,453	50,611	101,244	.....
December.	63,987	48,896	103,333	.....

NEW INCORPORATIONS.

The volume of new enterprises continues to show a large increase over the early months of 1915. However, incorporations in March do not make as good a showing as those in previous months this year, when the output of charters was on an exceptionally heavy scale. Papers filed for new companies in the principal Eastern States with a capital of $1,000,000 or over involved $144,750,000, an increase of about 170% over the total for March a year ago. Compared with February this year the returns indicate a decrease of over 40%. No small part of the last month's total was the $52,500,000 United Drug Company, which abandoned its New York charter and reincorporated under the laws of Massachusetts. A considerable portion of the total was also made up by the refinancing of maturing obligations.

The grand total of all companies with a capital of $100,000 or over, covering all States, including those of the East, reached $261,627,000.

Following are the comparative figures as specially compiled by The Journal of Commerce and Commercial Bulletin of companies incorporated in the Eastern States during the last three years with an authorized capital of $1,000,000 or more:

	1916	1915	1914
Jan. ..	$270,995,000	$51,150,000	$120,050,000
Feb. ..	365,995,300	53,950,000	51,575,000
Mar. ..	194,750,000	70,050,000	57,700,000
Totals	$831,740,300	$175,150,000	$229,325,000

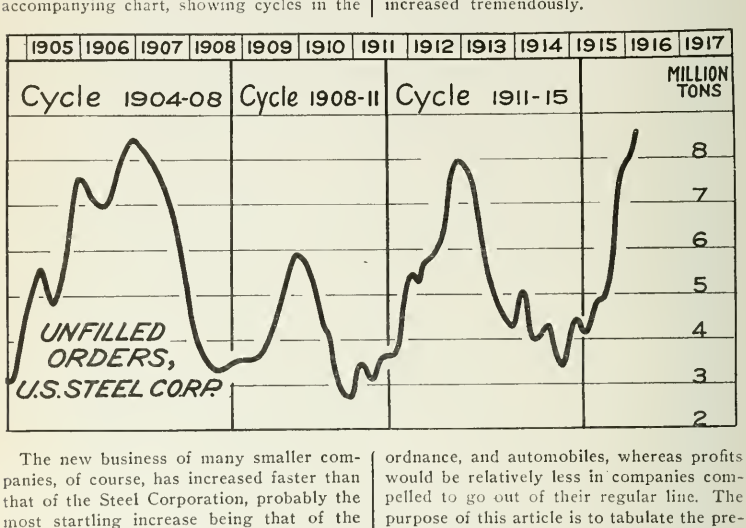
FAILURES DURING MARCH.

Making relatively the best exhibit in four months, strictly commercial failures in the United States during March, as reported to R. G. Dun & Company numbered 1,690 and supplied an aggregated indebtedness of $16,885,295. Though showing a slight increase over the 1,688 defaults in the shorter month of February, the latest figures compare with 2,009 insolvencies in January, 1,704 in December and 2,090 in March 1915, the amount involved a year ago,, reaching $23,658,130. Besides being the smallest since last November, when 1,565 firms suspended, owing $15,694,434, the present liabilities are the lightest for any March back to 1910, notwithstanding that reverses, as was to have been expected in view of the steady growth in the number of new enterprises, were more numerous than in all years prior to 1915. Classification of the March returns shows that there were 408 failures in manufacturing lines for $9,524,230 last year, while trading suspensions numbered 1,180 and involved $9,497,409, as compared with $12,366,775 in the earlier period. On the other hand, there were more defaults in other commercial occupations 102 against 85 while the indebtedness in this class, which embraces agents, brokers and similar concerns, was $2,567,637, in comparison with $1,767,125 in 1915.

War Profits and Security Prices.

By Warren F. Hickernell, Editor, The Brookmire Economic Service.

In the STEEL AND METAL DIGEST of September last, I pointed out that a new cycle of the stock market was beginning, and that prices were being elevated in anticipation of a period of prosperity. The accompanying chart, showing cycles in the steel industry, indicates that the anticipations of the stock market have been realized in the sense that the new business taken since that time, as reflected in the unfilled tonnage of the Steel Corporation, has increased tremendously.



The new business of many smaller companies, of course, has increased faster than that of the Steel Corporation, probably the most startling increase being that of the Bethlehem Steel Corporation, which, on December 31, 1915, had unfilled orders amounting to over ten times the average of the past ten years, as is shown in the following table:

Orders on Hand.

1905	$ 14,466,307.01
1906	13,300,885.36
1907	8,425,736.88
1908	7,592,502.62
1909	14,073,834.25
1910	17,370,660.17
1911	15,885,198.70
1912	29,282,182.27
1913	24,865,560.10
1914	46,513,189.95
1915	175,432,895.00

In my article last September, I also suggested that the profits would be largest in those companies which made a regular business of manufacturing powder, ammunition, ordnance, and automobiles, whereas profits would be relatively less in companies compelled to go out of their regular line. The purpose of this article is to tabulate the preliminary reports of war profits and state what conclusions seem indicated by the present trend of affairs.

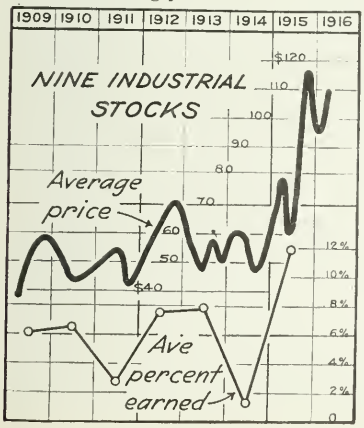
Profits of 1915.

During 1915 the Bethlehem Steel Corporation earned 112% on its common stock as compared with only about 6% from 1910 to 1912, and a deficit in 1908 and 1909. The General Motors Company, during the fiscal year ending last June, earned 81% as compared with from 15 to 38% during the four years previous. These two stocks, like the powder and ammunition companies, were working in their regular line during the first year of the war, and therefore increased their profits rapidly. In the case of the steel and equipment companies which attempted to go out of their regular line and take war orders, such as American Can, Baldwin Locomotive, and Pressed Steel Car, the earnings have not responded so quickly.

Annual Earnings, Per Cent Per Share.

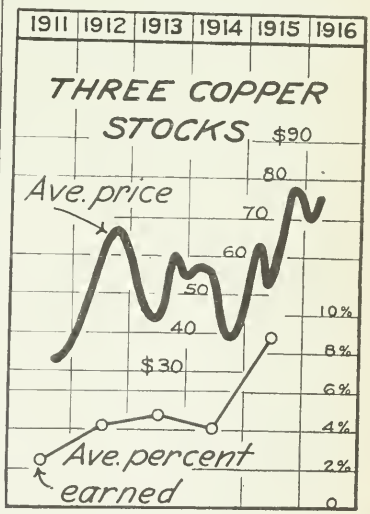
	1909.	1910.	1911.	1912.	1913.	1914.	1915.
American Can	0.31	0.15	0.07	8.86	2.66	3.61	5.19
Baldwin Locomotive	.....	.....	.....	11.49	13.09	–5.24	7.14
Central Leather	6.30	2.09	5.09	8.58	5.18	6.41	10.82
General Chemical Co.	19.37	19.52	19.77	21.72	19.19	18.73	44.27
Lackawanna Steel	2.24	7.29	0.24	2.91	7.93	–4.72	6.88
N. Y. Air Brake	2.69	4.48	0.48	5.72	6.55	6.41	13.44
Pressed Steel Car	7.68	5.55	0.14	0.76	10.56	0.14	3.60
Republic Iron & Steel	–0.44	4.24	0.75	1.78	4.97	2.65	6.49
U. S. Steel	10.59	12.23	5.92	5.71	11.02	–0.34	9.95
Average	6.01	6.38	2.78	7.50	7.91	1.37	11.97

The average per cent earned by these nine stocks during the past seven years is plotted on the accompanying chart, along with a trend line of the average price. The chart shows that the average price has advanced out of proportion to earnings for 1915. The explanation for this, however, is that most of the profits of 1915 were realized during the last half of the year, so that it is probable that the total earnings for 1916 will be so much higher than those of 1915 as to make the present prices of Industrial stocks seem reasonable. Since we are only in the middle of the present Cycle of Trade, there is a good chance that the earnings of 1916 will show large increases over 1915, but our conclusion is that the Stock Market prices of 1915 were too high for the earnings of that year, with the exception of Bethlehem Steel and a few other companies, so that the justification for the manipulation of Industrial shares last Fall must be based upon earnings to be realized during the coming year.



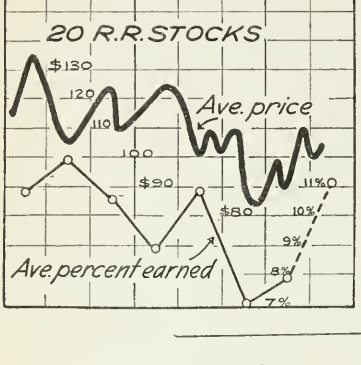
The copper companies were favored with large orders immediately upon the outbreak of the war, and before the end of 1915 showed a large increase in earnings, as reflected in the following table:

	1911	1912	1913	1914	1915
Amalgamated (Anaconda)	4.32	4.29	5.77	3.57	8.00
Chino	0.17	2.80	3.51	3.44	7.94
Utah	3.96	5.35	5.38	5.34	11.02
Average	2.82	4.14	4.89	4.09	8.99



The railroads, of course, did not begin to show increased earnings until war supplies began to be shipped in large quantities, so that large earnings during the first year of the war showed little benefit from European hostilities. In fact, the financial shock during the latter part of 1914 hurt

more than the war business early in 1915 helped. We have made estimates for railroad earnings for the fiscal year ending next June, however, which show very handsome increases over the past few years, and since the prices of railroad shares have been somewhat heavy on account of the selling of railroad securities from Europe, the majority of railway shares are selling on a fair investment basis. The accompanying chart shows that railroad prices have advanced only moderately in proportion to the very small recovery in railroad profits



Conclusions.

To sum up: The stock market was manipulated upward last Fall in anticipation of large profits. In case of the railroads, prices have risen only moderately and the increases in current earnings are large enough to support present prices. In case of the copper stocks, prices were advanced considerably above the average, but not enough to fully discount the rate of profits being earned in 1916, although it is likely that the prices of copper shares are high enough to discount what will be earned on the average during the next two or three years. In case of the manufacturing stocks which went out of their regular line to make war supplies, security prices were advanced far out of proportion to the earnings of the past few years, and in most cases too high to be justified by the earnings of 1915. Since earnings during the coming months will be larger than in 1915, however, it will be premature to say that Industrial stocks have been badly inflated until we know how long the war is going to last.

Astonishing Export Record For February.

American exports for February reached a total of $409,836,525 according to an announcement made by the Bureau of Foreign and Domestic Commerce, of the Department of Commerce. This is the highest point ever reached by the export trade in this country and exceeds the high mark for December, 1915, by $50,000,000. It exceeds the total for January by $83,000,000. The decline in January had been taken in some quarters to mean that the record figure for December had marked the high tide in the flow of American exports. The total exports for the first eight months of the fiscal year 1916 are $2,586,301,570 and it now seems probable that the exports for the whole fiscal year will reach $4,000,000,000.

February imports also set a new high record, being valued at $193,935,117, which is about $10,000,000 more than in January, and much above the total for any earlier February. Over two-thirds of the month's imports entered free of duty.

The excess of exports over imports amounted to $215,901,408 in February and to $1,295,217,462 during the eight months ending with February. Last year February showed an excess of $174,682,478 and eight-months period an excess of $578,834,390, or less than one-half that of the current period.

The international gold movements for February included imports valued at $6,016,006, against $12,726,492 for February, 1915; and for the eight months, $328,054,392 in 1916, against $46,267,209 in 1915. Gold exports in February totaled $13,684,667, against $1,053,879 in February, 1915; and in the eight months, $47,741,575, compared with $140,387,009 in a like period of 1915. The current fiscal year to the end of February showed a net inward gold movement of

$280,312,817, while a corresponding outward gold movement of $94,119,800.

Imports and Exports of Merchandise, by Months.

Following is the complete record of exports and imports by months for the past three years:

Imports.

	1914.	1915.	1916.
Jan.	$154,742,923	$122,148,317	$184,192,299
Feb.	148,044,776	135,123,391	193,935,117
	1913.	1914.	1915.
Mar.	$155,445,496	$182,555,304	$157,982,016
Apr.	146,194,461	173,762,114	160,576,106
May	133,723,713	164,281,515	142,284,851
June	131,245,877	157,529,450	157,695,140
July	139,061,770	159,677,291	143,244,737
Aug.	137,651,553	129,767,890	141,804,202
Sep.	171,084,843	139,710,611	151,236,026
Oct.	132,949,302	138,080,520	149,172,729
Nov.	148,236,536	126,467,062	164,319,169
Dec.	184,025,571	114,656,545	171,841,665
*8 mos.	$1,146,110,571	$1,214,845,272	$1,281,714,468
*12 mos.	1,782,406,823	1,733,760,010	1,918,284,057

Exports.

	1914.	1915.	1916.
Jan.	$204,066,603	$267,879,313	$335,535,303
Feb.	173,920,145	290,805,869	409,836,525
	1913.	1914.	1915.
Mar.	$187,426,711	$187,499,234	$296,611,852
Apr.	199,813,438	162,552,570	294,745,913
May	194,607,422	161,732,619	274,218,142
June	163,404,916	157,072,044	268,547,416
July	160,990,779	154,138,947	268,974,610
Aug.	187,909,020	110,367,494	261,025,230
Sep.	218,240,001	156,052,333	300,676,822
Oct.	271,861,464	194,711,179	328,030,281
Nov.	245,539,042	205,878,333	331,144,527
Dec.	233,195,628	245,632,558	359,301,274
*8 mos.	$1,481,179,034	$1,492,048,090	$2,399,494,991
*12 mos.	2,444,975,169	2,294,322,484	3,718,647,895

Excess of Exports.

	1913-14	1914-15.	1915-16.
*8 mo.	$335,028,463	$277,202,818	$1,117,780,523
*12 mo.	662,568,346	560,562,474	1,800,363,835

* Ended January.

Following were the changes last month compared with February, 1915:

Exports	Inc.	$111,108,768
Imports	Inc.	68,811,726
Excess exports	Inc.	$ 42,297,042

Changes in exports and imports for the eight months period follows:

Exports	Inc.	$952,913,665
Imports	Inc.	246,530,593
Excess exports	Inc.	$706,383,072

The February returns are compared in the following table with the returns of January and with February last year:

Exp.	$409,836,525	$335,535,303	$298,727,757
Imp.	193,935,117	184,192,299	125,123,391
Exc. exp.	$215,901,408	$151,343,004	$173,604,366

Our Foreign Trade.

The National City Bank of New York, in their April letter say:

"The rise of prices, scarcity of materials, difficulties and high cost of ocean transportation, and recovery of the home market, are together seriously interfering with our promising export trade in new markets. Many manufacturers who were eager for foreign orders a year ago now find themselves unable to take care of even the domestic business offered, and naturally feel that they must give their first attention to patrons of long standing. The rise of prices is not fully understood by new customers, who are inclined to think that dealers and manufacturers in the United States are taking advantage of their situation. Of course the situation is world-wide, beyond any possible control, and affecting domestic purchases as much as those for foreign delivery. Manufacturers and dealers are generally showing all possible consideration to people who have been accustomed to look to them for supplies, and in many instances orders from abroad are being filled without profit or at a loss, rather than have misunderstanding.

"It is of little avail to say that the United States is not making the most of its opportunity in foreign trade. Of course it is not doing all that might be done if the country was put in the hands of an Executive Committee with full powers to manage its affairs as though it was a single business corporation. The needs of the world, and our corresponding opportunities, are so great at this time that in surveying them the observer is almost persuaded that the people of the United States should be put on siege rations, with bread cards, meat cards and milk tickets, and compelled to economize and save, to offset the waste which is go-

ing on elsewhere and to make this country headquarters for world trade and finance. But that is an imaginary efficiency, worth thinking of only as it may influence the action of individuals. The consumptive requirements of the United States grow so fast that in each new period of general prosperity they over-run all anticipations. When the pressure upon our productive capacity comes, as we have it now, we proceed to enlarge it, as we are doing now, and this construction work increases the congestion for the time being. We can only build up a permanent foreign trade as we plan to care for it regularly, and although the present affords an unusual opportunity also create great difficulties in the way of a rapid development of new trade. The trade of the world cannot be shifted or re-organized over night; too, many relationships are affected and too many readjustments are required. For one thing it is certain that there can be no great expansion of industry in the United States, and no extensive shift of trade from Europe to the United States, without a revival of immigration. If Europe loses trade the people who have been employed upon it will certainly want to follow the trade, and they will be needed where the trade is taken on, but there is a popular feeling in the United States that this country no longer needs or wants immigration. People who think we can increase our foreign trade, or even hold what we have of it, without a growing supply of labor, are as obtuse as the British public which thinks that higher wages will enable it to have as many goods as formerly, although the goods cannot be made."

A New Bessemer Steel Plant.

For the first time in more than ten years there is occasion to record the news that a new Bessemer steel plant is to be built. On August 22, 1906, the first Bessemer steel was made by the Youngstown Sheet & Tube Company. Since that date no Bessemer steel plants have been built. Two Bessemer departments, those at Duquesne and Homestead, have been abandoned, and at other plants Bessemer converters have been turned more or less to duplexing. There was a serious question, indeed, whether any more Bessemer steel plants would ever be built, not because Bessemer steel would no longer be required, but because it might be that the existing Bessemer plants would be able to furnish all required. For steel pipe Bessemer seems to have the preference.

The new Bessemer steel plant will be built by the National Tube Company, at Gary, Ind., the following synopsis of the construction planned giving a full idea of the size and scope of the plant:

Ore docks.

Four blast furnaces, about 500 tons daily capacity each.

Two 12-ton Bessemer converters.

Two skelp mills, one universal plate mill and one sheared plate mill.

Five butt-weld and five lap-weld furnaces.

Galvanzing shop, coupling shop and jobbing shop.

A large warehouse.

The capacity will be about 500,000 tons of finished product a year.

From a purely business standpoint the item is of great importance. There is much new construction in the steel industry at present. Without counting the National Tube Company's plant at Gary, which will have a capacity of fully 600,000 tons of ingots a year, the Steel Corporation is making additions to capacity involving about 2,000,000 tons of ingots a year, while the independents are also engaged in a great deal of new construction. All this, however, may be classified as pertaining more or less to the heavy demand for steel that occurs in these war times, for in each instance there has been a strong chance that the new capacity would become productive before the war ends. With the National plant at Gary the case is different. The probabilities are strongly that the war will be over before the plant is completed. Even with the great facilities at command of the Steel Corporation the building of such a large and complete plant will take a great deal of time, more than a year, certainly, from the time actual construction work is begun.

The plant is clearly based upon expectations of a heavy demand for tubular goods after the war. Whether the Finance Com-

mittee, which has approved the large expenditure involved, felt that the demand after the war would run more strongly to tubular goods than to other lines we do not know, but it is significant that before the war the pipe mills were no more crowded with work than other departments of the finished steel trade, and since the war started the Jones & Laughlin Steel Company has projected a pipe mill for its Woodlawn works, which could be completed within the next six months if necessary.

In current market developments there are indications that there will be a heavy demand for tubular goods. In these war conditions, not only is there no demand for welded tubular goods for war purposes, but there is a great curtailment in the normal export trade, for while there is demand from neutral countries there are not sufficient shipping facilities to satisfy that demand. Nevertheless the orders of the pipe mills are running very heavy. The specific orders being booked from week to week, are far in excess of the shipments, even though shipments are being made from mill stocks in addition to the full output of the mills. It seems perfectly logical to assume that when trade has been restored to its normal channels, and the usual export trade, or a greater, is enjoyed with a heavy demand at home for oil development work, there will be a greater demand than ever for welded tubular goods.

The December earnings of the Steel Corporation were nearly ten millions in excess of the amount necessary to meet all charges, including 5% on the common stock, while month by month the earnings are increasing. Thus the financing even of so large a plant does not appear formidable by any means.

United States Steel Corporation's Earnings.

Earnings and Sales Total $726,683,589, Increase of $168,268,656 Over 1914 Surplus $44,260,374; Dividends $31,573,458.

The United States Steel Corporation issued its annual report on Mar. 16 for the year ended December 31, 1915. The report shows that the gross sales and earnings equalled the sum of $726,683,589, an increase of $168,268,656 over 1914.

Starting in 1915 with earnings during the first quarter of $15,082,369, which were second to the smallest in any quarter since 1910 and were $5,368,619 less than in the same period in the preceding year, the United States Steel Corporation, according to its report, closed the twelve months ended December 31st with a surplus net income of $44,260,374, as against a deficit of $16,971,984. This was left after dividends amounting to $31,573,458 had been paid from a balance of $75,068,019. It was equivalent to 9.97% earned on the $508,302,500 common stock, as compared with 6.52% earned on the same stock in the year before.

In his report to stockholders, Chairman Gary says:

"The improvement in the demand for iron and steel products which became evident before the middle of 1915 continued in increasing volume throughout the remainder of the year, both for the domestic and the export trade Until the latter part of the year, however, the advances in the prices received for domestic business were moderate and the average selling prices received for the year were only slightly in excess of those for the preceding year. In the closing months of the year the demand for products for the domestic trade for future delivery exceeded the producing capacity of the country and caused price advances. The demand for products for export was the largest for any year in the history of the corporation.

"The total production for the year 1915 of all classes of rolled and other finished steel products for sale was equal to about 85% of the annual capacity of the mills. During the last quarter of the year the output equaled the maximum steel producing capacity. The year's production of cement was about 64% of the capacity. The pro-

duction by the subsidiary companies in 1915 of basic raw and semi-finished materials and of rolled and other finished products for sale to customers, in comparison with the previous year's results, was as follows:

	Tons	
	1915.	1914.
Iron ore mined	23,669,676	17,034,981
Coal mined—		
For use in making coke	20,800,204	15,890,382
For steam, gas and other purposes	5,828,278	5,271,911
Total	26,628,482	21,162,293
Coke manufactured	14,500,818	11,173,914
Limestone quarried	5,795,925	4,676,479
Pig iron, ferro and spiegel	13,641,508	10,052,457
Steel ingots (Bessemer and O. H.)	16,376,492	11,826,476
Rolled and other finished steel products for sale	11,762,639	9,014,512
	Bbls.	Bbls.
Universal Portland cement	7,648,658	9,116,000

The shipments of all classes of products to customers during 1915, in comparison with the shipments during 1914, were as follows:

	Tons	
Domestic shipments—	1915	1914.
Rolled steel and other finished products	9,331,363	7,982,325
Pig iron, ingots, spiegel ferro and scrap	543,193	494,144
Iron ore, coal and coke	1,004,323	1,153,575
Sundry materials and by-products	103,869	80,357
Total tons all kinds of materials, except cement	10,982,748	9,710,401
Universal Portland cement (bbls)	8,176,583	9,117,752
	Tons	
Export shipments—	1915.	1914.
Rolled steel and other fin. products.	2,350,524	1,096,234
Pig iron, ingots and scrap	78,244	47,790
Sundry materials and by-products	971	190
Total all kinds materials	2,429,739	1,144,214
Aggregate tonnage of rolled steel and other finished products shipped to both domestic and export trade	11,681,887	9,078,559

Total value of business (covering all of the above tonnage)—	1915.	1914.
Domestic	$391,188,661	$337,444,052
Export	95,163,393	42,784,091
Total	$486,352,054	$380,228,143

The prices received in 1915, based on the total tonnage of rolled and other finished steel products shipped showed, in respect of domestic shipments, an increase of 26 cents per ton over the average price per ton received in 1914, but in respect of export shipments the increase was $4.19 per ton, and for both domestic and export the average increase was $1.05 per ton.

The following is a statement of the gross sales and earnings classified by operating groups. Gross sales of products are included on basis of f.o.b. mill values:

Gross sales by manufacturing, iron ore and coke companies.	1915.	1914.
To customers outside of U. S. Steel organization	$486,352,054	$380,228,143
Inter-company sales (sales between subsidiary companies)	178,576,468	129,565,729
	$664,928,522	$509,793,872
*Gross earnings and receipts of transportation and miscellaneous co.s	54,392,457	42,040,131
Misc. companies	7,362,610	6,580,930
Total	$726,683,589	$558,414,933

* Includes earnings and receipts both for inter-subsidiary company business and of business with interests outside of the U. S. Steel organization.

The average number of employes in the service of the Corporation and the subsidiary companies during the year and the total amount of pay roll, in comparison with similar statistics for 1914, were as follows:

	1915.	1914.
Average number of employes during the entire year	191,126	179,353
Total amount of pay rolls	$176,800,864	$162,379,907
Average salary or wage per employee per day	$3.01	$2.97

The lowest average number of employes in any single month in 1915 was 141,461 in January, and the highest average was 227,-051 in December, 1915. The total pay roll in January was $10,677,017 and in December $17,801,289.

On February 1, 1916, an advance was made in the wages and salaries of the employes of the subsidiary companies. This increase averaged approximately 10% on the rates previously paid the employes affected. On basis of an annual pay roll equal in numbers to that for 1915, these advances in rates will call for an increased disbursement of approximately $14,000,000 per annum, while on basis of an employment equal to the average during 1913 the increased amount will be about $18,000,000 annually.

The expenditures made by all companies during the year 1915 for maintenance and renewals, including the relining of blast furnaces, and for extraordinary replacements, in comparison with expenditures for the same purposes during the preceding year, were as follows:

	1915.	1914.
Ordinary maintenance and repairs	$39,877,484	$40,345,018
Extraordinary replacements	3,489,159	5,027,575
Total	$43,366,643	$45,372,594

Topical Talks On Iron.

XXXVI.—Coke.

Coke is the favorite fuel for the blast furnace, to reduce iron ore to pig iron. Raw bituminous coal was formerly quite largely used, and anthracite, particularly anthracite mixed with coke is still used. For the production of particularly pure pig iron charcoal is used, though necessarily at a high cost.

The advantage of coke becomes apparent when it is recalled that in a modern blast furnace there must be burned between 20 and 25 net tons of coke per hour, the maximum diameter of the furnace being about 23 feet, while the zone in which combustion occurs is only a small fraction of the total height of 80 to 90 feet. The blast of air must readily penetrate to the particles of carbon in the fuel, and the nature of coke facilitates this penetration. The tarry matter of the coal has been removed, the coke is strong and remains in lumps to the last moment, while its structure is finely cellular.

The preferable coke physically is fairly strong in structure and minutely cellular. Its ash is objectionable, as carbon is the required element and the more ash the less carbon, while the ash must be heated and fluxed away, and the more flux charged to the furnace the more coke is required to melt it. The ash, however, is necessary as it furnishes the coke its strength. Sulphur is objectionable as it must not be present to any extent in the iron and must therefore be fluxed off, involving an expense. While standard coke is supposed to contain less than 1.00% sulphur it is a superstition though not altogether an uncommon one that coke with somewhat higher sulphur will not produce good pig iron. It is simply more or less inconvenient up to about 1.50% while 2.00% sulphur is practically impossible.

Phosphorus in coke is a much more serious matter, as substantially all the phosphorus in the coke, ore and limestone is found in the iron produced, and thus phosphorus in the coke is limited to a very few hundredths of one per cent.

About four-fifths of the coke produced in the United States is used in the iron blast furnaces, the remainder being used in melting iron, in smelting other metals and for heating purposes generally.

The blast furnace interests are turning very rapidly to what is commonly known as by-product coke, though the generic process of manufacture would be described better by the use of the word retort, for it is the use of a retort, with heat applied through the walls of the retort to the coking coal inside, that constitutes the fundamental difference in process of manufacture from the older or beehive oven process, in which air for combustion is admitted directly to the coal in the oven.

There are at present in the United States about 93,000 beehive ovens, with a capacity for producing about 400 tons of coke each per year, on an average, though the larger

ovens run 500 tons or more a year. There are about 6,000 retorts completed, to make by-product coke, with capacities ranging from perhaps a shade under 3,000 tons a year up to about 4,000 tons. Thus the total capacities are something like 35,000,000 tons of beehive and 20,000,000 tons of by-product coke a year, while there are something like 1,500 retorts being built, to add 5,000,000 or 6,000,000 tons a year to the output, making a prospective capacity of over 60,000,000 net tons of coke a year, or considerably more than will be required. Beehive ovens will probably have to be abandoned to an extent in consequence.

Steel Plants.

V.—The Tata Works in India.

At Delhi there is an iron pillar 50 feet high and 16 inches in diameter, which dates back at least to 912 B. C. It appears to have been made of 50-pound blooms welded together. The manufacture of steel in India by modern methods, however, dates back only to February, 1912, when the Tata Iron & Steel Company, Limited, cast its first steel ingot and rolled its first rail.

The works was projected by the late J. N. Tata, of Bombay, India, a prominent Parsee manufacturer and merchant, and the enterprise is now in control of his two sons and his nephew, who are members of the firm of Tata Sons & Company, dealers in diamonds and silks.

The preliminary investigations, relative to the coal and ore that might be available, were conducted by C. P. Perin and C. M. Weld, the work beginning in 1903. When the project was finally adopted, Julian Kennedy, Sahlin & Company, Limited, of Brussels, were appointed designing and consulting engineers, in November, 1907, and W. O. Renkin became resident engineer for the firm. In 1908 Mr. Sahlin and the resident engineer selected the location for the plant, Sakchi, two miles from Kalimati, 150 miles west of Calcutta on the Bengal & Nangpur railway. The iron ore is 44 miles distant, at Gurumaishini, chiefly drift. It is picked up by women with baskets and carried to the stockpile whence it is conveyed by rail to the works. The dolomite quarries are 120 miles away, while the limestone comes 150 miles.

Coal is brought about 120 miles, and was recently stated to cost $1.04 per ton at the works. It has a volatile content ranging from 19 to 28%, with about 18% ash, and is estimated to yield 75% in coke. The coking operation costs about 65 cents, making the cost of the coke about $2.05.

In these costs there is a suggestion of the low wage rates prevailing in India, and thus the fact that at times there were as many as 8,000 men engaged in the preliminary work of building the plant is not so staggering, for they received only from four to six cents a day.

The coke plant comprises 180 Coppee retort ovens, but there is no by-product work conducted, partly for the reason that all the water there is from 98 to 110 degrees and that is too high for condensing ammonia vapor.

There are two blast furnaces, 20x80 feet, with a capacity of about 250 tons of pig iron each per day, with four stoves each, blast being supplied by turbo blowers, operated condensing.

Direct furnace metal is used through a 250-ton gas fired mixer to four 40-ton stationary open-hearth furnaces. Ingots 16x20-inch are cast, weighing about 2¼ tons, and bloomed in a 40-inch two-high reversing mill, driven by a three cylinder engine of 12,000 h. p. This engine also drives a 20-inch two-high reversing rail and structural mill with three stands of rolls. This mill produces rails as well as a fairly large line of structural shapes. For light rails, small shapes and merchant sections generally there is a separate mill with a 16-inch roughing and finishing train and two 10-inch finishing stands.

The power plant comprises 8,000 h. p. of boilers, of which 5,000 h. p. is fired by blast furnace gas, 1,000 h. p. by coke breeze and 2,000 h. p. by coal.

While a great deal of native labor is employed at the plant it is necessary to use imported labor for the jobs requiring any skill, and this labor is high priced, so that the economic advantages lies more largely in the low cost of the ore, coal and coke delivered than in low costs of conversion to finished product.

The Iron and Steel Situation.

During the past month the viewpoint from which the iron and steel situation must be studied has changed. The current developments have become of less importance, not because such developments would be of less value at this time than at other times, if they were of their usual character, but because perforce they have themselves become unimportant. It is not the situation in which important developments can well occur, unless they were such as would be considered beyond question as unfavorable. The market is sold, and bought, practically to a standstill, in other words. There are developments which regarded superficially may be regarded as suggestive but upon analysis they are seen to indicate but little as to the real foundation upon which the market must rest.

For instance, the large mills after definitely advancing bars and shapes to 2.35c and plates to 2.60c on March 13th, later in the month have been found to be quoting 2.50c and 2.75c respectively, but this later advance is not really significant because there is no volume of buying at these high prices comparable to that which occurred at lower prices. Only those to whom cost is a minor matter can afford to pay the prices and thus an advance at this time is vastly less significant than were the advances some time ago, which everyone was expected to pay—and did pay.

Again, the official announcement of the Chairman of the Steel Corporation made early in April, may easily be interpreted as more significant of conditions than it really is. It reads: "The subsidiary companies of the United States Steel Corporation which manufacture rails have decided to maintain present prices until May 1, 1916, as to rails sold for delivery up to May 1, 1917 but will make no commitment beyond that date." This was taken, no doubt rightly, to presage an advance of $5 or $10 a ton in the rail price, practically unchanged for 15 years. Such an advance would naturally constitute a very important event indeed, but what does the announcement really mean but that the railroads will be covered for the 1917 season, if they are willing to run the risk of having to take some of their rails a few months before they intend to lay them, and that for the season of 1918, two years hence, they may have to pay an advance. When the trade is wondering how many months this steel movement will last it is not particularly illuminating to learn that it is in the minds of the rail makers to make it possible to secure more money for rails to be made two years hence. Much can happen, much certainly will happen, before the two years have expired.

The Foundation of the Market.

The real foundation of the market can be discovered only by analyzing the condition rather than the trends that can be observed, for the trends that can be observed are not conclusive, and the trends that would prove conclusive cannot be analyzed. One can observe the trend of prices, but prices are already far beyond the levels that have hitherto been regarded as safe. They are beyond all precedents that have occurred in the present order of things, hence no one can possibly undertake to assert that they are safe. The trends that can be observed as to the rate of buying are not conclusive for months ago buyers fell into a panic for fear lest they should be unable to secure desired deliveries and in the circumstances what they do from day to day is not conclusive. If, on the other hand, it were possible to study the trends in the invoice prices of steel as it is shipped from week to week, and follow each ton of steel at its given price to its ultimate destination, comparing the tonnage consumed with the tonnage consumed at other prices, the study of such trends would prove very enlightening, beyond question. We just used the expression "ultimate destination," but a question mark at once springs up. How much of the steel shipped to-day is going to an ultimate destination? Who can make a comprehensive survey of the amount of steel that has been going into stocks of jobbers and manufacturing consumers?

Let us take a glance at the foundation of the market by reverting to the history of it in the making. In our review of October there were two sub-heads "Steel prices running away" and "Illustration of the runaway" and the illustration was that the Carnegie Steel Company advanced bars, plates and shapes from 1.40c to 1.45c on October 15th, to 1.50c on October 25th and to 1.60c on November 4th, advances at ten-

day intervals. Later the remark was made "The expiration of third quarter contracts and the coming into effect of fourth quarter contracts did not retard the rate of specifying by contract holders." See what a strong market that was! There was probably $1 to $2 a ton difference in the third quarter and fourth quarter contracts referred to, prices being in the neighborhood of 1¼ cents, while now they are 2½ to 2¾ cents. Those specifications the mills are now filling. The contracts now being specified against, with a freedom that in some quarters is considered so reassuring, are the contracts that were being made while the market was advancing at ten-day intervals.

On January 6th Chairman Garv's interview was published, expressing the general view that we were going too fast. There was expansion, and he feared there was inflation. Since then finished steel prices have advanced $11 a ton. At the time of the interview they were $6 a ton above the average level of the past 15 years. Now they are $17 a ton above that level.

The foundation the steel market is resting upon is not the fortuitous buying now in progress at high prices for early deliveries, or the greater or less willingness of some buyers to place contracts for specification long in the future, but the volume of tonnage being filled and to be filled, against such contracts as were referred to above. The high prices paid currently on some tonnage are doing scout duty for the army in the concrete trenches below. They may be able to discern the approach of an enemy, but the resistance offered is in the strongly fortified position.

The lower the price at which the mills are obligated upon this large tonnage the stronger the foundation of the steel situation. With contracts made for forward specification, and with mills far behind in filling the specifications after they are filed, it will be many months indeed before all the business placed on contract books before January 1st has been filled, and yet on January 1st finished steel prices stood at an average level $12.50 a ton, as shown by our composite, below the present level. In fact, prices were then just half way between the low level of December, 1914, and the present level. Thus the steel now being shipped and paid for, or the prices now ruling on such steel as is bought, are no indication as to the distant future.

The Future.

There is no reason to suppose that the tonnage now on the books of steel companies will be shipped when it can be ship-

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer, Valley	Basic, Phila.	No. 2 fdy, Phila.	Basic,	No. 2X fdy, Buffalo.	No. 2 fdy — Cleveland.	No. 2 fdy — Chicago.	Birmingham.	Ferro-manganese.*	Furnace coke†
1915—										
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. .	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. .	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. .	15.12	13.98	13.71	14.83	14.91	13.85	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. .	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. .	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916—										
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. .	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. .	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

ped, and paid for by the consignees. It is well recalled how when the steel market has experienced an advance, and seems to be about to stop advancing, there has been talk of the possibility of a flood of cancellations and postponements that would turn an apparently strong situation into a weak one, but we search steel market history in vain for an illustration of such a thing occurring. Rather one finds that when the edge comes off the market the mills run along on their old orders for a greater time than was expected. The keenest edge is probably off this market now, but if the volume of new obligations entered has fallen below the rate at which shipments are being made the crossing has occurred only very recently, since the end of February. The tonnage on books is sound and will in itself carry the mills for many months. If the bookings decrease month by month, say from 100% of capacity in March to nothing at all in October there will still be added enough to carry the mills several months longer. If steel prices should drop $10 a ton over night they would only be back to the level of February 1st, and the great bulk of the tonnage now in books was contracted for before that date. Thus the future promises, with almost absolute certainty, full operation of the mills for many months, probably at the worst through this year, and at the best, even with occasional price readjustments, for an indefinite period thereafter.

The March Movement.

Finished steel prices advanced about $5 a ton in March, against about the same amount in February, and $2 a ton in January. The total advance from the low point is about $25 a ton. In the early days of April the advancing tendency has become much less pronounced, though the period is too short for a conclusive deduction, and there is even question raised whether some of the recent advances are fully maintained. Another month will probably tell an important tale.

Pig iron production reached the 40,000,000 ton rate at the end of March, equal to the whole world's rate 16 years ago. When a rate of 38,000,000 tons was reached in December, it was regarded as substantially the limit, being indeed in excess of the estimates made of capacity not a year earlier. Possibly it is the phenomenal production of pig iron that has prevented the spectacular rise in pig iron prices predicted in so many quarters. Pig iron was strong in March, but not particularly active. There is still room for every interesting developments, for whatever the course of steel prices the requirements of the steel mills are likely to increase month by month, both by existing facilities making new records and by the completion of new construction, to balance which there is scarcely any blast furnace construction.

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved	—— Sheets ——				Comp.
						Wire	Steel			Blue	Tin	Fin.
1915—	Shapes,	Plates,	Bars,	Pipe,	Wire,	Nails.	Skelp.	Black.	Galv.	Annld.	plate.	steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3.60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.76	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5692
August	1.30	1.26	1.30	79	1.43	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916—												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579

Price Changes of Iron and Steel Products From February 11, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our composite finished steel. In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the dates are merely those upon which our quotations were changed. A few other price changes are included.

1915—

Feb. 11	Wire nails	1.55	to 1.60
" 11	Pipe	81% to	80%
" 15	Galv. sheets	3.00	to 3.25
" 25	Galv. sheets	3.25	to 3.40
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80% to	79%
" 1	Boiler tubes	75% to	74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½ to	63½
" 1	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galv. sheets	4.25	to 5.00
" 15	Boiler tubes	74% to	73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73% to	72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
July 4	Plates	1.50	to 1.60
" 4	Shapes	1.50	to 1.60
" 5	Tin plate	3.10	to 3.30
" 9	Galv. sheets	3.70	to 3.80
" 9	Blue ann. sheets	1.70	to 1.80
" 21	Bars	1.25	to 1.30
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
" 31	Bars	1.30	to 1.35
Aug. 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72% to	71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galv. sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71% to	69%
Nov. 1	Steel pipe	79% to	78%
" 1	Galv. sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galv. sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galv. sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70

Nov. 18	Shapes	1.60	to 1.70
" 18	Galv. sheets	4.00	to 4.25
" 24	Galv. sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galv. sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
1916—			
Jan. 3	Tin plate	3.60	to 3.75
" 3	Blue ann. sheets	2.25	to 2.35
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%	78%	to 77%
" 5	Blue ann. sheets	2.35	to 2.40
" 7	Boiler tubes	68%	to 66%
" 12	Blue ann. sheets	2.40	to 2.50
" 14	Boiler tubes	66%	to 64%
" 19	Blue ann. sheets	2.50	to 2.65
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00
" 14	Wire nails	2.20	to 2.30
" 15	Pipe	76%	to 75%
" 21	Bars	2.00	to 2.25
" 21	Plates	2.10	to 2.35
" 21	Shapes	2.00	to 2.25
" 21	Tin plate	3.75	to 4.00
" 29	Pipe	75%	to 74%
" 29	Boiler tubes	64%	to 63%
Mar. 1	Wire nails	2.30	to 2.40
" 8	Black sheets	2.60	to 2.75
" 8	Blue ann. sheets	2.65	to 2.90
" 13	Bars	2.25	to 2.35
" 13	Plates	2.35	to 2.60
" 13	Shapes	2.25	to 2.35
" 15	Steel pipe	74%	to 73%
" 15	Boiler tubes	63%	to 61%
" 23	Bars	2.35	to 2.50
" 23	Shapes	2.35	to 2.50
" 28	Plates	2.60	to 2.75
" 29	Sheets	2.75	to 2.85
" 29	Steel pipe	73%	to 72%
" 29	Boiler tubes	61%	to 60%
April 5	Sheets	2.85	to 2.90

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
July, 1914 ..	72,015	54,885	+ 17,130
August	51,231	54,112	— 2,881
September .	44,624	34,757	+ 9,867
October ...	45,241	39,410	+ 5,831
November .	35,325	40,748	— 5,423
December ..	27,458	42,525	— 15,067
January, 1915	20,684	31,556	— 10,872
February ..	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 ..	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ..	31,096	33,061	— 1,965
October ...	31,215	26,338	+ 4,877
November .	29,297	26,005	+ 3,292
December ..	23,173	23,743	— 570
January, 1916	17,293	4,015	+ 7,303
February ..	30,244	10,824	+ 19,420

United States citizens arrived and departed, with change thereby effected in United States population:

	Arrived.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915..	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September .	9,054	8,188	+ 866
October ...	8,991	8,329	+ 662
November .	8,364	9,166	— 802
December ..	8,458	9,349	— 891
Jan. 1916 ..	8,257	9,469	— 1,212
February ..	11,082	12,908	— 1,826

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,-237; July, 1915, +14,994; August, 1915, —15,-128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461; January, 1916, +6,091; Februray, +17,594; eight months, +28,920.

COMPOSITE STEEL.

Computation for April 1, 1916.

Pounds.	Group.	Price.	Extension.
2½	Bars	2.50	6.250
1½	Plates	2.75	4.125
1½	Shapes	2.50	3.750
1½	Pipe (¾-3)	2.75	4.125
1½	Wire nails	2.40	3.600
1	Sheets (28 bl.)	2.85	2.850
½	Tin plates	4.50	2.250
10 pounds			26.950
	One pound		**2.6950**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	.....
May	1.5590	1.7786	1.5078	1.5381	.....
June	1.5794	1.7719	1.4750	1.5812	.....
July	1.6188	1.7600	1.4805	1.5692	.....
Aug.	1.6784	1.7400	1.5241	1.6059	.....
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet. Pitts.	No. 1 R. Wrought. Pitts.	R. No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1914—						
June	11.75	9.10	11.75	12.25	10.50	9.80
July	11.75	8.50	11.75	11.50	10.60	9.75
Aug.	11.50	8.50	11.50	11.25	10.75	9.75
Sep.	11.25	8.70	10.50	11.25	10.75	9.25
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1916—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75

COMPOSITE PIG IRON.

Computation for April 1, 1916.

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.50)	37.00
One ton No. 2 foundry, valley	18.50
One ton No. 2 foundry, Philadelphia	20.00
One ton No. 2 foundry, Buffalo	19.25
One ton No. 2 foundry, Cleveland	19.00
One ton No. 2 foundry, Chicago	19.50
Two tons No. 2 Southern foundry, Cincinnati (17.90)	35.80
Total, ten tons	190.05
One ton	**19.005**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.420	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	.....
May	13.917	15.682	13.808	13.206	.....
June	14.005	14.968	13.606	13.047	.....
July	14.288	14.578	13.520	13.125	.....
Aug.	14.669	14.565	13.516	14.082	.....
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet bars. Pitts.	Rods. Pitts.	— Iron bars, deliv. — Phila.	Pitts.	Ch'go.
1914—						
Oct.	20.00	20.70	26.00	1.14	1.20	1.01
Nov.	19.25	19.75	25.00	1.13	1.20	.96
Dec.	18.75	19.25	24.40	1.12	1.20	.91
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2 40	2.17

† Premium for open-hearth.

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1911.	1912	1913.	1914.	1915	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,520,260	16,470,751	.....
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	.....
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	.....
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	.....
June	20,310,053	24,795,802	25,228,346	18,927,958	31,757,103	.....
July	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575	.....
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822	.....
September	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$51,643,807

EXPORTS OF TONNAGE LINES—Gross tons.

	1909.	1910.	1911	1912.	1913.	1914.	1915.	1916
January	70,109	118,681,	152,262	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	144,366	.....
March	94,519	124,980	216,360	218,219	257,519	159,998	174,313	.....
April	100,911	117,921	228,149	267,313	259,689	161,952	223,240	.....
May	109,808	135,306	178,589	307,656	242,353	139,107	263,649	.....
June	114,724	120,601	174,247	273,188	243,108	144,539	355,402	.....
July	100,850	127,578	162,855	272,778	237,159	114,790	378,897	.....
August	105,690	131,391	177,902	282,645	209,856	86,599	405,853	.....
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,295	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	357,122

IRON ORE IMPORTS.

	1913.	1914.	1915.	1916.
Jan.	175,463	101,804	75,286	89,844
Feb.	188,734	112,574	78,773	.....
Mar.	164,865	68,549	88,402	.....
April	174,162	111,812	91,561	.....
May	191,860	125,659	98,974	.....
June	241,069	188,647	118,575	.....
July	272,017	141,838	119,468	.....
Aug.	213,139	134,913	126,806	.....
Sept.	295,424	109,176	173,253	.....
Oct.	274,418	114,341	138,318	.....
Nov.	179,727	90,222	113,544	.....
Dec.	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	89,844

IRON AND STEEL IMPORTS.

	1912.	1913.	1914.	1915.	1916.
Jan.	20,008	21,740	17,776	10,568	15,824
Feb.	11,622	25,505	14,757	7,506	.....
Mar.	15,466	27,467	27,829	8,025	.....
April.	12,481	25,742	30,585	16,565	.....
May	15,949	28,728	28,173	28,916	.....
June.	21,407	36,597	23,076	32,200	.....
July	17,882	36,694	25,282	20,858	.....
Aug.	20,571	18,740	28,768	27,556	.....
Sept.	18,740	19,941	38,420	23,344	.....
Oct.	25,559	20,840	22,754	34,319	.....
Nov.	24,154	25,809	24,165	37,131	.....
Dec.	21,231	26,454	9,493	35,455	.....
Total	225,072	317,260	289,778	282,443	15,824

Comparison of Metal Prices.

Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing, Mar. 31, 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	20.00	21.00
Basic, valley	13.25	12.50	18.00	12.50	18.50	17.75	18.50
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.50	18.50
No. 2X fdy. Philadelphia.	1500	14.20	19.50	14.00	19.75	19.50	20.00
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	19.00	18.80	19.00
No. 2X foundry, Buffalo	13.75	12.25	18.00	11.75	19.00	18.00	19.00
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	19.00	18.50	19.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.50	15.00
Scrap Iron and Steel.							
Melting steel, Pittsburgh.	12.00	9.75	18.00	11.00	18.75	17.25	18.75
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	16.75	15.25	16.75
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	19.50
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.00	15.00	16.00
Heavy steel scrap, Phila	11.25	9.00	16.25	9.50	17.75	16.00	17.75
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.50	1.90	2.50
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.56	2.06	2.56
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.50	1.85	2.50
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	2.75	1.85	2.75
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	2.50	1.85	2.50
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	2.35	1.75	2.35
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	2.85	2.60	2.85
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.75	5.00
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	4.50	3.75	4.50
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.40	2.10	2.40
Steel pipe, Pittsburgh	79½%	81%	79%	81%	72%	78%	72%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	2.75
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.75	3.75
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	40.87½	49.25
Lake copper	15.50	11.30	23.00	13.00	28.50	23.00	27.12½
Electrolytic copper	14.87½	11.10	23.00	12.80	28.50	23.00	27.12½
Casting copper	14.65	11.00	22.00	12.70	27.00	22.00	25.75
Sheet copper	20.25	16.50	27.25	18.75	35.00	28.00	34.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	7.50
Spelter	6.20	4.75	27.25	5.70	21.17½	16.42½	17.67½
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	41.00	45.00
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	63.00	53.00	60.00
Silver	59¼	47⅝	56½	46¼	60¾	55⅞	60¾
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	8.00
Spelter	6.00	4.60	27.00	5.55	21.00	16.25	17.50
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.00	23.00	25.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	202	172	199
Standard copper, prompts	66¾	49	86⅜	57⅛	118¼	84¾	116
Lead	24	17⅞	30¼	18¼	36⅜	29¼	34⅞
Spelter	33	21¼	110	28⅛	111	85	96
Silver	27¼d	23¼d	27¼d	22 1/16d	28⅛	26 1/16d	28 1/16d

Comparison of Security Prices.

Railroads.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing. Mar. 31, 1916.
Atchison, Top. & Sante Fe...	100⅜	89½	111¼	92½	108½	101⅞	103½
Atch. Top. & Santa Fe,. pfd.	101¾	96½	102⅞	96	102	97⅞	100⅝
Baltimore & Ohio	95⅝	67	96	63¾	96	85	87
Canadian Pacific	220½	153	194	138	183¾	162½	167
Chesapeake & Ohio	68	40	64¾	35⅝	66⅞	60⅛	61⅝
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¾	102½	92¼	93
Erie R. R.	32½	20⅛	45⅝	19⅞	43⅝	35	36½
Great Northern, pfd.	134¾	111⅝	128⅜	112¾	127½	119⅛	121
Lehigh Valley	156¼	118	83⅜	64⅝	83	74½	76½
Louisville & Nashville	141⅞	125	130¼	104½	130⅝	121⅛	122
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	7¼	3⅜	3¾
Missouri Pacific	30	7	18¼	1¾	6⅝	4	5
New York Central	96⅝	77	110½	81½	111½	101¾	103⅞
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	63	63⅜
Northern Pacific	118½	97	119	99⅛	118⅞	111⅜	112½
Pennsylvania R. R.	115½	102½	61½	51¾	59¾	55⅝	56½
Reading	172¾	137	85⅝	69⅜	89⅝	75⅛	84½
Rock Island	16⅝	⅝	1⅛	⅛	⅞	⅜	⅜
Southern Pacific	99½	81	104⅛	81¼	104⅛	96⅛	97⅜
Union Pacific	164⅜	112	141½	115¾	140¼	130¼	132⅜
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¼	74	61¾	71½
American Can	35⅛	19¼	68½	25	65⅜	56⅛	61¼
American Can, pfd.	96	80	113½	89	113⅞	109½	111¾
Am. Car & Foundry	53½	42¼	98	40	78	63¾	68½
Am. Cotton Oil	46½	32	64	39	57½	51¼	54
Am. Locomotive	37¼	29¼	74¾	19	83¾	60¾	79
Am. Smelting & Refining	71⅛	50¼	108⅞	56	113⅜	95⅜	100¾
Brooklyn Rapid Transit	94¼	79	93	83¼	88	84¾	85⅛
Chino Copper	44	31⅝	57⅜	32¾	60	51¾	55⅛
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	53	39⅝	44⅞
Consolidated Gas	139½	112½	150½	113¾	144¾	130½	134⅛
General Electric	150⅝	137½	185½	138	178½	165	167¾
Interborough-Metropolitan ..	16¾	10¾	25	10⅝	20½	17	17
International Harvester	113½	82	114	90	112⅜	108½	110½
Lackawanna Steel	40	26½	94¾	28	86	72¾	76¾
National Lead	52	40	70¾	44	73⅞	64⅞	67
Ray Consolidated Copper	22½	15	27½	15¼	26	22¾	24
Republic Iron & Steel	27	18	57¼	19	55¼	48¼	50¾
Republic Iron & Steel, pfd...	91¼	75	112⅝	72	112	108	108½
Sloss-Sheffield	35	19½	66⅞	22	63¼	53¼	56½
Texas Co.	149⅞	112	237	120	235½	189	192¼
U. S. Rubber	63	44½	74¾	44	58½	47¾	51¼
U. S. Steel Corporation	67¼	48	89½	38	89	79¾	84⅝
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	118½	115½	116½
Utah Copper	59⅜	45⅜	81¾	48½	86¾	77	82⅛
Va.-Carolina Chem.	34⅞	17	52	15	51	42	44
Western Union Telegraph ...	66⅞	53⅜	90	57	92	87	91¼

CAR BUYING.

Freight cars ordered:		
First half 1913	114,000	
Second half 1913	33,000	
Year 1913		147,000
First half 1914	11,380	
Second half, 1914	13,6.0	
Year, 1914		80,000
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,210	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.

June 1914	23,650,000
July	23,350,000
August	23,600,000
September	23,200,000
October	21,200,000
November	18,700,000
December	18,100,000
January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,700,000
On March 1st	40,000,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	*2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1913—			
June	131,245,877	163,404,916	32,159,039
July	139,061,770	160,990,778	21,929,008
Aug.	137,651,553	187,909,020	50,257,467
Sept.	171,084,843	218,240,001	47,155,158
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
April	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,746,117	134,170,011
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	*193,935,117	*409,836,525	*215,901,408

* High record.

† Balance unfavorable.

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1909:

Quarter.	1915.	1914.	1913.
1st	$12,457,809	$17,994,382	$34,426,802
2nd	27,950,055	20,457,596	41,219,813
3rd	38,710,644	22,276,002	38,450,400
4th	51,277,504	10,935,635	23,084,330
Year	130,396,012	71,663,615	137,181,345

	1912.	1911.	1910.
1st	$17,826,973	$23,519,203	$37,616,877
2nd	25,102,266	28,108,520	40,170,961
3rd	30,063,513	29,522,725	37,365,187
4th	35,181,922	23,155,018	25,901,730
Year	108,174,673	104,305,466	141,054,755

Unfilled Orders.

(At end of the Quarter):

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	8,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,633	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

1914	Shipments. %	Bookings. %	Difference. %	Difference. Tons.
March	72	40	—32	—372,615
April	67	35	—32	—376,757
May	62	37	—25	—278,908
June	63	66	+ 3	+ 34,697
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September ..	62	24	—38	—425,664
October	55	28	—27	—326,570
November ..	45	32	—13	—136,505
December ..	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February ...	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September ..	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037
December .	102	152	+50	+615,731
January 1916	102	112	+10	+116,547
February ..	102	157	+55	+646,199

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January ..	1,021	795	226	939	718	221	1,133	797	336
February .	914	146	168	897	678	219			
March ...	1,091	801	290	1,012	720	192			
April	1,038	782	256	1,010	722	288			
May	1,047	800	247	1,040	732	308			
June	1,097	789	308	1,090	730	360			

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
	1915.	1916.	1915.	1916.
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. .	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April ..	13.60		12.50	
May ..	13.659		12.65	
June ..	13.75		12.724	
July ..	13.991		12.959	
Aug. ..	15.064		14.364	
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

BAR IRON AVERAGES.

Average realized prices on shipments of base sizes of common iron bars by the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and Highland Iron & Steel Company, as disclosed by wage adjustments of Amalgamated Association of Iron, Steel and Tin Workers, prices realized in bimonthly periods, governing wage rates for succeeding two months.

	1914.	1915	1916.
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	.....
May-June	1.1257	*1.10	....
July-August	1.0928	*1.15	....
September-October	1.0847	*1.20	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.14	....

* Settlement basis.

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1910	66,640	12,459
1911	14,098	61,466
1912	2,053	81,694
1913	20,680	57,812
1914	15,411	59,549
1915	..2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178

British tin plate exports have been as follows, in gross tons:

1913	494,921
1914	435,497
1915	368,602
January 1916	26,271
February	27,289

BRITISH IRON AND STEEL EXPORTS.

1914—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	74,617	43,133	47,237	385,301
Aug. ..	28,342	22,763	21,414	211,605
Sept. ..	37,793	39,185	23,440	228,992
Oct. ..	47,188	37,005	26,950	263,834
Nov. ...	49,666	16,181	30,942	240,608
Dec. ..	31,705	16,315	30,254	212,667
Year ..	780,763	433,507	435,392	3,972,348
1915—				
Jan. ..	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	15,101	198,294
Mar. ..	20,172	17,572	36,170	239,342
April ..	35,209	21,602	40,135	264,244
May ...	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	78,370	33,224	39,528	351,984
Aug. ...	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ...	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Tin in March.

Unprecedented Heavy Consumption, Record-Breaking Production and Radical Change in Merchandising Methods the Outstanding Features.

In considering March developments in the tin trade, three features stand out prominently upon the background of the war in Europe: The unprecedented heavy consumption in the United States, the record-breaking output at the Straits, and the radical change in methods of merchandizing due to the British trade regulations incidental to the war.

Shipments from the Straits in March—5,170 tons—while smaller than during each of the preceding four months, exceeded the March shipments last year by 200 tons. Total shipments from the East Indies since the first of January have been 17,515 tons and since the first of November last year, 29,529 tons. This is at an average monthly rate of 5,906 tons. The shipments during the first quarter of the year exceeded the shipments during the corresponding quarter last year by 1,671 tons.

The deliveries into domestic consumption in March were 4,726 tons, making total deliveries since the first of January 15,566 tons, exceeding the total deliveries during the corresponding period last year, by 6,388 tons.

Visible Supply Largest Since 1910.

The visible supply at the end of March was 18,782 tons an increase of 2,271 tons during the month and 3,315 tons larger than the supply held on the corresponding day last year. The visible March 31st was the largest since November 1910 when spot tin was selling in New York at 37.30c per pound. In addition to this supply, officially reported, there are still heavy stocks of unsmelted Bolivian tin ores held at Liverpool and a large accumulation of Banca tin at Batavia. Another source of supply in a very short time will be the smelting of Bolivian ores by the local works about to go into commission. Evidently, the statistical position alone gives small support to the high prices prevailing for spot at New York and London. Other factors of course, are responsible, such as the British government restrictions, including the difficulties of securing permits for shipment from either the Straits or London; the fear of heavy loss during transportation, due to the activities of submarines and the carrying of unusually heavy stocks by American consumers as a protection against sudden changes in trade relations, which stocks they are unable to resell under the provisions of the agreement with the British government.

The result of these combined influences was to maintain the price of spot tin at New York abnormally high but there was a variation of 10c per pound during the month, sales being made as high as 56c and as low as 46c per pound. On the first of March spot tin commanded 47½c New York and the March position sold at 45¾c. These tempting prices brought out offers to sell from dealers in the interior and from dealers on the Pacific coast. There was also some interest in far-off positions such as August, September arrivals from the Straits

TIN PRICES IN MARCH.

Day.	New York. Cents.	London £	s	d	London £	s	d
1	47.75	188	0	0	188	5	0
2	46.00	185	10	0	185	15	0
3	46.50	183	10	0	184	0	0
6	48.50	187	0	0	187	0	0
7	48.50	186	0	0	186	5	0
8	50.00	187	0	0	186	15	0
9	51.00	188	0	0	187	15	0
10	56.00	189	10	0	189	0	0
13	55.00	192	10	0	191	0	0
14	55.00	192	10	0	191	0	0
15	53.50	194	10	0	191	0	0
16	52.00	195	0	0	190	0	0
17	52.00	195	10	0	191	0	0
20	51.00	196	10	0	191	5	0
21	50.00	196	0	0	191	0	0
22	49.50	196	10	0	191	0	0
23	49.50	197	5	0	191	10	0
24	50.00	199	15	0	194	0	0
27	50.00	201	10	0	195	0	0
28	50.00	202	0	0	196	0	0
29	49.50	200	0	0	196	0	0
30	49.25	200	0	0	195	0	0
31	49.25	199	0	0	193	5	0
High ...	56.00	202	0	0	196	0	0
Low	46.00	183	10	0	184	0	0
Average .	50.424	193	12	2	190	11	1

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915.	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	.....
May	14,345	13,710	17,862	14,646	.....
June	12,920	11,101	16,027	15,927	.....
July	13,346	12,063	14,167	16,084	.....
Aug.	11,285	11,261	14,452	15,127	.....
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915.	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5.584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	.....
May	5,760	6,160	6,900	6,759	....
June	4,290	4,280	5,870	6,665	.....
July	4,580	4,770	4,975	5,606	.....
Aug.	5,210	6,030	3,315	4,712	....
Sept.	5,430	5,160	4,973	5,296	.....
Oct.	4,450	5,020	4,610	4,441	.....
Nov.	5,600	5,560	5,155	6,713	.....
Dec.	4,980	5,110	6,435	5,301	.....
Total	59,018	62,550	63,093	66,517	.....
Av'ge	4,918	5,213	5,258	5,543	.....

CONSUMPTION IN THE U .S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	.....
May	4,250	3,350	3,800	5,600	.....
June	2,850	3,800	3,650	3,900	.....
July	5,150	3,900	3,900	5,300	.....
Aug.	4,300	3,600	2,900	4,500	.....
Sept.	3,600	3,100	3,600	4,300	.....
Oct.	3,850	3,700	3,700	4,900	.....
Nov.	4,300	2,800	2,600	2,975	.....
Dec.	4,050	3,100	1,900	5,200	.....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4,125	3,658	3,475	4,062	.....

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	Mar.	Feb.	Mar.
Straits shipments	1916.	1916.	1915.
To Gr. Britain..	2,175	3,015	2,295
" Continent ..	495	1,145	1,220
" U. S.	2,500	2,090	1,555
Total from Straits	5,170	6,250	4,970
Australian shipments			
To Gr. Britain ..	245	316	200
" U. S.	nil	nil	nil
Total Australian	245	316	200
Consumption			
London deliveries	1,416	1,183	2,754
Holland deliveries	nil	nil	2,150
U. S.	4,726	6,388	3,200
Total	6,142	7,571	8,104
Stocks at close of month			
In London—			
Straits, Australian	1,644	974	3,317
Other kinds	886	1,607	2,123
In Holland	17	....	.....
In U. S.	2,746	1,308	905
Total	5,293	3,906	6,345
Afloat, close of month			
Straits to London.	4,945	4,645	3,363
" to U. S. ..	3,340	1,257	649
Banca to Europe..	5,204	6,703	5,110
Total	13,489	12,605	9,122
	Mar. 31,	Feb. 29.	Mar. 31,
Total visible supply	1916. 18,782	1916. 16,511	1915. 15,460

STRAITS TIN PRICES IN NEW YORK.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	48.93½	50.42
Apr.	44.02	49.12	36.10	47.98	.....
May	46.12	49.14	33.30	38.78	.....
June	47.77	44.93	30.65	40.37	.....
July	44.75	40.39	31.75	37.50	.....
Aug.	45.87	41.72	50.59½	34.39	.....
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

at 42¼c but there was relatively small attention paid to intermediate deliveries.

Heavy Break Precipitated by Suspension of Trading Order.

On March 2d, it was announced that the British government, in an effort to stop all speculation in metals used in the manufacture of war munitions, would prevent trading except to cover consumers' urgent requirements. Pig tin was the sole exception to this general rule, as tin is not used in the manufacture of destructive war munitions. The drastic action by the British government demoralized the trade in tin, however, as well as in other metals, resulting in a break of £4 in spot tin to £190; Standard tin fell £2 10s and the Singapore responded with a drop of £2, sales being made at £193 c.i.f. London equivalent. At New York there were free offerings of future positions from April to December arrivals at cut prices.

On the next day, March 3d there was another drop in all positions here and abroad. August, September and October arrivals breaking to 40½c when a large business was done with leading consumers who recognized an unusual opportunity to secure metal at relatively low prices. Spot tin remaining scarce and was held at 46c to 46½c while March arrivals were quotable at 45c.

Ban on Trading Lifted and Prices Advance Sharply.

The British government rescinding its orders against trading in metals on the London Exchange, there was a sudden rise, March 6th, in all positions in the English market but the Singapore market again dropped £2 5s to £186 c.i.f. London, this was £7 under the price at the beginning of the month, but, on the following day, there was a sharp recovery in the East Indies while the English market continued to advance further and the New York market rose to 48½c for spot, 46½c for March and 41¼c for October arrivals from the East.

At this time there was a general belief that the spot and March price at New York was being manipulated but the premium of 7c per pound prevailing on spot over July and August arrivals, would doubtless have been quickly eliminated if consumers could have sold the surplus they were carrying in stock. Naturally, interest in far off positions increased. On March 8th, all the foreign limits, of 41½c to 41¾c, for July to October arrivals, were taken and not a few unfilled orders were carried over into the next day, when sellers demanded an advance of from ¼c to ½c per pound. Considerable business was again done in May to October arrivals, the chief interest being in June at 42½c. For August, September and October arrivals, late in the day, sellers made concessions resulting in large buying at 41½c to 41⅞c. There also was an urgent demand for spot tin from consumers and even dealers bid 50½c. At the close there was some excitement and sales of spot were made at 55c per pound.

Strong Spot Position Due to Very Small Arrivals.

On March 10th the foreign market responded moderately to the activity in the American trade, and spot tin at New York was bid up to 55½c; in fact, sales were reported as high as 56c for spot and 50c was freely bid for March. The strength of nearby positions during the first ten days of the month was mainly due to the small arrivals from abroad and the stringency in the local supply available for the open market. Subsequently, there were freer offerings of spot and March but buyers, anticipating heavier shipments from abroad, held aloof.

Up to March 13th, only 343 tons had arrived at New York available for delivery compared with an average of 2,000 tons needed in a half month. The foreign market continued high, as a reflection of the extreme prices prevailing here, and one result was to bring out liberal offerings of English and Chinese tin for American importations.

During the next few days the market was relatively quiet and prices on nearby positions receded at the approach of steamships afloat, but future positions, notably August, September and October arrivals, remained strong at 42c to 43c. On March 22nd, the offering of tin ex steamer at dock, at 49c or less, reflected the relief afforded by arrivals of Straits and other tin.

The strength of the London market during the first half of the month was somewhat of a mystery here but the tightening of the position in nearby deliveries tended to accentuate the nursing of spot metal, the arrivals from the Straits being abnormally small at London as well as at New York. The famine conditions in Great Britain had the effect of stimulating the short interest to cover, which assisted the rapid advance in the cash metal in the English market.

The rise in the foreign markets on March 24th, was attributed to the increased difficulty in securing permits to ship tin from the Straits to America. Others claimed that the advance was due to important buying by a London operator who had been long out of the speculative market. From an American standpoint the movement was due to the efforts made here to buy tin afloat for America which disclosed the fact that there was very little tin in transit that was available.

Futures Irregular.

During the last week of the month there was considerable irregularity in future positions and sales were made on profit-taking as low as 45c ex steamships due to arrive in June. The same was true of July and August positions but foreign limits on far-off positions remained quite uniform. Consumers found increased difficulty in securing offers for definite delivery because of renewed submarine activities, tenders generally were made only "from specific steamers due to arrive during definite months."

On the last two days of the month there was a tendency toward reaction foreshadowing the unfavorable statistical position now fully apparent but there was a good demand here for spot at 49c to 49¼c and for April at 48½c to 49c. Far off positions were easier with importers willing to make concessions in prices.

A recapitulation of the movement in prices abroad is interesting. On the first of March spot tin at London was quoted at £194, spot Standard at £188 and future Standard at £188 5s. On March 3rd spot Straits had dropped £5, spot Standard was down £4 10s and futures were £4 5s lower. The Singapore market, also, had broken £4 5s from the quotation at the opening of the month. From this time on, the market rose, with inconsiderable reactions, until March 29th, when the advance culminated in a net rise of £13 on spot Straits, £16 on spot Standard and £12 on future Standard at London, while the Singapore market had advanced £10 5s. In the next two days prices reacted £2 on spot Straits, £1 on spot Standard and £2 15s on future Standard while Singapore dropped £2 with further declines anticipated.

Lead in March.

Lead dealings throughout the greater part of March were marked by activity, strength and buoyancy. At times excitement ran high in the western field where domestic consumers, previously sceptical of the strength of the market were compelled by their necessities to enter into unwilling competition with dealers who were also forced to cover contracts on future positions previously made and left unprovided for until the eleventh hour. The volume of business would have been even heavier had the metal been available but the largest producing interests were largely sold ahead and little metal was available for the current market. Refiners, however, did all they possibly could to supply the needs of regular consumers but the frantic efforts to buy nearby lead carried the market upward steadily to record-breaking prices.

Trust Loses Control of Market—Output Largely Oversold.

Evidence steadily accumulated during the month to show that the American Smelting and Refining Company had largely over-sold its output at relatively low prices for future delivery and consequently had lost control of the market which they usually maintain and exercise with impunity. Although the Trust price was advanced four times during the month it continued to drag hopelessly in the trail of the independent producers who constantly sold after the first week of the month, at from $2.00 to $10.00 per ton above the Trust nominal quotation.

However much the extremely high prices prevailing may be deplored they came about naturally from the relation between supply and demand without any effort at manipulation. One of the chief causes for the advance was the extraordinary demand that continued throughout the month for export to the Orient. It is estimated at about 5,000 to 6,000 tons were sold for prompt shipment and for delivery in March and early April to representatives of the Japanese and Russian governments. Most of the metal was sold for rail shipment across the continent to Seattle and San Francisco for later trans-Pacific shipment to destination.

Prices realized on these transactions ranged all the way from 6½c to 8¼c per pound at New York and East St. Louis. Some sales were also made at 8¼c and 8½c delivered on the Pacific coast. It is understood that special arrangements were made with the railroads for this movement of freight. Some of the metal sold for shipment to the Orient came from surplus stocks of consumers who were tempted to sell because of the large profits secured. Speculative orders were also released on these foreign orders at prices which easily enabled the purchases to pay the additional freight on the Atlantic coast as compared with the railroad rates in force from St. Louis to the western coast.

Trust Price Suddenly Advanced $10 Per Ton.

One of the significant developments of the month was the attitude taken by the American Smelting & Refining Company to justify its official prices which were practically a dead letter as far as actual business was concerned. The failure to keep pace with the advance in prices on current transactions was excused on philanthropic grounds but later, when the open market had receded, the Trust price was suddenly advanced $10 per ton. The business done by the American Smelting & Refining Company was largely on a sliding scale basis which may prove satisfactory to consumers but can hardly encourage the ore producers having contracts with the Trust.

Even as early as March 4th, the scarcity of spot lead in the St. Louis market, in conjunction with the active demand, enabled producers to obtain almost any price they asked. One of the interesting reports from St. Louis was that the Trust made purchases of lead in the open market at higher prices than they were quoting. Brokers paid as high as 6½c at a time when the market was $2.00 per ton less and it was simply impossible to supply the demand. On March 14th, when domestic consumers were eagerly taking all the lead available and the export demand was urgent, one block sold at 7½c East St. Louis. On the following day, sellers asked 7¾c. The market had now reached the highest point in the history of the trade, the previous maximum price, of 7½c East St. Louis, having been established June 14th, 1915. Excitement at this time was running high in the western market and in the next few days prices advanced to 8 and 8¼c for prompt shipment. The St. Louis market for the first time in the history of the industry was maintained at a premium over the New York market due largely to the demand from the Orient.

There was small sympathy between the American and European markets during the first half of the month and the suspension of trading upon the London Exchange for a few days made no impression upon the domestic market. At the beginning of the market month G. M. B. lead at London sold at £32 17s 6d for spot and at £32 2s 6d for futures. Business was suspended on the following day and when trading was resumed on March 6th, the London price had dropped to £31 15s for spot and £31 17s 6d for futures. By March 20th, the London market had advanced to £36 7s 6d for spot and £36 10s for futures. These prices were equivalent to 7.55c and 7.60c respectively. Prices prevailing in the United States were ½ and ¾c per pound premium.

LEAD PRICES IN MARCH.

Day.	New York.* Cents.	St. Louis. Cents.	London. £ s d
1	6.30	6.45	32 17 6
2	6.30	6.45	†
3	6.40	6.45	†
4	6.40	....	.....
6	6.40	6.55	31 15 0
7	6.60	6.60	31 17 6
8	6.60	6.75	32 0 0
9	6.60	6.75	32 15 0
10	6.60	6.87½	33 10 0
11	6.60	....	.....
13	6.60	7.12½	34 5 0
14	7.00	7.50	35 5 0
15	7.00	7.75	35 0 0
16	7.00	8.00	35 0 0
17	7.00	7.87½	35 10 0
18	7.00	....	.....
20	7.00	7.93½	36 7 6
21	7.00	8.12½	36 0 0
22	7.00	8.18¾	36 0 0
23	7.00	8.12½	35 2 6
24	7.00	8.12½	35 5 0
25	7.00	....	.....
27	7.00	8.12½	35 5 0
28	7.00	8.00	34 15 0
29	7.00	7.87½	35 0 0
30	7.50	7.87½	34 17 6
31	7.50	8.00	34 17 6
High	7.50	8.25	36 7 6
Low	6.30	6.40	31 15 0
Average	6.83	7.456	35 8 9

* Trust price. † Trading suspended.

England, however, obtains its lead supply largely from Spain and Australia. In this connection it may be noted that in 1915 England imported 256,476 tons of lead, of which only 52,058 tons came from America.

Market Closes Slightly Easier.

Toward the close of the month, although large export inquiries were in the market, the undertone was not quite so strong. Japanese and Russian agents were holding aloof in anticipation of a reaction in prices and domestic consumers were less eager to purchase nearby positions. The New York market receded fractionally below the St. Louis market but there were bids of 7⅞c for prompt shipments of round lots while carload lots sold at 8c. The net result of the month's movements was an advance of from 1½c to 1¾c in the domestic market and a rise of £2 at London.

The American Smelting and Refining Co.'s official price was advanced $2.00 per ton on March 3rd, $4.00 per ton on March 7th, $8.00 per ton on March 14th and $10.00 per ton on March 30th, making a total advance of $24.00 per ton during the month. Since the first of the year, the Trust price has been advanced 2c per pound equivalent to $40.00 per ton. Since September 14th, 1915, the Trust price has been advanced 3c per pound equivalent to $60.00 per ton while the open market price has been advanced 3¾c equivalent to $75.00 per ton.

LEAD (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19		3.70	4.11	
May	3.90	4.23½		3.81	4.16	
June	3.90	5.86		3.80	5.76	
July	3.90	5.74		3.75	5.52	
Aug.	3.90	4.75		3.73½	4.59	
Sep.	3.86	4.62		3.67	4.53	
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 10, 1915, have been as follows:

June 11, 1915		6.50
June 12	Advanced	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	"	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	10c to 5.00
November 10	"	15c to 5.15
November 15	"	.10c to 5.25
December 14	"	15c to 5.40
December 31	"	10c to 5.50
January 4, 1916	"	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60
March 14	"	40c to 7.00
March 30	"	.50c to 7.50

Copper in March.

Large Orders Placed by British and French Governments.

The vigorous buying of copper on foreign and domestic account that occurred during the last few days of March was in marked contrast to the dulness that prevailed most of the month. The buying movement was inaugurated by the announcement of the purchase of 10,000 tons of Electrolytic copper for April, May and June shipment by the French government. This was quickly followed by additional purchases by other French interests and the report that the British government had exercised an option of 60,000 tons of copper over the balance of this year, the option having been given at the time of a previous purchase—December 22, 1915—of an equal tonnage for shipment at the rate of 5,000 tons per month during 1916. It is now also reported that the British government is negotiating for 60,000 tons more but this report lacks confirmation. The first purchase was made at 20c per pound and the option was at the same price, latest negotiations, however, are reported to be 6c to 7c per pound higher.

According to the U. S. Government report exports of copper to the allied governments in 1915 were nearly 582,000,000 pounds, and these same governments are expected to take 120,000,000 pounds more in 1916 or a total of 702,000,000 pounds. The total exports in March were approximately 50,000,000 pounds, which is at the rate of 600,000,000 pounds annually. The shipments during the last week of the month were over 11,000 tons which is at a much heavier rate. Evidently the difficulty of securing steamships has much to do with the spasmodic foreign movement.

U. S. Consumption Record-Breaking.

Consumption of copper in this country reached record-breaking proportions during the month when 30,000,000 pounds are estimated to have been melted. The brass founders and other manufacturers of war munitions, were by far the heaviest consumers but there was also unprecedented consumption by wire drawers and electric equipment manufacturers. The railroads, too, placed larger orders for finished copper shapes and power companies in the Central and Far West bought heavily of copper wire. Consequently, it was only a question of time when manufacturers of such material would place additional large orders for refined copper.

The heavier purchases on foreign account stimulated the placing of contracts for home consumption. It is estimated that during the last five days of the month nearly 400,000,000 pounds were placed under contract by domestic and foreign consumers for delivery over the second, third and fourth quarters of the year, but mainly for third quarter delivery. The prices ranged from 27¼c for second quarter down to 26¾c for the last quarter. At the close of the month, however, it was difficult to purchase anything under 27¼c for fourth quarter delivery while prompt shipment commanded 27½c to 28c.

At the beginning of the month producing interests were holding prices firmly at 28 to 28¼c for spot and March shipment and at 27¼ to 27½c for June, but second hands were more anxious to sell and before the end of the first week, there was some pressure to dispose of resale lots as far forward as July and August at 26¾c to 26⅞c cash.

Suspension of Trading on Metal Exchange Has Unsettling Effect.

The open market was unsettled by the action of the British government in suspending trading on the London Exchange on March 2nd to March 6th, but the American producers, confident of the strength of their position, made no change in their attitude and belittled the importance of the London Standard market. It was pointed out that the embargo placed upon exports by the British government and its previous unsuccessful effort to control prices of copper at home had depressed prices of the Standard market unnaturally; and, if steamships were available and freight rates normal, copper could have been brought from England to the United States, refined and returned to Great Britain at a profit. Of course this was idle talk considering the conditions resulting from the war surrounding the market.

The British government believing that speculation and manipulation was largely responsible for the high prices prevailing

LAKE COPPER PRICES.

Monthly average prices of **Lake Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	.....
May	16.27	15.73	14.44	18.81	.....
June	17.43	15.08	14.15	19.92	.....
July	17.37	14.77	13.73	19.42	.....
Aug.	17.61	15.79	12.68	17.47	.....
Sept.	17.69	16.72	12.43½	17.76	.....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av..	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Monthly average prices of **Electrolytic Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	.....
May	16.16	15.63	14.13	18.60	.....
June	17.29	14.85	13.81	19.71	.....
July	17.35	14.57	13.49	19.08	.....
Aug.	17.60	15.68	12.41½	17.22	.....
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av..	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Monthly average prices of **Casting Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	.....
May	16.01	15.45½	14.00	17.41	.....
June	17.08	14.72	13.65	18.74½	.....
July	17.09	14.40½	13.34½	17.76½	.....
Aug.	17.35	15.50	12.27	16.46	.....
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av..	16.29	15.33	13.18	16.76	.....

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since April 22, 1915, are given in the following table together with the price of Lake Copper on the same dates:

1915—	Sheet Copper.	Lake Copper.
April 22	23.00	18.00
April 28	24.00	18.93¾
June 8	24.50	19.62½
June 9	25.00	19.87½
July 27	24.50	18.75
July 30	24.00	18.75
August 18	23.00	16.75
November 3	23.25	18.06¼
November 15	23.50	18.62½
November 16	23.75	18.75
November 17	24.00	18.87½
November 18	24.25	19.00
November 22	24.50	19.87½
November 23	25.00	19.87½
December 22	25.50	20.50
December 23	26.00	20.75
December 24	27.00	21.50
December 30	27.50	22.37½
1916—		
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.00	27.37½

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	23,663
February .	26,792	34,634	15,583	20,648
March ...	42,428	46,504	30,148	*24,231
April	33,274	35,079	18,738	.....
May	38,601	32,077	28,889	.....
June	28,015	35,182	16,976	.....
July	29,596	34,145	17,708	.....
August ..	35,072	16,509	17,551	.....
September	34,356	19,402	14,877	.....
October .	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December	30,653	22,166	42,426	.....
Total ..	382,810	360,229	276,344	.....

* Includes only exports from Atlantic ports.
† Approximate.

for refined copper, acted to correct this evil. Evidently the government's intention was known in the English market when on the first of March, prices of Standard broke from £4 to £4 10s on futures and spot respectively. During the second, third and fourth of March, business was suspended in the London Exchange but after a conference between the Minister of War Munitions and trade representatives, business was resumed on March 6th. It was agreed that all speculative trading in Standard copper on the English Exchange should be immediately discontinued and that all contracts in force should be liquidated by May 31st. The violent fluctuations since that time in prices of Standard copper—often ranging from £4 to £6 daily—have been entirely due to the efforts of long interests to liquidate and short interests to square their deals. The net result of the fluctuations during the month was an advance of £15 on spot and £14 on futures but the range from high to low point was fully £25. At one time, Standard copper was fully £40 under the price of Electrolytic but this was afterward shortened to £18. Of course these changes are abnormal and entirely independent of the supply of and the demand for the actual metal. Eventually the harmony between Electrolytic and Standard will be re-established.

In ordinary times, dealings in Standard copper create sentiment in the trade and are influential in causing a rise or fall in the market for Electrolytic and none know this better than the large producing interests in America. Recently, however, American refined copper has remained steady at £136 at London, for spot without reference to the fluctuations in Standard. On one day the price was advanced to £137 but quickly reacted, while late in the month there was some pressure to sell American Lake copper at £129 for May and June shipment which is equivalent to 27¾c delivered abroad and 26c at New York. This brings out the fact that Lake copper had been offered abroad at £2 less than Electrolytic which was held at £134. The recent offerings of Lake represent a concession of £5.

Consumption Equals Production.

It is estimated that the consumption of American copper on domestic and foreign account is about 6,000,000 pounds per day which is also the rate of production at the refineries. Stocks in producers' hands at the end of March are estimated to be 110,000,000 pounds which is equivalent to requirements for about 18 days. This surplus is of small moment under present conditions.

At various times during the month purchases of several thousand ton lots of bars, cakes and shapes were reported made on "German account" which possibly may be simply another name for "speculative account" for delivery, in monthly instalments from March to July inclusive, into American warehouses and for export after the war is over. That Germany will need to replenish supplies is clearly evident from reports that copper coins derived from Belgium, France, Italy and Spain have been sold by Switzerland to Germany at prices ranging from 15c to 80c per pound.

It develops that about the third week of the month brass founders in the Connecticut valley picked up quietly quite a fair tonnage of Electrolytic copper from second hands for April, May and June delivery at concessions of ½c per pound from producing interests' asking prices. Dealers also purchased quite liberally, in the aggregate,

COPPER PRICES IN MARCH.

	New York			London.		
	Lake.	Electro.	Casting.	Standard.		
Day.	Cents.	Cents.	Cents.	£	s	d
1	28.12½	28.12½	26.75	101	0	0
2	27.75	28.00	26.62½		†	
3	27.50	27.62½	26.12½		†	
6	27.37½	27.37½	26.00	101	0	0
7	27.37½	27.37½	26.00	100	10	0
8	27.37½	27.37½	25.87½	95	15	0
9	27.25	27.25	25.62½	97	15	0
10	27.25	27.25	25.62½	103	0	0
13	27.50	27.50	25.75	103	0	0
14	27.62½	27.62½	25.75	105	0	0
15	27.62½	27.62½	25.75	105	10	0
16	27.62½	27.62½	25.75	106	0	0
17	27.62½	27.62½	26.00	107	10	0
20	27.62½	27.62½	26.00	109	0	0
21	27.50	27.50	26.00	112	5	0
22	27.50	27.50	26.00	118	5	0
23	27.37½	27.37½	25.87½	113	0	0
24	27.37½	27.37½	25.87½	113	10	0
27	27.25	27.25	25.75	114	0	0
28	27.00	27.00	25.62½	113	0	0
29	27.00	27.00	25.62½	112	10	0
30	27.00	27.00	25.62½	114	0	0
31	27.12½	27.12½	25.75	116	0	0
High .	28.25	28.25	27.00	118	5	0
Low .	26.87½	26.87½	25.50	95	15	0
Av'ge	27.424	27.440	25.902	107	13	10

† Trading suspended.

from speculators and small producing interests. Some of this metal was disposed of toward the close of the month at fractional profits.

Consumer's Stocks Heavy.

Stocks in consumers' hands generally were quite heavy, otherwise many plants in New England would have been obliged to close down because of the railroad embargoes against shipments of metals.

Some excitement attended the heavy purchases during the last three days of March and apparently the buying movement had not spent its full force, when the month closed.

Spelter in March.

Violent Declines Mark Opening of Month.

Spelter was subjected to violent declines during the first 13 days of March. During the following week the lower prices developed a buying movement of unusual magnitude resulting in a partial recovery of the previous loss. After March 20th dulness prevailed throughout the domestic market, relieved by occasional large transactions for export. A gradual readjustment of the dislocated positions later placed the market in a nearly normal condition and on the closing day of the month a stronger and more confident tone was developed with an upward tendency in prices in anticipation of renewed activity, in response to the buying movement in copper.

London Price Reaches New High Record.

On March 1st, London cables announced an advance of £1 on prompt shipment spelter to £111, a new high record in the history of prices. England was also in the market for April, May and June shipments from the United States but the American market was dull, although firm, for prime western grades while there were freer offerings of grades used by brass manufacturers. On the following day the announcement that the British government had stopped trading, with the exception of tin, in all metals on the London Exchange, turned the local market downward with smelting interests more desirous of selling future positions and ready to make concessions on May and June and forward positions. April remained firm, being scarce, at 17¼c but May sold at 16½c, June at 16c and third quarter delivery at 15c per pound. Domestic consumers generally, however, were indifferent and export orders hung in the balance. The downward tendency was more apparent on the following day, March 3rd, when prices yielded ⅜c per pound, making the decline ¾c to ⅞c in two days. Producers could see no reason for the lower prices and charged operators with an effort to utilize developments abroad to make a drive against the market. Consumers, however, held aloof and dealers, formerly buyers, turned sellers.

Trading Resumed.

On March 6th, trading was resumed on the London Exchange, cables reporting a decline of £1 on spot and £3 on futures from the prices current on March 1st, when trading was suspended. The London prices were equivalent to 23⅜c per pound for prompt shipment and 19.80c per pound for future delivery, in marked contrast to St. Louis prices of 19¼c for prompt and 16¾c for second quarter delivery. The difference in prices, however, was due largely to the high ocean freights and the insurance and war risks.

At St. Louis, although smelting interests expressed confidence, the market was in danger from the heavy deliveries being made against previous low priced contracts. Some of the metal then delivered had been sold at 10½c and other consumers and dealers were receiving spelter bought at 13⅛c to 15c per pound for first quarter delivery. However, there was apparently little reselling by consumers.

Heavy Break Abroad—Freight Rates Advanced.

On March 7th, sentiment abroad was expressed in a break of £8 in the price of spot and £5 in the price of futures. These prices were equivalent to 21.67½c and 18.70c respectively. It is important to note that freight rates on spelter for shipment to England, France and Italy had advanced to 1½c to 1¾c per pound. Adding insurance and war risks of 1½% to 2% makes the total cost of shipping spelter

abroad 2c per pound against a charge of ¼c per pound in normal times. The domestic market, in response to London, was down ⅜c to ½c per pound with consumers and dealers holding off. The domestic market at this time suffered the first real reaction since early December. All the gain made in February was lost but prices were still 1½c per pound above those prevailing early in January and 4c per pound above the low level in December. The Joplin ore market was down $5.00 per ton. On the following day, March 8th, London again broke £3 to £4 and prices of prime western and brass spelter in the domestic market again suffered further decline but there was some improvement in the demand from domestic consumers. High grade spelter was also lower but largely nominal with one sale reported at 30c per pound.

During the next three or four days from March 9th, to March 13th, the foreign market broke £12 or more. The drop on the 13th, was sensational. By this time the English market had suffered a reaction of £26 and the American market had sustained a break of 3¼c to 4¼c per pound.

Heavy Business Done with Supply of Metal Large.

It is remarkable how plentiful spelter became even for delivery in April and May under the blighting influence of lower prices. Producing interests, who, a fortnight previous had no April and May spelter unsold, were offering these deliveries quite freely, and large invisible stocks were uncovered under the fear of still lower prices. A better demand developed for both domestic and foreign consumption about this time and on March 14th, a heavy business was done at advancing prices.

During the next week there was a flood of orders the demand being in excess of the offerings and on each day many unfilled commissions were carried over to be placed on successive days at higher prices. The buying movement was excessively heavy for all deliveries up to July and even some third quarter business was done at steadily advancing prices. The volume of business, crowded into a few days, was equal to buying in three weeks under ordinary conditions. The demand slackened about March 17th, consumers being less eager, having largely covered their requirements, but dealers continued to buy moderately. By this time the domestic market had recovered 1c to 1¼c per pound and the English market was up £7 to £12 from the low point on March 13th. According to western advices prompt shipment had sold at East St. Louis as high as 18c and April at 17½c previous to March 20th, but these reports apparently were exaggerated just as were the reports from other sources of second quarter sales at ½c to 1c per pound under the general market The readjustment that was evident for three or four days during the third week of the month brought about a closer range between prompt and second quarter delivery than had previously prevailed.

Large Orders Placed for Export—Encouraged by Reactionary Tendency.

On March 23rd, and on the few following days, there was a tendency to reaction here, which encouraged the placing of several large orders for export, one contract for April shipment from the West, was made at 17⅝c at East St. Louis for English shipment. Several additional large foreign orders were also reported for shipment in June and July but the domestic market con-

SPELTER PRICES IN MARCH.

Day.	New York Cents.	St. Louis. Cents.	London. £	s	d
1	20.67½	20.50	111	0	0
2	20.17½	20.00		†	
3	19.80	19.62½		†	
6	19.30	19.12½	110	0	0
7	18.80	18.62½	102	0	0
8	18.30	18.12½	98	0	0
9	17.80	17.62½	97	0	0
10	17.30	17.12½	93	0	0
13	16.67½	16.50	85	0	0
14	16.92½	16.75	85	0	0
15	17.42½	17.12½	90	0	0
16	17.92½	17.75	92	0	0
17	17.92½	17.75	93	0	0
20	17.92½	16.75	92	0	0
21	17.80	17.62½	92	0	0
22	17.67½	17.50	94	0	0
23	17.67½	17.50	94	0	0
24	17.67½	17.50	93	0	0
27	17.80	17.62½	96	0	0
28	17.73¾	17.56¼	95	0	0
29	17.67½	17.50	95	0	0
30	17.55	17.37½	95	0	0
31	17.67½	17.50	96	0	0
High	20.80	20.62½	111	0	0
Low	16.42½	16.25	85	0	0
Average	18.096	17.916	95	2	10

† Trading suspended.

tinued quiet. A canvas of the market on March 30th, showed that the April position was well sold and another lot of 1,000 tons, for May, June, July and August shipment, was reported sold, with other large foreign inquiries.

On the closing day of the month, there was more activity on domestic account with a particularly good demand for April and May delivery but producers were reluctant to sell for early shipment while more anxious to sell for June and later shipments. The third quarter was not well sold but a confident tone prevailed in anticipation of another buying movement. The spot position had now advanced 3⅛c per pound and the second quarter position 1½c per pound since March 13th. The English market closed at £96 for spot and £83 for futures this being a recovery of £11 on spot and £13 on futures from the low point on March 13th but a drop of £15 on spot and £13 on futures from the high point on March 1st.

SPELTER (Monthly Averages.)

	New York			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	5.33	6.52	18.18	5.14	6.33	18.01
Feb.	5.46	8.86½	20.09	8.62	19.92	19.92
Mar.	5.35	10.12½	18.09½	2.15	9.80	17.91
Apr.	5.22	11.51		5.03	11.22	
May	5.16	15.82½		4.96	15.52½	
June	5.12	22.62½		4.93	22.14	
July	5.03	20.80		4.84	20.53	
Aug.	5.63	14.45		5.45	14.19	
Sep.	5.52	14.49		5.33	14.10½	
Oct.	4.99½	14.07		4.81	13.89	
Nov.	5.15	17.04		4.97	16.87½	
Dec.	5.67	16.91		5.49	16.72	
Av.	5.30	14.44		5.11½	14.16	

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc Aug. 23rd, 1915 together with the price of spelter ruling on the same day.

1915—	Sheet Zinc.	Spelter St. Louis.
August 23	15.00	12.00
August 24	16.00	12.75
November 4	16.50	15.12½
November 9	17.00	15.87½
November 11	17.50	16.12½
November 12	18.00	16.31¼
November 17	19.00	17.25
November 18	20.00	17.37½
November 22	21.00	18.75
November 23	22.00	18.75
December 31	23.00	17.25
1916—		
January 26	24.00	19.00
February 17	25.00	20.87½

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	
May	7.13	5.77	5.38	20.55	
June	7.25	5.50	5.37	25.60	
July	7.46	5.61	5.26	24.90	
Aug.	7.34	5.99	5.66	19.30	
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

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Antimony In March.

On March 1st, importers of antimony reported a fair volume of business transacted in February and March shipments from the Far East. There was also a fair demand for prompt shipment of moderate lots at 44c to 44½c while March delivery was available at 42 to 42½c. Dullness developed during the following week with small inclination to purchase either future or spot metal but cables from Japan continued to report a strong tone. Domestic consumers for the time being were comfortably supplied and reluctant to consider purchases afloat. Dealers, because of the high prices, were still carrying light stocks and there were few inquiries from home munition manufacturers, but a large inquiry from Russia was reported about March 10th. Some quiet orders, however, were placed by domestic manufacturers of war munitions about the middle of the month.

An unexpected delay in the receipt of supplies, purchased in the Orient, for shipment by way of the Pacific Coast, caused an acute shortage of spot supplies of importers and dealers. Antimony which should have been received in February had not arrived on March 16th. One lot shipped to New York from Seattle by way of Galveston, was even further delayed by the slow movement of overland freight, congestion of traffic and embargoes against New York delivery. The result of this scarcity was an advance in the spot price to 45c duty paid on March 20th while March delivery was held at 43½c. A few days later, there were freer offerings of future positions, and March shipments from the Orient, which were available at 33¾c to 34c and April shipments at 33 to 33¼c in bond on March 20th, were later offered at concessions of about ½c per pound. Moderate arrivals toward the close of the month which were applied on consumers contracts, failed to relieve the spot market which remained strong at 45c but April arrivals were offered at 40c and May arrivals at 38c duty paid. On March 27th, one large contract, about 500 tons, was reported placed by a Canadian munition manufacturer but this purchase failed to stimulate other interest in future positions, as consumers anticipated further concessions in prices.

The English market maintained an even tenor throughout the month with British munition makers supplied at the official price of £95 while small lots were sold in the open market at £125.

ALUMINUM, SILVER and ANTIMONY PRICES IN MARCH.

	Aluminum.	— Silver —		Antimony.
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents.
1	62.00	56⅜	27 1/16	44.75
2	62.00	56⅞	27 1/16	44.75
3	62.00	56¾	27	44.75
4	.....	56¾	27	.....
6	62.00	56⅝	26 15/16	44.75
7	62.00	56¾	27	44.50
8	62.00	56¾	27	44.50
9	62.00	56¾	27	44.50
10	59.00	56¾	27	44.50
11	.....	56¾	27	.....
13	59.00	56⅝	27	44.25
14	60.00	56⅝	27	44.25
15	60.00	56¾	27 1/16	44.25
16	60.00	56⅞	27⅛	44.25
17	60.00	57	27 1/16	44.25
18	.....	57	27 3/16	.....
20	60.00	57⅜	27⅜	45.00
21	60.00	57⅝	27½	45.00
22	60.00	58½	27⅞	45.00
23	60.00	59¾	28½	45.00
24	60.00	60¾	28 13/16	45.00
25	.....	60⅛	28 5/16	.....
27	60.00	59⅝	28 7/16	45.00
28	60.00	60¼	28 11/16	45.00
29	60.00	60½	28 13/16	45.00
30	60.00	60¾	28 13/16	45.00
31	60.00	60¾	28 15/16	45.00
High	63.00	60¾	28 13/16	45.00
Low	58.00	56⅝	26 15/16	44.00
Av'ge	60.522	57.926	27.597	44.706

Aluminum In March.

Aluminum sustained a net decline of 2c per pound during March, resulting from a more ample supply, freer offerings and only a moderate demand. The trade entered the month, however, with a strong undercurrent and No. 1 Virgin, quotable at 61c to 63c per pound for nearby shipment. Domestic producers were twelve weeks behind in making deliveries on contracts but it was significant that small lots were available at lower prices than were carload lots. A firmer tone prevailed for 98 to 99% pure metal because of the higher prices prevailing for scrap and some sales were recorded as high as 60c per pound at shipping point; No. 12 alloy remelted, was also firmer at 49c, approximately.

A ripple appeared on the surface of the market early in the month, due to the report that the British government had requisitioned fifty tons of aluminum recently shipped from this country to a private firm but according to London cables it appears that fifty tons of aluminum shipped from the United States to Sweden was seized at the Orkney Islands and pronounced by a British Prize Court, to be destined to Germany. It is interesting to note, at this time also, British cables reported that the prize fund derived from the sale of contraband goods seized by the British navy in the first of March, amounted to about $30,000,000.

About the tenth of the month, evidence of a more ample supply resulted in freer offerings at concessions, No. 1 Virgin, was available at 60c New York, for March delivery, new sheet clippings sold at 50c per pound at shipping point while aluminum sheets were offered at 62c per pound. No. 1 Virgin was offered later as low as 58c, 98%to 99% remelted, was quotable at 56c to 58c; No. 12 alloy at 47c to 49c, showing a decline of 3 to 5c per pound on virgin, and 1c to 2c per pound on remelted. The lower prices encouraged exporters to enter the market for March and April shipments resulting in a firmer tone.

March and April shipments were offered at 60c New York, about the middle of the month but at interior points prices were higher, May, June and July shipments of No. 1 being held at 59c to 61c. A slight reaction followed with sales of Virgin at 59½c but 98% to 99% remelted, was offered at 57c for prompt, March and April shipments and this price might have been shaded.

During the next few days the market was heavy with freer offerings and buyers reluctant to trade. Some sales of remelted were made as low as 56c on March 21st. Sheet clippings were down to 50c and 50-ton lots of cable scrap were offered at 55c with buyers views about 52c. A fair volume of business was done with domestic consumers on March 22nd, for shipments over the balance of 1916, No. 1 Virgin selling in lots of 100 tons or more. A period of dullness succeeded with only insignificant changes in prices during the balance of the month.

CHINESE and JAPANESE ANTIMONY.
Average monthly price of **Chinese** and **Japanese** (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	.....
Apr.	6.87	7.82	5.82	23.97	...
May	6.98	7.75	5.78	34.71	...
June	7.07	7.62	5.62½	36.53½	....
July	7.37	7.55	5.44	35.98	.
Aug.	7.58	7.48	13.05	32.57	...
Sept.	8.00	7.31	9.79½	28.50	....
Oct.	9.11	6.46	11.64	30.96	...
Nov.	9.11	6.28	14.14	37.88...	...
Dec.	9.05	6.05	13.15	39.36½	...
Av..	7.63	7.43	8.53½	29.52	.....

ALUMINUM AND SILVER PRICES.
New York

	—Aluminum—			—Silver—		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	18.86	19.01	54.33	57.56	48.89½	56.77½
Feb.	18.80½	19.20	.....	57.50½	48.48	.....
Mar.	18.30	18.94½	.....	58.07	50.24	.....
Apr.	18.08	18.83	.....	58.52	50.25	.....
May	17.93	21.85	.....	58.18	49.91½	.....
June	17.82	29.66	.....	56.47	49.03	.....
July	17.59	32.50	.....	54.68	47.52	.....
Aug.	20.38	34.00	.....	54.34	47.18	.....
Sep.	19.28½	46.75	.....	53.29	48.68	.....
Oct.	18.25	54.17½	.....	50.65	49.38½	.....
Nov.	18.83	57.85	.....	49.10	51.71	.....
Dec.	19.02	56.80½	.....	49.38	54.97	.....
Av..	18.59½	34.13	.....	54.81	49.69	.....

Electrolytic Zinc.

The following is an extract from a paper presented at a joint meeting of the New York Sections of the American Electrochemical Society, the American Chemical Society and the Society of Chemical Industry, on February 11, 1916, but somewhat further elaborated for the Engineering & Mining Journal, of which the author is Editor, in its issue of March 4, 1916:

"With regard to the grade of electrolytic zinc, high purity is easily obtained. This is something that is far more under control than in refining by fractional distillation. Lead ought not to go appreciably into solution at all, while iron, copper, and cadmium—the other common impurities of spelter—are readily precipitated from the solution. The spelter first made at Anaconda was higher in cadmium than is permitted by the standard specifications for 'high-grade.' At that time zinc-dust, more or less impure, was being used as the precipitant for cadmium. Running the clarified solution through a tube-mill filled with zinc balls corrected this, and the grade of spelter was then raised to upward of 99.9%. Brunner, Mond & Company have been for many years guaranteeing their electrolytic spelter at 99.95% Zn, and there is no reason why the Anaconda spelter should not be made as good as that.

"Is electrolytic zinc extraction going to revolutionize the metallurgy of zinc? Unqualifiedly, no. When the zinc industry returns to its normal status, conditions will be in the main as they were before the war and the principles that I have previously stated will continue to obtain, with the difference that some people will have learned the details of the art, will have gone through the period of infantile mistakes in a time when almost any mistake was of no great consequence. By that time some of the concerns possessing exceptionally favorable conditions—Anaconda, if anybody—may be able to continue. Others will not.

"However, there are certain new industrial features that cannot yet be clearly estimated and may have a modifying effect upon this forecast. One of these relates to the matter of high-grade zinc. Previous to the war that class of spelter was produced in limited quantity and sold at a premium over common spelter of about 2½c per pound. Inventors, promoters and others who talked about making such zinc were discouraged from reckoning upon the premium by the dictum that the market would not take any more than the then supply which was indeed artificially limited, and that it was unsafe to count on anything but the price for common spelter. During the war high-grade spelter has fetched 40c per pound, and at times the demand for it has been insatiable. This demand has been especially in connection with the manufacture of ammunition and may be expected to cease with the war, but will the advertising that high-grade spelter has had and the wider knowledge of its peculiar properties that has been acquired give it a more extensive use in the peaceful arts and a maintenance of the premium for it, that will be to the advantage of the electrolytic producer? Or will it become a drug in the market, with entire disappearance of price differential? These are questions that nobody yet knows enough to answer reasonably."

In reviewing recent metallurgical accomplishments, John D. Ryan, president of the Anaconda Copper Co., has the following to say of his company's success in the manufacture of electrolytic zinc:

"In many of the mining districts of the West, particularly those who are producers of either silver-lead or copper ores, zinc in varying quantities forms an important and hitherto very objectionable constituent. Found usually in quantities insufficient to justify working the ores for the recovery of this metal, its presence occasioned the metallurgist numerous difficulties in the endeavor to eliminate it while saving the valuable metals associated with it in the ore. These difficulties compelled the smelters to impose heavy penalties on the zinc content in excess of certain percentages.

"The presence of such refractory ores in some of the mines of the Anaconda Co. led to a careful study of the problem by its research department. Gratifying success has resulted from this study. An electrolytic process has been evolved and patented to the company which makes it possible at a satisfactory cost to extract a high percentage of the zinc content of such ores, while the other valuable metals are precipitated in the form of an easily reducible resi-

duc. Following experiments sufficiently long continued to demonstrate the success of the method, a plant capable of producing 20,000 pounds of electrolytic zinc per day was built at Anaconda and has been in successful operation for several months. The product is very pure, its zinc content being about 99.9%. The brand, which has been trademarked Anaconda Electric finds ready sale at a considerable premium among manufacturers whose requirements demand zinc of the highest grade. This operation has been so successful that the company is now enlarging the plant at Anaconda sufficiently to make an output of 50,000 pounds of zinc per day. The product of this plant has been sold for a full year from the time when it will be in complete operation, at an estimated profit of over $4,000,000, and construction has been started upon a plant at Great Falls capable of making an output of 70,000,000 pounds of zinc per annum, which we hope to have in operation in the early autumn of this year."

Joplin Zinc And Lead Ore Markets.

The month of March showed a uniformly lower price level for zinc ores amounting to approximately $10 per ton over the month of February. The exact opposite took place with regard to lead ores the price advance being about $12 per ton. These price levels were responsible for the relative changes in the shipment records of the two ores, zinc ore being much lower and the lead ore being much higher. The same result is apparent with regard to the surplus stocks, zinc increasing notably and lead decreasing in proportion.

The month opened with sales of zinc blende ores from $95 to $115 as a general level. This was a decrease from the last week of February of $5 per ton. While the operators took the cut they took it with great protesting. This was followed by a still more drastic cut the week of March 11 when attempts to cut the base price to a maximum of $100 met with refusals to sell and a threat to close down the mines rather than submit. This brought the price back up to $115 at which price the market has stuck fast the remainder of the month. The average price for the month for blende ores was $99.11 as compared with $108.98 the previous month. Calamine ores sold on an average price of $73.61 as compared with $75.82 the previous month. The tonnage of blende shipped for the four weeks was 24,924 tons or an average of 6,231 tons weekly. This compares with 6,866 tons for February. The calamine ore tonnage was 2,252 tons or an average of 563 tons against 715 tons in February.

The stocks of ore in the producers' bins rose from 3,000 tons at the end of February to 10,462 tons at the end of March.

The situation in the lead market was just the reverse of that in zinc. Lead ore closed in February at $89 and at the end of March had reached $100. The sudden rise in pig lead reflected itself in the local lead ore market immediately although not to the extent it had been thought probable. The result of the higher prices is apparent in the average for the month which shows a shipment of 5,332 tons which brought $92.10 per ton. This compares with the average for February at $84.04. The average weekly shipment was 1,333 tons as against 1,055 tons in February. Stocks of lead ore at the end of February were 1,100 tons and at the end of March they were 635 tons.

Weather conditions have been very good on the whole and this has favored production. The return of good weather has also helped materially in forwarding the new construction work now in progress on so many new properties. The coming 60 days should see a very large addition to the productive list of mines and prospects.

Only one feature has arisen to interfere with the excellent outlook for a larger tonnage. This comes from the announcement of a strike by the machinists in the machine shops and foundries of the district. They demand more pay, shorter hours and recognition. Their demands have so far been refused by the employers and if the strike continues long, this means stopping all new construction work and the rapid addition of plants to the idle list as repairs cannot be made till machinists return to work. The battle seems to be drawn very tightly and it is likely to prove a hard and long fight. As a consequence the mine operators who are in a very large measure dependent upon the machine shops for all repair work and new supplies will suffer as much as the machine shop owners themselves by being deprived of a source for their machine supplies.

BRANDS OF COPPER IN UNITED STATES.

LAKE.

	Refined at:	Branded.
Adventure	Hancock, Michigan.	Adv. C. Co.
Atlantic	Houghton, Michigan.	A.
Calumet & Hecla	Hubbell, Michigan.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	B. L.
Centennial	Hancock, Michigan.	C. C. M. Co.
Copper Range	Houghton, Michigan.	C. R.
Franklin	Hancock, Michigan.	F. M. Co.
Isle Royale	Dollar Bay, Michigan.	I. R. C. Co.
Mass.	Hancock, Michigan.	Mass.
Michigan	Houghton, Michigan.	M. C.
Mohawk	Houghton, Michigan.	M. M.
Osceola	Dollar Bay, Michigan.	T. O.
Quincy	Hancock, Michigan.	Q. M. Co.
Tamarack	Dollar Bay, Michigan.	T. O.
Victoria	Hubbell, Michigan.	V. C.
Winona	Hubbell, Michigan.	W. A.
Wolverine	Houghton, Michigan.	W.

ELECTROLYTIC.

	Refined at:	Branded.
American S. & R. Co.	Perth Amboy, N. J.	P. A.
Balback S. & R. Co.	Newark, N. J.	Bb.
Baltimore Copper Works	Baltimore, Md.	B. E. R.
Boston & Montana Co.	Great Falls, Mont.	B. & M.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Copper Queen	Laurel Hill, L. I.	C. * Q.
Miami	Laurel Hill, L. I.	A. L. S.
Nichols Copper Co.	Laurel Hill, L. I.	L. N. S.
Orford Copper Co.	Chrome, N. J.	O. E. C.
Raritan Copper Works	Perth Amboy, N. J.	N. E. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. R. W.
United Metals Selling Co	Laurel Hill, L. I.	R. M. C.

CASTING.

	Refined at:	Branded.
Balbach S. & R. Co.	Newark, N. J.	N. B. C.
Boston & Montana Co.	Great Falls, Mont.	M. A.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Duquesne Reduction Co.	Pittsburgh, Pa.	D. E. C.
Nichols Copper Co.	Laurel Hill, L. I.	C. N. C.
Phelps, Dodge & Co.	Laurel Hill, L. I.	P. D. Co.
Tottenville Copper Co.	Tottenville, N. Y.	C. T. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. S.
White & Bro., Inc.	Philadelphia, Pa.	W. B.

Trade Notes.

The Cleveland Automatic Machine Co, Cleveland, O., has been incorporated to build machine tools; $500,000 capital stock; by J. T. Scott, David L. Johnson, M. C. Byrnes, M. C. McMeenan and B. E. Robertson.

The Dixon Valve & Coupler Company Philadelphia, Pa., has been incorporated with a capital stock of $25,000 by F. R. Hansell, Land Title Building, Philadelphia; George H. B. Martin, Camden, N. J., and S. C. Seymour, Camden, N. J., to manufacture couplers, clamps and articles from brass, steel, bronze and other metals.

The Vernon Machine Co., Worcester Mass., has been incorporated to make an 11-inch Prentice lathe; $10,000 capital stock; by Vernon F. Prentice, Victor E. Rolander Harry V. Prentice and Chester W. Warren. V. F. and Harry V. Prentice were formerly of the Prentice Bros. Co., absorbed by the Reed-Prentice Co., April 1, 1912. This company has started making lathes at 54 Hermon street and plans to build a factory.

The Jersey City Metal Treating Co., Trenton, N. J., has been incorporated to handle and prepare steel and metals; $100,000 capital stock by Henry Whitaker, Philadelphia, John E. Sandmeyer, Jr., John E. Sandmeyer, Newark .

The Louisville Steel & Iron Products Co., Louisville, Ky., has been incorporated with $1,125,000 capital to buy the plant of the Louisville Bolt & Iron Co., and will carry on the manufacture of sheet steel and bar iron. O. C. Carter, Chicago., is president, and George H. Holzbog, Louisville, is secretary-treasurer.

The M. & S. Gear Company, Detroit, manufacturer of differential gears, has increased its capital stock from $1,000,000 to $1,750,000, and is installing a quantity of new machinery. Louis H. Scurlock has been elected president and general manager.

The Crary Tool Co., Milwaukee, has been incorporated to manufacture chisels, pliers, wrenches and other tools; $30,000 capital stock; by John M. Hoerl, John Haubert and George E. Garent.

The Howe Chain Company, Muskegon, Mich., will begin business with an authorized capital of $100,000, specializing in the manufacture of chains of highest quality for elevating, conveying and power transmission purposes. The new company has secured a plant in Muskegon, which it is remodeling and which will be placed in operation as soon as the difficulty of obtaining raw material and necessary equipment can be overcome.

The Oakley Machine Tool Co., Cincinnati, has been incorporated with a capital stock of $40,000 to build machine tools. The company has been operating for six months in Oakley, a suburb. L. E. Voorheis will be the active head of the plant. The incorporators are George Haydock, Joseph L. Lackner, Joseph S. Graydon and L. E. Voorheis.

The Milwaukee Shaper & Transmission Appliance Company has been organized at Milwaukee with a capital stock of $75,000, to engage in the manufacture of machine tools and machinery specialties. The promoters are not ready to divulge their plans in detail.

The Castaluminum Body Company, Detroit, has been incorporated to manufacture car bodies and frames; $100,000 capital stock by Robert F. Byer, W. A. Watts, C. B. Bohn.

The United Electrical Manufacturing Company, Adrian, Mich., has been incorporated with $50,000 capital stock to manufacture electric devices and automobile parts. It has secured a factory and will begin operations at once. The directors include Karl F. Wagner, Walter T. Haley and D B. Hayes.

The National Electric Utilities Corporation, Danbury, Conn., has been incorporated with capital stock of $200,000 to manufacture electrical devices. The incorporators are Arthur E. Tweedy, Leopold Levy, Martin H. Griffing, John McCarthy, Martin R. Abrial, D. Frank Stevens, Charles D. Parks, Frank H. Lee and Charles A. Mallory.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, MAY, 1916. NO. 5.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President.
C. S. J. Trench, Secretary and Treasurer,
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Business Situation and Outlook.

A series of important events has focused attention upon the labor situation, and the attitude of labor is easily the most important factor in the business situation and outlook at this time. The steel industry has an accumulation of business on its books amply sufficient to warrant expectation that it will be called upon to operate at its fullest capacity into 1917, and it has no occasion to concern itself with questions as to when, and at what prices, the next buying movement will occur. It has great occasion to consider whether it will have available the labor necessary to operate at capacity, and whether its customers will be able to operate their shops so as to fabricate, at the expected rate, the steel they have ordered.

The seriousness of the labor situation is not simply that there are strikes and demands for higher wages. Strikes for a definite purpose can at least be settled by granting the demands, and higher wages can be paid if the prices at which manufactured goods are sold justify the payment of such higher wages. The seriousness of the situation lies chiefly in two facts: (1) That men frequently strike without knowing in advance what they are

striking for, hence affording no basis for an immediate settlement, but inflaming their minds and causing unrest in other labor circles; (2) That many of the strikes are directly for the purpose of decreasing the efficiency of the individual. The first tends to make striking chronic, the second tends to reduce the supply of labor when it is already insufficient.

There is a large volume of business on the books of manufacturers in the various industrial pursuits. The business is of the soundest description, provided the war does not end. When it does end there will be a pause and much of the business will have to be readjusted, probably as to delivery and possibly as to price. It is to the interest of industry to fill the orders as rapidly as possible. There is, perhaps, a time limit upon the activity, and every day that is lost in strikes, every per cent. by which the productiveness of the mechanic is decreased, is a loss in this business. Broadly speaking, there is no limit to the business to be done except the physical capacity to do it, but there is a time limit within which the work must be performed.

As soon as the volume of business done in the United States passed beyond its normal it was recognized that readjustments would be necessary after the war. Naturally those readjustments were feared, because men would with one accord be disposed to wait until they were accomplished. Each wage advance that is given under the pressure of present circumstances, each per cent. by which the day's performance of the mechanic is reduced, increases the extent to which readjustment must be made in future, presumably right at the close of the war.

The late thought has been that business was attaining such momentum, and the country was becoming so prosperous, that the readjustments necessary at the close of the war would be run through with easily and quickly. So quickly do circumstances change that these views must be modified by reason of what has during the past month become so apparent with respect to the attitude of labor. The nature of the demands when made, and the fact of men sometimes striking first and formulating demands afterwards, suggest that labor may be entering upon a carouse that will grow in intensity and madness until the foundation upon which our prosperity rests, the fact that we can produce goods, is destroyed.

Apart from the conditions disclosed with respect to labor the developments of the past month have in the main been decidedly favorable. The world of business and the world of finance received with greater calmness than would have been expected the despatch to Germany of what was virtually Washington's ultimatum on the submarine issue. If we are unprepared physically for war, there is reason to infer from what has occurred, or more accurately perhaps from what has not occurred, that we are mentally prepared for anything that may develop in our international relations.

In the kaleidoscopic changes that occur in the conditions and developments that confront the business man sight is lost of the fact that hitherto the quadrennial "presidential year" has been regarded as more or less inimical to business. If American business had nothing to contend with except the fact that six months hence the people are to choose their chief magistrate and most of their representatives in Congress it would have very plain sailing indeed. American business is not concerned with what may

occur March 4, 1917, but with the many things that are to occur in the ten months we must first live through.

The steel market may now be said to have found its position, even though the steel trade is confronted with the very serious problems already referred to, whether it will have the labor to produce, and its customers the labor to fabricate or consume, the steel that has been bought. As to the market, it has become inactive as to the far forward deliveries the mills could compass conveniently, sellers and buyers being alike indifferent. The task is to fill the business already on books and that task would be a great one even under conditions universally favorable. The earnings assured if the orders can be filled in due course are such that the future can well be left to itself. While the heavy buying is over for the time being there is always business drifting in from buyers who could not foresee their wants, and this business tends to strengthen the situation further. Steel has not become more plentiful but rather has grown scarcer, and that despite the fact that the productive capacity has been slightly increased and the old units are almost continually breaking their tonnage records.

Prices for steel products for far forward delivery, shipment practically at mill convenience, showed a slight stiffening tendency in April, while the premiums for early delivery, charged by the small mills that do not fill up far ahead, have increased.

The metals as a whole showed little gain or loss in price during April. Tin, spelter, lead and aluminum showed substantially no change. Copper advanced about 2½ cents, while antimony lost 6½ cents and quicksilver lost no less than one-third of its price. The comparison suggests how little the metal market follows ordinary trade laws at a time when every commodity is the creature of the circumstances immediately surrounding it.

The outlook for business in the United States is good for months to come, the chief disturbing element being labor. Financial affairs are being conservatively managed and has been conducting itself in such a way as neither to encourage a break nor to invite the unloading upon us of foreign held securities at prices we might regret afterwards we had paid.

The more distant future is "in the lap of the gods", but there is an observation that is worth setting down, with respect to the fears entertained of aggressive competition in steel on the part of foreign manufacturers, and that is that the steel companies are amassing huge reserves in liquid capital, reserves against aggressions that foreign manufacturers will have sense enough to fear when they contemplate attempting to make inroads in our domestic markets for steel and coke by-products or upon our legitimate foreign trade.

Business Trends.

THE STOCK MARKET.

Despite periods of depression improvement in values characterized the trading in stocks at the opening of April. Sentiment appeared more cheerful in Wall Street and as a reflection of the better feeling, the general undertone of the market was stronger and the trend of prices was distinctly upward. But it was not long before the initial strength gave way to nervousness and irregularity which in turn was followed by actual weakness. The change in the market's position was ascribed to the strained international relations of the United States and Germany in connection with the Sussex case and also to the unfavorable interpretation placed on reports from Mexico.

The market continued dull and uninteresting until about the middle of the month when a general and sharp decline in values was witnessed, followed by heavy offerings, caused by late news in connection with the Mexican situation, and this nation's controversy with Germany. The market disregarded favorable factors and developments in the domestic field, notably the record-breaking tonnage statement of the U. S. Steel Corporation and as a result the unsettling nature of the foreign situation continue to dominate dealings.

As was generally expected, a substantial improvement set in immediately after the Easter holidays and though more or less irregularity developed as time progressed the advance was resumed as the close of the month drew near. The largest gains were recorded by the industrial issues which had previously showed the widest losses. In the late dealings sentiment appeared more bullish than at the outset of the month. The better feeling was variously attributed to a more confident view with regard to the international political situation, to the accumulating evidence of remarkable earnings and the prospect of further increases in dividends.

The future of the stock market depends almost entirely on the result of the submarine controversy between this country and Germany, and operators are anxiously awaiting to see what course President Wilson will take now that Germany's reply to his ultimatum has been received.

NEW ENTERPRISES IN APRIL.

While the output of charters still continues largely in excess of the early part of 1915, it does not reach the excessive proportions attained during the previous months of the present year. This is indicated in the papers filed for new companies in the principal Eastern States with a capital of $1,000,000 or over for April, which represented a total of $166,650,000. These figures show an increase of about 400% over the total for the same month a year ago. Contrasted with March this year, the returns show a decrease of about 10%. The Hammond Arms Company took out a charter for $25,000,000, but this was an exceptionally large amount. Decidedly the most significant feature of the returns was the fact that virtually all lines of business were represented in the incorporations.

The grand total of all companies with a capital of $100,000 or over, covering all States, including those of the East, amounted to $223,908,900, compared with $77,466,000 in 1915. The March total for this year was $261,627,000.

Following are the comparative figures as specially compiled by the Journal of Commerce and Commercial Bulletin of companies incorporated in the Eastern States during the last three years with an authorized capital of $1,000,000 or more. During the first four months of the year the total corporations of more than a million capital reached nearly $1,000,000,000, against over $200,000,000 last year and $365,000,000 the year before:

	1916.	1915.	1914.
Jan.	$270,995,000	$51,150,000	$120,050,000
Feb.	365,995,300	53,950,000	51,575,000
Mar.	194,750,000	70,050,000	57,700,000
April	166,650,000	32,200,000	136,185,000
Totals	$998,390,300	$207,350,000	$365,510,000
May	.....	78,950,000	62,700,000
June	.....	181,247,100	70,050,000
July	.....	71,100,000	68,700,000
Aug.	.....	67,100,000	50,600,000
Sept.	.....	286,625,000	54,800,000
Oct.	.....	208,695,000	35,487,500
Nov.	.....	190,075,000	81,650,000
Dec.	.....	135,125,000	105,450,000
Year	.....	$1,426,267,100	$894,947,500

Business Trends.

FURTHER RISE IN COMMODITY PRICES.

"Bradstreet's" index number of commodity prices for April 1st, works out at $11.755 establishing a new high record and marking the seventh unbroken rise in as many months. It represents a rise of 3.3% over March 1st, of 20.2% over April 1, 1915, and of 34.2% over corresponding time in 1914.

In citing the influences that have forced commodity prices up to their present high level 'Bradstreet's' says in part as follows:

"Barring slight reactions, which have been of the character of barely perceptible eddies in a steadily widening stream, the movement of commodity prices has been upward since the European war broke out —a war that has thrown inordinate demands into our markets, while keeping oversea products from coming here.

* * *

"Domestic developments have been accentuated by widespread prosperity, which has caused merchants to divorce themselves from a long practiced policy of buying frequently but in small lots on each occasion, and the reaction in the opposite direction has superinduced demands that considerably exceed floating supplies. There exists the fear that supplies may become still scarcer, that prices may go even higher, and with such factors prevailing, price is not being considered. Indeed, the situation has got around to the point where numerous commodities are marked by what are usually designated runaway conditions, with goods virtually selling themselves, as it were, and with some manufacturers evincing a disposition to jack up prices to stay insistent demands. Indeed, the more prudent are questioning whether prices on many commodities have not gone high enough, and whether there has not been more or less overbuying."

COMMERCIAL FAILURES SHOW FALLING OFF.

Not since last August have there been so few business reverses in the United States as during April, insolvencies in that period, as reported to R. G. Dun & Company, numbering 1,399 and supplying aggregate debts of $18,382,637. These figures do not include a real estate investments default in New York, involving upward of $24,500,000, as this cannot properly be classed as strictly commercial.

Last month's record compares with 1,690 failures for $16,885,295 in March; 1,688 in February for $18,744,165, and 2,009 in January, when the amount owed was $25,863,286. In April, a year ago, 2,063 firms suspended and the liabilities of these, as a result of several bankrupticies of unusual size, were $43,517,870. Moreover, the present indebtedness is less than in 1914 and 1913, while the number of insolvencies shows a comparatively small increase over those years.

Prosperity, according to "Bradstreet's", made a decided step forward during April, judging by the returns of failures and liabilities in that month. There were less failures in April than during any month since the war began, while the liabilities were the smallest since May, 1912, and the lightest for any April since 1907. There were 1,262 failures reported during April this year, a decrease of 22% from March and of 24.6% from April a year ago.

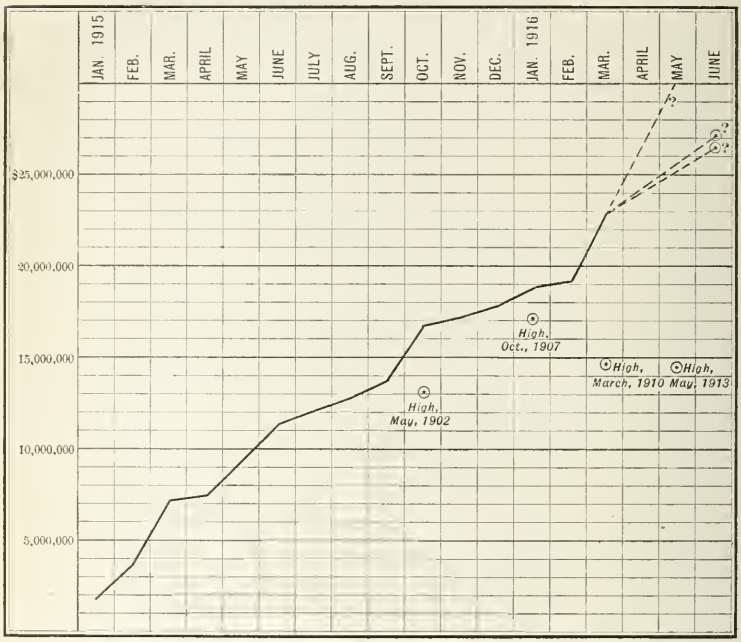
IRON PRODUCTION SLOWS UP.

April pig iron production, according to the "Iron Age", fell off enough to show the strain blast furnaces are under to keep near a 40,000,000-ton rate. The total for the 30 days was 3,227,768 tons, or 107,592 tons a day, against 3,337,691 tons in March, or 107,667 tons a day. Poor working of a number of furnaces tells the story of thinning linings that must soon be renewed.

The daily average production of coke and anthracite pig iron in the United States by months since January, 1913, is given as follows by the "Iron Age."

	1913.	1914.	1915.	1916.
January ..	90,172	60,808	51,659	102,746
February .	92,369	67,453	59,813	106,456
March ...	89,147	75,738	66,575	107,667
April	91,759	75,665	70,550	107,592
May	91,039	67,506	73,015	.....
June	87,619	63,916	79,361	.....
July	82,601	63,150	82,691	.....
August ...	82,057	64,363	89,666	.....
September	83,531	62,753	95,085	.....
October ..	82,133	57,316	100,822	.....
November	74,453	50,611	101,244	.....
December.	63,987	48,896	103,333	.....

The Rise in Steel Corporation Earnings.



The phenomenal rise in the monthly earnings of the United States Steel Corporation is graphically represented above. The earnings in January, 1915, where the diagram starts, were the lowest on record. Beginning with December last the monthly earnings began making successive new high records.

From the organization of the Steel Corporation there have been four great movements in the steel market, and the earnings in the record high month for each movement are plotted in the diagram. The high month in each movement is shown below, with the month's earnings:

May, 1902	$13,120,930
October, 1907	17,052,211
March, 1910	14,684,001
May, 1913	14,554,566

It is interesting to note that in each of the last three movements the high point in steel earnings was reached considerably after the market activity had subsided, or in other words months after the price advances had ceased. In the first movement the case was different. While the largest earnings were in May, 1902, the largest production fell just a year later. The reason earnings did not correspondingly increase was that the 1902 movement had a legacy of some old high prices in certain finished products, which yielded under real competition at a time when tonnage demand was good.

The increase in the Steel Corporation's earnings since the beginning of last year is certainly a remarkable one and the increase is emphasized by the fact that the start was made from record low earnings,

in January, 1915. The monthly earnings, plotted on preceding page, are as follows:

January, 1915	$1,687,150
February	3,638,578
March	7,132,081
April	7,286,409
May	9,320,576
June	11,343,070
July	12,048,218
August	12,869,099
September	13,793,327
October	16,563,854
November	16,990,968
December	17,722,682
January, 1915	18,794,912
February	19,190,396
March	22,728,316

In the diagram shown we have ventured to plot with broken lines three of the various possible courses the earnings may pursue during the present quarter. The greatest increase plotted is taken by prolonging the line from February to March, which is excessive according to the absolutely known conditions as February had two working days less than March. The next plot is by prolonging the straight line that could be drawn joining the earnings of January, 1915, with those of March, 1916. The third is plotted by using March, 1916, as the pivotal point and allowing the ruler to touch the highest point in the curve preceding.

It might be suggested that allowance should be made, as to earnings in the current quarter, for the wage advance becoming effective May 1st, and involving a cost doubtless exceeding $1,000,000 a month. Such a point would be well taken, yet it is well to observe that the advance of February 1st, fully as large, if not larger, was quickly absorbed. The February earnings showed but a slight increase over those of January, but March showed a tremendous gain. If the ruler be laid so as to touch the earnings of January, before the advance, and those of March, after the advance, it will be seen to have a greater inclination upwards than the curve as a whole.

Steel Corporation Earnings.

Remarkable Record Already With Higher Earnings in Prospect—Reserve Being Accumulated.

Steel Corporation earnings in December broke the previous record for a month while the monthly earnings in the first quarter of this year show progressive increases. Last year was a noteworthy one in Steel Corporation earnings, January being the lowest month on record and December the highest. Elsewhere in this issue there is given the quarterly statement just issued, and there is also a diagram showing the monthly earnings since the beginning of 1915, the diagram depicting also the high months in the previous movements.

With existing trade conditions very large earnings for the Steel Corporation are to be expected. Its annual earnings have ranged from $71,663,615 in 1914 to $160,964,000 in 1907. If it had not been for the slump in the last two months of 1907 the year's earnings would have been about $180,000,000. In the 12 consecutive months ended October, 1907, the earnings were $172,000,000, and that may be taken as the corporation's real record for a year, reflecting the market conditions and the capacity of that period.

Starting with $172,000,000 a year earnings in 1907 conditions, the Steel Corporation has to-day a productive capacity fully one-third larger, and the average market for finished steel products, delivery at mill convenience, is fully $13 a net ton higher than the top prices of 1907. Very large earnings are therefore to be expected. The earnings in any month in the present movement are simply a function of the progress the corporation makes in working off old and low priced business and entering upon the filling of newer and higher priced orders. We estimate roughly that with production at capacity, the corporation would earn about $25 000,000 per quarter, if the material were priced at the low level obtaining in 1914, and $100,000,000 per quarter if the material were all priced at the steel prices now ruling for delivery at mill convenience.

The earnings in March, $22,728,316, were $5,000,000 in excess of the earnings in December, although a wage advance was absorbed, the wage advance becoming effective

February 1st and costing nearly, if not quite, $1,500,000 a month. Another wage advance is to be absorbed, effective May 1st, and costing doubtless fully $1,000,000 a month. A similar $5,000,000 gain upon the March earnings would place those in June at $28,000,000, or at the rate of $84,000,000 a quarter, to be compared with the roughly assigned limits of $25,000,000 and $100,000,000 per quarter mentioned above, according to invoice prices.

It may be fairly assumed that at this time the Steel Corporation is doing little but piling up reserves against what may occur in future. The current earnings are to be regarded simply as earnings, not as establishing a rate of earnings. What the earnings may be after the present congestion of business is worked off is a question no one has either the time or the skill to study. There is a large construction program being worked upon, but it is impossible to place equipment contracts or hire men in such volume as to absorb more than a small fraction of the surplus earnings. If the corporation establishes a defense fund that will, when the war is over, command the respect and the fear of possible foreign competitors, with respect to our domestic and the foreign markets it will be a good thing for the corporation and the other domestic producers, as well as for the country itself.

The Functions of Speculation.

It is time that some action was taken to dispel the ignorance which prevails in regard to the function of speculation in the markets of the world, and if possible to disabuse the mind of the public of a preconceived idea that speculation is necessarily and always an evil thing, tending to the exaggeration of prices and the robbery of the people. There is also urgent need to enlighten the minds of those of our pastors and masters in England who have recently shown such conspicuous inability to understand commercial platitudes.

As a matter of fact, speculation, in some form or other, enters into almost all commercial activities, and into many industrial activities. There can, for instance, be no more doubtful operation than that of the agriculturist who plants wheat or cotton in the spring of the year, and yet one is never taught to believe that this man is a "wicked speculator." One would shock the conscience of the world by the mere suggestion of such an idea; but in what essential so far as the speculative element is concerned, does his action differ from that of the man who buys iron or copper in the spring because he thinks it cheap, with the view of working it off upon manufacturers at a profit during the summer or autumn? There is in truth very little ordinary business possible in the world which does not include some form of speculation; some more or less intelligent anticipation of what is likely to happen in the future. So much may be said in reprobation of the prevalent notion that speculation is necessarily an evil which must be extirpated.

The belief, now so common, in the evil effects of speculation, has resulted from certain kinds of speculation which are generally known as "corners," in which an attempt is made by one wealthy man, or a group or syndicate of wealthy men, to control a certain market by seizing all available supplies and compelling the consumer to pay extravagant prices, and it may perhaps be admitted that speculation so employed is objectionable, although to the commercial expert it is obvious that, even in this case, there are compensating elements. It must, however, be pointed out that "corners" are a comparatively rare outcome of the speculative spirit; and what is more important, they generally result in enormous losses which fall upon those instrumental in getting them up. There was a great corner in wheat some years ago in America, which caused temporary inconvenience, but ended in the utter dissipation of the big fortune of the operator, to the general advantage of the community. There was also a corner in copper, associated with a big Paris bank, which ended in the complete ruin of many concerned in it, and enabled all consumers of copper throughout the world to obtain their metal upon exceptionally favorable terms for years afterwards. Did these two typical "corners" really inflict injury upon the community at large? One is inclined to doubt it, and to believe that on the other

hand the community benefited; but in any case, the operators were severely punished. Other similar historical occurrences might be adduced. There was, for instance, a few years ago, an attempt to corner cotton oil, but enough has been done to show that corners are not only infrequent but most often disastrous to those who get them up, and this latter circumstance is a sufficient protection against the abuse of speculation.

There are two main uses for a speculative market in all the staples of commerce; first that there may be a guiding influence which prevents too great fluctuations either upward or downward (acting much in the same way as the fly-wheel of a great engine), protecting consumers from the unchecked propensity on the part of manufacturers to obtain the highest possible prices; or helping these same manufacturers when the pressure or difficulty would drive prices down too far; and secondly, that there may be a means of buying at a close market, price securities which will move with the commodity market, thus covering engagements which could not otherwise be covered at all. We do not know whether this statement is quite clear without an illustration. Let it be supposed that a manufacturer, say of waterproof sheets, enters into a contract which will involve the use of 50 tons of linseed oil next December. It is improbable that any mill will sell him this oil, but he can go into the speculative market and buy it at a price, and, indeed, can ascertain what he will have to pay for it as a basis for his contract. In this case the speculative market is used distinctively to enable a trader to avoid taking undue risks, or in other words, to keep him from the necessity of speculating in the ordinary course of his business. We have no space to pursue the subject further, but probably enough has been said to arouse attention, and to show that any attempt on the part of the Government to stop speculation will be unfortunate; first, because it must check business by taking away the means by which forward transactions can be safeguarded; and, secondly, because it will remove a valuable market control and enable manufacturers and producers to obtain higher prices and larger profits from the community. The British Government recently issued an edict to stop speculation in metals, and, of course, as a result the prices have risen considerably. We have not seen the final issue, but the chances are that the closing of the London speculative market in copper will throw the whole control of the metal into the hands of the Americans, who will know how to make us pay for copper just as they have known how to make us pay for spelter. Anything more futile, indeed, than the official attitude towards the metal trades is hardly conceivable.

Rail Production Statistics.

The statistics of rail production in 1915 as gathered by the American Iron and Steel Institute are given elsewhere. The output of all classes of rails, including renewed and rerolled rails, was 2,204,203 gross tons, the smallest for any year since 1898 barring 1908 and 1914. The production was only a trifle more than half that of 1906, which has now held the record for nine years and may possibly hold it for another nine.

The statistics are gathered in such detail that with the aid of a little other information we are able to make an approximate statement of the uses to which rails were put in 1915, as follows:

Industrial purposes:	
Light rails	250,000
Standard sections	25,000
Electric lines:	
Chiefly girder and high T rails	150,000
Steam roads:	
New track	150,000
Renewals	1,315,000
Exports	390,000
Total	2,280,000

The total given here is 75,000 tons above the production reported, this being due to our estimates finding place for the 78,525 tons of rails imported last year.

The figures in the above table are all practically normal, with the exception of the consumption of rails for new steam track. This item was extremely light, as was shown at the first of the year by the statistics of track laying compiled by the

Railway Age Gazette. There have been years in which ten times as much such work has been done. Whether there will be such years in the future is a question.

There is no reason to suppose that this year's production of rails will materially exceed that of last year. In this respect the present extremely heavy demand for steel is peculiar. The remarkable scarcity of steel in 1899 is recalled, and 1899 did something the 11 preceding years had failed to do; it broke the rail production record made in 1887. The crest of the 1905-6-7 movement fell in 1906, and that year showed heavy rail production, making a record that has stood to date. In 1909-10 there was much heavier production of pig iron and steel than in 1908, and in 1912-13 there was much heavier production than in 1911, and in each case there was a large increase in the production of rails. In this steel demand rails do not take a prominent place.

The production of Bessemer rails in 1915 was 326,952 tons, or 3,000 tons more than the production in 1914. The 326,952 tons of Bessemer rails stood against 1,775,168 tons of open-hearth, there being besides these two classifications 102,083 tons of rails rolled from old rails, which of course could not be classified as to Bessemer or open-hearth. One need go back only to 1907 to find the proportions reversed, there being in that year 252,704 tons of open-hearth rails and 3,380,025 tons of Bessemer. The Bessemer rails rolled in 1915 were chiefly light rails, with a sprinkling of medium weight sections. Of the 688,995 tons of rails 100-pound and over barely one per cent. was Bessemer.

Spelter Production Statistics For 1915.

The spelter statistics issued by the United States Geological Survey and compiled by Mr. C. E. Siebenthal, show that the production of primary spelter in the United States in 1915 amounted to 489,519 tons, valued at $121,401,000 as compared with 353,049 tons, valued at $36,011,000 in 1914. The increase on a tonnage basis was 136,470 tons, or 39%, but the increase in the value was no less than 237%. The production according to the locality in which smelted is shown in the following table:

	1913.	1914.	1915.
Illinois	106,654	127,946	159,958
Kansas	74,106	44,510	100,983
Oklahoma	83,214	91,367	109,208
Other States	82,702	89,226	118,930
Total	346,676	353,049	489,519

The production according to source of ore was as follows:

	1913.	1914.	1915.
Domestic	337,252	343,418	458,135
Foreign:			
Canada	1,424	4,538	5,103
Mexico	6,205	5,093	13,943
Europe	1,175	.....	1,073
Asia	620	.....	1,030
Australia	.....	.....	10,235
Total foreign	9,424	9,631	31,384
Total	346,676	353,049	489,519

The consumption of primary spelter in 1915 amounted to 364,382 tons, as against 299,125 tons in 1914, an increase of 65,257 tons, or 22%. The apparent consumption for the past ten years is given below:

	Tons.		Tons.
1906	220,781	1911	280,059
1907	226,969	1912	340,341
1908	214,167	1913	295,370
1909	270,730	1914	299,125
1910	245,884	1915	364,382

There was also a very large increase in the exports of spelter. The exports of domestic metal amounted to 117,796 tons, or nearly double that of the year before.

There was very little zinc ore exported but the importation of zinc ore increased five times what they were in 1914. The exports and imports are shown in the following table:

	Imports.	Exports.
1907	103,117	20,352
1908	53,757	26,108
1909	114,850	12,455
1910	72,626	19,711
1911	39,116	18,281
1912	43,940	23,349
1913	31,416	17,713
1914	31,962	11,110
1915	158,852	832

Regarding the large increase in the zinc smelting capacity Mr. Siebenthal says as follows:

The number of retorts at zinc smelters has been greatly enlarged in the last year as compared with the year before, increasing from 111,458 at the end of 1913 to 115,114 at the close of 1914, to 130,642 at the middle of 1915, and to 156,658 at the close of 1915. At the beginning of 1916 there was under construction or contemplated additional capacity amounting to 26,992 retorts, which has now been increased to 49,612. When these are completed the total number of retorts will be 206,270 capable of an annual yield under average conditions of approximately four tons each, equal to a total of 825,000 tons, if we neglect the number of retorts employed in refining prime western spelter by redistillation. To this capacity will be added the capacity of the electrolytic zinc plants listed above, over 60,000 tons a year, giving a capacity for the country of about 885,000 tons annually. As if this were not enough, there are reports of still other zinc smelters to be built in Illinois, Missouri, Arkansas, and Oklahoma.

The abnormal demand for high-grade spelter at present has resulted in the employment of a considerable proportion of the retort capacity of the country in the redistillation of prime western spelter to improve its grade, but with the resumption of normal conditions these retorts, if operated, will necessarily be put back upon ore. This prodiction is rendered certain by the growth in number and size of the plants producing spelter by electrolytic deposition, a list which is given above. Electrolytic spelter is of high grade, and the recovery is high compared with the production of high-grade spelter by two distillations. The output of electrolytic zinc in the United States in 1915, the initial year of its production, was only 252 tons, but the production is rapidly increasing and by the end of 1916 will undoubtedly reach the rate of over 60,000 tons a year, which, with the output of high-grade spelter from lead-free zinc ores of the Eastern States will be ample to supply the demands for high-grade spelter in ordinary times, thus releasing for ore smelting the retorts engaged in redistilling prime western spelter.

At the close of 1916 the spelter-producing capacity of the country, taking into account the capacity for primary spelter listed above, the output of secondary spelter by the large special retorts, and the output of remelted spelter, will apparently be considerably more than 900,000 tons, or nearly three times the probable domestic demands. The world's consumption of spelter in 1913 was 1,102,456 short tons. It requires no particular insight to recognize that the end of the war, except for a single contingency, will bring about the sudden extinction of a large number of the less advantageously situated smelters. That contingency, which would perhaps justify this abnormal smelting capacity, is the conclusion of arrangements by which in the future practically the whole of the Australian zinc output would be smelted in the United States. In such an event it would seem that smelters fired with producer gas and situated on the Atlantic seaboard, with adjacent markets for acid, would have the advantage over the inland smelters, which have to pay railroad transportation charges, even if such charges are partly offset by the saving involved in using natural gas for fuel.

Prices and Value.

In the Survey's New Year estimate of the production of spelter in 1915 the value of the output was calculated from the yearly average of the prices quoted in St. Louis for prime western spelter for immediate delivery, and the statement was made that the real value was probably from 10 to 25% higher than the figures given, because a considerable part of the sales represented the better grades—brass special, intermediate, and especially high-grade spelter—all of which commanded premiums, high-grade spelter selling at times for nearly double the quoted price of prime western spelter. This statement immediately brought the comment from producers that because spelter was largely sold for future delivery at 1 to 3 cents a pound less than the prices quoted for immediate delivery, the average price received for all grades was probably under rather than over the average price quoted for immediate delivery. To settle this very interesting question each producer was asked to give the average price at which his output was sold. From these returns, which were received from every producer, the average selling price for 1915 for all grades was determined at 12.4 cents a pound, as compared with 14.2 cents a pound, the average quoted price for prime western spel-

Note: These statistics are in tons of 2,000 lbs.

ter for immediate delivery. It is thus shown as was in fact intimated in the trade journals, that the output of the smelters was generally sold up for two, three, or more months in advance. It is also shown that the real value, instead of being 10 to 25% above the value calculated from the average price quoted, as stated in the New Year estimate, was in fact about 13% below that value.

Explanatory Note.

The figures given in the foregoing tables are based on confidential reports by each zinc-smelting company in operation in the United States. The figures of imports and exports are taken from the records of the Bureau of Foreign and Domestic Commerce of the Department of Commerce, recalculated to short tons, and those for 1915, not having been finally checked, are subject to minor revision. This statement is designed to afford at the earliest practicable date authentic figures of the production of spelter in the United States in 1915. The co-operation of zinc smelters is cordially acknowledged.

By-Product Coke Oven Building.

There are more than 2,100 by-product coke ovens either under actual construction or planned with the idea of construction work being started as soon as possible. It is not likely our list is absolutely complete, but we feel that it is substantially accurate as far as it goes. The last new by-product ovens completed and put in operation were the additional 75 of the Republic, making 141 in the plant. The Lehigh (Bethlehem) Coke Company's addition of 214 ovens, to 214 in operation for some time, is understood to be practically completed though not in absolutely full operation. Starting with it we have the following, roughly arranged in order of probable completion:

Independents.

Lehigh Coke Company.
River Furnace & Dock Company.
Toledo Furnace Company.
United Furnace Company.
Gulf States Steel Company.
Wickwire Steel Company.
Dover By-Products Company.
Inland Steel Company.
La Belle Iron Works.
Brier Hill Steel Company.
Zenith Furnace Company.

Steel Corporation

National Tube Company, Lorain, O.
American Steel & Wire Company, Central Furnaces, Cleveland.
Clairton Steel Company.
Carnegie Steel Company, Ohio works, Youngstown.
Carnegie Steel Company, New Castle works.

The independent by-product ovens make a total of about 1,200, while the Steel Corporation ovens total 965, making a grand total of over 2,100 ovens. It would probably be conservative to estimate the capacity of the total at 7,000,000 tons of coke a year. This is about one-half the maximum output of by-product coke that has thus far been attained, while it is more than one-seventh of the maximum productoin of coke reached, beehive and by-product combined.

Unless unusual construction difficulties intervene it would seem that practically all the by-product plants considered above will be completed and in operative condition a twelvemonth hence. The Lehigh, Youngstown Sheet & Tube and Toledo can all be counted on by about July 1st of this year, together with at least half of the River Furnace & Dock Company's retorts.

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Copper Production Statistics For 1915.

Advance statement issued by the United States Geological Survey and compiled by Mr. B. S. Butler, show that the smelter production of primary copper in the United States in 1915 was 1,388,000,000 pounds, compared with 1,150,000,000 pounds in 1914, an increase of 21%. The total value of the 1915 output at an average price of 17.5 cents a pound is $242,900,000, compared with $152,900,000 for 1914.

In the following table the production for 1915 is apportioned to the States in which the copper was mined. The total is made up of fine copper contents of blister produced and of the smelter output of ingot and anode copper from Michigan. The production of 1913 and 1914 is given for comparison.

Production of Copper in the United States in 1913, 1914 and 1915.

(Smelter output, in pounds fine.)

	1913.	1914.	1915.
Alaska.	23,423,070	24,985,847	70,695,286
Arizona	404,278,809	382,449,922	432,467,690
Cal. ..	32,492,265	29,784,173	37,658,444
Col. ..	9,052,104	7,316,066	7,272,178
Idaho..	8,711,490	5,875,205	6,217,728
Md. ...	.....	12,248	15,426
Mich. .	155,715,286	158,009,748	238,956,410
Mo. ...	576,204	53,519	306,406
Mont. .	285,719,918	236,805,845	268,263,040
Nevada	85,209,536	60,122,904	67,757,322
N. Mex.	50,196,881	64,204,703	62,817,234
N. C. ..	180	19,719	33,383
Oregon	77,812	5,599	797,471
Penn. .	245,337	422,741	.....
Tenn..	19,489,654	18,661,112	18,205,308
Texas .	39,008	34,272	38,971
Utah ..	148,057,450	160,589 660	175,177,695
Ver. ..	5,771	..... .	23,995
Va. ...	46,961	17,753	50,008
Wash..	732,742	683,602	903,661
Wyo. .	362,235	17,082	351,871
Undis..	51,385	65,479	.....
	1,224,484,098	1,150,137,192	1,388,009,527

Refined Copper.

The total production of new refined copper in 1915 was 1,634,000,000 pounds, an increase of 100,000,000 pounds from the output in 1914.

The production of electrolytic, lake, casting, and pig copper from primary sources and the production of secondary copper by the regular refining plants in 1913, 1914, and 1915 is shown in the following table:

Production of Primary and Secondary Copper by the Regular Refining Plants in 1913, 1914, and 1915, in Pounds.

Primary:

	1913.		1914.		1915.	
	Domestic.	Foreign.	Domestic.	Foreign	Domestic	Foreign
Electro. .	1,022,497,601	378,243,869	991,573,073	323,358,205	1,114,345,342	246,498,925
Lake ..	155,715,286	.....	158,009,748	.....	a 236,757,062	.....
Casting.	22,606,040	.....	21,506,325	.....	21,555 129	.....
Pig	36,004,986	.....	39,334,043	.....	15,047,990	.....
Total primary	b1,236,823,913	b378,243,869	b1,210,423,189	b323,358,205	b1,387,705,523	246,498,925
	1.615,067,782		1,533,781,394		1,634.204.448	
Secondary:						
Electrolytic	14,862,577		27,702,928		38,156,789	
Casting	22,360,182		4,224,052		21,417,901	
Total secondary ..	37,222,759		31,926,980		59,574,690	
Total output ...	1.652,290 541		1,565,708,374		1.693,779,138	

a Some Lake copper was refined at seaboard plants and doubtless marketed under some brand other than Lake. This has been excluded from the Lake copper.

b The distribution of refined copper of domestic and foreign origin is only approximate, as an accurate separation at this stage of manufacture is not possible.

In addition to the secondary material treated by the regular refining companies, plants that treated secondary material exclusively produced a total of about 332,700,000 pounds of copper as copper and in brass and other alloys of copper, making a total production of 392,274,000 pounds from secondary sources. Of this total at least 150,000 pounds was produced by remelting clean scrap produced in the process of manufacture of copper and brass articles.

If the output of plants treating purely secondary material is added to the production of the regular refining companies, the contribution from plants in the United States to the world's supply of copper for 1915 is found to be 2,026,000,000 pounds.

In addition to the output of metallic copper the regular refining companies produced bluestone with a copper content of 10,621,000 pounds.

Stocks.

Returns from all producing companies show that the following stocks of electrolytic, lake, casting, and pig copper were on hand at the beginning and end of the year 1915:

Stocks of Refined Copper.

	Pounds
January 1, 1915	173,640,501
January 1, 1916	82,429,666
Decrease during 1915	91,210,835

In addition to the stocks of refined copper, there were reported as at the smelters, in transit to the refineries, and at the refineries, blister copper and material in process of refining to the amount of 274,000,000 pounds on January 1, 1916, compared with 203,000,000 pounds on January 1, 1915.

Consumption.

The apparent consumption of refined new copper in the United States in 1915 was about 1,043,000,000 pounds. In 1914 it was about 620,445,373 pounds. The method employed in determining the quantity of copper retained for domestic consumption is shown in the following table, which does not include stocks of copper held by consumers:

Apparent Domestic Consumption of Refined New Copper in 1912, 1913, 1914, and 1915. in pounds.

Total refinery output of new copper	1,568,104,478	1,615,067,782	1,533,781,394	1,634,204,448
Stock at beginning of year	88,372,195	105,497,683	90,385,402	173,640,501
Total available supply	1,656,476,673	1,720,565,465	1,634,166,796	1,807,844,949
Refined copper exported	a 775,000,658	a 817,911,424	a 840,080,922	a 681,953,301
Stocks at end of year	105,497,683	90,385,402	173,640,501	82,429,666
Total withdrawn from supply	880,498,341	908,296,826	1,013,721,423	764,382,967
Apparent consumption	775,978,332	812,268,639	620,445,373	1,043,461,982

a Exports of pigs, ingots, bars, rods, etc., reported by the Bureau of Foreign and Domestic Commerce.

If to the 1,043,461,982 pounds of new refined copper is added the 392,274,000 pounds of secondary copper and copper in alloys produced during the year, it is found that a total of about 1,435,000,000 pounds of new and old copper was available for domestic consumption.

Note.—A more comprehensive report on the copper industry in 1915 is in preparation and will later be published by the Geological Survey as a part of a general review of the industries of gold, silver, lead, zinc, and copper. The preliminary statement here presented is brought out in advance of the fuller report in answer to a demand for official figures at earliest possible date.

The figures of secondary copper presented here are estimates by Mr. J. P. Dunlop and are subject to revision when complete returns have been compiled.

The figures presented here are smelter and refinery figures and represent the actual recovery, in terms of blister and refined copper from materials treated in 1915. These figures may not exactly correspond with those showing the mine production during the same period, although the variation should not be great. The smelter production and the mine production, representing as they do different steps in the process of producing copper, should not be confused.

The statistics here given have not been available at an earlier date, although estimates of the smelter and refinery production were made January 6, 1916. So far as known at present, no revision of these statistics will be necessary, but any slight reapportionment that final analysis of the figures may require will be made in the complete report.

The War Copper Production.

United States Refineries Producing at Rate of 2,000,000,000 Pounds Per Annum—Indications for 1916 are an Increase Over Three Times Larger than Ever Before.

The Boston News Bureau, one of the leading authorities on copper production, publishes the following interesting resume of the situation existing to-day:

A most extraordinary situation exists in copper. In the face of an unprecedented outpouring of the metal, sales of hundreds of millions of pounds are being made to eager buyers for delivery up to the end of the year at 27½ cents. This is the figure understood to be the price to be paid for the 300,000,000-pound order recently closed with the British government.

On top of all this we have heard of sales of electrolytic for May and June at better than 29 cents. Not in any year since 1873 has copper sold above 26¼ cents.

So spectacular are certain phases of the situation that the Boston News Bureau has compiled some highly interesting figures of probable output for the current year. The results are striking. It finds that if the present rate of output is maintained our refinery production for the twelve months of 1916 will for the first time exceed 2,000,000,000 pounds.

Where the Increase is Coming From.

We estimate the total at 2,096,875,000 pounds, an increase of 449,875,000 pounds over 1915, or 27%. It is important to note, however, that five producers will be responsible for 78% of this increase, as follows:

	Lbs. increase.
Kennecott (Including Braden)	105,000,000
Inspiration	80,000,000
Chile Copper	67,000,000
Anaconda	60,800,000
Greene-Cananea	38,500,000

Never before in the history of the industry has the increase in any one year exceeded 150,000,000 pounds.

The copper producers would seem to be assured of a gross business this year of at least $524,000,000 and this assumes an average price of only 25 cents per pound. If an average of 27 cents is received, the producers stand to sell their product for $565,920,000. Such is the boon conferred by the European war. The full gross value of $288,220,000 for the 1915 production and $205,066,000 for the 1914 period Tabulated, the gross value of the estimated output of 1916 and that of the two preceding years is as follows:

Year.	Production lbs.	Av. selling price.	Gr. value.
1916	2,096,875,000	27c	$565,920,000
1915	1,647,000,000	17½	288,220,000
1914	1,533,781,000	13⅜	205,066,500

In arriving at the output for 1916—and the figures include importations from Canada, Mexico and South America—we have prepared the following table of 27 active producers which sets forth the probabilities for the current twelve months, contrasted with the actual production of 1915. The figures for 1916 embrace all but 249,000,000 pounds of miscellaneous output which is not classified and against this miscellaneous output we have reckoned no increase over 1915 in order to compensate for any possible excess estimates for the 27 producers enumerated.

The Total Refinery Output Compared.

Combining the figures into concrete totals, we find that the refinery output for the current year will, as above estimated, amount to over 2,000,000,000 pounds. These figures cover total refinery output, including all the product refined in this country from both domestic and foreign ores. It will be seen by a little figuring that we are turning out to-day 175,000 000 pounds of copper per month and yet the supply seems unequal to the demand. Refinery figures compare:

	Output.	Increase.
1916 (est.)	2,096,875,000	449,875,000
1915	1,647,000,000	113,219,000
1914	1,533,781,000	*88,669,829
1913	1,622,450,829	40,530,542
1912	1,581,920,287	149,981,949
1911	1,431,938,338	*20,183,782
1910	1,452,122,120	46,719,064
1909	1,405,403,056	.....

* Decrease.

Comment is unnecessary. The figures speak for themselves. Nothing approaching the 1916 totals was ever before dreamed of.

Carrying the calculation a step further and analyzing the copper situation from a

world viewpoint, we find that allowing for an arbitrary increase of 10% in the output of the world other than that refined in this country—and this is a liberal estimate—the United States will this year send forth from her refineries no less than 79% of the world's output. So rapid has been our expanding production that we should this year produce more than did the whole world only five years ago.

The following percentages are illuminating (in pounds):

	World output.	U. S. output.	% of U. S. to world.
1916 (est)	2,692,094,292	2 096,875,000	79
1915	2,225,237,032	1,647,000,000	74
1914	2,161,522,076	1,533,781,000	71
1913	2,198,732,480	1,622,450,829	74
1912	2,259,100,480	1,581,920,287	70
1911	1,954,955,520	1,431,928,338	73
1910	1,903,296,640	1,452,122,120	76
1909	1,874,588,800	1,405,403,056	75

The production of copper, other than on the North American continent, has remained practically stationary during the past five years. No discoveries of new fields in the eastern hemisphere have come forward to help out the older producers.

The United States clearly dominates the great copper industry, so essential in man's constructive and destructive effort. Great as have been our achievements in the past, the year 1916 will far surpass all that has gone before.

Twenty-seven Active Producers.

The table referred to on the previous page and which is self explanatory, is appended (in pounds):

	1916 (est.)	1915.	Inc.	% inc.
Anaconda	290,000,000	229,200,000	60,800,000	26.5
Allouez	11,000,000	10,044,000	956,000	9.5
Ahmeek	25,000,000	21,800,000	3,200,000	14.7
Calumet & Hecla	75,000,000	71 000,000	4,000,000	5.6
Calumet & Arizona	72,000,000	65,268,000	6,732,000	10.3
Chile	85,000,000	18,000,000	67,000,000	372.2
Chino	70,000,000	64,887,000	5,113,000	7.6
Cerro de Pasco	72,000,000	60,000,000	12.000,000	20.
Copper Range	54,000,000	53,739,000	261,000	.5
Granby	48,000,000	38,000,000	10,000,000	26.3
Greene-Cananea	55,000,000	16,500,000	38,500,000	233.3
Inspiration	100,000,000	20,000,000	80,000,000	400.
Kennecott	*180,000,000	*75,000,000	105,000,000	140.
Miami	50,000,000	41,907,000	8,093,000	19.3
Mohawk	16,000,000	15,883,000	117,000	.7
Nevada Consolidated	70,000,000	62,727,000	7,273,000	11.6
North Butte	22,000,000	19,235,000	2,765,000	14.4
Old Dominion	32,000,000	27,736,000	4,264,000	15.4
Osceola	20,000,000	19,731,000	269,000	1.4
Phelps-Dodge	145,000,000	140,500,000	4,500,000	3.2
Quincy	23,000,000	22,055,000	945,000	4.3
Ray Consolidated	65,000,000	60,339,000	4,661,000	7.7
Shattuck Arizona	17,000,000	11,154,000	5,846,000	52.4
Tennessee Copper	12,000,000	12,000,000	.....	....
Utah Copper	160,000,000	148,397,000	11,603,000	7.9
United Verde	50,000,000	45,100,000	4,900,000	10.9
United States Smelting	28,000,000	26,923,000	1,077,000	4.0
Total	1,847,000,000	1,397,125,000	449,875,000	32.2

* Including Braden Copper Co. in both years.

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Topical Talks On Iron.

XXXVI. Steam Engines.

The first important adoption of the large gas engine in blast furnace and steel works practice in the United States was by the Lackawanna Steel Company, which in 1903-4 completed a very large plant at Buffalo. There were eight Koerting gas engines of 100 h. p. each, driving dynamos, and two plants of blast furnace blowing engines, each comprising eight Koerting gas engines of 2,000 h. p. each. Soon afterwards the steam turbine for producing current and the direct coupled motor for driving rolling mills came into vogue. In very recent years one has heard nothing of steam engines but a great deal of gas engines, turbines and electric motors in connection with blowing blast furnaces and driving blooming and other large mills. The impression created is that there has been in very recent years a sudden shift, and it seems well to devote one of these "Topical Talks" to the subject, to point out that the gas engine and turbine are not so extremely new, only their quite general adoption being new, while even in relatively recent years there has been great development in steam engines. We mention therefore some typical new steam engines that have been brought out within a dozen years or so, to illustrate the fact that the steam engine has been developing in relatively recent times, and since the first appearance of the gas engine and steam turbine.

In 1903 Westinghouse built three blast furnace blowing engines for the South Chicago Furnace Company and a similar battery for the Toledo Furnace Company. The middle engine was low pressure, the two outside engines being high pressure, with a receiver between the high and low pressure engines, only one of the high pressure engines operating at a time, while the low pressure engine was arranged to run on high pressure steam upon occasion, through a reducing valve. The engines were to run condensing or non-condensing as desired. Each engine was calculated to furnish 2,000 h.p.

While the Corliss engine had found its way into many steel rolling mills a dozen years ago the tandem compound engine with piston valve steam distribution was regarded as thoroughly modern and of this type, made by Tod, there were among others the following recent installations: 18 and 32 by 36 inch at Monterey, Mexico; 24 and 44 by 48 inch at several mills in Youngstown, and 42 and 76 by 60 inch at the Jones & Laughlin works, Pittsburgh.

In 1905 Mesta built the first Corliss engine intended for rail mill drive. This was a 44 and 72 by 60 inch Corliss compound, the high pressure cylinder being horizontal and the low pressure vertical. With 150 pounds steam pressure at the throttle and 85 revolutions the engine indicated 6500 h. p. with cut off at one-half stroke, and 10,000 h.p. with cut off at eight-tenths, the maximum.

When the Youngstown Sheet & Tube Company built its Bessemer steel plant, completed about August, 1906, there was selected for blowing a Tod cross compound engine, 44 and 84 by 72 inch, and for driving the reversing blooming mill a Tod twin cylinder, 54 by 66 inch.

In 1907, owing to a 45 by 72 inch twin reversing engine, only a few years old, having proved too light for driving the three-high blooming mill at Carnegie's Ohio works, Youngstown, there was installed a very large Tod tandem compound Corliss, 52 and 90 by 60 inch. This engine was designed to furnish a remarkable range of power, for while it was to develop 8,000 h. p. at its regular rate a 250,000-pound flywheel was provided to deliver a much greater power momentarily for the first passes of the ingot. The range of cut off was from nothing to full stroke.

What was then built, and probably still is, the most powerful steam engine in the world, was made in 1907 by Allis Chalmers for Carnegie's South Sharon reversing mill. The engine was rated at 25,000 h. p. and weighs 550 tons without foundation plates, and no flywheel. It is a horizontal twin tandem compound condensing, with cylinders 42 and 70 by 54 inch, designed for 175 pounds steam pressure and speed up to 200 revolutions. The reversing mechanism and the valves are operated by auxiliary engines.

In 1909 there was installed at the Clairton beam mill an engine with new and improved valve mechanism, a Hamilton-Cor-

liss compound condensing, 42 and 78 by 60 inch, weighing 400 tons.

The engines noted above were all at the time of their installation strictly modern, involving important new features, and showing that for years after the first installations of gas engines, turbines and rolling mill motors the steam engine made important progress. The adoption of the newer drives is now proceeding rapidly, but the first installations occurred while the steam engine was being developed and improved in an important way. There is no doubt that the steam engine for blowing blast furnaces and driving heavy mills made more progress in the ten years from 1900 to 1910 than it had made in any period of 20 years previously. Formerly a great many works kept their machinery until it was worn out, and there was much less incentive for the machinery builders to develop new anl better types. As an instance it may be noted that when in 1901-2 the Lackawanna Iron & Steel Company abandoned and dismantled its large steel plant at Scranton, Pa., preparatory to starting a new and larger plant at Buffalo, there were in operation at the plant engines with one foundation for the cylinder and separate foundations for the shaft.

Steel Plants.

VI. The Minnesota Steel Company.

By far the most flexible of the United States Steel Corporation's plants, considering its size, is the one practically completed early this year near Duluth, Minn., and operated by its subsidiary the Minnesota Steel Company. The site selected is far removed from the great centers of steel production and it was desirable to make as large a range of products as consistent with economical operation. The plant, however, is much larger than was originally contemplated. The project was undertaken at the time it was largely as a matter of policy. The people of Minnesota had become quite restless over the fact that such a large tonnage of iron ore was annually shipped from their state and schemes of taxation were proposed that would have been quite onerous, the favorite proposition being one to place a tax of five cents on each ton of ore mined, quite irrespective of the fact that the ore in the ground had been brought to the basis of a heavy annual tax as realty. A peculiar feature of the tonnage tax proposition, by the way, was that it would increase the taxes of the Steel Corporation much less than the taxes of many of the independents, for the reason that the Steel Corporation had larger reserves for the future, against which it was already paying the realty tax. The Corporation's plans for building a steel plant in the northwest were hastened by the attitude of the people.

The original plans for the Minnesota steel plant as conceived in 1906 involved an expenditure of about $6,000,000. The plans have from time to time been materially enlarged. There is no official statement on record of the expenditures on the plant prior to 1910, but the expenditures since then are as follows, from the annual reports:

1910	$1,715,518
1911	1,323,570
1912	2,676,066
1913	5,912,027
1914	4,094,364
1915	2,541,698
Total	$18,263,243

Thus the plant is likely to have cost about $20,000,000 when entirely completed along the present line, there having been some construction expenditures since the beginning of this year, as well as some expenditures prior to 1910. Nevertheless it is rather a small plant, as steel plants go. The work begun in 1907 was chiefly in clearing ground and establishing railroad connections. In 1912 active work on building the plant was begun. A great many houses for employes have been built, and the establishment of adequate railroad facilities cost money, so that the expenditure has not been on the steel plant alone.

The plant includes the following: 90 by-product coke ovens, producing 1,000 tons of coke daily; two blast furnaces, 20½ by 89 feet, 500 tons of pig iron each per day; 10 open-hearth furnaces of 75 tons capacity

each, seven having been completed at the end of 1915; 40-inch two-high reversing blooming mill, driven by a 40 and 66 by 60 inch twin tandem reversing steam engine, developing 6,000 h. p. at 88 revolutions and taking ingots 22x26x77 inches; 28-inch mill producing rails and large channels, beams, angles, flats, rounds and squares; 18-inch mill producing light rails and lighter beams, channels, flats, rounds, square and angle splice bars; 16, 12, 10 and 8-inch mill, producing a full complement of bar sections and sizes.

The capacity of the plant is stated to be about 360,000 tons of finished products a year.

U. S. Foreign Trade Greatest in History of the Country.

The preliminary returns made public by the Bureau of Foreign and Domestic Commerce for the month of March and for nine months of the fiscal year exhibit in a striking way the abnormal condition of our foreign trade at the present time. Approximately $410,000,000 worth of goods was exported from the United States during March, exceeding the corrected total for February by $7,000,000 and representing more goods than any other nation ever exported before in any one month. It was $113,000,000 more than the like period of 1915 and is nearly double the March average for the preceding five years. In the nine months ending with March exports fell less than $5,000,000 short of $3,000,000,000, thus exceeding by more than $1,000,000,000 the record for the corresponding period of any preceding fiscal year.

March imports amounted to $214,000,000, exceeding by $20,000,000 the previous record of February, by $56,000,000 the total for March, 1915, and by 50% the March average for the preceding five years. Nine months' imports to March 31st last aggregated $1,505,000,000, compared with $1,214,000,000 last year, and $1,402,000,000 in 1912-13, the former record year. On March imports 67.8% entered free of duty.

The month's export balance was $196,000,000, compared with $139,000,000 in March, 1915, and $5,000,000 in March, 1914. For the nine months the present fiscal year to date shows an export balance of $1,491,000,000, being more than double that of last year and more than three times that of two years ago. Present indications point to an export balance of $2,000,000,000 by the end of the fiscal year.

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The Iron and Steel Situation.

A month ago our review noted "The viewpoint from which the iron and steel situation must be studied has changed." It has changed again. Then the chief point was that the steel market was bought and sold practically to a standstill. The course of the steel trade for as many months ahead as one could normally expect to look was established by the volume of business on books, for that business, plus such as would naturally drift in even during the usual spell between great buying movements, would call upon the mills to operate at capacity not only through this year but into 1917.

Labor the Dominant Trade Factor.

Now the point of chief interest is different. The question of labor supply has arisen, and that is a double question, whether the number of men, both in the producing and in the consuming industries will be sufficient, if they worked at former rates, and whether the men individually will in future be willing to do the same day's work as formerly. In a monthly review it is not well to attempt to go into details, but in general it may be observed that the supply of men is not fully adequate, and the men in both the steel producing and the steel consuming industries are showing a disposition to strike, chiefly for shorter hours.

Thus the quantity of work that will be done in the next six months is in doubt The effect on the steel market cannot be predicted. One does not know whether the serious labor troubles that have started, and the more serious troubles that may come, will affect the ability to produce or the ability to consume in the greater measure.

After the War Readjustments Serious.

One thing, however, can be predicted with certainty, and that is that the readjustments through which the iron and steel industry as a whole, producers and consumers, must pass at the close of the war will be much more important than would have been expected 60 days ago. Business is being conducted, and will be conducted for months, under hot house culture and the plants will not be able to stand the weather they must live in after the war ends without their being made much more hardy. Business men may be quick to recognize the changed conditions that will come after the war, and keen to adjust their affairs to them, but labor can be expected to be quick only to strike against the removal of war bonuses and keen not even to adjust their demands to their own best interests.

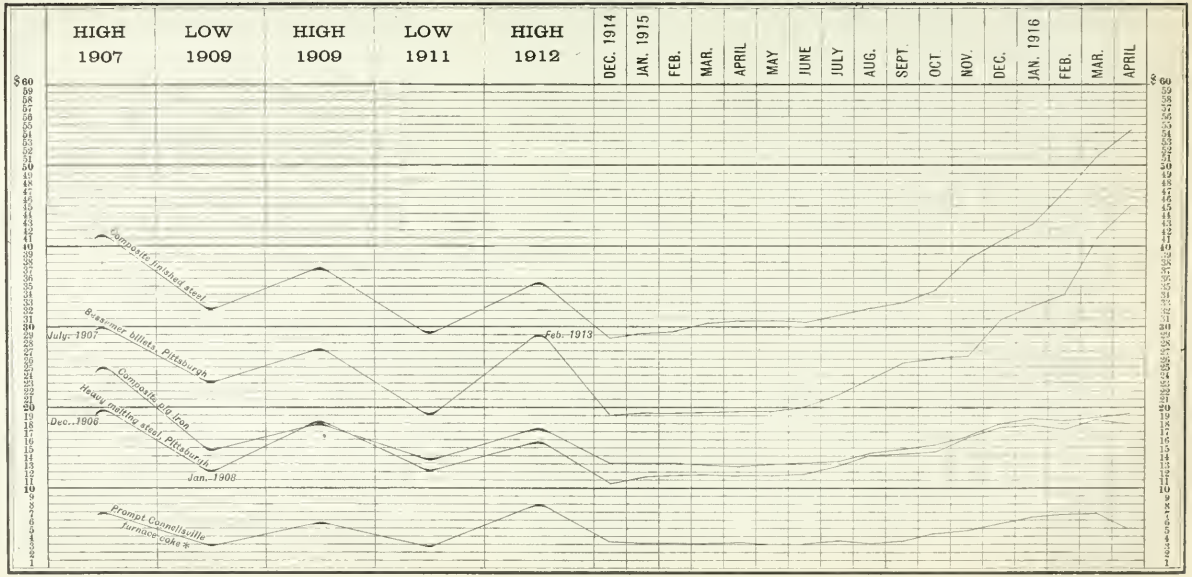
War Orders.

The blunt statement of E. R. Stettinnius, of the Morgan firm on his return from abroad, that there would be few "war orders" in future, aroused scarcely a ripple of interest in the steel trade. The steel trade has been turning down inquiries for large tonnages of war steel and is filled at capacity to the end of the year. The prince and pauper steel trade may be an uncertain one for the prophet, but the fortunes of war are still more uncertain.

Before the American Newspaper Publishers' Association on April 27th Mr. C. M. Schwab made the statement: "It may surprise you to know that less than 10% of the steel manufactured in the United States has been used outside the United States." There was either an error or a "catch" in the statement, for the February exports, quite typical of the exports in the eight months ending February, were 334,178 gross tons of steel in the form of billets, rods, bars, rails, wire, structural steel, sheets, tin plates, and cognate products. If this were less than 10% the production of finished steel would have to be more than 40,000,000 tons. The production of ingots is more than 40,000,000 tons but the production of finished rolled steel is under rather than over 30,000,000 tons. Apart from these direct exports, in which the steel certainly has not been "used" in the United States, there is steel made into shells, some exported loaded and some unloaded, steel made into automobiles, locomotives, freight cars, machinery, etc., for export. The steel is "used" in the United States to produce these manufactures, but the manufactures are used abroad. If, however, these manufactures, together with the tonnage of rolled steel already mentioned as export in that form, are exported not for use but for ornament or some other purpose, Mr. Schwab wins and we lose.

Our estimate is that from July 1, 1915, to

Iron and Steel Price Movement Compared With Old High and Low Points



Coke plotted at double the actual price in order to emphasize the fluctuations

The plotting is from monthly averages of daily quotations. Where the high and low points of billets and scrap fell at times widely different from the general high and low points the fact is indicated. Prices are per net ton of composite finished steel and coke, and per gross ton of other materials

the present time the proportion of the output of finished rolled steel in the United States exported direct or consumed in the making of manufactures for export has lain within the limits of 20 and 25%, the rate of production in recent months having lain between the limits of 28,000,000 and 30,000,000 tons a year, and the tonnage involved in direct and indirect exports being less than 7,000,000 tons a year, quite possibly a shade less than 6,000,000 tons.

Steel Price Trends.

Steel price advances in April included the following: Black sheets, $1 a ton; blue annealed sheets, $2; steel boiler tubes, $8; black iron and steel pipe, $4 a ton on base sizes, ranging up to $10 a ton on certain large sizes, with an extra $2 a ton on the corresponding sizes of galvanized pipe; tin plate, 50 cents a box to $5.00; shafting, $5 a ton; rivets, $10 a ton.

Our composite finished steel advanced $1.20 per ton in April, against advances of $5 a ton each in March and February and $2 a ton in January. In the 16 months that have elapsed since the low level of December, 1914, the advance in the composite has been $26.65 per ton. This advance has been distributed as follows: First half of 1915, 10%; second half, 39%; first four months of 1916, 51%.

The advances since the first of the year have been of a nature to discourage buying, except for the most pressing requirements, and this, the general view, probably, of the trade at large, is supported by the interesting coincidence that at the beginning of this year our composite stood precisely at the top level reached in 1907, the highest level in really modern times in the steel market. Since the first of the year, however, there has been heavy buying, but in recent weeks the buying has been light, the change being attributable in part directly to the price advances, but in large part also to the fact that the additional buying covered the period for which buyers could rationally commit themselves.

There was during April a tendency for the prices bid for prompt deliveries of certain scarce commodities to represent a larger spread than formerly over prices for late deliveries, plates being a conspicuous example.

An advance of $5 a ton in the price of standard steel rails becomes effective May 1st, making Bessemer approximately $33 and open-hearth $35 per gross ton, the precise prices to be quoted being 1.47½c and 1.56½c respectively. The $28 price on Bessemer rails had been established in February, 1901, open-hearth rails being fixed at

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer, Valley	Basic, Phila.	No. 2 fdy, Basic, Phila.	No. 2 X fdy, Buffalo.	No. 2 fdy — Cleveland.	No. 2 fdy — Chicago.	Ferro-manganese.*	Birmingham.	Furnace coke†
1915—									
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. ..	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	**15.75**	**15.25**	**15.08**	11.71	105.00	2.18
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	**14.23**	**14.31**	**14.47**	10.59	91.71	1.79
1916—											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.45

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

$30 when a half dozen years later became an important market commodity. The rail advance is not indicative of a current trend, as it may be taken to represent the cumulative force of the advance in other finished steel products. The rail mills covered the railroads for 1917 to the extent of perhaps 1,500,000 tons, or for what was considered normal requirements.

The Character of Buying.

As already observed, buying for far forward delivery has almost ceased. The buying for early deliveries, from such mills as can make them, is fairly active, but of course represents a relatively small tonnage. The volume has been sufficient to indicate that the purposes for which very high priced steel can be employed are not inconsequential, while the premium prices obtained indicate that steel is scarcer than it was a month or two months ago.

Buying of freight cars has almost ceased, but the buying was good even into the fore part of April, leaving a large volume of business on books of car companies, sufficient to run them at their present rate for about six months, possibly longer.

While it is the common observation that prices have very largely curtailed building plans a great deal of structural business has been booked steadily to date, and the projects on the boards, with the prospective buyers fully apprised of the high costs now ruling, are far from unimportant.

Belated buyers in the automobile industry have cut some figure in the steel market even in the past month. A small part at least of the automobile steel recently bought has been for delivery to July 1, 1917, in other words, in part for "1918" models.

Future of the Automobile Trade.

The automobile consumption of steel has come to be regarded as a very important item, and it may not be inappropriate to mention at this point something that is a conundrum to the writer. Using round figures, believed to be substantially accurate, the production of automobiles in the 1915 season has been given at 700,000; the prospective production for the 1916 season, to August 1st next, at 1,250,000 to 1,400,000. The number of automobiles in use at the beginning of this year has been given at 2,200,000. Presumably few of the 1916 season cars were in the 2,200,000, and allowing liberally for discards there should be more than 3,000,000 automobiles in use August 1, 1916. The last income tax statement showed about 275,000 persons with incomes of $4,000 a year or more. Those who own more than one automobile are usually those who own very high priced cars, of which not many are made, so not much allowance should be made for duplication. Allowing

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved —— Sheets ——						Comp.
						Wire	Steel			Blue	Tin	Fin.
1915—	Shapes,	Plates,	Bars,	Pipe,	Wire,	Nails.	Skelp.	Black.	Galv.	Annld.	plate.	steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3.60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.76	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5692
August	1.30	1.26	1.30	79	1.43	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916—												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.25	2.40	2.35	2.89	5.00	2.95	4.70	2.7166

however, two cars for everyone who reports an income over $4,000, there would be left about 2,500,000 or fixe-sixths of the total, owned by persons having less than $4,000 income. As incomes run more than half the 2,500,000 cars must be against incomes of less than $2,000. How is the increasing make to be absorbed? It is hard to believe it can be by cars being abandoned, for if five-sixths are owned by persons with incomes less than $4,000, many with incomes much less, it is hard to see how they can afford to run their cars to the scrap heap and buy new cars at frequent intervals.

The Future.

The next few months in the steel industry will present questions not of markets but of production and distribution. The business is on books and the question is one of filling it. Unless the steel consuming industries have much more difficulty in securing labor than the steel producing industry there will be ample call for all the steel that can be produced for many months, and presumably well into 1917.

Pig Iron.

Pig iron has been a continued disappointment to those who, from grounds that seemed reasonable enough, predicted an acute scarcity. Pig iron in the various districts has ranged from steady to strong, but there has been up to date nothing like a spectacular movement in prices, at all comparable with what has occurred in steel. It is still believed in many quarters that the many additions to steel making capacity now being rushed to completion will change the balance in such a way as to bring very high prices for pig iron within a few months. A "tip" may be mentioned as one worth bearing in mind. The United States Steel Corporation and the Republic Iron & Steel Company, both with large merchant iron interests in the south, are understood to have been chary of late in selling their southern iron, because they might need additional iron at their northern steel plants, and in such event they could either ship the iron or by matched sales and purchases scalp a profit, for the southern market can usually be trusted to lead the northern in an advance, and particularly so if large sellers have sold less than their usual quotas. To date the southern market has not been overly strong, and in the circumstances a definite rise in southern iron could probably be properly interpreted as the forerunner of a general advance in all pig iron markets.

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U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1909:

Quarter.	1916.	1915.	1914.
1st	$60,713,624	$12,457,809	$17,994,382
2nd	.....	27,950,055	20,457,596
3rd	.....	38,710,644	22,276,002
4th	.....	51,277,504	10,935,635
Year	.....	130,396,012	71,663,615

	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38,450,400	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year	137,181,345	108,174,673	104,305,466

Unfilled Orders.

(At end of the Quarter).

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	4,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,833	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220
1916..	9,331,001			

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

1914—	Shipments. %	Bookings. %	Difference. %	Difference. Tons.
May	62	37	—25	—278,908
June	63	66	+ 3	+ 34,697
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September	62	24	—38	—425,664
October	55	28	—27	—326,570
November	45	32	—13	—136,505
December	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September	98	133	+35	+409,163
October	103	172	+69	+847,834
November	102	186	+84	+1,024,037
December	102	152	+50	+615,731
January 1916	102	112	+10	+116,547
February	102	157	+55	+646,199
March	104	162	+58	+762,035

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January	1,021	795	226	939	718	221	1,133	797	336
February	914	146	168	897	678	219			
March	1,091	801	290	1,012	720	192			
April	1,038	782	256	1,010	722	288			
May	1,047	800	247	1,040	732	308			
June	1,097	789	308	1,090	730	360			

Production of Rails in the United States in 1915.

(From Special Bulletin of American Iron and Steel Institute.)

Production of Rails by Processes, in Gross Tons, 1897-1915.

Years.	O. H.	Bessemer.	Rerolled*	Electric	Iron.	Total.
1897	500	1,644,520	Included with Bessemer and open-hearth steel rails from 1897 to 1910 inclusive.	.....	2,872	1,647,892
1898	1,220	1,976,702		.....	3,319	1,981,241
1899	523	2,270,585		.....	1,592	2,272,700
1900	1,333	2,383,654		.....	695	2,385,682
1901	2,093	2,870,816		.....	1,730	2,874,639
1902	6,029	2,935,392		.....	6,512	2,947,933
1903	45,054	2,946,756		.....	667	2,992,477
1904	145,883	2,137,957		.....	871	2,284,711
1905	183,264	3,192,347		.....	318	3,375,929
1906	186,413	3,791,459		.....	15	3,977,887
1907	252,704	3,380,025		.....	925	3,633,654
1908	571,791	1,349,153		.....	71	1,921,015
1909	1,256,674	1,767,171		†	.....	3,023,845
1910	1,751,359	1,884,442		†	230	3,636,031
1911	1,676,923	1,053,420	91,751	462	234	2,822,790
1912	2,105,144	1,099,926	119,390	3,455	.....	3,327,915
1913	2,527,710	817,591	155,043	2,436	.....	3,502,780
1914	1,525,851	323,897	95,169	178	.....	1,945,095
1915	1,775,168	326,952	102,083	.....	.....	2,204,203

* Rerolled from old steel rails and renewed rails which the manufacturers could not classify as Bessemer or open-hearth. † Small tonnages rolled in 1909 and 1910 but included with Bessemer and open-hearth rails for these years.

Production of Rails, Showing Increase by Processes, 1914-1915.

Kinds.	1915.	%	1914.	%	Increase.	%
Open-hearth	1,775,168	80.54	1,525,851	78.45	249,317	16.34
Bessemer	326,952	14.83	323,897	16.65	3,055	.94
All other	102,083	4.63	95,347	4.90	6,736	7.06
Total	2,204,203	100.00	1,945,095	100.00	259,108	13.32

Girder and high T rails for electric and street railways are included in the figures given above. For recent years the tonnage thus included was as follows: 1912, 174,004; 1913, 195,659; 1914, 136,889; 1915, 133,965 gross tons.

The total production of rails as given above includes, in addition to new rails rolled during the year, rails rerolled from defective rails and from old rails. The total of renewed or rerolled rails so included is given in gross tons in the following table.

Production of Renewed and Rerolled Rails, 1911-1915.

Years.	Rerolled from new seconds, new defective rails, etc. Open-hearth.	Bessemer	Total.	Rolled from old rails.	Total rerolled.
1911	2,631	19,379	22,010	91,751	113,761
1912	13,140	29,446	42,586	119,390	161,976
1913	13,052	30,741	43,793	155,043	198,836
1914	13,538	13,234	26,772	95,169	121,941
1915	6,477	2,652	9,129	102,083	111,212

(Continued on next page.)

Works Rolling or Rerolling Rails in 1915.

States.	active works. No. of	O. H.	Bessemer.	Electric.	Rerolled.*
		Of these the following rolled—			
New York	1	1	1	0	0
Pennsylvania	8	5	4	0	3
Maryland	2	1	1	0	1
West Virginia	1	0	0	0	1
Alabama	2	2	0	0	0
Ohio	2	1	0	0	1
Indiana	1	1	1	0	0
Illinois	2	1	1	0	1
Wisconsin	1	1	1	0	0
Colorado	1	1	0	0	1
Washington	1	0	0	0	1
Total	22	14	9	0	9

*Includes only plants that renewed rails or rerolled old rails.

Production of Alloy-Treated Steel Rails, 1909-1915.

Years	Total production. Gross tons.	Production by alloys. Titanium.	Other alloys.	Production by processes. Open hearth and elect.	Bessemer.	Production by weight per yard. Under 45 lbs.	45 and under 85 lbs.	85 and under 100 lbs.	100 lbs. and over.
1909	49,395	35,945	13,450	13,696	35,699	..	9,132		40,263
1910	257,324	256,759	565	27,389	229,935	..	70,170		187,154
1911	153,989	152,990	999	38,539	115,450	..	27,097		126,892
1912	149,267	141,773	7,494	40,393	108,874	21	5,426		143,820
1913	59,519	47,657	11,864	33,567	25,952	*91	†9,414		50,014
1914	27,937	23,321	4,616	27,447	490	*14	†1,168	8,301	18,454
1915	24,970	21,191	3,779	24,367	603	*6	†1,977	6,555	16,432

* Includes rails under 50 pounds. † Includes 50 pounds and less than 85 pounds.

Production of Alloy-Treated Steel Rails, 1915.

Alloys.	Total production.	Production by processes. Open-hearth.	Bessemer.	Production by weight per yard. Under 50 lbs.	50 lbs. to 84 lbs.	85 lbs. to 99 lbs.	100 lbs. and over.
Titanium	21,191	20,588	603	6	1,823	6,186	13,176
Manganese	3,779	3,779	...	..	154	369	3,256
Total	24,970	24,367	603	6	1,977	6,555	16,432

Production of Rails in Pennsylvania, 1906-1915.

Years.	Open-hearth.	Bessemer.	Total.	Years.	Open-hearth.	Bessemer.	All other.	Total.
1906	1,703	1,298,409	1,300,112	1911	477,228	352,331	10,104	839,663
1907	36,837	1,093,932	1,130,769	1912	526,755	343,837	18,080	888,672
1908	177,461	315,547	493,008	1913	618,795	326,819	26,206	971,820
1909	301,988	553,719	855,707	1914	423,426	142,662	26,444	592,532
1910	395,229	591,473	986,702	1915	494,595	162,575	37,375	694,545

Price Changes of Iron and Steel Products From March 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our composite finished steel. In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the dates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15 .	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80% to	79%
" 1	Boiler tubes	75% to	74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½ to	63½
" 1	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galv. sheets	4.25	to 5.00
" 15	Boiler tubes	74% to	73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73% to	72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
July 4	Plates	1.50	to 1.60
" 4	Shapes	1.50	to 1.60
" 5	Tin plate	3.10	to 3.30
" 9	Galv. sheets	3.70	to 3.80
" 9	Blue ann. sheets	1.70	to 1.80
" 21	Bars	1.25	to 1.30
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
Aug. 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
" 31	Bars	1.30	to 1.35
Aug. 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72% to	71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galv. sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71% to	69%
Nov. 1	Steel pipe	79% to	78%
" 1	Galv. sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galv. sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galv. sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
Nov. 18	Shapes	1.60	to 1.70
" 18	Galv. sheets	4.00	to 4.25
" 24	Galv. sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50

Nov. 30	Galv. sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
1916—			
Jan. 3	Tin plate	3.60	to 3.75
" 3	Blue ann. sheets	2.25	to 2.35
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%	78%	to 77%
" 5	Blue ann. sheets	2.35	to 2.40
" 7	Boiler tubes	68%	to 66%
" 12	Blue ann. sheets	2.40	to 2.50
" 14	Boiler tubes	66%	to 64%
" 19	Blue ann. sheets	2.50	to 2.65
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00
" 14	Wire nails	2.20	to 2.30
" 15	Pipe	76%	to 75%
" 21	Bars	2.00	to 2.25
" 21	Plates	2.10	to 2.35
" 21	Shapes	2.00	to 2.25
" 21	Tin plate	3.75	to 4.00
" 29	Pipe	75%	to 74%
" 29	Boiler tubes	64%	to 63%
Mar. 1	Wire nails	2.30	to 2.40
" 8	Black sheets	2.60	to 2.75
" 8	Blue ann. sheets	2.65	to 2.90
" 13	Bars	2.25	to 2.35
" 13	Plates	2.35	to 2.60
" 13	Shapes	2.25	to 2.35
" 15	Steel pipe	74%	to 73%
" 15	Boiler tubes	63%	to 61%
" 23	Bars	2.35	to 2.50
" 23	Shapes	2.35	to 2.50
" 28	Plates	2.60	to 2.75
" 29	Sheets	2.75	to 2.85
" 29	Steel pipe	73%	to 72%
" 29	Boiler tubes	61%	to 60%
April 5	Sheets	2.85	to 2.90
" 15	Boiler tubes	60%	to 56%
" 19	Tin plate	4.50	to 5.00
" 24	Pipe	72%	to 70%
May 1	Wire nails	2.40	to 2.50

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
September 1914	44,624	34,757	+ 9,867
October ...	45,241	39,410	+ 5,831
November .	35,325	40,748	— 5,423
December ..	27,458	42,525	— 15,067
January, 1915	20,684	31,556	— 10,872
February ..	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 ..	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ..	31,096	33,061	— 1,965
October ...	31,215	26,338	+ 4,877
November .	29,297	26,005	+ 3,292
December ..	23,173	23,743	— 570
January, 1916	17,293	4,015	+ 7,303
February ..	30,244	10,824	+ 19,420
March	33,685	9,894	+ 23,791

United States citizens arrived and departed, with change thereby effected in United States population:

	Arrived.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915..	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September .	9,054	8,188	+ 866
October ...	8,991	8,329	+ 662
November .	8,364	9,166	— 802
December ..	8,458	9,349	— 891
Jan. 1916 ..	8,257	9,469	— 1,212
February ..	11,082	12,908	— 1,826
March	15,065	10,867	+ 4,198

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,237; July, 1915, +14,994; August, 1915, —15,128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461; January, 1916, +6,091; February, +17,594; March, +27,989; nine months, +56,909.

COMPOSITE STEEL.

Computation for May 1, 1916:

Pounds.	Group.	Price.	Extension.
2½	Bars	2.50	6.250
1½	Plates	2.75	4.125
1½	Shapes	2.50	3.750
1½	Pipe (¾-3)	2.95	4.425
1½	Wire nails	2.50	3.750
1	Sheets (28 bl.)	2.90	2.900
½	Tin plates	5.00	2.500
10 pounds			27.700
	One pound		**2.7700**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7166
May	1.5590	1.7786	1.5078	1.5381	.....
June	1.5794	1.7719	1.4750	1.5312	.....
July	1.6188	1.7600	1.4805	1.5692	.....
Aug.	1.6784	1.7400	1.5241	1.6059	.....
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet Pitts.	No. 1 R. R. Wrought Pitts.	No 1 Cast. Pitts.	No. 1 Heavy Steel. Phila.	Melt'g. Ch'go.
1914—						
July	11.75	8.50	11.75	11.50	10.60	9.75
Aug.	11.50	8.50	11.50	11.25	10.75	9.75
Sep.	11.25	8.70	10.50	11.25	10.75	9.25
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.66	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75

COMPOSITE PIG IRON.

Computation for May 1, 1916:

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.25)	36.50
One ton No. 2 foundry, valley	18.50
One ton No. 2 foundry, Philadelphia	20.25
One ton No. 2 foundry, Buffalo	19.25
One ton No. 2 foundry, Cleveland	19.00
One ton No. 2 foundry, Chicago	19.50
Two tons No. 2 Southern foundry, Cincinnati (17.90)	35.80
Total, ten tons	189.80
One ton	**18.980**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.420	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	.....
June	14.005	14.968	13.606	13.047	.....
July	14.288	14.578	13.520	13.125	.....
Aug.	14.669	14.565	13.516	14.082	.....
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, Phila.	deliv. — Pitts.	Ch'go.
1914—						
Nov.	19.25	19.75	25.00	1.13	1.20	.96
Dec.	18.75	19.25	24.40	1.12	1.20	.91
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35

† Premium for open-hearth.

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1911.	1912	1913.	1914.	1915	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,613,807
February	18,690,792	21,801,570	24,089,871	16,5[illegible]0,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,310	20,551,137	20,985,505	.....
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	.....
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	.....
June	20,310,053	24,795,802	25,228,346	18,927,958	31,757,103	.....
July	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575	.....
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822	.....
September ...	19,873,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$105,799,193

EXPORTS OF TONNAGE LINES—Gross tons.

	1909.	1910.	1911	1912.	1913.	1914.	1915.	1916
January	70,109	118,681,	152,262	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	144,366	369,000
March	94,519	124,980	216,360	218,219	257,519	159,998	174,313	.....
April	100,911	117,921	228,149	267,313	259,689	161,952	223,240	.....
May	109,808	135,306	178,589	307,656	242,353	139,107	263,649	.....
June	114,724	120,601	174,247	273,188	243,108	144,539	355,402	.....
July	100,850	127,578	162,855	272,778	237,159	114,790	378,897	.....
August	105,690	131,391	177,902	282,645	209,856	86,599	405,853	.....
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	726,122

IRON ORE IMPORTS.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,844
Feb. ..	188,734	112,574	78,773	.....
Mar. .	164,865	68,549	88,402	.....
April .	174,162	111,812	91,561	.....
May .	191,860	125,659	98,974	.....
June .	241,069	188,647	118,575	.....
July .	272,017	141,838	119,468	.....
Aug. .	213,139	134,913	126,806	.....
Sept. .	295,424	109,176	173,253	.....
Oct. ..	274,418	114,341	138,318	.....
Nov. .	179,727	90,222	113,544	.....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	89,844

IRON AND STEEL IMPORTS.

	1912.	1913.	1914.	1915.	1916.
Jan. .	20,008	21,740	17,776	10,568	15,824
Feb. .	11,622	25,505	14,757	7,506	20,000
Mar. .	15,466	27,467	27,829	8,025	.....
April.	12,481	25,742	30,585	16,565	.....
May .	15,949	28,728	28,173	28,916	.....
June.	21,407	36,597	23,076	32,200	.....
July .	17,882	36,694	25,282	20,858	.....
Aug. .	20,571	18,740	28,768	27,556	.....
Sept..	18,740	19,941	38,420	23,344	.....
Oct. .	25,559	20,840	22,754	34,319	.....
Nov. .	24,154	25,809	24,165	37,131	.....
Dec. .	21,231	26,454	9,493	35,455	.....
Total	225,072	317,260	289,778	282,443	35,824

Comparison of Metal Prices.

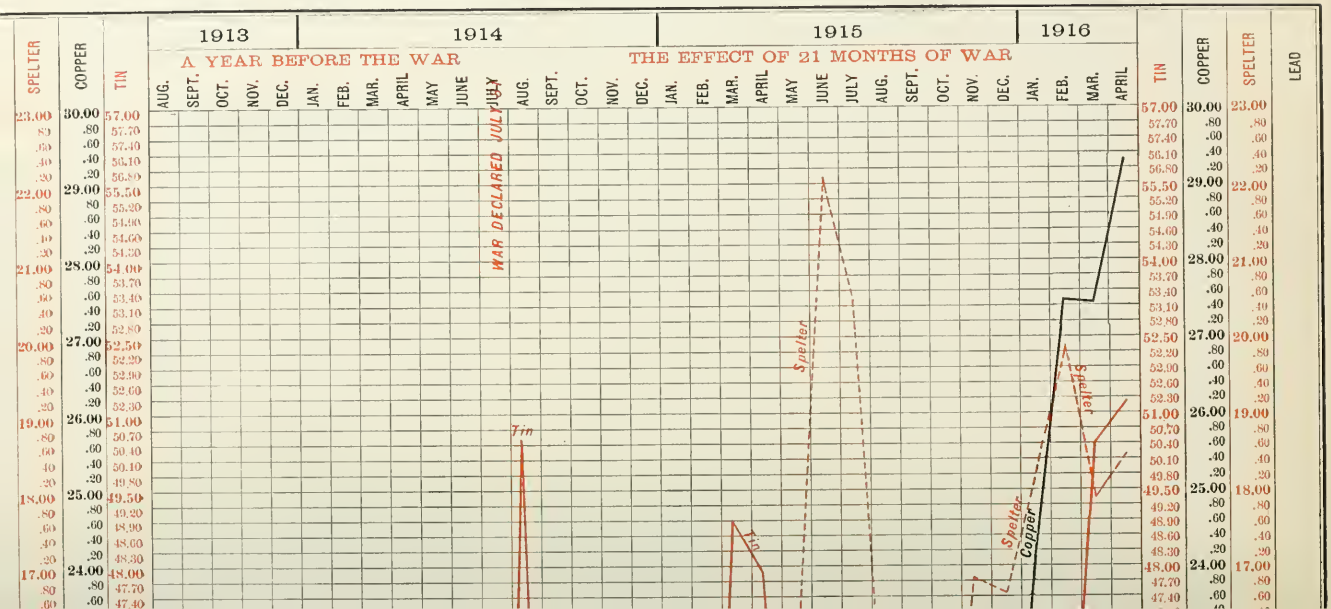
Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closin April 2 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	20.00	21.00
Basic, valley	13.25	12.50	18.00	12.50	18.50	17.75	18.25
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.50	18.50
No. 2X fdy. Philadelphia.	1500	14.20	19.50	14.00	20.25	19.50	20.25
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	19.00	18.80	19.00
No. 2X foundry, Buffalo	13.75	12.25	18.00	11.75	19.00	18.00	19.00
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	19.00	18.50	19.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.50	15.00
Scrap Iron and Steel.							
Melting steel, Pittsburgh.	12.00	9.75	18.00	11.00	18.75	17.25	17.50
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	16.75	15.25	16.75
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	19.25
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.00	15.00	16.00
Heavy steel scrap, Phila	11.25	9.00	16.25	9.50	17.75	16.00	17.75
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.50	1.90	2.50
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.50	1.85	2.50
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	2.75	1.85	2.75
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	2.50	1.85	2.50
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	2.35	1.75	2.35
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	2.90	2.60	2.90
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.75	5.00
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	5.00	3.75	5.00
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.40	2.10	2.40
Steel pipe, Pittsburgh	79½%	81%	79%	81%	70%	78%	70%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	2.30
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.75	3.75
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	40.87½	50.00
Lake copper	15.50	11.30	23.00	13.00	30.00	23.00	29.75
Electrolytic copper	14.87½	11.10	23.00	12.80	31.00	23.00	30.50
Casting copper	14.65	11.00	22.00	12.70	28.00	22.00	27.75
Sheet copper	20.25	16.50	27.25	18.75	36.50	28.00	36.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	7.50
Spelter	6.20	4.75	27.25	5.70	21.17½	16.42½	17.80
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	37.50	38.00
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	63.00	53.00	60.00
Silver	59¼	47⅝	56½	46¼	73½	55⅞	73½
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	7.37½
Spelter	6.00	4.60	27.00	5.55	21.00	16.25	17.62½
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	23.00	25.50
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	205	172	198
Standard copper, prompts	66¾	49	86⅜	57⅛	132	84¾	132
Lead	24	17⅞	30¼	18¼	36⅜	29¼	34½
Spelter	33	21¼	110	28⅛	111	85	105
Silver	27¼d	23¼d	27¼d	22⅜d	35⅛d	26 11/16d	35⅛d

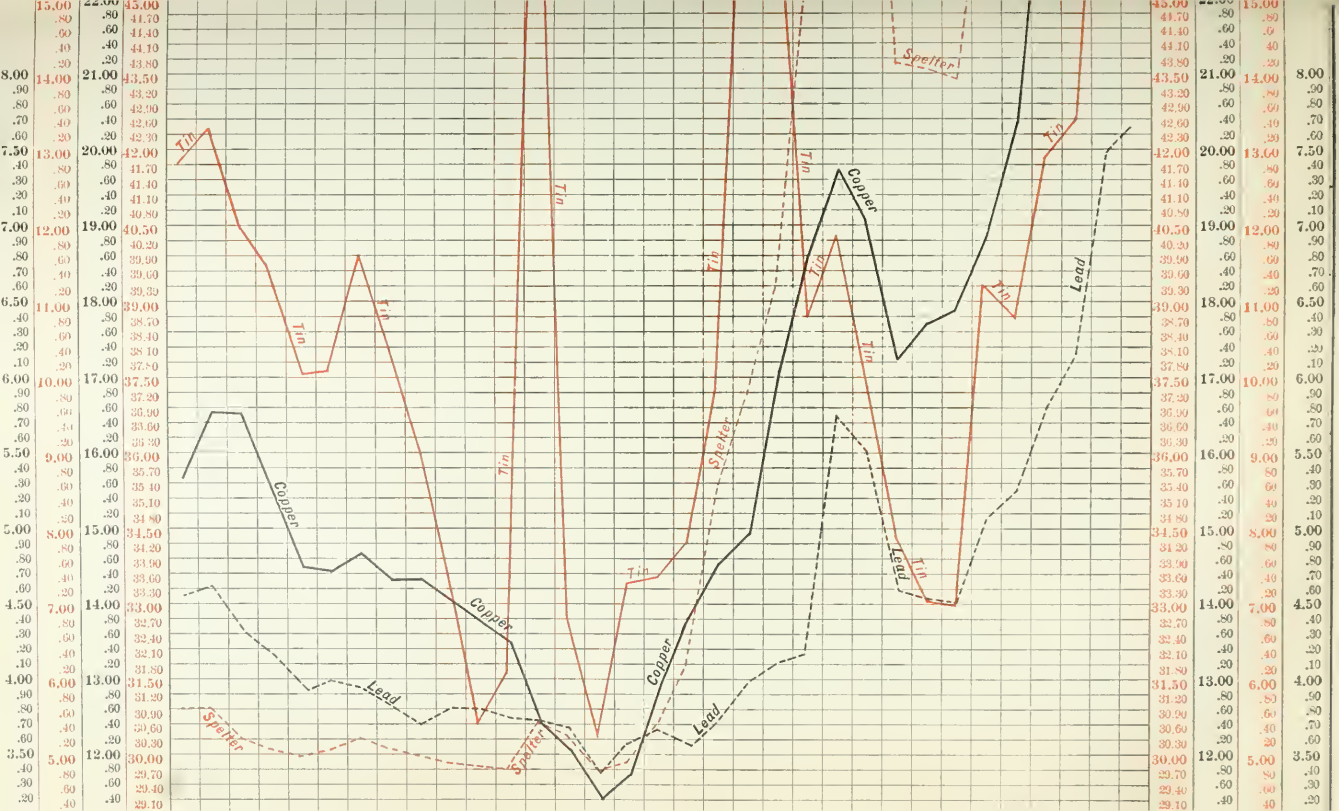
THE
STEEL and METAL
DIGEST
MONTHLY.

Extraordinary Effect of 21 Months of War on Metal Prices

COPPER - TIN - LEAD - SPELTER

Plotted according to the monthly prices of Electrolytic Copper, New York; Straits Tin, New York; Pig Lead, St. Louis; Prime West. Spelter, St. Louis.




Tin
Copper
Lead
Spelter

Comparison of Security Prices.

Railroads.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing. Apr. 28. 1916.
Atchison, Top. & Sante Fe...	100⅜	89½	111¼	92½	108½	100¼	102
Atch. Top. & Santa Fe,. pfd.	101¾	96½	102⅛	96	102	97⅞	101
Baltimore & Ohio	95⅝	67	96	63¾	96	82⅞	85⅝
Canadian Pacific	220½	153	194	138	183¾	162½	167½
Chesapeake & Ohio	68	40	64¾	35⅝	66⅞	58	61¾
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¾	102½	91	94
Erie R. R.	32½	20⅛	45⅝	19⅞	43⅝	32	35⅞
Great Northern, pfd.	134¾	111⅝	128⅜	112¾	127½	118⅞	119¾
Lehigh Valley	156¼	118	83⅜	64⅝	83	74½	78
Louisville & Nashville	141⅞	125	130¼	104½	130⅝	121⅛	124⅛
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	7¼	3¼	3¾
Missouri Pacific	30	7	18¼	1¾	6⅝	3½	4¼
New York Central	96⅝	77	110½	81½	111½	100¼	103¾
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	57	59¼
Northern Pacific	118½	97	119	99⅛	118⅞	109¾	111¼
Pennsylvania R. R.	115½	102½	61½	51¾	59¾	55⅝	56¾
Reading	172¼	137	85⅝	69⅜	89⅝	75⅛	87
Rock Island	16⅝	⅝	1⅛	⅛	7/8	¼	¼
Southern Pacific	99½	81	104⅛	81¼	104⅛	94¼	97⅛
Union Pacific	164⅜	112	141½	115¾	140¼	129¾	133½
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¾	74	61¾	69
American Can	35⅛	19¼	68½	25	65⅜	52½	56
American Can, pfd.	96	80	113½	89	113⅞	109	111
Am. Car & Foundry	53½	42¼	98	40	78	55	59⅜
Am. Cotton Oil	46½	32	64	39	57½	50½	53
Am. Locomotive	37¼	29¼	74¾	19	83¾	60¾	69½
Am. Smelting & Refining	71⅛	50¼	108⅞	56	113⅜	88½	96¾
Brooklyn Rapid Transit	94¼	79	93	83¼	88	83½	84½
Chino Copper	44	31⅝	57⅜	32¾	60	51	54¼
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	53	38⅛	41¾
Consolidated Gas	139½	112½	150½	113¾	144¾	130½	134¼
General Electric	150⅝	137½	185½	138	178½	159	163
Interborough-Metropolitan ..	16⅜	10¾	25	10⅝	20½	17	
International Harvester	113½	82	114	90	114½	108½	113
Lackawanna Steel	40	26½	94¾	28	86	65	70
National Lead	52	40	70¾	44	73⅞	60½	66
Ray Consolidated Copper	22½	15	27½	15¼	26	22	23⅜
Republic Iron & Steel	27	18	57¼	19	55¾	43⅜	46¾
Republic Iron & Steel, pfd...	91¼	75	112⅝	72	112	107¼	108
Sloss-Sheffield	35	19½	66⅞	22	63¼	47	52
Texas Co.	149⅞	112	237	120	235½	180	186¾
U. S. Rubber	63	44½	74¾	44	58½	47¾	52⅝
U. S. Steel Corporation	67¼	48	89½	38	89	79¾	83¾
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	118½	115½	116
Utah Copper	59⅜	45⅜	81¾	48½	86¾	77	81½
Va.-Carolina Chem.	34⅞	17	52	15	51	36	42½
Western Union Telegraph ...	66⅞	53⅜	90	57	92	87	92

CAR BUYING.

Freight cars ordered:		
First half, 1913	114,000	
Second half 1913	33,000	
Year, 1913		147,000
First half 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,210	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.

August 1914.	23,600,000
September	23,200,000
October	21,200,000
November	18,700,000
December	18,100,000
January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,700,000
On April 1st	40,000,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,734	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1913—			
June	131,245,877	163,404,916	32,159,039
July	139,061,770	160,990,778	21,929,008
Aug.	137,651,553	187,909,020	50,257,467
Sept.	171,084,843	218,240,001	47,155,158
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,746,117	134,170,011
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,379
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	*193,935,117	*409,836,525	*215,901,408

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
	1915.	1916.	1915.	1916.
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. .	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April .	13.60	20.70	12.50	18.00
May ..	13.659		12.65	
June ..	13.75		12.724	
July ..	13.991		12.959	
Aug. ..	15.064		14.364	
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

BAR IRON AVERAGES.

Average realized prices on shipments of base sizes of common iron bars by the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and Highland Iron & Steel Company, as disclosed by wage adjustments of Amalgamated Association of Iron, Steel and Tin Workers, prices realized in bimonthly periods, governing wage rates for succeeding two months.

	1914.	1915	1916.
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	....
May-June	1.1257	*1.10	....
July-August	1.0928	*1.15	....
September-October	1.0847	*1.20	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.14	....

* Settlement basis.

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1912	2,053	81,694
1913	20,680	57,819
1914	15,411	59,549
1915	..2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,263
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178
February	107	13,534

British tin plate exports have been as follows, in gross tons:

1913	494,921
1914	435,497
1915	368,602
January 1916	26,271
February	27,289
March	39,482

BRITISH IRON AND STEEL EXPORTS.

1914—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	74,617	43,133	47,237	385,301
Aug. ..	28,342	22,763	21,414	211,605
Sept. ..	37,793	39,185	23,440	228,992
Oct. ..	47,188	37,005	26,950	263,834
Nov. ...	49,666	16,181	30,942	240,608
Dec. ..	31,705	16,315	30,254	212,667
Year ..	780,763	433,507	435,392	3,972,348
1915—				
Jan. ..	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	15,101	198,294
Mar. ..	20,172	17,572	36,170	239,341
April ..	35,209	21,602	40,135	264,244
May ...	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	78,370	33,224	39,528	351,984
Aug. ...	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ...	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	87,283	3,366	39,482	307,488

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Tin in April.

Difficulty in Securing Permits to Ship Tin, the Continued Manipulation of the Spot Price and the Sharp Advance in War Risks, the Three Predominating Factors.

Three factors governed the price of tin in the world's markets during April. The most important element was the difficulty in securing permits at London for shipments to the United States from either Great Britain or the East Indies. This was the unknown quantity of the problem and is still more or less an enigma to the trade. It caused demand to be turned more heavily upon Banca, English and Chinese tin which brands bought in considerable quantities by home consumers at concessions although the American trade much prefers Straits tin.

The second feature of prominence was the continued manipulation of spot tin prices in the American market and the preference shown by home consumers to purchase far-off future deliveries. The third development, which came late in the month, was the sharp advance in war risks on tin, shipped from foreign countries to the United States.

There was much irregularity in prices of all positions on occasions as the market was swayed by various causes from day to day and from week to week, and prices fluctuated within a range of £6 at Singapore and £4 at London. Spot tin at New York varied 6c per pound and futures ranged within limits of 2½c per pound. The result, at the close of the month, was a slight change in the New York market while spot tin at London was down £2 and the Straits market was up £5 compared with the prices current on the closing day of March.

Small Stock Carried in Store.

Early in the month only 700 tons of tin were carried in store in this country and as the arrivals during the first half of April would be light there was a disposition to hold spot tin to meet April obligations, especially as much of the tin in steamers at dock was to be applied on consumers' contracts. There was not much demand for spot tin, however, outside of the small consumer who generally buys from hand-to-mouth and 50c was bid for spot by small interests and 49c was bid for April. Interest was largely centered in June-July shipments from the Straits and large consumers purchased this position at 42½c being encouraged to do so by this relatively low price. All of the foreign limits were taken for shipment from the Straits on the opening day of the month.

Spectacular Advance in Spot Tin.

On April 5th there was a spectacular demonstration in the spot position on the New York Exchange when 55c was bid for spot tin at one o'clock and offered by the same operator for 53c at three o'clock. In the next few days prices were irregular on all positions; but, with the tendency sharply upward, large American consumers purchased further lots of June-July shipments from the Straits at prices ranging from 43¾c to 44¾c. The advance of 4c to 5c per pound on spot Straits tin brought out freer offerings of English and Chinese metal. L. & F. was sold at prices ranging from 49½c to 50c for spot, and 48½c for delivery during the first half of April. L. &

TIN PRICES IN APRIL.

	New York.	London					
Day.	Cents.	£	s	d	£	s	d
3	50.50	197	10	0	192	10	0
4	51.00	197	0	0	192	5	0
5	52.00	199	5	0	193	15	0
6	53.00	201	0	0	196	0	0
7	53.50	202	0	0	196	0	0
10	54.50	205	0	0	199	0	0
11	54.00	202	0	0	199	15	0
12	54.00	198	0	0	197	0	0
13	53.75	199	5	0	198	5	0
14	53.50	200	0	0	198	10	0
17	52.50	201	0	0	198	10	0
18	51.50	200	0	0	198	0	0
19	51.00	198	0	0	196	5	0
20	50.00	198	10	0	196	10	0
24	50.00	.....			.....		
25	49.50	198	0	0	196	0	0
26	49.50	198	5	0	196	0	0
27	49.50	196	15	0	196	0	0
28	50.00	198	0	0	197	0	0
High ...	54.50	205	0	0	199	15	0
Low	49.50	196	15	0	192	5	0
Average .	51.75	199	8	4	196	10	3

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915.	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	.....
June	12,920	11,101	16,027	15,927	.....
July	13,346	12,063	14,167	16,084	.....
Aug.	11,285	11,261	14,452	15,127	.....
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915.	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5.584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	.....
June	4,290	4,280	5,870	6,665	.....
July	4,580	4,770	4,975	5,606	.....
Aug.	5,210	6,030	3,315	4,712	.....
Sept.	5,430	5,160	4,973	5,296	.....
Oct.	4,450	5,020	4,610	4,441	.....
Nov.	5,600	5,560	5,155	6,713	.....
Dec.	4,980	5,110	6,435	5,301	.....
Total	59,018	62,550	63,093	66,517	.....
Av'ge	4,918	5,213	5,258	5,543	.....

CONSUMPTION IN THE U .S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	.....
June	2,850	3,800	3,650	3,900	.....
July	5,150	3,900	3,900	5,300	.....
Aug.	4,300	3,600	2,900	4,500	.....
Sept.	3,600	3,100	3,600	4,300	.....
Oct.	3,850	3,700	3,700	4,900	.....
Nov.	4,300	2,800	2,600	2,975	.....
Dec.	4,050	3,100	1,900	5,200	.....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4.125	3,658	3,475	4,062	.....

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	April 1916.	March 1916.	April 1915.
Straits shipments			
To Gr. Britain..	2,475	2,175	1,865
" Continent ..	950	495	1,295
" U. S.	1,260	2,500	2,110
Total from Straits	4,685	5,170	5,270
Australian shipments			
To Gr. Britain ..	245	245	200
" U. S.	nil	nil	nil
Total Australian	245	245	200
Consumption			
London deliveries	1,455	1,416	1,667
Holland deliveries	77	nil	681
U. S.	4,202	4,726	3,200
Total	5,734	6,142	5,548
Stocks at close of month			
In London—			
Straits, Australian	2,858	1,644	3,598
Other kinds	1,005	886	1,846
In Holland	7	17	55
In U. S.	2,756	2,746	3,041
Total	6,626	5,293	8,540
Afloat, close of month			
Straits to London.	4,242	4,945	2,315
" to U. S. ..	4,692	5,204	4,330
Banca to Europe..	4,179	3,340	600
Total	13,113	13,489	7,245
Total visible supply	Apr. 30, 1916. 19,739	Mar. 31, 1916. 18,782	Apr. 30, 1915. 15,785

STRAITS TIN PRICES IN NEW YORK.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	48.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	.....
June	47.77	44.93	30.65	40.37	.....
July	44.75	40.39	31.75	37.50	.....
Aug.	45.87	41.72	30.59½	34.39	.....
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

F. was offered at 46½c for prompt shipment from London but resales were made at lower prices. Small lots of April, May and June shipments from the Straits were also sold on profit-taking at 46c, 45c and 44c respectively.

The foreign markets were extremely strong at the end of the first week of the month, and active buying caused a sharp rise at Singapore. It was surmised here, that foreign governments had made heavy purchases, as well as American consumers, but on April 11th, there was a reaction at London and on April 13th the Straits market broke £5 10s. This was followed by irregularity at London and the Singapore market became erratic. The difficulty of securing permits for shipments caused an accumulation of spot tin in the English market resulting in a drop of £4 on April 12th.

Market Turns Weak and Declining.

American consumers, encountering much difficulty about April 12th in acquiring tin for specified deliveries placed unusually large orders for solder instead. Competition being keen, solder manufacturers assumed the risk of obtaining tin and made definite sales to meet the requirements of the canners and packers. By the end of the second week spot tin in New York had receded to 53¾c to 54c, and April to 51½c to 52c; but, interest still remained mainly in far-off positions which were easier at 44c to 44½c.

During the third week of the month weakness was developed in all positions and in all markets. The smaller demand from American consumers was held responsible for the reaction at London and the Straits, while the local spot market receded because of the arrivals of several steamships from the East Indies. The quick discharge of one of these vessels caused a still weaker and more irregular market for spot metal. The April position also receded 2c to 3c per pound.

A period of dulness was experienced just prior to the Easter holidays, as large consumers had covered their requirements by future contracts and much of this tin was coming forward. Some effort to sell tin discharged from steamers at dock at this time brought about a still further reaction in prices. Banca tin was in especially liberal supply and its freer offering had an unsettling effect upon spot. It is reported that about 4,000 tons of tin were recently taken out of Banca stock at Batavia

War Risks Advance 1½%.

The most important development during the last week of the month was the advance in war risks which are now 3% against 1½% the week previous. The advance in the prices for July-August shipments from the Straits to the United States at this time was attributed to this cause. Spot tin, which had receded to 49¼c under freer offerings, was again advanced to 49¾c and at the close of the month it was difficult to purchase spot even at 50c; but, with the arrivals of the Tuscan Prince and the Toyohashi Maru, lower prices are anticipated. April deliveries were accomplished without difficulty as arrivals for the month, at Atlantic ports only, were 3,610 tons.

American consumers and dealers bought quite freely of June, July and August shipments to the United States at prices ranging from 44 to 44¼c c.i.f. New York. The increasing difficulty in securing permits for shipment from London threw more business into the primary market and the latest sales made at Singapore were at a premium of £3 over the English market, at the equivalent of £201 10s c.i.f. London.

The deliveries of tin into American consumption in April were 4,202 tons, this being 524 tons less than the distribution in March. Since the first of January total deliveries have been 19,768 tons. Of the deliveries in April 3,600 tons were shipped from the Atlantic and 602 tons from Pacific ports. Stocks in warehouse and landing April 30th, were 2,756 tons, of which 756 tons only were in store as about 2,000 tons is being applied upon consumers' contracts.

LEAD (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19	7.50	3.70	4.11	7.67
May	3.90	4.23½		3.81	4.16	
June	3.90	5.86		3.80	5.76	
July	3.90	5.74		3.75	5.52	
Aug.	3.90	4.75		3.73½	4.59	
Sep.	3.86	4.62		3.67	4.53	
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

Lead in April.

Lead Market Dull With Prices Declining Throughout the Month.

Lead suffered a break of ½ to ¾c per pound during April, the decline being progressive throughout the month. The main cause of the reaction was the withdrawal of large export inquiries that had been the mainstay of the market during March. At London there was much irregularity but the net result of fluctuations was only a slight decline. While the English market had no direct influence here it was responsible for the smaller inquiries from Japan, which in turn caused a weaker tone and lower prices at St. Louis.

Spot, April and May lead at E. St. Louis was held at 7¾c to 8c per pound but there were few inquiries from domestic consumers, who preferred to purchase upon a sliding scale basis from the Trust rather than pay the high prices asked in the open market by the independents.

On April 5th, the London market for prompt shipment broke £2 with sales at £32 equivalent to 6⅝c per pound which was from 1 to 1⅜c per pound under prices prevailing here. Under these circumstances few export orders were likely to come to the United States from Japan which country would naturally turn to Australia. At the close of the first week some small sales were made at New York and there were free offerings at St. Louis and Chicago at 7⅞c for prompt shipment in April and May.

Word was received on April 10th, of free offerings in Japan far below the American parity. Japanese speculators and traders were reselling because of the large offerings and lower prices in Australia, consequently, few orders could be expected to come to this country. On the following day, however, sales were made for export to Russia at 7¾c St. Louis for May delivery at New York. The domestic demand was light. Producers were sold ahead but reported few shipping directions indicating small interest by consumers.

Several additional orders for carload lots were taken at 7¾c for shipment to Russia at the end of the second week but it was difficult to purchase a round lot of one hundred tons under 8c. Prices were very irregular in the next few days with some sales reported at 7⅝c East St. Louis for April shipment. The Trust declined to sell at a flat price but continued to take business at an average monthly price.

During the third week, the home market continued to recede with few sales of any importance for either foreign or domestic account. The London market on April 18th had advanced to £35 for prompt shipment equivalent to 7⅜c per pound or slightly under United States parity.

During the last week of the month prices in the outside market dropped slightly below the level of the Trust price, the two interests having drifted apart for two months, and, about the middle of March, there was a difference of 1c per pound. During the latter part of the month the St. Louis market was more or less demoralized, although there was not much lead left to be sold during May. Producers, consequently, were not pressing sales but some orders were taken at 7⅜c East St. Louis for May shipment and buyers b'd 7¼c for June shipment without securing any important lots of metal. On the closing day of the month the market was dull but slightly firmer in tone.

LEAD PRICES IN APRIL.

Day.	New York.* Cents.	St. Louis. Cents.	London. £	s	d
3	8.00	8.00	34	12	6
4	8.00	8.00	34	5	0
5	7.87½	7.87½	32	0	0
6	7.87½	7.87½	33	0	0
7	7.75	7.75	33	10	0
10	7.75	7.75	34	0	0
11	7.75	7.75	34	5	0
12	7.75	7.75	34	15	0
13	7.75	7.68¾	35	5	0
14	7.75	7.68¾	35	5	0
17	7.75	7.68¾	35	2	6
18	7.68¾	7.62½	35	2	6
19	7.62½	7.56¼	35	2	6
20	7.56¼	7.56¼	34	12	6
24	7.50	7.41¼	.....		
25	7.50	7.43¾	34	0	0
26	7.50	7.43¾	34	10	0
27	7.50	7.43¾	34	15	0
28	7.50	7.37½	34	10	0
High	8.12½	8.12½	35	5	0
Low	7.50	7.32½	32	0	0
Average	7.70	7.67	34	7	4

* Open market.

Copper in April.

Month Opens With Active and Feverish Buying.

The active and fevered buying of copper characterized trade during the early part of April, after a temporary lull. The renewed buying was accomplished by vigorous strength and no little excitement with prices steadily rising on all positions. Before the close of the month electrolytic had advanced from 1c to 3c per pound in the New York market which was reflected in an appreciation of £6 in American electrolytic at London. It is estimated that April sales made on domestic and foreign account aggregated between 300,000,000 and 400,000,000 pounds. About one-fourth of the contracts was placed by domestic consumers which was the reverse of the transactions in March.

Many reports were circulated concerning foreign negotiations which it was difficult to verify, as most of the reports were colored by kaleidscopic views through Wall street. The British Government, which had exercised an option on 60,000 tons of electrolytic copper before the close of March, was said to have placed an equal tonnage for this year's delivery at close to 27c per pound. It is significant, however, that during the first quarter of this year Great Britain had received only 12,000 tons of copper from the United States whereas the single purchase made by the English Government in December last called for shipments of 5,000 tons per month. It is claimed that the difficulty of securing steamships or freight room was responsible for the deficiency in the foreign movement.

The French Government also was reported to have purchased between 30,000,000 to 40,000,000 pounds of American electrolytic for May, June and July shipment. Italy, and possibly Russia, also bought a moderate tonnage during the first week of the month. During the first quarter of the year, it is interesting to note, that France took more than 34,000 tons of American copper or about 5,000 tons more than during the corresponding period last year, whereas shipments to the United Kingdom were 10,000 tons less than during the first three months of 1915; while less than 3,000 tons were expected to Russia during the same period of which 2,000 tons were shipped in March. Italy took 14,000 tons during the first three months of this year which was about 300 tons less than during the corresponding period last year. The foreign shipments to all countries in April aggregated about 50,000,000 pounds, with shipments from southern and Pacific ports estimated.

Since the first of January the allied governments have taken at rate of about 562,000,000 pounds for the year whereas nearly 582,000,000 pounds were shipped to Great Britain, France and Russia in 1915. It is evident that there must be a radical increase in the foreign movement if the estimate of 700,000,000 pounds made early this year for these countries in 1916 is even approximated.

Heavy Buying Sends Price Up 3c Per Lb.

Consumers of copper wire and also exporters have made heavy purchases for shipment over the next four months; that is, for delivery up to August this year. The result of the heavy buying was an advance of about 3c per pound. The base price of copper wire at the close of the month was 33c per pound on the average, but prices ranged from 32½c to 33½c according to deliveries.

Nearby Positions Irregular.

There was considerable irregularity in prices on nearby positions during the second half of the month. The large producing interests were reported to have sold capacity up to August but apparently there was an ample amount of copper available to meet the reduced requirements of belated buyers for April, May, June and July shipments. It is generally believed in the trade that considerable metal carried on speculative account was fed cautiously to consumers at high premiums. At times other second hand offerings caused temporary reactions in prices but the domestic demand absorbed most of these offerings within a fraction of the prices asked by large interests who, late in the month, discovered moderate amounts of copper left over available for early shipment.

High Prices Stimulated Production—Consumption Impeded by Labor Difficulties.

Production, of course, was stimulated enormously by the extraordinarily high prices

LAKE COPPER PRICES.

Monthly average prices of **Lake Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	.....
June	17.43	15.08	14.15	19.92	.....
July	17.37	14.77	13.73	19.42	.....
Aug.	17.61	15.79	12.68	17.47	.....
Sept.	17.69	16.72	12.43½	17.76	.....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av..	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Monthly average prices of **Electrolytic Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	.....
June	17.29	14.85	13.81	19.71	.....
July	17.35	14.57	13.49	19.08	.....
Aug.	17.60	15.68	12.41½	17.22	.....
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av..	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Monthly average prices of **Casting Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	.....
June	17.08	14.72	13.65	18.74½	.....
July	17.09	14.40½	13.34½	17.76½	.....
Aug.	17.35	15.50	12.27	16.46	.....
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av..	16.29	15.33	13.18	16.76	.....

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since August 18, 1915, are given in the following table together with the price of Lake Copper on the same dates:

1915—	Sheet Copper.	Lake Copper.
August 18	23.00	16.75
November 3	23.25	18.06¼
November 15	23.50	18.62½
November 16	23.75	18.75
November 17	24.00	18.87½
November 18	24.25	19.00
November 22	24.50	19.87½
November 23	25.00	19.87½
December 22	25.50	20.50
December 23	26.00	20.75
December 24	27.00	21.50
December 30	27.50	22.37½
1916—		
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 19	36.50	29.75

WATERBURY COPPER AVERAGE.

The Waterbury copper average for the month of April is 29 cents.

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	23,663
February .	26,792	34,634	15,583	20,648
March ...	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	*19,980
May	38,601	32,077	28,889	.....
June	28,015	35,182	16,976	.....
July	29,596	34,145	17,708	.....
August ..	35,072	16,509	17,551	.....
September	34,356	19,402	14,877	.....
October .	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December	30,653	22,166	42,426	.....
Totals .	382,810	360,229	276,344	90,612

* Includes only exports from Atlantic ports.

prevailing, it being estimated that the April output was between 180,000,000 to 190,000,000 pounds. Those in closest touch with the situation confidently predict an output of 200,000,000 pounds in July. Domestic consumption continued heavy but toward the close of the month, because of labor difficulties and strikes, melting was somewhat reduced. Even if 130,000,000 pounds were shipped to consumers in April and 50,000,000 pounds exported a surplus of about 5,000,000 pounds was accumulated by producers making stocks of about 110,000,000 pounds at the close of the month.

Total London advance for month: £7 10s on Electrolytic; £17 on Standard Spot; £13 on Standard Futures.

The London market for American electrolytic advanced from £136 at the beginning of the month to £143 10s at the close of the month. Standard copper, while irregular for a week or so, developed a much stronger tone, spot advancing £17 and futures advancing £13. It is notable that there is now a difference of only £10 between spot standard and spot electrolytic whereas not long since the difference was as great as £40, due to the preparations making to liquidate all standard contracts by the end of May.

The domestic market during the last few days of the month was moderately active with a firm undercurrent but there was considerable irregularity and a wide variation in prices on the same position. Small sales of April were made as high as 31c ten days ago, but at the close of the month sales were made at 30½c, May sold at 30¼c, June and July at 30c, July alone at 29⅛c to 29¾ and August ranged from 29 to 29¾c. Small interest was taken in fourth quarter shipments at 28¼ to 28½c which producing interests were asking, whereas such sales had been early in the month at 27¼c.

Producers Well Sold Ahead.

The one feature that eclipses all others at the end of the month is the fact that producing interests have sold the equivalent of nine months capacity and hence can wait developments with confidence.

Copper Production.

The total output of refined copper from primary sources in 1915, according to the final report of the United States Geological Survey, was 1,634,204,448 pounds, equivalent to 619,674 tons; including metal from secondary sources the total production was 1,693,779,138 pounds. The apparent consumption of refined copper in the United States last year was 1,043,000,000 pounds in 1914, the indicated consumption was 620,445,373 pounds. If secondary copper and copper in alloys be included, the total consumption in this country last year was 1,435,000,000 pounds. Stocks of refined copper carried at the refineries on January 1, 1916, amounted to 82,429,665 pounds against refined stocks of 173,640,501 pounds on January 1, 1915. On the other hand, stocks of blister copper at smelters, in transit to the refineries and at the refineries on January 1, 1916, were 274,000,000 pounds, while on January 1, 1915, such stocks were 203,000,000 pounds. Thus there was an increase of 71,000,000 pounds in stocks of blister copper and a decrease of 91,210,935 pounds in stocks of refined copper during 1915.

COPPER PRICES IN APRIL.

	—— New York ——			London.		
	Lake.	Electro.	Casting.	Standard.		
Day.	Cents.	Cents.	Cents.	£	s	d
3	27.62½	27.62½	26.25	115	5	0
4	27.75	27.75	26.25	116	0	0
5	27.75	27.75	26.25	117	0	0
6	27.75	27.75	26.25	117	0	0
7	27.75	27.75	26.25	118	0	0
10	28.25	28.25	26.50	118	10	0
11	28.50	28.50	27.00	120	0	0
12	28.75	29.00	27.00	122	10	0
13.	29.25	29.75	27.50	124	0	0
14	29.25	29.75	27.50	126	0	0
17	29.25	29.75	27.50	127	0	0
18	29.25	29.75	27.50	128	0	0
19	29.75	30.50	27.75	130	10	0
20	29.75	30.50	27.75	131	0	0
24	29.75	30.50	27.75	.....		
25	29.75	30.50	27.75	131	0	0
26	29.75	30.50	27.75	132	0	0
27	29.75	30.50	27.75	132	0	0
28	29.75	30.50	27.75	132	0	0
High .	30.00	31.00	28.00	132	0	0
Low .	27.50	27.50	26.00	115	5	0
Av'ge	28.91½	29.31	27.16	124	6	4

Spelter in April.

Spelter was active, strong and buoyant during the first half of the month, especially so during the first ten days, when heavy sales were made for export and prices were advanced from 1 to 2c per pound on all positions. A lull followed and dulness was pronounced just preceding and immediately following the Government statistical report on April 17th. Domestic consumers remained out of the market during the third week of the month and while producers continued to have faith in the market the balance was turned by the dealers who switched from the buying to the selling side of the market, bringing about a sharp break in prices; and, before the close of the month, all the previous advance had been lost. A steadier tone was evident on the closing day of the month, however, with galvanizers in the market for May and June shipments.

It is remarkable that London continued strong throughout the month, being unaffected by the reaction in the United States and recorded a net advance of £12 on spot and £11 on futures with a very strong tone at the close.

Large Export Business.

Manufacturers of war munitions, especially brass makers, were prominently in the market during the first week and dealers were also free buyers of second quarter positions. Domestic galvanizers, however, were reluctant buyers and confined their purchases to nearby delivery. The main support of the market, however, came from abroad, exporters placing large contracts for deliveries from May to September for shipments from the West. Domestic buyers requirements, apparently, were quickly satisfied and at the end of the first week the market was in the hands of the dealers and exporters.

In the mining districts the principal feature of interest was the strike of the machinists threatening to curtail production, following the suspension of work by the moulders in many of the producing fields.

During the second week of the month more heavy orders were placed upon a rising market although domestic consumers were inclined to hold aloof anticipating a reaction. Dealers and other professional operators, however, encouraged by the activity and strength in copper, continued to purchase as prices advanced. It was pointed out that with the exception of brass makers, domestic consumers were poorly supplied to meet their requirements beyond May.

Domestic Buyers Enter Market for Heavy Tonnages.

Manufacturers of war munitions entered the market with greater force about April 12th, buying brass special at 21 to 22c per pound for April, May and June, as well as prime western. Other domestic consumers also came into the market placing liberal contracts for delivery up to September, but especially for June, July and August. During the next two days there was some falling off in business with freer offerings of future positions. Most of the transactions were of a professional character, dealers both buying and selling. Brass founders, already well covered for the third quarter, bought for delivery over the fourth quarter, but sheet mills and other galvanizers continued to confine their purchases to second quarter delivery. Few, if any, galvanizers had placed any orders for delivery beyong June.

Prices Decline Following Publication of Government Statistics.

On April 17th, the Geological Survey issued its statistical report for 1915 which had a profound effect upon the market and was later held responsible for the steady decline during the following ten days. The Government report shows that there was an increase in production of 136,470 tons or 39% in 1915, and that to-day there is under construction or planned for, smelting capacity amounting to 49,612 retorts. When these are completed the yield of spelter will be at the annual rate of 825,000 tons. To this, however, must be added 60,000 tons to be derived from the electrolytic zinc plants, giving a total capacity of 885,000 tons per year.

The Government statement makes clearly evident the extraordinary changes in the industry resulting from the war. Prior to 1914 the United States had never produced as much as 350,000 tons and had never consumed more than 340,000 tons of spelter in one year. It is pointed out that when the retorts now building are finished, the productive capacity of the United States

will be nearly three times the normal domestic consumption. The world's consumption of spelter in 1913, as reported by the Government, was 1,102,456 tons and therefore the prospective capacity of the United States is equal to 80% of the world's consumption about two year's ago.

Germany Shall Never Smelt Australian Zinc Concentrates Again.

The changes wrought by the war are likely to help the United States to maintain commanding position in the spelter industry after hostilities cease. Germany and Belgium, that previously supplied about one-half of the world's requirements, obtained their ores from Australia but Great Britain and Australia have declared that never again shall Australian zinc concentrates be smelted in Germany or in Belgian plants controlled by German interests.

In the mining district of the west, the settlement of the labor difficulties through the return to work of molders and the yielding of several shops to the machinist's demand, facilitated a larger output of ore. The market for spelter, however, remained dull and prices yielded during the third week of the month about ½c per pound. Producers did not press sales but the market lacked support of buying orders. Foreign political complications also had a depressing effect.

SPELTER PRICES IN APRIL.

	New York.	St. Louis.	London.		
Day.	Cents.	Cents.	£	s	d
3	17.92½	17.75	93	0	0
4	18.05	17.87½	91	0	0
5	18.17½	18.00	92	0	0
6	18.42½	18.25	93	0	0
7	18.67½	18.50	94	0	0
10	18.80	18.62½	97	0	0
11	19.05	18.87½	98	0	0
12	19.17½	19.00	100	0	0
13	19.30	19.12½	100	0	0
14	19.30	19.12½	100	0	0
17	19.17½	19.00	102	0	0
18	19.17½	19.00	103	0	0
19	19.05	18.87½	103	0	0
20	18.92½	18.75	103	0	0
24	18.55	18.37½	.....		
25	18.30	18.12½	103	0	0
26	18.05	17.87½	103	0	0
27	17.80	17.62½	103	0	0
28	17.80	17.62½	105	0	0
High	19.42½	19.25	105	0	0
Low	17.67½	17.50	91	0	0
Average	18.61½	18.44	99	1	1

Weakness Characterizes Close.

Signs of weakness were more apparent during the fourth week and prices suffered a break of 1 to 1½c per pound under free offerings by dealers. Producing interests also were more anxious to sell for deliveries over the second and third quarters of the year, as anticipated foreign buying failed of realization. Brass makers came into the market on April 27th, placing a few orders for "brass special" and on the closing day of the month more interest was shown by other domestic consumers at the lower prices current Sheet galvanizers placed some orders for prompt, May and June shipment at 17½, 17, and 16½c respectively. The London market continued strong, advancing £2 on the closing day of the month.

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	
June	7.25	5.50	5.37	25.60	
July	7.46	5.61	5.26	24.90	
Aug.	7.34	5.99	5.66	19.30	
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

SPELTER (Monthly Averages.)

	New York			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	5.33	6.52	18.18	5.14	6.33	18.01
Feb.	5.46	8.86½	20.09	8.62	19.92	19.92
Mar.	5.35	10.12½	18.09½	2.15	9.80	17.91
Apr.	5.22	11.51	18.61½	5.03	11.22	18.44
May	5.16	15.82½		4.96	15.52½	
June	5.12	22.62½		4.93	22.14	
July	5.03	20.80		4.84	20.53	
Aug.	5.63	14.45		5.45	14.19	
Sep.	5.52	14.49		5.33	14.10½	
Oct.	4.99½	14.07		4.81	13.89	
Nov.	5.15	17.04		4.97	16.87½	
Dec.	5.67	16.91		5.49	16.72	
Av.	5.30	14.44		5.11½	14.16	

LIST OF ACTIVE ZINC SMELTERS IN THE UNITED STATES, SHOWING CAPACITY IN 1915, BY COMPANIES AND STATES.

(From Special Bulletin of U. S. Geological Survey.)

(Includes plants working on ore alone, on ore and drosses, and on drosses alone.)

Company and State.	Location.	Acid plant.	Retorts at close of 1915.	Retorts to be added in 1916.
ARKANSAS.				
Fort Smith Spelter Co.	Fort Smith	....	.....	2,560
Arkansas Zinc Co.	Van Buren?	....	.....	2,400
Total			.....	4,960
COLORADO.				
United States Zinc Co.	Pueblo	....	2,208	.....
ILLINOIS.				
American Zinc Co. of Illinois	Hillsboro	A	4,000	800
Collinsville Zinc Smelter	Collinsville	....	1,792	512
Granby Mining & Smelting Co.	East St. Louis	A	3,220	.....
Hegeler Zinc Co.	Danville	A	3,600	1,800
Illinois Zinc Co.	Peru	A	4,640	800
Matthiesson & Hegeler Zinc Co.	La Salle	A	6,168	.....
Missouri Zinc Co.	Beckemeyer	....	352	.....
Mineral Point Zinc Co.	Depue	A	9,068	.....
National Zinc Co.	Springfield	Aa	3,200	640
Robert Lanyon Zinc & Acid Co.	Hillsboro	A	1,840	800
Sandoval Zinc Co.	Sandoval	....	672	.....
Total			38,552	5,352
KANSAS.				
American Spelter Co. (b)	Pittsburg	....	896	.....
American Zinc, Lead & Smelting Co.	Caney	....	c7,360	.....
Do	Dearing	....	4,480	.....
Chanute Spelter Co.	Chanute	....	1,280	.....
Cherokee Smelting Co.	Bruce	....	896	.....
Edgar Zinc Co.	Cherryvale	....	4,800	.....
Granby Mining & Smelting Co.	Neodesha	....	3,760	.....
Iola Zinc Co.	Concreto	....	660	.....
Joplin Ore & Spelter Co.	Pittsburg	....	1,444	.....
Pittsburg Zinc Co.	do	....	1,358	.....
Prime Western Spelter Co.	Gas	Ad	4,868	.....
United States Smelting Co.	Altoona	....	3,960	.....
Do	Iola	....	3,440	.....
Do	La Harpe	....	1,924	.....
Total			41,126	.....
MISSOURI.				
Edgar Zinc Co.	St. Louis	....	2,000	.....
Nevada Zinc Co.	Nevada	....	672	.....
Rich Hill Zinc Co.	Rich Hill	....	.....	448
Total			2,672	448
OKLAHOMA.				
Bartlesville Zinc Co.	Bartlesville	....	5,184	.....
Do	Blackwell	....	.....	4,800
Do	Collinsville	....	10,752	672
Henryetta Spelter Co.	Henryetta	....	.....	1,800
J. E. Hildt	Tulsa?	....	.....	3,660
J. B. Kirk Gas & Smelting Co.	Checotah	....	.....	3,200
Kusa Spelter Co.	Kusa	....	3,720	.....
La Harpe Spelter Co.	do	....	.....	4,000
Lanyon-Starr Smelting Co.	Bartlesville	....	3,456	.....
National Zinc Co.	do	....	4,970	.....
Oklahoma Spelter Co.	Kusa	....	.....	1,600
Picher Lead Co.	Henryetta	....	.....	3,200
Tulsa Fuel & Manufacturing Co.	Collinsville	....	6,232	.....
Tulsa Spelter Co.	Sand Springs	....	5,680	800
United States Smelting Co.	Blackwell	....	.....	6,000
Total			39,994	29,732

(Continued on next page.)

PENNSYLVANIA.				
American Steel & Wire Co.	Donora	A	3,648	5,472
American Zinc & Chemical Co.	Langeloth	A	3,648	3,648
New Jersey Zinc Co. (of Pennsylvania)..	Palmerton	....	6,720	.....
Total			14,016	9,120
WEST VIRGINIA.				
Clarksburg Zinc Co.	Clarksburg	....	3,648	.....
Grasselli Chemical Co.	do	Ae	5,760	.....
Do	Meadowbrook	Ae	8,592	.....
Total			18,000	.....
Total for all States			156,568	49,612

(a) The National Zinc Co. has zinc-roasting furnaces at Argentine, Kans., where the sulphur gases are utilized in an acid plant, the roasted concentrates being shipped to the smelter at Springfield, Ill.

(b) Completed in 1915, but not operated until 1916.

(c) Including furnaces of Owen Zinc Co., operated under lease.

(d) The Prime Western Spelter Co. has roasting furnaces and an acid plant at Tiltonville, Ohio.

(e) The Grasselli Chemical Co. operates acid plants in connection with its zinc-roasting furnaces at Grasselli, Ind., Cleveland, Canton, and Lockland (near Cincinnati), Ohio, and Newcastle, Pa., the roasted zinc concentrates being shipped to the smelters at Clarksburg and Meadowbrook, W. Va.

TRADE NOTES.

The United Zinc Smelting Corporation was chartered on April 18, under the laws of New York, with 600,000 shares of no par value, to acquire control of the zinc-lead mines of the Kenefick Zinc Corporation in the Joplin district, and of the smelting plant of the Clarksburg Zinc Co., at Clarksburg, W. Va., and to conduct a general mining, smelting and manufacturing business.

The following directors have been elected: Russel A. Cowles, of the Buffalo Copper & Brass Rolling Mills Corporation; Arthur Day and Arnold L. Davis, of Parker, Davis & Wagner; William Kenefick, Benjamin Lissberger, of B. Lissberger & Co., New York; Martin M. Pearlman, of the Pearlman Co., Inc., and George M. Pynchon, H. Raymond, and William E. Reis of Raymond, Pynchon & Co.

The United Zinc Smelting Corporation has offered to purchase all common shares (200,000) of Kenefick Zinc Corporation at 1¼ shares of its stock for each common share of Kenefick Zinc Corporation.

Stock of Kenefick Zinc Corporation was issued only last February and has already received two monthly dividends of 10 cents per share.

The Kenefick Zinc Corporation properties include the following mines in the Joplin district: Media (new mill only recently completed), Electrical, Coyote, Airedale and Milan; these properties are estimated to have an annual output of 25,000 to 30,000 tons of concentrates, and there are no outstanding bonds or other liabilities other than current indebtedness. The zinc-smelting plant of the Clarksburg Zinc Co. controlled by Pearlman Co., Inc., contains 3,648 retorts comprised in four blocks of 912 retorts each. It is planned to construct two additional blocks, bringing the total equipment up to 5,472 retorts. A new acid plant will be an important feature of the improvements at this works.

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc Aug. 23rd, 1915 together with the price of spelter ruling on the same day.

1915—	Sheet Zinc.	Spelter St. Louis.
August 23	15.00	12.00
August 24	16.00	12.75
November 4	16.50	15.12½
November 9	17.00	15.87½
November 11	17.50	16.12½
November 12	18.00	16.31¼
November 17	19.00	17.25
November 18	20.00	17.37½
November 22	21.00	18.75
November 23	22.00	18.75
December 31	23.00	17.25
1916—		
January 26	24.00	19.00
February 17	25.00	20.87½

Aluminum In April.

Market Dull and Prices Unchanged.

Aluminum was dull throughout April there being scarcely enough business in the open market to determine the exact position of prices. At the beginning of the month No. 1 Virgin for early shipment was offered at 59 to 61c. Pure, 98 to 99%, remelted, was offered at 57 to 59c and No. 12 alloy remelted, at 48 to 50c. The tone of the market was easier for several days with May, June and July shipment of No. 1 Virgin available at several cents per pound less than the asking price for spot. At this time the Aluminum Company of America was making better deliveries on contracts with consumers bidding 57 to 58c for early shipment and holders asking from 1 to 2c per pound higher. Sales of remelted were made in small lots at 57c in the east, while western holders were asking 56 to 57c at shipping points but there were few buyers except at radical concessions.

Deliveries Held Up by Labor Difficulties.

About April 20th, the Aluminum Co. of America, crippled by strikes and other labor difficulties, fell behind in deliveries; consequently, dealers refused to quote small consumers for specific shipments but prices were nominally from 1c to 2c lower. The market became more settled toward the close of the month when shipments were made regularly with the resumption of work at the plants of the largest interests; but there were few offerings for future delivery because of the uncertainties surrounding the market. Export business was almost entirely suspended because of the restrictions placed by the British Government against purchases by individuals. Trading in the English market has been eliminated with all supplies concentrated and utilized by the Government in the manufacture of war munitions. Prices in the open market here, at the close of the month varied but slightly from those prevailing when the month opened.

ALUMINUM AND SILVER PRICES.

New York

	—Aluminum—			—Silver—		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	18.86	19.01	54.33	57.56	48.89½	56.77½
Feb.	18.80½	19.20	57.50	57.50½	48.48	56.75½
Mar.	18.30	18.94½	60.52	58.07	50.24	57.92½
Apr.	18.08	18.83	60.00	58.52	50.25	64.37½
May	17.93	21.85	.....	58.18	49.91½	.....
June	17.82	29.66	.....	56.47	49.03	.....
July	17.59	32.50	.....	54.68	47.52	.....
Aug.	20.38	34.00	.....	54.34	47.18	.....
Sep.	19.28½	46.75	.....	53.29	48.68	.....
Oct.	18.25	54.17½	.....	50.65	49.38½	.....
Nov.	18.83	57.85	.....	49.10	51.71	.....
Dec.	19.02	56.80½	.....	49.38	54.97	.....
Av..	18.59½	34.13	.....	54.81	49.69	.....

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 11, 1915, have been as follows:

June 11, 1915		6.50
June 12	Advanced	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	"	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	.10c to 5.00
November 10	"	.15c to 5.15
November 15	"	.10c to 5.25
December 14	"	.15c to 5.40
December 31	"	.10c to 5.50
January 4, 1916	"	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	.05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60
March 14	"	.40c to 7.00
March 30	"	.50c to 7.50

Antimony In April.

The Month Opened With Heavy Break in Prices, Continuing Weak and Dull Throughout.

Antimony was heavy, weak and lower throughout April because of light demand from manufacturers of war munitions and from other domestic consumers, in conjunction with larger arrivals of domestic and foreign metal and freer offerings of future shipments from the Orient. The result was a break of 6 to 7c per pound on spot, 5 to 6c per pound on nearby futures and 4 to 5c per pound on shipments from China and Japan.

At the beginning of the month importers and dealers were asking 43 to 44c for either American or Oriental antimony for prompt shipment while April was offered at 39 to 40c per pound duty paid. The demand was almost entirely confined to small lots of one to five tons, as munition makers were out of the market having previously covered their requirements by executing future contracts.

As the month progressed the spread between spot and future positions increased, ranging from 5 to 10s per pound for a time, through the recession of all positions but especially of future contracts. By the tenth of the month spot had receded to 42½c, April to 39½c, May to 37½c, June to 36c and July to 34c, duty paid.

Toward the middle of the month larger arrivals from the far East caused a further recession of 1c to 2c per pound, and importers were ready to make even greater concessions, although unwilling to force sales on reluctant buyers. The market was almost entirely lifeless, and the previous two weeks proved to be the dullest since the beginning of the European war. During the third week of the month additional arrivals from Japan caused a further drop in prices when some sales for May delivery were made at 36½c followed by several large sales on April 25th, of May, June shipments from the Orient at 30c in bond. Still lower prices were made in the next few days and the market closed heavy, weak and lower at 37½c for prompt, and 35 to 36c for May delivery, duty paid. Further concessions would be made for shipments from the Far East but there was scarcely enough doing to determine the exact position of the market.

CHINESE and JAPANESE ANTIMONY.

Average monthly price of Chinese and Japanese (ordinary brands) in New York.

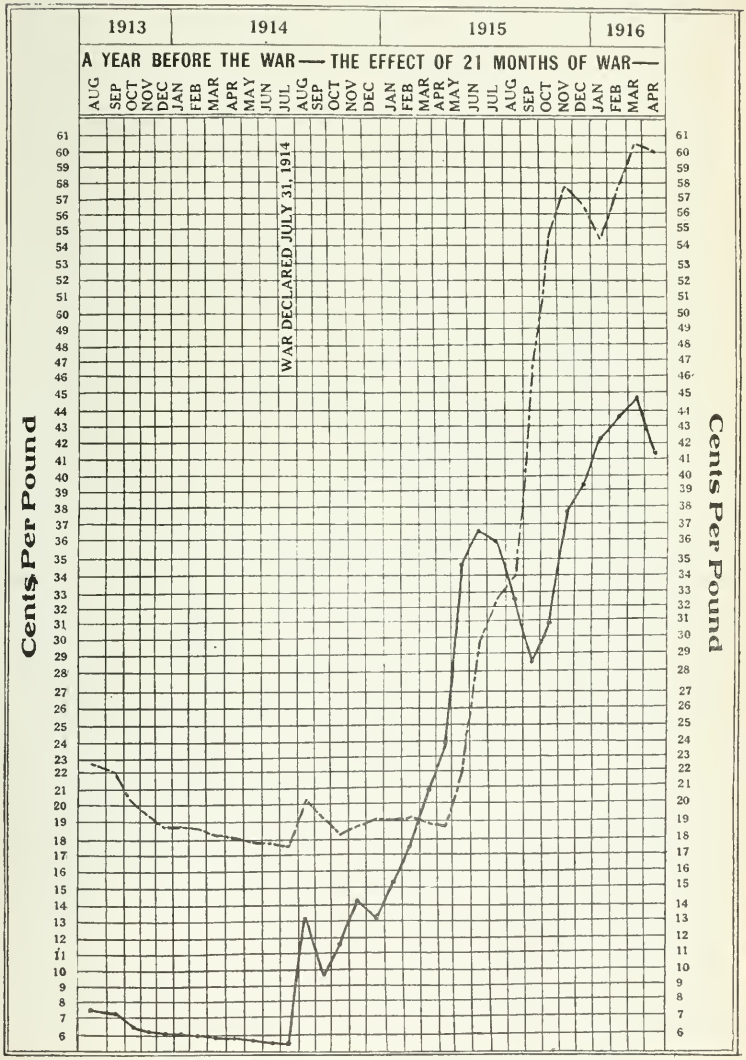
	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	.....
June	7.07	7.62	5.62½	36.53½	.....
July	7.37	7.55	5.44	35.98	.....
Aug.	7.58	7.48	13.05	32.57	.....
Sept.	8.00	7.31	9.79½	28.50	.....
Oct.	9.11	6.46	11.64	30.96	.....
Nov.	9.11	6.28	14.14	37.88	.....
Dec.	9.05	6.05	13.15	39.36½	.....
Av..	7.63	7.43	8.53½	29.52	.....

ALUMINUM, SILVER and ANTIMONY PRICES IN APRIL.

	Aluminum.	— Silver —		Antimony.
Day.	N. Y. Cents.	N. Y. Cents.	London. Pence..	N. Y. Cents.
1	....	60⅞	29	.....
3	.... 60.00	61⅝	29⅜	44.00
4	.... 60.00	61¾	29⅞	43.50
5	.... 60.00	61⅝	29⅜	43.50
6	.... 60.00	61¾	29⅞	43.50
7	.... 60.00	61⅝	29⅜	43.50
8	....	61¾	29⅞	.....
10	.... 60.00	62¼	29 11/16	43.00
11	.... 60.00	62½	29 15/16	42.75
12	.... 60.00	62¾	29⅞	41.50
13	.... 60.00	63	30	41.50
14	.... 60.00	63¼	30⅛	41.50
15	....	63¾	30⅜	.....
17	.... 60.00	64	30⅝	40.50
18	.... 60 00	63¾	30⅞	40.50
19	.... 60.00	64½	30¾	40 2'
20	.... 60.00	65⅜	31⅞	40.0'
22	....	65⅜	....	.....
24	.... 60.00	65⅜	....	40.00
25	.... 60.00	67⅛	32	40.00
26	.... 60.00	67⅛	32 1/16	39.25
27	.... 60.00	69	33	39.00
28	.... 60.00	71¾	34⅛	38.00
29	....	....	....	.....
High..	61.00	73½	55⅛	44.00
Low .	59.00	60⅞	29	37.50
Av'ge .	60.00	64 18	35.21	41.35½

The Extraordinary Effect of 21 Months of War on Aluminum and Antimony Prices.

Plotted from monthly averages of No. 1 Virgin Aluminum and Chinese and Japanese grade Antimony.



Joplin Zinc And Lead Ore Markets.

Never in the history of the Joplin district has there been such a monthly shipment of ores both in tonnage and in value as was shipped during the month of April. Of blende ores the average for the five weeks was 8,750 tons and of calamine 815 tons, a total of 9,565 tons of all zinc ores weekly. Part of this great shipment of ores which reached the impressive total of 47,827 tons of zinc ores was surplus stock which was enticed out of the bins of the holders by the higher priced levels that prevailed during the middle of the month. The surplus stocks at the beginning of the month were 10,825 tons while at its close they had dwindled down to 8,200 showing an absorbtion of 2,625 tons. Taking this into consideration it is evident that the zinc ore production is now running above 9,000 tons weekly, a production level never hitherto believed possible for the field. But with the performance now accomplished and with a review of the new plants under construction it becomes evident that the year will see even greater production before it closes. It would surprise no one now if the year closed with an average of 10,000 tons per week for the entire period.

The price levels for the month were also higher than those of the previous month. The average price for all grades of blende ores was $106,47 for the month; for calamine ores it was $81.61. The base range was highest for the week of April 15 when it touched $125. It ranged from $110 to $120 for the other weeks of the month. The lowest range of base was for the first week of the month when ore sold as low as $90 base for 60% zinc ores. During no week of the month was the average settlement price for all grades of blende below $101.50 and as high as $112.50 was reached for the week of April 15.

Calamine prices were not so variable in base price for the month but the average settlements for the various weeks did vary on account of grade. The base range for this class of ore held firmly to $75 to $95 for 40% ores. The average for all grades for the month was $81.61. The lowest average was for the week of April 22 when the average was $76. The production of this class of ores has been showing an increase recently which has been bringing it back somewhat nearer the proper proportion to blende ores. A few years ago the normal relation of calamine ores to blende was in the proportion of one ton of calamine to ten of blende. The last month saw a closer approximation of this than for some time.

The lead ore market held steady to the mark set the previous month and sold quite uniformly from $96 to $102.50 per ton of 80% lead. The average of all grades was slightly above $100 per ton. The tonnage shipped reached 6,333 tons or an average of 1,266 tons per week. This shipment of ore took care of practically the output save for 250 tons which was added to the surplus stock. At the end of the month the surplus stock was 750 tons.

The increased output of 1916 over 1915 for both lead and zinc is assuming a surprisingly large per cent. With regard to blende ores the increase in tonnage is 39,669 tons or 47%, for calamine it is 4,222 tons or 67% and for lead ores it is 6,757 tons or 52%. If these increases are maintained throughout the coming months and every indication now points in that direction, the output of ores will reach very large figures.

In spite of the increase in production, however, there seems an ever increasing demand for the ores and as rapidly as it reaches the bins of the ore producers it is purchased by the smelters so that the surplus stocks have never reached any dangerous proportions. This month sees the announcement of the building of three more zinc smelting plants, one at Quentin and another at Boynton, Okla., and a third at Fort Smith, Ark. All three of the plants will be gas fuel plants. Two of the plants are already under construction while the other is just starting.

An Abnormal Market on Silver.

The market situation of silver during the past month has been sensational to a marked degree, and prices obtaining at the time of writing are 76⅞ cents New York, and 37 pence London, which show a slight reaction from the high points reached May 3rd, namely: 77¼ cents and 37⅛ pence in the New York and London markets respectively. These prices are above the high level of 1906 and it is necessary to go back to the silver boom of 1893 to find their equal. Withdrawal of gold as a medium of circulation from practically all the markets of the world except this country accounts almost fully for the sensational advance in silver. Incidentally, the Mexican disturbances have served to materially curtail the supply from that source.

For the past year, but more especially in recent months, there have been heavy shipments of silver from this country to England, France and Russia, while the demand from China and East India has been almost unprecedented.

The Journal of Commerce has the following to say on the silver situation:

"The highest prices for silver since the halcyon days of so-called free silver back in 1893 are now being enjoyed by the silver producers of the country. Last fall, the price of silver, at 47 cents per ounce, was the lowest in history. This week it passed 73 cents an ounce, soaring 10 pounds in a week. The average price in recent years has been between 55 and 60 cents. During the 1906-1907 boom, the price at one time passed 71 cents. Up to 1873, the price was fixed at $1.29 an ounce. That was in the days of real free silver, at 16-to-1. From 1873 to 1893, under partial free silver, the price hovered around $1.00 an ounce, more or less.

"The boom in silver is due to the demand for coinage purposes by practically all European countries. Gold has disappeared from circulation throughout Europe. The Allied Powers and the Central Powers are issuing torrents of silver money, and reams upon reams of silver certificates or paper money backed by silver reserves, or ostensibly so backed.

"Already there is talk, owing to the hoarded supply of gold, and the demand for silver currency both during the war, and after, that silver may once more be monetized in Europe.

"Free silver, due to the scarcity of gold in Europe, is not an impossiblity.

"As a probability it looms up most exceedingly remote.

"But then, this war has upset all established precedents in many other lines of thought and action which this world of ours had conceived as 'fixed.'

"Free silver means that silver producers may sell their entire output to government mints at a fixed price and that the government may coin this silver in free and unlimited amount, according to this price, which represents a fixed ratio between gold and silver. Bryan's '16-to-1' meant only that the price of silver would be fixed at 1-16th that of gold, which was, and is, $20.67 an ounce. That would have made silver worth $1.29 an ounce. That was the price of silver up to the time the metal was demonetized in this country in 1873. It was the price at which the government agreed to buy large quantities of silver for coinage after 1873—but no free and unlimited quantities. It was this purchase by the government which held up the price of silver—near or above $1.00 up to 1893.

"Free silver does not mean necessarily 16-to-1. The Allied Powers may, conceivably declare for free silver at, let us say, 30-to-1. With gold at $20.67 per ounce, that would give silver a fixed value of 68.9 cents an ounce, for coinage purposes. Free silver at 25-to-1 would mean 82.6 cents an ounce for silver.

"As to this war leading to possible remonetization of silver—free and unlimited coinage, at a fixed ratio from the Franco-Prussian war, and Berlin's demand that the war-debt be paid in gold, which was the real cause for the demonetization of silver in this country in 1873.

"Will this war swing the pendulum to the opposite extreme, and bring silver back again to free and unlimited coinage at some fixed rate—and fancy price per ounce?

"Quien sabe?"

BRANDS OF COPPER IN UNITED STATES.

LAKE.

	Refined at:	Branded.
Adventure	Hancock, Michigan.	Adv. C. Co.
Atlantic	Houghton, Michigan.	A.
Calumet & Hecla	Hubbell, Michigan.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	B. L.
Centennial	Hancock, Michigan.	C. C. M. Co.
Copper Range	Houghton, Michigan.	C. R.
Franklin	Hancock, Michigan.	F. M. Co.
Isle Royale	Dollar Bay, Michigan.	I. R. C. Co.
Mass.	Hancock, Michigan.	Mass.
Michigan	Houghton, Michigan.	M. C.
Mohawk	Houghton, Michigan.	M. M.
Osceola	Dollar Bay, Michigan.	T. O.
Quincy	Hancock, Michigan.	Q. M. Co.
Tamarack	Dollar Bay, Michigan.	T. O.
Victoria	Hubbell, Michigan.	V. C.
Winona	Hubbell, Michigan.	W. A.
Wolverine	Houghton, Michigan.	W.

ELECTROLYTIC.

	Refined at:	Branded.
American S. & R. Co.	Perth Amboy, N. J.	P. A.
Balback S. & R. Co.	Newark, N. J.	Bb.
Baltimore Copper Works	Baltimore, Md.	B. E. R.
Boston & Montana Co.	Great Falls, Mont.	B. & M.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Copper Queen	Laurel Hill, L. I.	C. * Q.
Miami	Laurel Hill, L. I.	A. L. S.
Nichols Copper Co.	Laurel Hill, L. I.	L. N. S.
Orford Copper Co.	Chrome, N. J.	O. E. C.
Raritan Copper Works	Perth Amboy, N. J.	N. E. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. R. W.
United Metals Selling Co.	Laurel Hill, L. I.	R. M. C.

CASTING.

	Refined at:	Branded.
Balbach S. & R. Co.	Newark, N. J.	N. B. C.
Boston & Montana Co.	Great Falls, Mont.	M. A.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Duquesne Reduction Co.	Pittsburgh, Pa.	D. E. C.
Nichols Copper Co.	Laurel Hill, L. I.	C. N. C.
Phelps, Dodge & Co.	Laurel Hill, L. I.	P. D. Co.
Tottenville Copper Co.	Tottenville, N. Y.	C. T. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. S.
Philadelphia, Pa.	White & Bro., Inc.	W. B.

Index To Advertisements.

Trade Notes.

The New England Brass Company, Taunton, Mass., has been incorporated with a capital stock of $125,000. William M. Lovering is president and Frederick H. Gooch treasurer. It plans to build, on Park Street, a rolling mill, 60x125 feet and a casting shop 50x60 feet, to be completed in June.

A new steel company—Halcomb & Davidson, Inc.—with offices in the Singer Building, New York, has been formed by C. Herbert Halcomb, formerly a director and works manager, and William P. Davidson, for 11 years vice-president and general manager of the International High Speed Steel Company, who have severed their connections with that company. The new company will engage in the manufacture and sale of all kinds of tool steel, high-speed steel, alloy steels and drill steels, solid and hollow.

The Canadian Steel Specialty Company, Ltd., Grimsby, Ont., has been incorporated with a capital stock of $100,000 by Harry G. Hess, Jesse J. Foster, Clyde B. Van Dyke and others to manufacture machinery, tools, metals, etc.

The Simplex Seamless Tube Corporation, according to an announcement made by the Buffalo Chamber of Commerce, has been incorporated and will erect a plant in Buffalo, N. Y. for the manufacture of seamless steel tubing. The plant at the outset will have a capacity of 7,000,000 to 10,000,000 lin. ft. per year. Rogers, Locke and Babcock, attorneys for the new corporation, are conducting the arrangements. The plant is to be ready for operation as quickly as possible. The first mill will contain from eight to 12 benches. Representatives of the company state that contracts have been closed for tubing that will keep the plant busy on a 24-hour day basis for the next year.

The Stanley Steel Company, Ltd., Hamilton, Ont., has been incorporated to carry on the business in iron and manufacture of steel and iron; $250,000 capital stock; by Arthur T. Hatch, Frederick M. Hatch, Thomas C. Haslett and others of Hamilton.

The Apex Steel Corporation, Port Ewe N. Y., has been incorporated by J. J. Mi laney, 50 Church Street; W. H. Hicken, N. Emley, 15 William Street, N. Y., to co duct business in mining, smelting and ma ufacturing. The capital stock is $30,000.

The Roberts Tool Company, 391 Mu berry Street, Newark, N. J., has been i corporated to manufacture rivet sets a other shock resisting tools by a newly d veloped process. It involves the use of special analysis steel which is subjected a heat-treating process that gives the e terior of the tool great heat-resisting qua ities. By virtue of soft cores, the rivet se and other tools will not break at the shan The company will begin to manufactu early in May.

It is announced that Philadelphia inte ests and others have financed the Delawa Steel & Ordnance Company, which h taken over the plant of the Diamond Stat Steel Company. The capital subscrib was $5,000,000 and operations will be r sumed at the plant within 30 days. At fir 1,000 men will be employed, and the nu ber will be increased to 1,500.

Maryland Iron and Steel Company a plied for articles of incorporation on Apr 13th at Dover, Del. The company w have a capital stock of $1,000,000.

The Frost Steel & Wire Company, Han ilton, Ont., has been incorporated with capital stock of $6,000,000 to manufactu fences, gates, posts, etc.

The Sterling Metal Company, Auburn Ind., organized with $25,000 capital stoc will make knives and forks, dental an plumbers supplies. Orlando Rex is pres dent and A. L. Kuhlman secretary.

The Foundry & Machine Company, Mon treal, Quebec, has been incorporated t carry on a general foundry business, t manufacture machinery, tools, shells, mun tions, motors, etc.; $200,000 capital stock by John J. Tolland, Joseph U. Emard, Joh A. Sullivan, G. A. Normandin, and other all of Montreal.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, JUNE, 1916. NO. 6.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President.
C. S. J. Trench, Secretary and Treasurer,
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

The War to Kill England's Free Trade Policy.

Some of the great economie changes to take place in the British Empire as result of the war, are foreshadowed in resolutions passed at the special and fifty-sixth annual meetings of the Chambers of Commeree of the United Kingdom, lately held in London, at whieh over 100 Chambers of Commeree were represented.

The resolutions that we give below were all passed unanimously. The British nation has been taught by the war that the day of free trade is past. The proteetion poliey of Germany and the United States has been demonstrated as the only safe poliey for England in the future. Nothing else than the present awful war and the economie situation uneovered and the effeets that have followed in eonsequenee could have converted the British nation from the fetish of free trade. Even free trade strongholds like Manchester were found voting unanimously for a protective poliey in future.

The whole question has been removed out of the sphere of a politieal question. All British parties and business interests are at one on the question.

There is also to be no return to ordinary free and unrestrieted eommercial intereourse and eomity between the allies and their enemies after the war. As it has been the most extraordinary war in the annals of the world, so also its after effeets are to be unprecedented and extraordinary. It is well that the leading neutral eountry

the United States, should realize this, and in the meanwhile make preparations for the new economic conditions and tariffs that are to be met and contended with.

Some of the resolutions passed unanimously follow:

"That this Association desires to place on record for the guidance of those who follow us in days to come, its firm conviction, based on experience of the war, that the strength and safety of the Empire lie in the ability to produce all its requiries as largely as may be possible from its own soil and factories."

"That H. M. Government take immediate steps to consult the Governments of the Dominions overseas, and ascertain: (a) Their views in regard to the various trade problems arising as the result of the war, especially in regard to reciprocal trading and (b) The regulation of trade relations with enemy countries and the control of business in the Empire managed or owned by the subjects of enemy countries; it being important that their views be first obtained before any definite steps are taken by this country."

"That His Majesty's Government be urged to inquire into the desirability of fostering and safeguarding those industries in this country which have since the commencement of the war been engaged in the manufacture of articles formerly made, to a large extent, in enemy countries, or any industries which have in the past suffered seriously from German and Austrian competition; and further for the development of industries generally. His Majesty's Government be urged to provide larger funds for the promotion of scientific research and training, and to relax the present restrictions upon the subscription of capital for existing and new enterprises so far as may be consistent with the conduct of the war."

"That this Association is of the opinion that, with the object of maintaining and increasing our trade after the conclusion of the war, it is necessary that the different parts of the British Empire be drawn into closer commercial union, and that our trading relations with our Allies be fostered an that for the accomplishment of this pu pose it is desirable that provision shoul be made:

"(a) For preferential reciprocal tra ing between all parts of the Britis Empire;

"(b) For reciprocal trading relatio between the British Empire and th Allied Countries;

"(c) For the favorable treatment Neutral Countries; and

"(d) For restricting, by tariffs an otherwise, trade relations with all en my countries, so as to render dumpin or a return to pre-war conditions in possible, and for stimulating the deve opment of home manufacture and th consequent increased employment of n tive labor."

"That His Majesty's Government without delay requested by deputati from this Association to invite repr sentatives from the Colonies and th allied countries to confer in the first i stance seperately and subsequent collectively with representatives fro this country with the object of arri ing at common action."

"That the Association welcome t statement made by the President of t Board of Trade in the House of Co mons on the 10th of January, that privileges should be given to forei shipping which are not enjoyed by o own, and that the handicap under whi British shipping labors in this respe should be removed. They also welco his condemnation of the existing la under which subsidized foreign shi can make use of British ports and o tain the benefit of harbor facilit while escaping the payment of harb dues, and they strongly urge His M jesty's Government to take such ste as will effectively remove the gri ance."

"That legislation should be enacted u der which His Majesty's Governme shall have power to insist that any co panies or firms producing, manufact ing or trading in the United Kingdo India or the Crown Colonies shall **British controlled,** both as regards ma agement and ownership—also that the event of enemy companies or fir

being permitted to re-open or commence trading in any part of the United Kingdom, India and the Crown Colonies, they shall be subject to such control and inspection as shall make it impossible for them to be used as political agencies under the guise of commercial establishments."

"That legislation should be promoted to prevent enemy subjects for a period after the war from taking up employment or a domicile in this country without special license."

"That the Association of Chambers of Commerce of the United Kingdom, recognizing that no sacrifice is too great to ensure victory, and that only by rigid national and personal economy can the material resources of the Empire be made available for the prosecution of the war to a victorious peace, urges all the constituent Chambers of the Association to support the campaign inaugurated by the National Organizing Committee for War Savings by every means in their power."

"That this Association urges His Majesty's Government to announce a moratorium simultaneously with the declaration of peace so as to prevent the payment of debts due by British firms to enemy firms until such time as His Majesty's Government are satisfied that the debts due by enemy firms to British firms will be paid."

"That the Scientific and Technical Staff of the Imperial Institute which works in co-operation with the Colonial Office and the India Office, having rendered useful service in securing industrial employment in this country for the raw materials of the Sister States and India, be brought into touch with the Chambers of Commerce and that the Association should be represented on the Council of the Imperial Institute."

"This Association is of the opinion that in order to meet the competition of Germany and other countries in the markets of the world after the war, it is absolutely necessary that this country should use every endeavor to increase its exports. The Association is further of opinion that this country has not hitherto exercised its powers of production to the fullest possible extent, and to rectify this they urge that a strong effort should be made both by employers and employees to arrive at a friendly working agreement by which both parties will undertake to encourage the scientific development of their maximum powers of production, realizing that by so doing they will be aiding each other and placing the country in a better position to compete with other countries."

"That this Association is of opinion that the passing of a Registration of Firms Bill is urgently desirable."

"That in view of the desirability of the war of encouraging the development of mutual trading relations between the United Kingdom and Russia, it is desirable that manufacturers and merchants who are in a position to do so, and whose products are suitable for Russian markets, should be strongly urged to provide facilities for some member of their family or staff to reside in Russia for a definite period, with the view of learning the language and studying the commercial requirements and trade customs of Russian buyers;

"This Association is of opinion:

"(a) That in the case of aliens from late enemy countries British citizenship or naturalization should not be allowed until after twenty years uninterrupted residence under police registration and supervision in the British Empire; but in the case of aliens from neutral countries after ten years.

"(b) That the Oath of Allegiance should be accompanied by an Oath of Divestment of Allegiance to the Power of which the person has hitherto been a subject, preceded by a certificate from the Government of his native country declaring that he is released from all obligations and allegiance as a citizen thereof.

"(c) That only persons of British birth and parentage should sit in the House of Commons, the House of Lords, or on the Privy Council, or the Commission of the Peace, exception to be made in special cases by a resolution passed by both Houses of Parliament."

Business Trends.

THE STOCK MARKET VERY IRREGULAR.

There were many favorable signs during the month of May which tended to cause a continuance of the spirit of cheerfulness in both business and finance. Reports from all parts of the country stated that the crest of our manufacturing capacity has been reached. The returns of the railroads continued to show record-breaking earnings. Our foreign trade also showed no signs of slackening. Many of the industrial concerns, and some of the railroads reported increased or extra dividends. Yet despite these bullish factors the tone of the stock market at the opening of May was dull and irregular; declining tendencies ruled. As has been the case for several months past international uncertainties with possibilities of daily surprise influenced stock trading considerably and were factors imposing restraint on operations for higher values.

The market developed a strong undertone about the middle of the month and became quite active, mainly because of assurances that the crisis between Germany and the United States over the submarine controversy had passed, and stock values responded more readily to constructive factors being substantially higher in the average.

After about a fortnight of strength and activity, irregular tendencies in the market marked the close of the month. This reaction may be attributed to the presidential conventions and the new Mexican uncertainties looming up on the political horizon. These influences make for more conservative trading and few interests seem disposed to take an aggressive position on either side. All interest is centered at Chicago where the Republicans and Progressives are assembled in convention and the developments at that point promise to have quite an effect on the future of the stock market.

HEAVY BANK CLEARINGS.

Convincing evidence of the remarkable activity in general business now prevailing in every part of the country is provided by the enormous volume of bank exchanges during May at practically all the leading cities in the United States, the total, according to the statement prepared by "Dun's Review," which includes returns from 131 centers, amounting to $20,445,769,417, an increase of 40.5% as compared with the same month last year and of no less than 56.1% as contrasted with the corresponding month in 1914. Greater activity in the speculative markets helped to swell bank clearings at New York City, the total at that center being 45.3% larger than last year and 72.1% in excess of two years ago, but in the main these gains must be attributed to the remarkable volume of operations in ordinary business channels.

RECORD IRON PRODUCTION.

May was a month of high-rate production in the pig iron trade, the total output being 3,351,073 tons, according to the "Iron age"; or 108,099 tons a day, against 3,227,768 tons in April, or 107,592 tons a day, and 107,667 tons a day in March, the previous high rate. With 321 furnaces in blast June 1 the capacity active was 108,386 tons a day, against 109,072 tons a day for 322 furnaces at the beginning of May.

Three furnaces have blown in since this month opened, so that production is now at the yearly rate of about 40,300,000 tons. But furnaces keep going out for repairs, and on its present base the industry strains hard for any output above the 40,000,000-ton mark.

The daily average production of coke and anthracite pig iron in the United States by months since January, 1913, is given as follows by the "Iron Age."

	1913.	1914.	1915.	1916.
January ..	90,172	60,808	51,659	102,746
February .	92,369	67,453	59,813	106.456
March ...	89,147	75,738	66,575	107,667
April	91,759	75,665	70,550	107,592
May	91,039	67,506	73,015	108,099
June	87,619	63,916	79,361	.....
July	82,601	63,150	82,691	.....
August ...	82,057	64,363	89,666	.....
September	83,531	62,753	95,085	.....
October ..	82,123	57,316	100,822	.....
November	74,453	50,611	101,244	.....
December.	63,987	48,896	103,333	.....

Business Trends.

RISE IN COMMODITY PRICES.

"Bradstreet's" latest index number indicates that the upward sweep of commodity prices that has been in progress in a broad way since the outbreak of the European war has been halted, for the time being at least. The number registered for May 1st is $11.748 which represents a drop of a very small fraction of 1% from April but shows an increase of 19.8% over the same period a year ago, when prices were deemed to be high and reflects an advance of 36% over the like date in 1914, at which time prices reached a low level.

Although the undertone of most commodity prices continues remarkably strong, the ebb and flow of the respective movements seem to be such as to suggest the inference that the high point has been reached. On this point "Bradstreet's" Journal has the following to say:

"There are so many undercurrents by which the general tide is influenced that predictions based on the price changes of a single month might be deemed hazardous. Yet there is enough evidence cropping out to warrant the impression that prices from now on will be likely to find it harder to make further ascents. Indeed, the movement as a whole has been working upward so rapidly and continuously that a halt is not unwelcome. While buying has been largely on the basis of needs, it is probable that fear of still higher prices has spurred on demand and has made for what might be termed a bidding-up process. At the same time it is conceded that some projects, especially in the building industry, have been put off against the time when lower prices shall appear, and it is also admitted that buying of cars by the railways has been deferred. But the pace of things is so active that a negative influence here and there is really a negligible factor."

CHARTERING NEW ENTERPRISES CONTINUES HEAVY.

Activity among promoters of new enterprises continues on a large scale. This is made decidedly apparent by the papers filed in May for new companies in the Eastern States with a capital of $1,000,000 or over, which involved a total of $209,735,000. These figures indicate an increase of almost 170% over the total for the same month a year ago. Compared with April this year the returns show an increase of approximately 25%. However, a few companies furnished a good part of the total. One concern being incorporated for $50,000,000 and another for $25,000,000. Companies representing numerous industrial lines were incorporated with an authorized capital ranging from $5,000,000 to $12,000,000.

The grand total of all companies with an authorized capital of $100,000 or over, covering all States, including those of the East, amounted to $311,745,200, an increase of more than 150% over 1915.

Following are the comparative figures as specially compiled by "The Journal of Commerce and Commercial Bulletin" of companies incorporated in the Eastern States during the last three years with an authorized capital of $1,000,000 or more. During the first five months of the year the total corporations of more than a million capital reached $1,208,125,300, against only $286,300,000 last year and $428,210,000 the year before:

	1916.	1915.	1914.
Jan.	$270,995,000	$51,150,000	$120,050,000
Feb.	365,995,300	53,950,000	51,575,000
Mar.	194,750,000	70,050,000	57,700,000
April	166,650,000	32,200,000	136,185,000
May	209,735,000	78,950,000	62,700,000
Total	$1,208,125,300	$286,300,000	$428,210,000
June	.....	181,247,100	70,050,000
July	.....	71,100,000	68,700,000
Aug.	.....	67,100,000	50,600,000
Sept.	.....	286,625,000	54,800,000
Oct.	.....	208,695,000	35,487,500
Nov.	.....	190,075,000	81,650,000
Dec.	.....	135,125,000	105,450,000
Year	.....	$1,426,267,100	$894,947,500

REMARKABLE FOREIGN TRADE.

Our foreign trade in April and for the four months ending April 30th compare as follows:

April—	1915.	1916.
Exports	$294,745,913	$404,300,000
Imports	160,576,106	217,800,000
Excess of exports	$134,169,807	$186,500,000

Four months ended April 30th:

	1915.	1916.
Exports	$1,159,042,947	$1,549,852,603
Imports	565,829,830	909,687,019
Ex. of exports.	$593,213,117	$640,165,584

Cost Readjustments After The War.

Month by month the necessity of the steel industry's readjusting its production cost after the war is being made more apparent. To those not entirely familiar with steel mill operations it is well to point out that the testimony of mill managers is that in a period of intensive production like the present there is a strong tendency for costs to advance, apart from such influence as is exerted by the higher wages paid and the higher costs of the materials that must be bought. Expensive habits are contracted, born of the necessity of producing tonnage. It is true that certain elements of cost are reduced, by broader distribution of the overhead when tonnage records are being broken, but these disappear automatically when the pressure for tonnage is reduced, while the bad habits remain until they are shaken out. Usually a period of light operation is necessary.

In speaking of readjustments in cost the question of wage rates per day or per ton is not particularly in mind, insofar as that relates to the two general wage advances that have been made this year in the steel industry, effective February 1st and May 1st respectively. Conditions may be such as to indicate that the advanced rates should continue, thought this is by no means certain. Among the various items that are to be considered, however, are the habits workmen form of not doing as much work per day or per hour as when jobs are in demand, and the paying of premium rates to some men, above the general and prevailing rates. There are many other items that are pushing costs upward.

As to commercial conditions after the war there is one point with respect to steel that cannot be too strongly emphasized, and that is that the belligerents are nursing their steel industries because they produce material for war. The end of the war, therefore, will find the steel works abroad fully manned, but with enormous steel requirements suddenly shut off. No one must think that the vital point to us will be the shutting off of our own business in war steel. What we are making for the allies is very small in proportion to what they are making for themselves, and what they and we make is perhaps but little less than what the central powers are making for themselves. We feel we are assigning perfectly safe limits in estimating that our production of shell steel of all descriptions lies between one-fifth and one-tenth of the world's total production this year of that material. Thus at the end of the war there will be released, abroad, a very large steel making capacity, already fully manned.

To make a demand for steel sufficient to engage the world's capacity, therefore, it will be necessary for a great deal of new demand to arise, and our competition will be with works in good running order. As to wages that will be paid abroad it is usually argued that high rates will continue for the men will demand them. Should the war end in a draw the battle would be continued commercially and every effort would be made abroad to force down production costs. Should one side be victorious the men there might demand and receive high wages, but with a victor there is a vanquished and in the vanquished nation high wages cannot be expected. It would be that side that would set the pace for us.

When in the growth of the prosperity we are now enjoying it became recognized that war orders were contributing less and less, that the important demand for steel was purely domestic, hope arose that the activity might continue right through the commercial shock that the end of the war must necessarily occasion, but with the necessity of a general reconstruction of costs, at one time or another, fully recognized it becomes apparent that the work may as well be done at the outset. It seems a reasonable expectation, therefore, that the steel mills will address themselves first to reconstructing their costs and afterwards to reconstructing their market. To strive to maintain prices, permitting operations to decrease and facilitating the cost readjustment, would appear to be a much better course than to try to make prices low enough to continue heavy buying and thus postpone the readjustment in costs that must be made thoroughly at some time.

Judge Gary's Views.

E. H. Gary, chairman of U. S. Steel Corporation, addressing the members of the American Iron & Steel Institute at annual meeting held at Waldorf-Astoria Hotel, said, in part, as follows:

"In connection with the conservation of our wealth and prosperity there must be considered the question of adequate and proper legal protection to American industries. As to many products, some of the other countries can produce at a lower cost than we can produce, based on the past and present scale of wages for labor. The labor of this country is thus brought into direct competition with the labor of other countries. It is well known that wages in the leading foreign countries have been about one-half the amount paid here for similar services and that in some countries, such as China, it is many times lower. Many foreigners have heretofore been in competition with us in selling to non-producing countries and they have also dumped their surplus stocks in this country in times of depression, at prices even below our costs and sometimes below their own. Most of the foreign producing countries have in force tariff laws that fully protect their industries; and probably all will hereafter have similar laws. Besides many of the governments furnish aid to their industries in many ways not necessary to mention at this time. After the war is over the contending nations will be impoverished and in great need of business and money They will produce as much as possible and their facilities are generally unimpaired. They will sell wherever they can find a market and at low prices if necessary, including this country, if we are not protected against them; and we cannot sell in their countries because they are and will be protected against us. We have for many months past been secure by reason of the well known conditions of war, but if we carry our minds back to the circumstances existing shortly prior to the war we know what we may expect after the close, unless there is a change in our laws. From the time the present tariff laws came into force, in October, 1913, until some time after the war was started the effect upon our business was very bad. It was almost desperate with many. The prices of imported products dumped into our markets, though not large in volume as to some items, were so low that we were compelled to put out prices down to about cost and in instances, below. Many were operating at a loss. We were going from bad to worse. Except for the war and war orders, wages would necessarily have been materially reduced and even then many employers would have been compelled to suspend. We know by sad experience that unless our tariff laws are changed so as to protect our business and place us on a parity with our foreign competitors, the large majority of producers will suffer, that business will be depressed, that the number of idle mills and cars and men will be increased and that wages will be lowered. We have seen these conditions before and there is reason to fear that they may be worse than ever unless our tariff laws are improved.

"The principle of protection to industry by means of tariff laws has built up the commerce and the wealth of this country and other producing countries that have had a surplus for export. Its value has been demonstrated. As between nations, it is simply a safe, sound, business proposition. So long as one country maintains it, others similarly circumstanced must do likewise in order to protect the interests of the large majority, including particularly the great aggregate of workmen. When our competitors in other leading countries are ready to adopt the laws of free trade for our commodities it will be soon enough for us to favorably consider similar action. If we were to have free trade throughout the world, we could probably take care of ourselves in any contest for the disposal of what we have for sale. In view of conditions as they exist in normal times, it is not logical to place or to leave the United States in a position of disadvantage when we have the opportunity to establish a parity. The doctrine of America first, which is a patriotic one, applies with peculiar force to the idea of sufficient protection to American industries. This means not a prohibitive tariff, but one large enough to permit continued success in competition with the outside world.

"The cost of providing and maintaining

a sufficient army and navy will be large, but small in comparison with the cost of war if one should be forced upon us because of a state of unpreparedness. As a mere matter of economy it is quite probable there would be saved billions of dollars by expending hundreds of thousands for military purposes. Withholding appropriations needed for purposes of preparing and keeping prepared for defense would be a false economy. Besides, if the United States is to assume and maintain the important position among nations that has been thrust upon her, she must be possessed of the same elements of power and strength that others have. She must be prepared to protect her commerce on the seas, which, let us hope, may equal that of any other single country. She must be ready to support other nations in the insistence that the ports of all foreign friendly nations shall remain free and open to all. And even more important to consider, we would be able to exert a powerful influence in aiding and even compelling international peace.

"The steel industry is good; better than ever before. There have recently been publications to the effect that there is a falling off in new orders and this may be true to a slight extent, but the daily bookings generally are larger in volume than the total producing capacity, and as the unfinished orders on hand are sufficient to keep the mills busy for the remainder of this calendar year and a large portion of 1917 there is not much, if any, cause for concern on the part of manufacturers for the next twelve months at least. We could hope that we had been permitted to continue cooperation on a basis that would have influenced greater stability in prices, higher in times of depression and lower in times of great activity, for it would have been satisfactory and beneficial to both producer and consumer and to their employes; but circumstances, over which we had no control, brought about a change in this particular. Public sentiment may bring about a restoration of the former and better methods. Who can tell? We know, at least, that conditions in our industry are infinitely better than they were fifteen years ago or more."

Tin in Tin Plate And What It Costs.

The census report on tin plate, although belated as census reports always are, contains some figures that prompt study, as it is possible from the figures to make a rough analysis of the pig tin consumption in making tin plate, and also to make a comparison between the prices reported as paid for pig tin and the average market, to see whether the tin mills "beat the average" in their pig tin purchases. According to the census figures they did not. The falling market was against them.

The figures are for the calendar year 1914. Production is given as follows:

1914.	Pounds.
Coke tin plate	1,855,892,526
Charcoal tin plate	45,439,369
Terne plate	138,234,249
Total	2,039,566,144

As the American Iron and Steel Institute reported early last August the 1914 production of tin plate and terne plate the only news in the census figures of production is the output of charcoal tin plate. The census figures are lower than the Institute figures by 2.0% in tin plate, 5.5% in terne plate and 2.2% in total tin and terne plate.

Tin, lead and purchased terne mixture consumed in the production of the above tin and terne plate, according to the census report, were as follows, with the cost:

	Pounds.	Cost.
Tin	36,542,881	$14,167,237
Lead	2,269,160	94,024
Terne mixture	6,618,211	783,546

The average cost per pound, indicated above, compares with the year's market average, compiled by averaging daily quotations for spot, New York, as follows:

	Cost.	Market.
Tin	38.77	35.70
Lead	4.14	3.87

The lead average is the trust price. The open market at St. Louis averaged 3.74.

On account of the nature of the fluctuations in pig tin in 1914 that resolved themselves into the year's average given above it would have been very difficult for a buyer to equal the year's average. The last four months of the year, when tin mill operations were light, showed an average of under 33c. while in February the average was almost 40c. The cost shown for lead, allowing for freight, corresponds quite closely with the average monthly price in the early months of the year. The lowest lead prices were in the last three months of the year.

The terne mixture purchased appears to have analyzed as follows:

	Pounds.	Per cent.
Tin	1,506,755	22.8
Lead	5,111,456	77.2
Total	6,618,211	100.0

As noted above there was 2,269,160 lbs. of lead purchased as such and if the terne mixture made was composed of the same proportions as that purchased the total terne mixture used to produce 138,234,249 pounds of terne plate was 9,558,000 lbs. making a proportion of 6.9% of terne mixture to total weight of terne plate. In the case of I. C. 15-pound coated ternes the net weight is 221 pounds, which divided into 15 pounds gives 6.8%. The average therefore, was just a shade above what would have been the case if the country's entire product was I. C. 15-pound coated. We think this is the first time such an average has ever been struck.

Deducting the tin that appears to have been used in making terne mixture there is left 35,872,000 pounds of tin, used in the manufacture of 1,855,892,526 pounds of coke tin plate and 45,439,396 pounds of charcoal tin plate. While we can only guess the tin consumption of the charcoal plate, the proportion to coke is so great that no material error can arise by making the guess. Taking the average of 4% for charcoal plate there is left 34,054,000 pounds of tin used in making 1,855,892,526 pounds of coke tin plate, the proportion being 1.835%.

The tin purchased as tin, 36,542,881 lbs., was 16,314 tons of 2,240 pounds, this being 39% of the tin deliveries in 1914, exclusive of Pacific Coast. It should be noted that in addition there was 673 tons of tin purchased in terne mixture.

Iron Ore Production.

Fourteen Million Tons Increase in 1915.

According to particulars obtained by U. S. Geological Survey the iron ore mined in the United States in 1915 reached the great total of 55,526,490 gross tons, the greatest output made in any year except 1910 and 1913. The shipments in 1915, namely 55,493,100 gross tons, valued at $101,288,984, were a little less than the quantity mined. The quantity mined in 1915 was an increase of 14,000,000 tons over the output in 1914. The increases in quantity and in value of iron ore shipped amounted to about 40 and 41%, respectively. The average value per ton in 1915 was $1.83, compared with $1.81 in 1914. These figures, which are just made public by the United States Geological Survey, were prepared by E. F. Burchard, who states that the production of iron ore from the Lake Superior district alone in 1916 will possibly be 60,000,000 tons, and that there will probably be an increase in price of 70 to 75 cents a ton for this ore.

Iron Mining by States.

Iron ore was mined in 27 States in 1914 and 23 in 1915. Three of these States, Idaho, Nevada, and Utah, produced small quantities of ore for metallurgical flux only; part of the production from California and Colorado was for smelter flux and part for pig iron and ferro-alloys; the remaining States produced iron ore for blast furnace use only except small tonnages for paint from Georgia, Michigan, New York, Pennsylvania and Wisconsin. Five States, Minnesota, Michigan, Alabama, Wisconsin, and New York, which have in recent years produced the largest quantities of iron ore, occupy in 1915 their accustomed places. Only one of these States, New York, produced less than 1,000,000 tons in 1915.

Iron Mining by Districts.

The principal iron-mining districts in the United States, except the Adirondack district, are interstate, and statistics of production by districts are of more interest and importance than statistics by States.

The Lake Superior district mined nearly 85% of the total ore in 1915 and the Birmingham district about 8.5%, or a little more than one-tenth as much as the Lake district. None of the other districts mined as much as 1,000,000 tons. The increase in production in 1915 was especially marked in the Lake Superior district, where it reached 40%; the Adirondack and Chattanooga districts each showed a large increase, namely, 28 and 25% resepectively; the total for a number of widely separated districts, including those in the western States, showed a decrease against 1914.

Iron Ore Mined in the United States by Mining Districts in 1914 and 1915.

District.	1914.	1915.	(†)
Lake Superior *	33,540,403	46,944,254	+40
Birmingham	4,282,556	4,748,929	+11
Chattanooga	432,006	539,024	+25
Adirondack	544,724	699,213	+28
Northern New Jersey and southeastern New York	541,084	644,493	+19
Other districts	2,098,988	1,950,577	— 7
	41,439,761	55,526,490	+34

* Includes only those mines in Wisconsin which are in the true Lake Superior district. † Percentage of change in 1915.

Lake Superior Iron Ranges.

All the ranges in the Lake Superior district mined a larger quantity of iron ore in 1915 than in 1914, the largest increases having been in the Mesabi and Cuyuna ranges —56 and 44% respectively. The output of the Cuyuna Range exceeded 1,000,000 tons for the first time.

Iron ore mined in Lake Superior ranges * in 1914 and 1915.

Range.	1914.	1915.	(†)
	Gross tons.	Gross tons.	
Marquette (Mich.)	3,320,763	3,817,892	15
Menominee (Mich. & Wisconsin)	3,671,499	4,665,465	27
Gogebic (Mich. & Wisconsin)	4,601,240	4,996,237	9
Vermilion (Minn.)	1,362,416	1,541,645	13
Mesabi (Minn.)	19,808,434	30,802,409	56
Cuyuna (Minn.)	776,051	1,120,606	44
	33,540,403	46,944,254	40

* Includes only such Wisconsin mines as are in the true Lake Superior district.

† Percentage of increase in 1915.

Consumption of Iron Ore.

The apparent consumption of iron ore, obtained by adding together the shipments of ore from the mines, the sales of zinc residuum, and the imports of iron ore, and deducting from the sum of these the exports of iron ore, was 56,286,058 gross tons in 1915, compared with 40,613,448 gross tons in 1914, an increase of nearly 39%. The ratio of pig iron produced to iron ore consumed was 53.15% in 1915 compared with 57.45% in 1914.

Largest Iron Ore Mines.

There were seven mines that produced more than 1,000,000 tons of iron ore each in 1915, two more than in 1914. First place in 1915 was held by the Mahoning mine at Hibbing, Minn., second place by the Hull-Rust mine at the same place, and third place by the Red Mountain group near Bessemer, Ala. The production of these mines in 1915 was respectively, 2,311,940 tons, 2,307,195 tons, and 2,138,015 tons, compared with 1,212,287 tons, 458,468 tons, and 2,008,465 tons in 1914. The Red Mountain group was thus the largest producer in 1914. The increase in production of the Hull-Rust is noteworthy—more than 400%; from practically a condition of idleness the Morris within a year yielded 1,167,421 tons, and the Burt moved from 41st place, with a production of about 250,000 tons to 7th place with a production of more than 1,000,000 tons in 1915. These records illustrate the rapidity with which the rate of output of mines in the Lake Superior district may be increased in response to demand. None but open-pit mines could be made to respond to such a degree.

Pig Iron.

The production of pig iron, including ferro-alloys, was 29,916,213 gross tons in 1915, compared with 23,332,244 gross tons in 1914, an increase of 28%, according to figures published by the American Iron and Steel Institute February 26, 1916. The pig iron, exclusive of ferro-alloys, sold or used in 1915, according to reports of producers to the United States Geological Survey, was 30,384,486 gross tons, valued at $401,409,604, a gain of 36% in quantity and 34% in value. The average price per ton at furnaces in 1915 as reported to the Survey was $13.21, compared with $13.42 in 1914. At the close of the year, however, prices of pig iron had advanced 35 to 40%.

In the canvass for iron ore statistics in 1915 the State Geological Surveys of Alabama, Maryland, Minnesota, Missouri, New Jersey, North Carolina, Virginia, and Wisconsin co-operated with the Federal Survey and that of Michigan co-operated in the subject of pig iron.

American Iron and Steel Institute.

The tenth general meeting of the American Iron and Steel Institute was held at the Waldorf-Astoria, New York City, May 26th, with record attendance, about 750 members and guests attending the sessions and banquet. The October meeting will be held in St. Louis.

One of the events was the address at the banquet of Hon. Edward N. Hurley, vice-chairman of the Federal Trade Commission, urging co-operation and citing in detail the methods of co-operation employed by steel makers in Italy, France, Belgium, Great Britain and Germany. He strongly advocated co-operation in foreign trade by steel manufacturers, and also co-operation between the government and the manufacturers, observing that "our businessmen and our government have been losing valuable time during the past 15 years in trying to settle our economic and business problems, not by co-operation, not by any scientific method which will bring about results beneficial to our people as a whole, but by resorting to the courts." Mr. Hurley had gone to Washington with the idea that business men did not want to co-operate with the government but he soon found that the reverse was the case, and it was now up to the government. Mr. Hurley has said much in previous addresses as to loose accounting methods prevailing in many industries, insisting that better methods were necessary so that manufacturers would not sell below their costs. Before the Insitute he said: "It is gratifying to know that practically all iron and steel manufacturers are recording and classifying their costs on a substantially uniform basis, are distributing their overhead expense by the same methods, and are adequately providing for depreciation and exhaustion."

Judge Gary in his presidential address made a strong argument for protection, for the merchant marine and for preparedness against war. Public opinion was coming Judge Gary's way and he urged things by way of co-operation between the public and the government and manufacturers that he would have hesitated to urge a few years ago.

The by-products of coke making were discussed in exhaustive manner by William Hamlin Childs, president of the Barrett Company.

Rail manufacture was presented by Dr. John S. Unger of the Carnegie Steel Company, with discussion by H. C. Ryding, assistant to vice president and general manager, Tennessee Coal, Iron & Railroad Company.

An authorized official announcement of plans of the United States Steel Corporation to become the largest maker of electric steel in the world was made in the paper on "The electric furnace in steel making" presented by Dr. John A. Mathews, president of the Halcomb Steel Company. There will be built three Heroult furnaces at South Chicago, one 15-ton and two 20-ton, with a total capacity of at least 800 tons of ingots in 24 hours. A 20- ton electric furnace will also be added to the Duquesne Steel Works. The paper was discussed by several members.

George W. Vreeland, superintendent of the Mingo blast furnaces of the Carnegie Steel Company, presented "Distribution of raw material in the blast furnace", the paper being discussed by several members.

IRON AND STEEL WORKS DIRECTORY.

IRON AND STEEL WORKS DIRECTORY OF THE UNITED STATES AND CANADA; pp viii+437; 8¼ x 5¾ inches; cloth bound; published by the American Iron and Steel Institute, 61 Broadway, New York City; price $12.00. Supplied by the American Metal Market Company, postpaid, at publisher's price.

There were 17 editions of "Swank's Directory" published by the American Iron and Steel Association, of which the late Mr. James M. Swank was manager for 40 years, to January 1, 1913. Shortly after his retirement the American Iron and Steel Institute took over the work. It has since been gathering the production statistics, and now it presents a new edition of the directory. The last edition of the directory

was dated 1908, two supplements, 1910 and 1912, having later been issued.

The present directory is not numbered according to its predecessors, or it would be number 18, but one cannot help reviewing it as another edition of the directory. One is at once struck with the divergence in plan, whereby the work is made much more convenient for reference. Through the growth and development of the industry Mr. Swank's arrangement had grown cumbersome. The old directories were divided into two parts, certain large companies being given in the first part, others in the second part, and there was a geographical division into states and then into districts which was quite cumbersome and militated against ready reference. In the present directory all the companies, even those in Canada, are given in a straight alphabetical list. Even the various Steel Corporation subsidiaries appear among other manufacturing companies in regular alphabetical place. By a happy thought, however, the separate lists of blast furnaces, steel mills, steel foundries and rolling mills given without detailed description in the latter part of the book are divided by states, whereby if one desire he can quickly obtain an idea of the importance of the different states. No attempt is made to segregate the plants into districts. Such an arrangement could not but prove interesting, but it is easier to call for such a thing than to produce it, as anyone who is interested may prove to himself by making the attempt.

Despite the fact that the industry has grown greatly in eight years, and more detailed information as to individual works is given, the present directory contains barely nine-tenths as many pages as its predecessor. This desirable end has been attained partly by the new and simple arrangement, whereby many duplications and cross references are avoided, and partly by a system of abbreviations. There is a key, but the majority of those who consult the directory will hardly need to refer to the key, the abbreviations in the body of the work being readily understood.

The scope of the directory may be described in a few words. Like its predecessors, it refers to all plants making pig iron or steel, or rolling steel hot. Departments for finished rolled steel into pipe, wire, tin plate, etc., are also referred to. The directory giving these descriptions embraces 365 pages of the work, and this general directory is followed by lists of blast furnaces, steel works and steel foundries, there being also separate lists of makers of rolled billets, sheet bars, rails, shapes, rods, plates, black sheets, galvanized sheets, black plates, tin and terne plates, muck bar, merchant bars, tool steel, horseshoe bars and horseshoes, hoops, bands and cotton ties, splice and tie bars, etc., skelp, pipe, seamless tubes, wire nails and cut nails.

Steel Plants.

VII. The Pennsylvania Steel Company.

May 23, 1916, the litigation to restrain the sale of control in the Pennsylvania Steel Company to the Bethlehem Steel Corporation was dismissed from court, the principal complainant having disposed of his shares. The Pennsylvania Steel Company is now a subsidiary of the Bethlehem Steel Corporation. The Pennsylvania Steel Company of New Jersey owns the Pennsylvania Steel Company of Pennsylvania, the Maryland Steel Company and the Spanish American Iron Company.

The Pennsylvania Steel Company as a steel producer dates from June, 1867, when it produced its first Bessemer steel, for rail making, but the first blast furnace was not blown in until October, 1873. The manufacture of open-hearth steel was commenced in 1875, with two 15-ton furnaces, these being replaced eight years later by 30-ton furnaces.

The present blast furnace plant comprises the five Steelton blast furnaces, the first completed in October, 1873, while the last was blown in September 21, 1915, together with three detached furnaces, the two Lebanon furnaces and Lochiel furnace at Harrisburg.

The steel plant is unique in flexibility, having been rebuilt in 1913-14 with this end in view. The old Bessemer converters and all the open-hearth furnaces were aban-

doned, with the exception of a battery of five modern 90-ton open-hearth furnaces built in 1907. The present plant was built around those furnaces. A sixth stationary furnace was added, also two 200-ton tilting furnaces and two 20-ton Bessemer converters, with a 400-ton and an 800-ton metal mixer. The Bessemer and open-hearth processes may be carried on separately, or the plant used partly or wholly as a duplexing plant. The company's Mayari chrome-nickel ore, from the remarkable Mayari deposits in Cuba, make it desirable to duplex, the metal being partially dechomized into the converters. The principal mills comprise the original rail mill, rebuilt from time to time, a merchant mill, formerly a billet mill, and a new mill completed in the summer of 1915, a combination mill capable of producing girder and T rails, I beams up to 24-inch, channels up to 8-inch and angles as large as 8x8x1⅛ inch. Girder rails can be rolled 140 feet long. The attendant blooming mill has surplus capacity and thus can produce billets for other departments or for sale.

The company has 120 by-product coke ovens at Steelton and 90 at Lebanon, all Semet-Solvay.

The Maryland Steel Company dates from 1891, when the first metal was blown, August 1st, the first rail being rolled two days later. The plant comprised two 20-ton converters, presumably the largest in the world at the time. There were four blast furnaces, built 1889-91, each 85x22 feet. When the Pennsylvania Steel Company of New Jersey was formed, April 29, 1901, it acquired the Pennsylvania Steel Company of Pennsylvania and the Maryland Steel Company.

The Maryland Steel Company properties, at Sparrows Point, Md., on tidewater, comprise the original four blast furnaces, rebuilt several times, but of the same height and with bosh diameters ranging from 20 to 22 feet, three 18-ton converters and five 50-ton tilting open-hearth furnaces and a large billet and rail train. The annual capacity as stated by the management furnishes an idea of the tonnages available from duplexing, as the capacity is given at 440,000 tons annually of Bessemer ingots and 160,000 tons of open-hearth, when the departments are run separately, and 702,000 tons of open-hearth when the plant is run duplexing.

In 1914 there was completed a plant of 120 by-product coke ovens, replacing 200 ovens, built about ten years earlier.

Topical Talks On Iron.

XXXVII. Railroads Reclaiming Old Material.

Brief mention was made in Talk No. 32 of the fact that a number of railroads operated small rolling mills for reclaiming old material, the roads mentioned being the Pennsylvania, Baltimore & Ohio and Buffalo, Rochester & Pittsburgh. Mention may be made of some other roads, with details as to the character of plant operated.

The Great Northern classifies all the scrap at its various shops, so that no usable scrap leaves the shop. The great bulk of the scrap shipped is sent to St Cloud, Minn., where a full fledged rolling mill has been operated since August, 1913. The mill is a 12-inch, with three stands of three-high rolls, driven by a 125 h.p. Buckeye engine. The plant is equipped with a total of 44 rolls, to provide the necessary sections. Iron axles are rolled direct, for engine bolts, rivets, etc., while miscellaneous scrap is made into piles 75 to 250 pounds in weight. The output of the plant in 1914 was as follows:

	Pounds.
Round iron, common	6,326,865
Square iron, common ...	42,780
Flat iron, common	1,852,625
Deformed iron, common	14,505
Hexagonal iron, refined.	91,480
Round iron, refined	507,407
Flat iron, refined	28,163
Total	8,863,835

The estimated average cost, taking the scrap at marketable value and including overhead charges, was computed at about 90 cents per hundred pounds.

At its shops at St. Paul, Minn., the Great Northern operates a 4,000-pound hammer, which takes scrap piles of 250 pounds weight, producing slabs and heavy bar iron, while in a pinch driving axles have been made.

The Atchison, Topeka & Santa Fe oper-

ates a rolling mill at Corwith, Ill., near Chicago, comprising a three-high mill for reducing 3½-inch stock to 2-inch, and a three-high for reducing 2-inch to ½-inch. These mills are driven respectively by 100 h.p. and 50 h.p. electric motors, geared down, with a fly wheel on the motor shaft. This rolling plant was completed shortly before that of the Great Northern referred to above, but a scrap handling plant had been operated at Corwith for years. Material that can be used with little alteration is not sent to Corwith, which handles only material that is really scrap, the tonnage being say 125,000 to 150,000 tons a year. More than half the scrap is sold after sorting, the remainder being reworked in one way or another. A large part of the scrap reclaimed does not pass through the mill, merely requiring to be sorted and in some cases repaired. All the wheels, steel tired wheels being standard on the road, are retired at this plant, when formerly they were sent east to be retired. Nuts are rethreaded, spikes straightened and sharpened and various other classes of reclamation work done.

The St. Louis & San Francisco in 1913 established at Springfield, Mo., an extensive reclamation plant, with about 250 employes. About 4,000 tons a month of scrap is delivered to the plant, approximately three-fourths of this proving to have no reclamation value. This scrap is merely sorted and sold to dealers. The remaining 1,000 tons a month is put through various operations. Bolts are straightened and have their damaged ends cut off, being then rethreaded and provided with nuts when they go to the store house. New bolts and pins are made from round iron picked from the scrap, and thus the road is supplied with practically all the bolts it requires. Hand and push cars are repaired, frequently by selecting pieces from two or three cars. A particularly profitable part of the plant is that in which the oxy-acetelene process is used for welding and cutting, it being possible at relatively small expense to make switch and crossing frogs as good as new.

Blast Furnace Slag Utilization.

E. C. Brown, chief civil engineer of the Carnegie Steel Company, read a paper before the Engineers' Society of Western Pennsylvania, printed in the January proceedings just issued, on the utilization of iron and steel works slag, with special reference to blast furnace slag. The earlier form of disposition was simply for filling low lying ground, the slag being run in trenches and broken by sledges when cold for loading, while when circumstances permitted it was run molten on little trucks or "modocks" to a convenient disposal place. Later a hot slag ladle on a standard railroad truck was developed, quite economical in operation.

Granulated slag weighs from one-fifth to one-third as much, volume for volume, as when cooled in mass. One method of granulation is to run the molten slag into a tank or pit partly filled with water. Another, sometimes known as "gun granulation", uses a water spray, producing a material sometimes used as a substitute for sand in concrete. A method used to some extent in Europe involves a dry granulation process, the slag being broken up by a blast of air, with a small proportion of steam.

While blast furnace slags vary, calcium and magnesia generally make up one-half, the remainder being chiefly silica and alumina. The slags are generally decidedly basic in character, and there is no tendency to produce rust in iron and steel embedded in slag concrete.

Hard slag, crushed and screened to size, forms an excellent material for railroad ballast, road macadam and paving foundation, concrete aggregate, etc. For several years the Carnegie Steel Company has used slag almost exclusively at most of its blast for its concrete work, and has also sold large quantities, no cases of unsatisfactory results being reported.

The Iron and Steel Situation.

May was a month of further quieting down in the domestic market for steel; it was April emphasized. At the close of the month there is scarcely any buying in the domestic market for the far forward deliveries, and not as much for prompt deliveries as there was, while specifications against contracts have undergone a decrease, though in some departments they are still equal to the shipments. Prices have been substantially stationary.

The quieting down in the market has not been attended by, nor has it produced, any weakness on the part of sellers. That is is the test, whether a buying movement has been a well ordered and legitimate performance. Assuming, of course, a case in which no great disaster or influence from without forces a change in the conduct of buyers or sellers, if buyers suddenly and unexpectedly reduce their rate of buying the suggestion is furnished that they realize they have been traveling too fast a pace and this means that they have bought too much. If on the other hand sellers suddenly weaken it indicates that they had assumed too strong a position, that they were trying to secure higher prices than the fundamental conditions warranted, thereupon they suddenly find they "can't get away with it" and accordingly weaken.

No such symptoms appear at this time. There is every evidence that the business on books is sound and will carry the mills for many months. A buying movement such as we have had must necessarily come to an end, and what is surprising is that the recent movement lasted so long as it did. The original beginning occurred in December, 1914, under the stimulus of very low prices, of a market thoroughly shaken out. There was a backset, however, after January, and the active and confident buying did not begin until June. The high point in buying was reached in November, when the Steel Corporation increased its unfilled obligations by more than a million tons. The buying continued fairly heavy through March. The buying movement as a whole was long and strong and the end was slow rather than quick in coming.

The major portion of total price advance occurred after the buying movement was more than half passed, but there was fairly heavy buying in February and March, when prices were advancing at a spectacular rate. While the buying has been sound and the mills will probably be easily able to maintain their position until the bulk of the deliveries have been made, it does not follow that the buyers did not pay more than they would have needed to pay, and still get their material, if they had been less enthusiastic. Many were in a perfect ecstasy of fear lest they would not get needed deliveries unless they bought at whatever price was asked. Indeed, there were stories of some buyers offering orders and let the mill place the price upon the tonnage when ready to do so.

The Steel Mill Position.

Be that as it may, the steel mills have the contracts, and as to a large part of the tonnage, perhaps more than half, they have the actual specifications or could have them if they asked. Taking its extreme limits the buying movement lasted nearly 18 months, a very long time for such a thing in the steel trade. The active and excited buying lasted six months, October to March inclusive.

The Steel Corporation has ten million tons of obligations on its books, an amount equal to its full production for eight months, so that theoretically the tonnage would carry it to March 1, 1917. The other large steel interests, with the exception of one that pursues a sales policy of its own, may be assumed to be in substantially the same position. One must allow for some of the business on books not resulting in actual fulfilment, but 25% would be a very liberal estimate for that. On the other hand allowance must be made for the fact that even in the quietest market some new business is placed from week to week, and on the most conservative basis that would more than make up for the 25% allowance just mentioned. There is another point to be considered, however, and that is while the position of the large mills is as just indicated the small mills have a relatively small amount of forward engagements. Purposely they limit their commitments in order to take advantage of such premiums as may be obtained for early deliveries. If the new buying is relatively light during

the remainder of the year the lion's share of the orders will have to go to the smaller mills, otherwise a point would be reached at which the small mills, after eliminating premiums, would cut under regular mill prices and the market would become more or less disorganized. It seems as fair a guess as any, therefore, that the mill position is such that with the lightest buying that can well be conceived the mills are all assured full activity until well beyond January 1, 1917.

Export Trade to the Front.

The most striking new development in May, a month not marked by many developments, was a very decided expansion in the export demand. In the first place, there was heavy war demand. A month ago we noted: "The blunt statement of E. R. Stettinius, of the Morgan firm, on his return from abroad, that there would be few 'war orders' in future, aroused scarcely a ripple of interest in the steel trade." The steel trade is to be congratulated on its powers of self restraint, for we now have to record an estimate that since our observation was made there have been orders placed involving more than half a million tons of war steel, while there is still some important inquiry before the trade, suggesting that June may add considerable to this total.

The placing of this war steel business, however, was not of paramount importance. There had been large buying before, and much steel was undelivered. Periodic spells of buying of shells and shell steel is to be expected as long as the war lasts. The buying is periodic but the production is steady. Of more importance was the broadening in general export inquiry. Russia came out with large inquiries for barb wire, and the wire trade with neutral countries increased. Japan has been a particularly insistent inquirer, for ship plates and has not hesitated to pay rather large premiums for deliveries. All in all the export market has become much more active and it is much more promising.

The part that high ocean freights play in our steel export trade may not be universally recognized by reason of the fact that as it is we have been exporting iron and steel products as unfinished steel, rolled steel, wire, pipe, etc., at the rate of over 4,000,000 tons a year. That tonnage was not all subject to the high ocean rates by any means, since much of it went in vessels controlled by the allies. To the neutral countries the high freights that have been demanded have been a serious ob-

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer,	Basic,	No. 2 fdy.	Basic,	No. 2 X fdy,		—— No. 2 fdy ——		Ferro-		Fur-
		Valley		Phila.	Phila.	Buffalo.	Cleve-land.	Chi-cago.	Birm-ingham.	manga-nese.*	nace coke†
1915—											
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. ..	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916—											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.45
May ..	21.00	18.21	18.44	20.50	20.25	19.15	19.08	19.50	15.00	175.00	2.34

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

stacle. Of late the rates have been tending downwards, and the establishment of still lower rates, as hoped for in most quarters, would bring about a much larger export movement to neutral countries. As ocean freights have in many instances greatly exceeded the cost of the steel products, delivered seaboard, the importance of a reduction in ocean freights can readily be realized.

Prices and Consumption.

All are familiar with the observation that high prices for steel will restrict consumption. There have been many illustrations of the fact, in projects deferred, and evidently it is well for the steel industry that they are deferred, for that is not abandonment and the steel industry already has as much business as it can handle. Structural steel work, however, is not stopped. The structural shops are filled for six months or more. In March, the month in which the price of plain shapes stopped advancing, the structural lettings as reported by the Bridge Builders and Structural Association represented 102% of the capacity for a month, while April lettings were reported at 72½%. A circumstance that permits the continuance of some structural work is that the fabricating interests have tonnage still due them from mills at lower than current prices, and thus some business can still be taken care of without extreme prices being paid.

It is quite certain that if all consumers were actually paying the current market prices consumption would be materially less than it is. They are not, and for months to come there will be some relatively cheap steel delivered. When the market finally breaks, whenever that may be, there will probably still be some steel on books at lower than to-day's prices and we believe that statement would hold good if the break did not occur until a twelvemonth hence.

Coke.

The market in May was extremely dull as to coke contracts. Spot coke stiffened somewhat in the closing week of the month, chiefly by reason of a strike involving nearly all the union mines in the Pittsburgh coal district throwing some demand to the Connellsville region for raw coal.

Pig Iron.

May was certainly a disappointing month to sellers of pig iron. Not only did the long predicted advance let another month go by without putting in its appearance, but the market in some districts actually softened. The Buffalo market declined. Southern iron developed a weakness. The

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved	—— Sheets ——				Comp.
					Wire	Steel			Blue	Tin	Fin.
1915—	Shapes,	Plates,	Bars,	Pipe,	Wire,	Nails.	Skelp.	Black.	Galv.	Annld.	plate.	steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3.60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.76	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5691
August	1.30	1.26	1.30	79	1.43	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916—												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.25	2.40	2.35	2.89	5.00	2.95	4.70	2.7166
May	2.50	2.83	2.50	70	2.45	2.50	2.35	2.90	5.00	3.00	5.46	2.8043

furnaces, which had been demanding $15, Birmingham, for prompt and $15.50 for second half, receded to $15 for all positions. Speculators became alarmed and after a number of sales of speculative iron at fractional cuts from $15 there were offerings of odd lots at the even $14. The weakness in southern iron may be due to the steel interests which have merchant furnaces in the south holding their iron for a possible scarcity at their northern steel works and then finding that no scarcity was likely to develop. In the valley market there were sales of basic at $18 followed by larger sales at $18.25. Bessemer iron, which advanced sharply to $21, valley, last December, and has since been at that figure, is certain to advance again if ocean freight rates decline enough to allow the latent demand of France and Italy to express itself. Otherwise it is difficult to find in present circumstances any "bull card" for pig iron.

Unfinished Steel.

The placing of large orders for war steel was followed by a weakness showing itself in billets for prompt shipment, whereby there were sales down to $40 and possibly a shade less. The billet market had previously been almost nominal. Perhaps there is something in the theory that the mills were holding their capacity against war steel orders and when they were able to measure the extent of that business they felt freer to make commitments in other directions. The offerings have been chiefly of prompt lots, merely such tonnages as a mill had accumulated, or could find an early place for on rolling schedules. For regular deliveries over a period of months the mills quote as stiff prices as formerly.

The Distant Future.

If the new construction program is an index, the mills are showing great confidence in the more distant future of the American steel market, after the war is over, for much of the new construction now undertaken cannot be completed until the war ends, unless it lasts longer than most observers expect, and in any event no prices could be realized that would enable new construction to pay half its cost—a high one at present—in a year. The steel interests are particularly strong in urging that ample tariff protection be afforded the industry for after the war conditions.

Much that is said as to high wages and shortage of labor after the war in the belligerent countries does not apply to steel. The belligerents are making more than 10,000,000 tons, possibly more than 15,000,000 tons a year of war steel. They must keep their works fully manned for this purpose, and after the war the men will be there while the requirement in war steel will be gone. It will require a very large demand for steel for peace purposes to put those mills in comfortable position. With the new construction now in progress or definitely projected, completed, the United States will have a capacity to make more than 45,000,000 tons of steel ingots and castings a year. Many projects are delayed until after the war and a period of activity is to be expected, the question being how long it will last, with such excellent means provided for meeting the demand.

LAKE SUPERIOR IRON ORE.

Shipments of iron ore down the lakes have been as follows, in gross tons:

	1911.	1912.	1913.	1914.	1915.	1916.
April	331,645	204,042	866,386	269,686	506,832	1,658,411
May	3,684,819	5,919,074	7,284,212	3,852,063	5,012,359	.....
June	4,819,996	7,567,555	7,974,444	5,502,367	6,005,091	.....
July	5,221,373	7,600,233	8,204,416	5,784,514	7,204,021	.....
August	5,548,311	7,760,248	7,677,601	5,869,477	8,081,117	.....
September	5,231,069	7,287,230	7,258,413	5,438,049	7,863,146	.....
October	4,769,965	7,010,219	6,526,103	4,242,392	7,146,873	.....
November	2,523,253	4,072,674	3,270,958	1,068,682	4,445,129	.....
December	.....	14,579	18,545	1,411	57,236	.....
Season Lake	32,130,411	47,435,777	49,070,478	32,021,987	46,318,804	1,658,411

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1911:

Quarter.	1916.	1915.	1914.
1st	$60,713,624	$12,457,809	$17,994,382
2nd		27,950,055	20,457,596
3rd		38,710,644	22,276,002
4th		51,277,504	10,935,635
Year		130,396,012	71,663,615

	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38,450,400	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year ...	137,181,345	108,174,673	104,305,466

Unfilled Orders.

(At end of the Quarter).

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	4,489,718
1907..	8,043,858	7,603,878	6,423,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,833	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220
1916..	9,331,001			

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

1914—	Shipments. %	Bookings. %	Difference. %	Difference. Tons.
June	63	66	+ 3	+ 34,697
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September ..	62	24	—38	—425,664
October ...	55	28	—27	—326,570
November .	45	32	—13	—136,505
December .	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February ..	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September .	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037
December .	102	152	+50	+615,731
January 1916	102	112	+10	+116,547
February ..	102	157	+55	+646,199
March	104	164	+60	+762,035
April	104	146	+42	+498,550

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January ..	1,021	795	226	939	718	221	1,133	797	336
February .	914	746	168	900	680	220	1,140	800	340
March	1,091	801	290	1,015	722	293	1,260	844	416
April	1,038	782	256	1,010	722	288			
May	1,047	800	247	1,040	732	308			
June	1,097	789	308	1,090	730	360			

Price Changes of Iron and Steel Products From February 11, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our **composite finished steel.** In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the rates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
Feb. 11	Wire nails	1.55	to 1.60
" 11	Pipe	81%	to 80%
" 15	Galv. sheets	3.00	to 3.25
" 25	Galv. sheets	3.25	to 3.40
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 24	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galvanized sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c

1915—			
Aug. 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
" 31	Bars	1.30	to 1.35
" 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galvanized sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galvanized sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galvanized sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galvanized sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
Nov. 18	Shapes	1.60	to 1.70
" 18	Galvanized sheets	4.00	to 4.25
" 24	Galvanized sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galvanized sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25

Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
1916—			
Jan. 3	Tin plate	3.60	to 3.75
" 3	Blue ann. sheets	2.25	to 2.35
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%	78%	to 77%
" 5	Blue ann. sheets	2.35	to 2.40
" 7	Boiler tubes	68%	to 66%
" 12	Blue ann. sheets	2.40	to 2.50
" 14	Boiler tubes	66%	to 64%
" 19	Blue ann. sheets	2.50	to 2.65
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00
" 14	Wire nails	2.20	to 2.30
" 15	Pipe	76%	to 75%
" 21	Bars	2.00	to 2.25
" 21	Plates	2.10	to 2.35
" 21	Shapes	2.00	to 2.25
" 21	Tin plate	3.75	to 4.00
" 29	Pipe	75%	to 74%
" 29	Boiler tubes	64%	to 63%
Mar. 1	Wire nails	2.30	to 2.40
" 8	Black sheets	2.60	to 2.75
" 8	Blue ann. sheets	2.65	to 2.90
" 13	Bars	2.25	to 2.35
" 13	Plates	2.35	to 2.60
" 13	Shapes	2.25	to 2.35
" 15	Steel pipe	74%	to 73%
" 15	Boiler tubes	63%	to 61%
" 23	Bars	2.35	to 2.50
" 23	Shapes	2.35	to 2.50
" 28	Plates	2.60	to 2.75
" 29	Sheets	2.75	to 2.85
" 29	Steel pipe	73%	to 72%
" 29	Boiler tubes	61%	to 60%
April 5	Sheets	2.85	to 2.90
" 15	Boiler tubes	60%	to 56%
" 19	Tin plate	4.50	to 5.00
" 24	Pipe	72%	to 70%
May 1	Wire nails	2.40	to 2.50
" 3	Tin plates	5.00	to 5.50
" 16	Plates	2.75	to 2.90

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
September 1914	44,624	34,757	+ 9,867
October	45,241	39,410	+ 5,831
November ..	35,325	40,748	— 5,423
December ...	27,458	42,525	— 15,067
January, 1915.	20,684	31,556	— 10,872
February ...	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 .	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ...	31,096	33,061	— 1,965
October	31,215	26,338	+ 4,877
November ..	29,297	26,005	+ 3,292
December ...	23,173	23,743	— 570
January, 1916.	17,293	4,015	+ 7,303
February ...	30,244	10,824	+ 19,420
March	33,685	9,894	+ 23,791
April	36,999	10,856	+ 26,143

United States citizens arrived and departed, with change thereby effected in United States population:

	Arrived.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September ...	9,054	8,188	+ 866
October	8,991	8,329	+ 662
November ...	8,364	9,166	— 802
December	8,458	9,349	— 891
January, 1916.	8,257	9,469	— 1,212
February	11,082	12,908	— 1,826
March	15,065	10,867	+ 4,198
April	12,522	8,051	+ 4,471

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,237; July, 1915, +14,994; August, 1915, —15,128; September, 1915, — 1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461; January, 1916, +6,691; February, +17,594; March, +27,989; April, +30,614; ten months, +87,623.

Comparison of Metal Prices.

Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing, May 31, 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	20.00	21.00
Basic, valley	13.25	12.50	18.00	12.50	18.50	17.75	18.25
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.50	18.50
No. 2X fdy. Philadelphia.	1500	14.20	19.50	14.00	20.25	19.50	20.25
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	19.00	18.80	19.30
No. 2X foundry, Buffalo	13.75	12.25	18.00	11.75	19.00	18.00	18.50
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	19.00	18.50	19.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.50	15.00
Scrap Iron and Steel.							
Melting steel, Pittsburgh.	12.00	9.75	18.00	11.00	18.75	17.25	16.75
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	16.75	15.25	15.50
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	19.25
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.00	15.00	16.00
Heavy steel scrap, Phila	11.25	9.00	16.25	9.50	17.75	16.00	16.25
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.47
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.50	1.90	2.60
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.50	1.85	2.50
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	2.75	1.85	2.90
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	2.50	1.85	2.50
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	2.35	1.75	2.35
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	2.90	2.60	2.90
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.75	5.00
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	5.00	3.75	5.50
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.40	2.10	2.50
Steel pipe, Pittsburgh	79½%	81%	79%	81%	70%	78%	70%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	2.60
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.75	3.35
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	40.87½	45.75
Lake copper	15.50	11.30	23.00	13.00	30.25	23.00	28.25
Electrolytic copper	14.87½	11.10	23.00	12.80	31.00	23.00	28.50
Casting copper	14.65	11.00	22.00	12.70	28.25	22.00	26.50
Sheet copper	20.25	16.50	27.25	18.75	37.50	28.00	37.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	7.50
Spelter	6.20	4.75	27.25	5.70	21.17½	13.30	13.42½
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	25.00	25.50
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	63.00	53.00	60.00
Silver	59¼	47⅝	56½	46¼	77¼	55⅞	68¾
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	7.15
Spelter	6.00	4.60	27.00	5.55	21.00	13.12½	13.25
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	22.50	22.50
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	205	172	187½
Standard copper, prompts	66¾	49	86⅜	57⅞	146	84¾	121
Lead	24	17⅞	30¼	18¼	36⅜	29¼	31¾
Spelter	33	21¼	110	28⅛	111	80	80
Silver	27¼d	23¼d	27¼d	32⅛d	37⅛d	26⅛d	32⅞d

Comparison of Security Prices.

Railroads.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing. May 31, 1916.
Atchison, Top. & Sante Fe...	100⅜	89½	111¼	92½	108½	100¼	105½
Atch. Top. & Santa Fe,. pfd.	101¾	96½	102⅛	96	102	97⅞	101
Baltimore & Ohio	95⅝	67	96	63¾	96	83⅞	91⅜
Canadian Pacific	220½	153	194	138	183¾	162½	178⅝
Chesapeake & Ohio	68	40	64¾	35⅜	66⅞	58	62⅝
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¾	102½	91	98¼
Erie R. R.	32½	20⅛	43⅝	19⅞	43⅝	32	38⅝
Great Northern, pfd.	134¾	111⅝	128⅛	112¾	127½	118	121
Lehigh Valley	156¼	118	83⅜	64⅝	84¼	74½	83
Louisville & Nashville	141⅞	125	130¼	104½	131⅜	121⅛	131⅜
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	7¼	3¼	4¼
Missouri Pacific	30	7	18¼	1¾	7⅜	3½	6¼
New York Central	96⅝	77	110½	81½	111½	100¼	106
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	57	61
Northern Pacific	118½	97	119	99⅛	118⅞	109¾	114
Pennsylvania R. R.	115½	102½	61½	51¾	59¾	55¼	57⅜
Reading	172¼	137	85⅝	69⅜	110¾	75⅛	101½
Rock Island	16⅝	⅝	1⅛	⅛	⅞	¼	¼
Southern Pacific	99½	81	104⅛	81¼	104⅛	94¼	98½
Union Pacific	164⅜	112	141½	115¾	143⅜	129¾	140
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¼	79	61¾	76
American Can	35⅛	19¼	68½	25	65⅛	52½	56½
American Can, pfd.	96	80	113½	89	113⅞	109	110
Am. Car & Foundry	53½	42¼	98	40	78	55	59½
Am. Cotton Oil	46½	32	64	39	57½	50½	53⅞
Am. Locomotive	37¼	29¼	74¾	19	83¾	60¾	72½
Am. Smelting & Refining	71⅛	50¼	108⅞	56	113⅜	88½	97½
Brooklyn Rapid Transit	94¼	79	93	83¼	88½	83½	88⅜
Chino Copper	44	31⅝	57⅜	32¾	60	51	52⅝
Colo. Fuel & Iron Co.	34½	29½	66½	31¾	53	38⅛	44
Consolidated Gas	139½	112½	150½	113¾	114¾	130½	138
General Electric	150⅜	137½	185½	138	178½	159	172
International Harvester	113½	82	114	90	114½	108½	113⅛
Lackawanna Steel	40	26½	94¾	28	86	64	71
National Lead	52	40	70¾	44	73⅞	60½	67
Ray Consolidated Copper	22½	15	27½	15¼	26	21¾	22⅜
Republic Iron & Steel	27	18	57¼	19	55¼	43⅛	47¼
Republic Iron & Steel, pfd...	91¼	75	112⅜	72	112	107¼	111¾
Sloss-Sheffield	35	19½	66⅞	22	63¼	47	54
Texas Co.	149⅞	112	237	120	235½	180	193¾
U. S. Rubber	63	44½	74¾	44	58½	47¾	55¾
U. S. Steel Corporation	67¼	48	89½	38	89	79¾	83⅜
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	118½	115	117
Utah Copper	59⅜	45⅜	81¾	48½	86¼	77	80¾
Va.-Carolina Chem.	34⅞	17	52	15	51	36	42¾
Western Union Telegraph ...	66⅞	53⅛	90	57	96⅞	87	95½

COMPOSITE STEEL.

Computation for June 1, 1916:

Pounds.	Group.	Price.	Extension.
2½	Bars	2.50	6.250
1½	Plates	2.90	4.350
1½	Shapes	2.50	3.750
1½	Pipe (¾-3)	2.95	4.425
1½	Wire nails	2.50	3.750
1	Sheets (28 bl.)	2.90	2.900
½	Tin plates	5.50	2.750
10 pounds			28.175
	One pound		2.8175

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7166
May	1.5590	1.7786	1.5078	1.5381	2.8043
June	1.5794	1.7719	1.4750	1.5312	....
July	1.6188	1.7600	1.4805	1.5692	.....
Aug.	1.6784	1.7400	1.5241	1.6059	.....
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet Pitts.	No. 1 R. R. Wrought Pitts.	No. 1 Cast. Pitts.	No. 1 Heavy Steel. Melt'g. Phila.	Ch'go.
1914—						
July	11.75	8.50	11.75	11.50	10.60	9.75
Aug.	11.50	8.50	11.50	11.25	10.75	9.75
Sep.	11.25	8.70	10.50	11.25	10.75	9.25
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75
May	17.00	13.65	19.65	16.10	17.00	15.90

COMPOSITE PIG IRON.

Computation for June 1, 1916:

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.25)	36.50
One ton No. 2 foundry, valley	18.50
One ton No. 2 foundry, Philadelphia	20.25
One ton No. 2 foundry, Buffalo	18.75
One ton No. 2 foundry, Cleveland	19.30
One ton No. 2 foundry, Chicago	19.50
Two tons No. 2 Southern foundry, Cincinnati (17.90)	35.80
Total, ten tons	189.60
One ton	18.960

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.420	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	18.965
June	14.005	14.968	13.606	13.047	.....
July	14.288	14.578	13.520	13.125	.....
Aug.	14.669	14.565	13.516	14.082	.....
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, deliv. — Phila.	Pitts.	Ch'go.
1914—						
Nov.	19.25	19.75	25.00	1.13	1.20	.96
Dec.	18.75	19.25	24.40	1.12	1.20	.91
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35
May	43.00	43.00	59.00	2.66	2.60	2.35

† Premium for open-hearth.

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1911.	1912	1913.	1914.	1915	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,5[illegible]0,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	58,300,297
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	.....
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	.....
June	20,310,053	24,795,802	25,238,346	18,927,958	31,757,103	.....
July	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575	.....
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822	.....
September ...	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$164,099,490

EXPORTS OF TONNAGE LINES—Gross tons.

	1909.	1910.	1911	1912.	1913.	1914.	1915.	1916
January	70,109	118,681,	152,262	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	139,946	368,867
March	94,519	124,980	216,360	218,219	257,519	159,998	174,104	438,058
April	100,911	117,921	228,149	267,313	259,689	161,952	223,240	.....
May	109,808	135,306	178,589	307,656	242,353	139,107	263,649	.....
June	114,724	120,601	174,247	273,188	243,108	144,539	355,402	.....
July	100,850	127,578	162,855	272,778	237,159	114,790	378,897	.....
August	105,690	131,391	177,902	282,645	209,856	86,599	405,853	.....
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	1,164,047

IRON ORE IMPORTS.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,844
Feb. ..	188,734	112,574	78,773	93,315
Mar. .	164,865	68,549	88,402	93,383
April .	174,162	111,812	91,561	.....
May .	191,860	125,659	98,974	.....
June .	241,069	188,647	118,575	.....
July .	272,017	141,838	119,468	.....
Aug. .	213,139	134,913	126,806	.....
Sept. .	295,424	109,176	173,253	.....
Oct. ..	274,418	114,341 .	138,318	.....
Nov. .	179,727	90,322	113,544	. ....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	276,542

IRON AND STEEL IMPORTS.

	1912.	1913.	1914.	1915.	1916.
Jan. .	20,008	21,740	17,776	10,568	15,824
Feb. .	11,622	25,505	14,757	7,506	20,280
Mar. .	15,466	27,467	27,829	8,025	15,162
April.	12,481	25,742	30,585	16,565	.....
May .	15,949	28,728	28,173	28,916	.....
June.	21,407	36,597	23,076	32,200	.....
July .	17,882	36,694	25,282	20,858	.....
Aug. .	20,571	18,740	28,768	27,556	.....
Sept..	18,740	19,941	38,420	23,344	.....
Oct. .	25,559	20,840	22,754	34,319	.....
Nov. .	24,154	25,809	24,165	37,131	.....
Dec. .	21,231	26,454	9,493	35,455	.....
Total	225,072	317,260	289,778	282,443	51,266

CAR BUYING.

Freight cars ordered:		
First half, 1913	114,000	
Second half 1913	33,000	
Year, 1913		147,000
First half 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,210	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	
May	6,204	

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.

October 1914	21,200,000
November	18,700,000
December	18,100,000
January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,600,000
April	39,600,000
On May 1st	40,100,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1913—			
Aug.	137,651,553	187,909,020	50,257,467
Sept.	171,084,843	218,240,001	47,155,158
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,746,117	134,170,011
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	193,935,117	402,991,118	*209,056,001
Mar.	213,589,785	*409,850,425	196,260,640
Apr.	*217,800,000	404,300,000	186,542,616

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April .	13.60	20.70	12.50	18.00
May ..	13.659	20.833	12.65	18.1607
June ..	13.75		12.724	
July ..	13.991		12.959	
Aug. ..	15.064		14.364	
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

BAR IRON AVERAGES.

Average realized prices on shipments of base sizes of common iron bars by the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and Highland Iron & Steel Company, as disclosed by wage adjustments of Amalgamated Association of Iron, Steel and Tin Workers, prices realized in bi-monthly periods, governing wage rates for succeeding two months.

	1914.	1915.	1916.
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	*1.60
May-June	1.1257	*1.10	....
July-August	1.0928	*1.15	....
September-October	1.0847	*1.20	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.144	....

* Settlement basis.

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1912	2,053	81,694
1913	20,680	57,812
1914	15,411	59,549
1915	2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178
February	107	13,534
March	44	20,364

British tin plate exports have been as follows, in gross tons:

1913	494,921
1914	435,497
1915	368,602
January 1916	26,271
February	27,289
March	39,482
April	23,337

BRITISH IRON AND STEEL EXPORTS.

1914—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	74,617	43,133	47,237	385,301
Aug. ..	28,342	22,763	21,414	211,605
Sept. ..	37,793	39,185	23,440	228,992
Oct. ..	47,188	37,005	26,950	263,834
Nov. ...	49,666	16,181	30,942	240,608
Dec. ..	31,705	16,315	30,254	212,667
Year ..	780,763	433,507	435,392	3,972,348
1915—				
Jan. ..	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	15,101	198,294
Mar. ..	20,172	17,572	36,170	239,341
April ..	35,209	21,602	40,135	265,244
May ...	29,342	21,776	33,727	267,524
June ..	39.127	23,728	33,986	272,195

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*
Aug. ...	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ...	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	87,283	3,366	39,482	307,488
April ..	82,976	10,510	23,337	293,897

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Tin in May.

One of the Dullest and Most Unsatisfactory Months on Record—Continued Difficulty in Securing Permits to Ship, Scarcity of Spot Metal and Heavy Domestic Consumption the Main Features.

May proved to be one of the dullest months in Straits tin ever experienced by local dealers. It was also an unsatisfactory period from the standpoint of profits. After the first week—during which higher prices were established at London and when there was some appreciation of prices, with the exception of spot, on all positions in the New York market—prices suffered a heavy decline with few temporary rallies throughout the month. Spot at New York broke 5½c per pound and future positions declined 2½c to 3c per pound. At London, the net result of the fluctuations in prices from the end of April to the close of May was £10 on spot Straits and future Standard and £10 10s on spot Standard, while the Singapore market was down £10; but from the highest prices recorded during the month, on May 5th, the break was £13 10s on spot and £12 15s on future Standard; £13 on spot Straits at London and £12 10s at Singapore.

The main features of the industry in May were very similar to the prominent points brought out in April, including annoying or exasperating delays, if not refusals, in securing permits for shipments from London or Straits; the scarcity of spot tin at New York during the month, and the heavy consumption in the United States.

Domestic consumers either acquired wisdom from previous experience in the war market or were favored by kind fortune throughout the month, in that they were independent of the high spot market for Straits metal. Many of the large melters received ample tin on contracts or availed themselves of the opportunity to secure spot tin from importers of Banca, English or Chinese tin at liberal concessions from the prices demanded for spot Straits. The large arrivals of other than Straits tin in this country was the key to the situation, apparently upsetting calculations abroad that the visible supply would be sharply reduced by small shipments from the Straits Settlements. As it was, over 1,100 tons came in from the Dutch East Indies and moderate amounts from China as well as from Cornwall; besides, there are now 4,498 tons Banca and Billiton tin afloat from Batavia for the United States and Europe, as compared with 63 tons a year ago. This was the "joker" in the May statistics offsetting the decrease of 2,794 tons in the May Straits shipments compared with the movement in May last year. Deliveries into American consumption were again heavy, 5,455 tons, but European deliveries of 1,852 tons, were 507 tons less than in May, 1915, so that the visible supply was decreased only 125 tons during the month and is now 19,614 tons which is 4,968 tons larger than one year ago. Stocks at New York and outports at the end of the month were 2,468 tons against 2,756 tons at the end of April and against 1,425 tons at the end of May last year.

TIN PRICES IN MAY.

	New York.	London					
Day.	Cents.	£	s	d	£	s	d
		Spot.			Futures.		
1	51.50	200	0	0	199	0	0
2	51.50	201	0	0	199	5	0
3	51.50	200	0	0	198	15	0
4	51.25	200	0	0	198	15	0
5	50.50	201	0	0	199	15	0
8	50.00	200	10	0	199	10	0
9	49.75	199	10	0	198	5	0
10	49.25	198	10	0	197	5	0
11	49.00	198	0	0	197	15	0
12	49.25	198	0	0	197	10	0
15	49.00	197	0	0	197	0	0
16	49.25	197	10	0	197	15	0
17	49.25	197	5	0	197	10	0
18	49.25	197	5	0	197	10	0
19	49.00	197	5	0	197	10	0
22	48.75	196	0	0	196	5	0
23	48.00	193	0	0	193	5	0
24	47.75	192	0	0	192	5	0
25	47.50	192	10	0	192	15	0
26	47.37½	193	0	0	193	0	0
29	47.00	193	0	0	192	10	0
30	.....	190	0	0	189	15	0
31	45.75	187	10	0	187	0	0
High ...	51.50	201	0	0	199	15	0
Low	45.75	187	10	0	187	0	0
Average .	49.15	196	10	2	196	1	6

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	19,614
June	12,920	11,101	16,027	15,927	.....
July	13,346	12,063	14,167	16,084	.....
Aug.	11,285	11,261	14,452	15,127	.....
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	3,965
June	4,290	4,280	5,870	6,665	....
July	4,580	4,770	4,975	5,606	....
Aug.	5,210	6,030	3,315	4,712	....
Sept.	5,430	5,160	4,973	5,296	....
Oct.	4,450	5,020	4,610	4,441	....
Nov.	5,600	5,560	5,155	6,713	....
Dec.	4,980	5,110	6,435	5,301	....
Total	59,018	62,550	63,093	66,517	....
Av'ge	4,918	5,213	5,258	5,543	....

CONSUMPTION IN THE U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	3,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	5,455
June	2,850	3,800	3,650	3,900	....
July	5,150	3,900	3,900	5,300	....
Aug.	4,300	3,600	2,900	4,500	....
Sept.	3,600	3,100	3,600	4,300	....
Oct.	3,850	3,700	3,700	4,900	....
Nov.	4,300	2,800	2,600	2,975	....
Dec.	4,050	3,100	1,900	5,200	....
Total	49,500	43,900	41,700	48,750	25,223
Av'ge	4,125	3,658	3,475	4,062	5,045

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	May 1916.	April 1916.	May 1915.
Straits shipments			
To G. Britain..	1,415	2,475	2,031
" Continent ..	405	950	923
" U. S.	2,145	1,260	3,805
Total from Straits	3,965	4,685	6,759
Australian shipments			
To Gr. Britain ..	312	245	153
" U. S.	nil	nil	nil
Total Australian	312	245	153
Consumption			
London deliveries	1,758	1,455	2,276
Holland deliveries	94	77	83
U. S.	5,455	4,202	5,600
Total	7,307	5,734	7,959
Stocks at close of month			
In London—			
Straits, Australian	2,512	2,858	1,716
Other kinds	1,862	1,005	1,673
In Holland	7	7	63
In U. S.	2,468	2,756	1,425
Total	6,849	6,626	4,877
Afloat, close of month			
Straits to London.	3,460	4,242	3,071
" to U. S. ..	4,807	4,692	6,635
Banca to Europe..	4,498	4,179	63
Total	12,765	13,113	9,769
	May 31, 1916.	Apr. 30, 1916.	May 31, 1915.
Total visible supply	19,614	19,739	14,646

STRAITS TIN PRICES IN NEW YORK.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	49.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	49.15
June	47.77	44.93	30.65	40.37	.....
July	44.75	40.39	31.75	37.50	.....
Aug.	45.87	41.72	30.59½	34.39	.....
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	...

Permit Situation a Serious Handicap to English Trade.

The English trade was much handicapped by inability to fill the numerous orders that poured in upon them from neutral countries other than the United States. Their incapacity to ship was due not to a lack of metal but to Government authorities refusals to issue permits, based upon inexpediency, incompatible with the interest of the British nation now at war. One result of the restrictions was the resale of considerable Straits tin at London that contributed to the decline in the English market late in the month. Much of the recession in prices at London and Singapore, however, was attributed to the keen competition from the tin produced in the Dutch East Indies and sold in the New York market. It was claimed that the United States Steel Corporation, forced by necessity, or disgruntled, because of the refusal to issue ample permits for shipment from the Straits Settlements, turned with avidity to Banca tin, and some other U. S. consumers followed their example. Whatever were the merits or demerits of this action the result was not only to reduce prices but to shake British control of the tin consumed in this country as the Banca metal is not subject to the sale restrictions placed upon Straits and English tin.

Spot Tin Declines.

Spot Straits tin at New York on May first was held at 51½c with 51c bid. The stock on hand was considered too small to dispose of until there were assurances of a more generous supply later in the month. The freer offerings of Banca, English, Bolivian and Chinese tin, at concessions, however, caused a change of view and prices receded to 50½c at the end of the first week. All positions were irregular and the only business of importance transacted in futures was on the opening day of the month.

Chinese Tin Affected by Sensational Rise in Silver.

During the following week there was small disposition to make commitments to future obligations. Consumers gave small heed to the arrivals during the first ten days of the month, requirements being well covered ahead and being able to purchase other kinds than Straits at steadily declining prices. The sensational rise in silver, however, affected Chinese tin which advanced close to the level of Straits metal. By the end of the second week arrivals had been only 1,048 tons whereas consumption was probably fully 2,000 tons, yet spot tin had receded to 49c.

Large Sale of Banca.

The main feature of interest during the third week was the sale of about 500 tons Banca, mainly spot, to domestic consumers at 47c or about 2c per pound under the price of Straits which sold to a small extent at 49c. A large part of the spot, May and June Banca was taken by a Michigan consumer. English tin sold at concessions of 2½c to 3c and later, Chinese tin sold 3c per pound under the prices asked for Straits. The English smelters produced more freely and apparently there was less difficulty in securing permits for Cornwall shipments than for the movement of Straits metal. Future positions of Straits tin receded ½c to ¾c without attracting actention.

Month Closes Weak and Declining.

Weakness was pronounced during the fourth week when spot prices suffered a decline of 1½c and futures receded 1c per pound at New York with moderate, quiet buying of October, November arrivals at 42¼c to 42½c, some importers taking chances on securing permits for East Indian shipment. The foreign markets also were weak and lower with some recovery at the close but London was down £4 to £4 10s and Singapore £5 to £5 10s net. Freer shipments from London and offerings of tin ex vessels about to sail from London were responsible for the drop in spot tin to 47¼c to 47½c.

The decline was precipitous during the last three days of the month, spot dropping 1½c to 1¾c and futures ½c to 1c per pound. Cables from the Straits revealed anxiety to do business at substantial concessions for delivery far into the future, even for arrivals here early next year and one or two large orders were rumored to have been placed. London was depressed during the holiday here and on the closing day of May reported a break for the two days of £5 10s on Standard and £4 15s on spot Straits. Singapore was less heavy but yielded £3 10s.

Copper in May.

Month of May Witnesses a Peculiar Situation in the Copper Market.

A most peculiar development in the copper world during May was the change in the relative positions of producer and consumer. The change was gradual and was most marked during the last week of the month when many melters became sellers and some of the largest producers became purchasers.

In the slowing of the wheels of industry, forced by the attitude of labor, resulting in strikes, it became evident that consumers had overbought and that stocks of metal at the manufacturing plants had accumulated too fast to be either comfortable or profitable; carrying charges became burdensome. To relieve the strain and at the same time to make virtue of necessity, consumers sold nearby copper at the high premiums then prevailing and purchased late positions at lower prices. Such a movement resulted naturally in an elimination of the premiums on spot, May and June positions, consequently reducing the profit on the exchange transactions, causing in turn, a reduction in the volume of business. At the same time a counter-movement was in progress. Producers—who had sold heavily while the market was rising under the active and feverish demand to cover war contracts, with small regard for prices paid—discovered a necessity for more metal, notwithstanding the enormous production, in order to prevent default on contracts. The largest producers, evidently, had over-sold in expectation that all of the metal disposed of to consumers would not be needed within the time of the contracts. Where consumers had resold, however, the demand for the metal was urgent and in some cases producers were forced to buy in the open market. In the next few days, possibly, the same producers would find themselves possessed of a surplus, through requests for delay in shipments on contracts from consumers who could not sell at a profit, or, through a larger yield than had been anticipated from the refineries.

Dealers Also Anxious to Sell.

Another factor was the increased pressure to sell metal carried by dealers or operators. In the same category was the short-selling, indulged in by some interests, who were encouraged to anticipate a sharp break in the market because of increased evidence of continued enormous production and decreased consumption, incidental to inadequate and inefficient or intermittent labor. Some of these operators offered copper for delivery abroad, for both nearby and future shipment, so persistently and in such substantial amounts, as to cause a violent decline in American Electrolytic in London, as well as in Standard, notwithstanding the scarcity of spot metal in English trade circles, outside of the British government which was and is amply supplied with copper for the manufacture of war munitions. The freer offering of Electrolytic copper abroad was induced by the improved shipping facilities and lower freight rates. Not only could copper be shipped to Europe at 70c per 100 pounds through eleventh hour arrangements but carrying contracts at 45c per 100 pounds were still in force. Yet exports in May were smaller than in April and much smaller than in May last year. On the other hand, imports were liberal and it is still notable that since January 1st, arrivals of foreign copper have been almost double the imports during the corresponding time last year.

Many Cross-Currents.

It is evident that the market throughout May was influenced by many cross currents, modifying the general downward trend of prices. There were few fluctuations in the home market; that is, there were few if any recoveries from each succeeding decline, but there were wide variations in prices in the same position on the same day and the full drop in the price of spot copper for the month was 2½c to 3c per pound, while future positions declined 2c per pound in the open market. At the same time the largest producing interests, with capacity well sold until fall, were disinclined to press sales upon an unwilling market. They therefore made no change in their nominal asking price of 29c for October, November and December shipment, relying upon a renewal of demand to bring the open market back to their level.

Some of these interests, indeed, affected to

LAKE COPPER PRICES.

Monthly average prices of Lake Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	29.28½
June	17.43	15.08	14.15	19.92	....
July	17.37	14.77	13.73	19.42	.....
Aug.	17.61	15.79	12.68	17.47	.....
Sept.	17.69	16.72	12.43½	17.76	.....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av.	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Monthly average prices of Electrolytic Copper in New York.

	1912.	1913.	1914.	1915.	1916
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	29.81
June	17.29	14.85	13.81	19.71	.....
July	17.35	14.57	13.49	19.08	....
Aug.	17.60	15.68	12.41½	17.22	....
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av.	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Monthly average prices of Casting Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.18	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	27.37
June	17.08	14.72	13.65	18.74½	.....
July	17.09	14.40½	13.34½	17.76½	.....
Aug.	17.35	15.50	12.27	16.46	.....
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av.	16.29	15.33	13.18	16.76	....

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper so far this year are given below together with the price of Lake Copper on the same dates:

1916—	Sheet Copper.	Lake Copper.
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 19	36.50	29.75
May 5	37.50	29.75

WATERBURY COPPER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.50	17.00	14.75	14.12½	24.75
Feb.	14.50	15.50	15.12½	15.25	27.75
Mar.	15.00	15.12½	15.00	15.75	28.00
Apr.	16.00	15.75	14.87½	18.50	29.00
May	16.37½	15.87½	14.75	22.50	29.87½
June	17.50	15.37½	14.37½	22.50	....
July	17.75	14.75	14.12½	22.25	....
Aug.	17.75	15.62½	13.00	19.50	....
Sept.	17.87½	16.87½	12.87½	18.50	....
Oct.	17.75	16.87½	12.25	18.25	....
Nov.	17.75	16.25	12.25	19.37½	....
Dec.	17.75	15.00	13.50	20.75	...
Av.	16.71	15.83	13.91	18.94	....

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	23,663
February .	26,792	34,634	15,583	20,648
March ...	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	21,654
May	38,601	32,077	28,889	*14,705
June	28,015	35,182	16,976	.....
July	29,596	34,145	17,708	.....
August ..	35,072	16,509	17,551	.....
September	34,356	19,402	14,877	.....
October .	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December .	30,653	22,166	42,426	.....
Totals ..	382,810	360,229	276,344	106,991

* Includes only exports from Atlantic ports.

believe that the open market was manipulated in the interest of war munition manufacturers who were expected to come into the market in the near future. The other causes cited, however, seem sufficiently potent to have caused the drop in prices although operators' movements may have helped the reaction.

On the other hand, during the first week of the month, all of the so-called manipulative energies were expended in trying to further excite buyers and to induce purchases for shipment over the last quarter of 1916 at fractional advances in prices. During this time spot Electrolytic was quoted at 30½c to 31c, May at 30½c, June at 30c, July at 30c, August at 29½c and later deliveries at 28¾c. At the same time there were constantly repeated rumors and assertions that France would have to buy or did buy 200,000,000 pounds more of American copper for delivery from July to December. There was no confirmation of such sales and the transactions were not credited outside of Wall Street. In the second week the market was largely professional in character and while prices on the earlier deliveries up to September receded, those for later deliveries were fractionally higher, but without substantial trading to establish the advances.

Sharp Break in Prices.

During the next two weeks dulness was more pronounced and with increased pressure to sell prices broke sharply, especially during the last week, when Electrolytic was offered at 28c for May, June and July and at 27c for shipment during the last quarter of the year. Lake copper was even more difficult to sell than was Electrolytic at times, even though lower prices were asked.

The English market displayed considerable strength during the first half of the month when spot American Electrolytic advanced from £143 to £158, a rise of £15. Standard at the same time advanced £14 on spot and £18 on futures. Recession began May 17th and by May 30th, American Electrolytic had dropped £16 to £142 for spot with a recovery of £2 on the last day of the month, while Standard had broken £25 on spot and £23 on futures by May 26th, but on the following business day, May 29th, there was a recovery of £5 on both spot and futures, succeeded by an equal decline the next day.

Producers Not Short—But Long!

It is difficult to fully reconcile statistical reports with commercial developments during the month. The May output of the smelters and refineries is estimated to be 190,000,000 pounds and by July, fully 200,000,000 pounds will have been produced. May exports were probably not over 35,000,000 pounds from all ports and even if 130,000,000 pounds were shipped to consumers, which seems doubtful, there was an accumulation of fully 25,000,000 pounds in producers' hands. If the largest producers supply fell short of requirements what must have been the accumulation in the hands of smaller producers? It is interesting though, to note that at the close of the month some producers who thought they were short, discovered a surplus!

COPPER PRICES IN MAY.

	New York			London.
	Lake.	Electro.	Casting.	Standard.
Day.	Cents.	Cents.	Cents.	£ s d
1	29.75	30.50	27.75	133 0 0
2	29.75	30.50	27.75	134 0 0
3	29.75	30.50	27.75	135 0 0
4	29.75	30.50	27.75	137 0 0
5	29.75	30.50	27.75	137 0 0
8	30.00	30.75	28.00	140 0 0
9	30.00	30.75	28.00	139 10 0
10	29.75	30.50	27.75	140 0 0
11	29.75	30.25	27.75	141 0 0
12	29.75	30.25	27.75	141 0 0
15	29.75	30.25	27.75	143 0 0
16	29.75	30.00	27.62½	146 0 0
17	29.25	29.75	27.50	145 0 0
18	29.25	29.75	27.25	143 0 0
19	29.00	29.50	27.25	138 0 0
22	28.75	29.25	27.00	137 0 0
23	28.75	29.25	27.00	136 0 0
24	28.75	29.00	26.75	132 0 0
25	28.25	28.50	26.50	129 0 0
26	28.25	28.50	26.50	121 0 0
29	28.25	28.50	26.50	126 0 0
30	.....	.....	.....	121 0 0
31	28.25	28.50	26.50	121 0 0
High .	30.25	31.00	28.25	146 0 0
Low .	28.00	28.25	26.25	121 0 0
Av'ge.	29.28½	29.81	27.37	135 0 2

Lead in May.

Trust Price Unchanged Throughout the Month.

The American Smelting & Refining Co. tenaciously held to its official price of 7½c New York, and 7.42½c East St. Louis, for lead throughout May and was supported in this position by independent producers, who, until late in the month, made light of the re-selling by consumers and the persistent offerings by dealers at concessions of several dollars per ton from the Trust price. Producers declared with confidence, during the first week of the month, that current orders would be numerous enough and of sufficient volume to take up the May output and would leave little if any accumulation at the end of the month. When the month closed the producers' tone was less confident; they admitted the weakness of the market and some, who more anxious for orders, were willing to accept concessions to make sales. The largest interest, however, gave no sign of distress but continued to maintain the price established March 30th, and for the last sixty-days has taken business steadily on an average scale basis. In the meantime, prices in the open market fluctuated from ¼c above to .30c below the Trust level; the lowest point being touched at the end of May.

The English market was well maintained during the first half of the month but also yielded from £2 10s to £3 before the month closed. At times there was some reason to anticipate that lead might be purchased here for Europe, but hopes were not high, consequently there was not much disappointment when no English orders were received.

Market Very Dull at Opening.

May opened upon a very dull market with increasing offerings by second hands at slight concessions from the official price, but dealers found it exceedingly difficult to make sales. The sensational advance in the price of silver, for a few days proved a depressing factor in the lead market. Consumers were not unmindful that should the output of silver-bearing lead ore be too greatly stimulated by the sharp rise in silver the lead smelters might apply the corrective measure of lower priced lead. This would be the natural tendency under ordinary conditions but to-day the market cannot be measured by common standards. Consumers, however, were made more conservative by the new development and were less inclined to place future contracts of importance. In fact, some consumers as well as dealers were eager to resell lead delivered on contract, that they might reap the profit in hand and take chances on the future with the strong tendency toward lower prices.

Some large export inquiries came to the surface toward the end of the first week, but they were not taken seriously and hence failed to stimulate the market. Resale lots continued to go begging even at concessions, but the largest interest still made sales on a sliding scale basis, demonstrating its hold upon many consumers. It was recalled that the Trust price during the 1906-07 "boom" was held firmly at 6c maximum for over six months uninfluenced by fluctuations in the open market. To-day

LEAD PRICES IN MAY.

Day.	New York.* Cents.	St. Louis. Cents.	London. £ s d
1	7.50	7.37½	34 15 0
2	7.50	7.35	34 10 0
3	7.50	7.30	34 12 6
4	7.43¾	7.30	34 12 6
5	7.43¾	7.30	34 2 6
8	7.43¾	7.25	34 5 0
9	7.43¾	7.25	34 5 0
10	7.43¾	7.25	34 5 0
11	7.43¾	7.25	34 5 0
12	**7.50**	**7.40**	33 15 0
15	7.50	7.37½	33 10 0
16	7.50	7.37½	33 15 0
17	7.47½	7.37½	32 10 0
18	7.45	7.37½	31 12 6
19	7.40	7.30	31 10 0
22	7.30	7.25	31 12 6
23	7.30	7.25	31 10 0
24	7.30	7.20	31 7 6
25	7.30	7.20	31 7 6
26	7.25	7.15	31 5 0
29	7.25	7.15	31 10 0
30	....	....	31 10 0
31	7.25	7.15	31 15 0
High	7.50	7.45	34 15 0
Low	7.20	7.10	31 5 0
Average	7.40½	7.28	32 19 3

* Outside market.

the same policy is being exercised with the maximum at 7½c New York. On the other hand, it was pointed out that the productive cost to-day is about 3½c to 4c per pound and that the smelters would not care to maintain a selling price of 7½c at the expense of piling stocks; but this contingency is based upon an anticipated large increase in output of silver-lead ores, because of the sky-rocketting price of metallic silver. Speculations of this sort have resulted in nothing practical to date.

The market continued to drag the second week with producers holding firmly; dealers and operators pressing sales; domestic consumers awaiting developments and with export inquiries nebulous. At St. Louis, the reselling of small lots to such consumers as electrical supply interests and to paint manufacturers satisfied the demand.

Concerted Buying for Foreign Account Sends Outside Market Up $3 Per Ton Above Trust Price.

On May ninth, there were rumors that England was negotiating here for round lots of lead as a result of the scarcity of labor in Australia and the lack of coal storage facilities in Spain, which was interpreted to mean an inadequate supply of lead for the Allies, who would in such an emergency, turn to the United States. Possibly for this reason, two days later, there was more buying than at any time in a month, with orders placed for export to the Far East. Sales of 600 tons were reported on the Atlantic and Pacific coasts. Further inquiries from Russia and Japan in the next few days induced dealers and operators to feverishly purchase supplies in the open market which caused an advance of $3 per ton over Trust prices. There were also inquiries for 2,000 to 3,000 tons for Canada which again excited operators. The upward tendency was also assisted by threatened strikes at Flat River, Missouri, but wage adjustment, through bonuses, soon eliminated the latter factor.

Reaction to a lower level came with the third week of the month. Export demand failed to meet expectations and adjustment of labor demands was followed by freer offerings at concessions in prices, with small buying. Dealers, becoming more anxious to sell, cut the Trust prices $2.00 per ton with small success. Government returns for April became public about this time, showing exports of 2,850 tons from San Francisco and Seattle to China, Japan and Vladivostok, but May and June exports from the Pacific will be much larger.

The London market was also a disappointment when on May 18th, the English price dropped to the equivalent of 6.15c per pound below the open market price, here.

Month Closes With Outside Market $3 to $4 Per Ton Below Trust Price.

The pressure to sell, by holders other than producers, increased during the fourth week when prices in the open market were $3 to $4 per ton under the Trust price. Japan inquired for 1,000 tons, but dealers and operators took small interest and continued to be free sellers of May and June shipment at 7½c and a few days later, the outside price had dropped $4 to $5 below the nominal official base. On May 26th, cables reported that the Japanese Government had purchased 7,000 tons lead at 7½c delivered Japan, which is equivalent to 6c St. Louis, the freight rate to the Orient being 1½c per pound. The business was taken by Japanese houses.

On the last two days of the month, some sales of prompt and early June shipment were made at 7.10c to 7.15c East St. Louis, and at 7.20c New York. Some of the independent producers, too, were seeking orders for June and July at concessions. The average prices in May was about $2.00 per ton below the American Smelting & Refining Co., quotation, whereas in February, March and April, the average price was between $5 and $6 higher.

LEAD (Monthly Averages.)

	——New York*——			——St. Louis——		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19	7.50	3.70	4.11	7.67
May	3.90	4.23½	7.50	3.81	4.16	7.28
June	3.90	5.86		3.80	5.76	
July	3.90	5.74		3.75	5.52	
Aug.	3.90	4.75		3.73½	4.59	
Sep.	3.86	4.62		3.67	4.53	
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

Production of Lead In The United States in 1915.

Advance Statement by C. E. Siebenthal, of the United States Geological Survey.

The production of primary refined lead in the United States in 1915 was 550,055 tons as compared with 542,122 tons in 1914, an increase of 7,933 tons or 1.3%.

The total value of the 1915 output is placed at $51,705,000 as compared with $42,286,000 for 1914.

In the following table the production for 1915 and previous years is apportioned to the states in which the ore was mined.

Primary Lead Smelted or Refined in the United States.
(In short tons of 2,000 pounds.)

Domestic ore:	1910.	1911.	1912.	1913.	1914.	1915
Alaska	75	51	45	6	.....	358
Arizona	948	3,428	3,891	4,901	5,601	6,953
Arkansas	.....	15	.....	.....	52	51
California	1,207	615	811	3,294	3,698	5,606
Colorado	38,542	30,442	37,039	42,840	41,198	32,352
Idaho	109,951	117,335	127,780	137,802	177,827	160,680
Illinois	263	308	513	619	427	910
Iowa	.....	.....	.....	.....	34	.....
Kansas	1,308	2,522	1,937	1,504	1,043	1,320
Kentucky	50	.....	91	16	16	95
Missouri	161,659	182,203	162,610	152,430	194,275	195,634
Montana	1,943	2,484	2,517	3,256	4,386	4,853
Nevada	2,246	1,082	5,699	6,142	5,996	7,664
New Hampshire	.....	.....	.....	.....	.....	3
New Mexico	1,890	1,371	2,511	1,821	741	2,157
North Carolina	2	35	34	10	.....	.....
Oklahoma	1,805	1,925	2,500	3,214	3,916	4,346
Oregon	.....	11	21	37	17	11
South Dakota	8	33	12	7	2	5
Pennsylvania	.....	.....	.....	.....	.....	6
Tennessee	.....	.....	.....	.....	.....	8
Texas	36	57	30	108	89	111
Utah	60,605	54,933	60,664	71,069	88,976	106,105
Virginia	87	400	85	878	143	457
Washington	339	612	53	9	2	11
Wisconsin	3,909	3,966	3,301	2,639	1,819	2,632
Wyoming	.....	.....	.....	.....	.....	6
Undistributed	101	48	120	63	99	116
Zinc residues	2,237	1,987	3,131	3,765	4,125	4,567
Total from domestic ore	389,211	405,863	415,395	436,430	534,482	537,012
Foreign ore:						
Africa	3,310	582	1,774	5,976	2,942	.....
Canada	25	123	29	16	2	1,174
Central America	3	28	.....	.....	.....	1
Mexico	11,704	7,333	7,407	4,512	2,386	5,437
South America	2,996	2,677	2,332	2,617	1,821	2,829
Other foreign	27	22	30	102	488	140
Foreign base bullion:						
Mexico	76,805	84,220	76,805	37,359	21,689	33,176
South America	.....	.....	.....	.....	.....	275
Total from foreign ore and base bullion	94,870	94,984	88,377	50,582	29,328	43,029
Grand total, derived from all sources	484,081	500,847	503,772	487,012	563,810	580,044

Production of Refined Primary Lead in the United States.

	1910.	1911.	1912.	1913.	1914.	1915.
Domestic desilverized lead	206,132	200,381	221,486	250,578	311,069	301,564
Domestic soft lead	141,318	155,947	141,248	131,867	158,219	161,461
Domestic desilverized soft lead	27,952	35,667	29,789	29,433	43,506	44,001
Foreign desilverized lead	94,870	94,984	88,377	50,582	29,328	43,029
Total production of refined primary lead	470,272	486,979	480,894	462,460	542,122	550,055
Production of antimonial lead	14,069	14,078	13,552	14,667	16,668	23,224

Primary Refined Lead Available for Consumption in the United States.

Supply:						
Stock in bonded warehouses Jan 1	17,405	35,972	4,481	10,492	5,310	7,668
Imports—						
For consumption	15,359	13,281	14,146	11,980	7,386	9,680
For warehouse	93,249	76,671	69,414	45,165	20,952	41,816
Increase by liquidation	.....	.....	.....	.....	.....	2,250
Production from domestic ores	375,402	391,995	392,517	411,878	512,794	507,026
Total supply	501,415	517,919	480,558	479,515	546,442	568,440
Withdrawn:						
Exports of foreign lead—						
From warehouse	69,786	101,227	64,906	44,544	21,545	38,445
In manufactures, with benefit of drawback	8,800	12,080	11,320	9,757	9,399	3,983
Exports of domestic lead	.....	.....	.....	.....	58,722	87,092
Decrease by liquidation	7,661	14,812	5,692	419	56	.....
Stock in bonded warehouse Dec. 31	35,972	4,481	10,492	5,310	7,668	12,169
Total withdrawn	122,219	132,600	92,410	60,030	97,390	141,689
Available for consumption	379,196	385,319	388,148	419,485	449,052	426,751

Production of Secondary Lead in the United States.

Pig lead	29,492	27,389	30,266	33,104	29,337	36,300
Lead in alloy	25,930	26,895	36,902	39,730	31,725	35,000
Total recovered lead	55,422	54,284	67,168	72,834	61,077	71,300

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 11, 1915, have been as follows:

June 11, 1915		6.50
June 12	Advanced	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	Reduced	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	.10c to 5.00
November 10	"	.15c to 5.15
November 15	"	.10c to 5.25
December 14	"	.15c to 5.40
December 31	"	.10c to 5.50
January 4, 1916	"	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	.05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60
March 14	"	.40c to 7.00
March 30	"	.50c to 7.50
June 2	Reduced	.50c to 7.00

Spelter in May.

A Very Unsatisfactory Month to the Trade—Prices Drop 4c Per Pound Here; £24 to £25 Abroad.

May was a mournful month for sellers of spelter. At times dullness was profound and weakness was most pronounced. Pressure to sell increased with the waning of the month and at the close, the break in prices during the four weeks was 4 to 4¼c per pound on prompt shipment and 3½c to 4c on June to September inclusive, while prices for the fourth quarter shipment suffered even more. Today prices in the United States are the lowest since September, 1915—a period of eight months.

The English market also sustained a fracture of £24 to £25, equivalent to 4.80 to 5c per pound. London, however, was on a relatively higher basis than was New York or East St. Louis, even at the close of the month. British trading prices, except for spot, were lower than official figures indicated. Under such circumstances there was no outlet for surplus American supplies through London. It is significant to-day, however, that the low level of prices here has at last attracted British attention and there are export inquiries for 3,000 tons for shipment at the rate of 1,000 tons per month in June, July and August. This may prove to be the long expected and anxiously awaited turning point for our market.

Domestic consumers generally are working into a vulnerable position. Purchases for the last four weeks have been of a hand-to-mouth character. Galvanizers with only 50% of capacity busy on the average, had small need to purchase except in very small lots and, with lower and still lower prices probable from day-to-day, it was considered foolish to cover far into the future; but should it be demonstrated that the bottom has been reached buying tactics speedily would be changed. Other consumers, with the exception of the brass founders and mills, while better covered are understood to be in need for July and later months.

Brass Manufacturers Well Covered.

Brass manufacturers, however, seem better supplied with stocks and have liberal amounts still due them on contracts. The output of "brass special," intermediate grades and high grades of spelter has been exceptionally heavy, as production was encouraged because of the great premiums—3 to 15c per pound—obtained over prime western prices, during the time of greatest activity. The heavy output of these grades recently has militated against these premiums which have been cut in half; at least, as far as "brass special" is concerned. While this readjustment was in progress purchases were naturally small and are likely to remain light until competition for such business is less keen among producers and it is shown that no more premiums are to be eliminated.

Producers Confident at Opening of Month; Discouraged and Disgruntled at Close.

Early in May producers were of stout heart and continued confident during the first half of the month—while current orders were discouraging—because they were steadily shipping on relatively higher priced contracts and accumulating little surplus. The selling market was largely in the hands of dealers, and producers met this competition with reluctance. Offerings were light but still were in excess of demand and production increasing, the decline in prices, while only fractional, continued steadily. Watchful waiting was the attitude of large consumers who were well supplied with metal, but sheet galvanizers—operating only 35% to 40% of galvanizing pots—bought small lots. Wire and pipe galvanizing mills operated full capacity but needed little spelter.

Producers, while leaving the market for May and June largely to dealers, became more anxious for third and fourth quarter orders near the middle of the month. Those making "brass special" were especially anxious to secure contracts for shipment over the second half of the year. Occasionally, for a few days at a time, there was some semblance of life when a number of small orders were bunched, but the temporary better buying, failed to check the downward tendency. Sentiment became more bearish and, like many other diseases, the distemper was contagious. It was sig-

nificant also that the decline was pushed by interests anxious to secure ore based upon the average price of the metal. At the end of the second week some export business was transacted but domestic buying was reduced to the minimum. Producers became more anxious to sell and "brass special" was offered down to 18c per pound for May delivery but manufacturers were unresponsive.

Several desirable export orders were taken early in the third week at greater concessions but the demand was soon satisfied. The premium commanded by spot metal for several months gradually disappeared as the supply for prompt shipment became more ample and the home demand failed to improve.

Labor Strikes Leave Output Unaffected.

Labor strikes at smelters in the west, about this time, became a factor in the situation but they were of too short duration to seriously check the output.

The fourth week of the month failed to develop any improvement in domestic buying and it became evident that few of the producers had orders that would keep them busy after June unless there was a decided change in conditions; consequently, there was more pressure to sell, especially for delivery over the second half of the year. Heavier concessions were made which resulted, toward the close of the month, in sales to home consumers for July to December at close to 12½c per pound. The London market also dropped heavily, £15 in three days. On May 29th, some large prospective export orders came into the market, resulting in considerable business, on the closing day of the month, in prompt, June and future deliveries. Domestic buyers also were stimulated by the lower prices to place larger orders for June delivery than at any time in a month. There was also some buying of July and August on home account. Nearly all of the orders were taken by producers. A more cheerful and confident market is developing.

SPELTER PRICES IN MAY.

	New York.	St. Louis.	London.		
Day.	Cents.	Cents.	£	s	d
1	17.80	17.62½	99	0	0
2	17.67½	17.50	98	0	0
3	17.55	17.37½	98	0	0
4	17.55	17.37½	98	0	0
5	17.42½	17.25	98	0	0
8	17.17½	17.00	98	0	0
9	17.05	16.87½	98	0	0
10	16.92½	16.75	98	0	0
11	16.67½	16.50	98	0	0
12	16.30	16.12½	96	0	0
15	15.67½	15.50	98	0	0
16	15.55	15.37½	95	0	0
17	15.42½	15.25	95	0	0
18	15.30	15.12½	95	0	0
19	15.30	15.12½	95	0	0
22	15.17½	15.00	95	0	0
23	15.05	14.87½	95	0	0
24	14.80	14.62½	95	0	0
25	14.67½	14.50	95	0	0
26	14.30	14.12½	90	0	0
29	13.67½	13.50	80	0	0
30	.....	.....	80	0	0
31	13.42½	13.25	80	0	0
High	17.92½	17.75	99	0	0
Low	13.30	13.12½	80	0	0
Average	15.93	15.75½	94	4	4

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc since Nov. 12th together with the price of spelter ruling on the same day.

1915—	Sheet Zinc.	Spelter St. Louis.
November 12	18.00	16.31¼
November 17	19.00	17.25
November 18	20.00	17.37½
November 22	21.00	18.75
November 23	22.00	18.75
December 31	23.00	17.25
1916—		
January 26	24.00	19.00
February 17	25.00	20.87½
April 22	25.50	18.75
May 15	24.50	15.50
May 23	23.50	14.87½
May 26	22.50	14.12½
June 2	21.00	13.12½

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	21.20
June	7.25	5.50	5.37	25.60	
July	7.46	5.61	5.26	24.90	
Aug.	7.34	5.99	5.66	19.35	
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

Spelter From Australian Concentrates.

Imports of zinc ore and calamine in the first three months of this year represented an amount of zinc, allowing for loss in smelting, equal to precisely one-half of the total production of spelter in the United States in the record year prior to the war. The large imports are, of course, chiefly Australian concentrates for use at the new Donora smelter. In a table shown we give for a series of years, and also by months since the beginning of last year, the imports of zinc ore and calamine as reported in the Monthly Summary of the Department of Commerce, with the ascertained zinc contents, which are dutiable at the rate of 10%, and our computation of the percentage of zinc contents.

The sources of the zinc ore imports are not given in the Monthly Summary, but from publications of the Geological Survey it is learned that the largest imports of zinc ore from Mexico were in 1909, 104,826 tons. The zinc contents are not given, but they are given for the following year, showing a proportion of 34.6%. Since the trouble in Mexico began, the imports from Mexico have been insignificant. In 1913 the total imports, gross weight, were 28,000 tons and in 1914 they were 46,000 tons. In April, 1915, the imports began to assume large proportions, reaching 12,000 tons a month, but they decreased later in the year. This year a gait has been struck that appears to be permanent. Statistics are available through March, showing that in the first three months of the year the imports were 112,516 gross tons, with 44,114 gross tons of zinc contents. Allowing an 85% recovery this would represent 156,000 gross tons of spelter a year, or precisely one-half the largest production of spelter in the United States prior to the war, that record having been 346,676 net tons, in 1913.

The average zinc content of the imports in the first three months of this year was 39.2%. Our computation shows that there have been wide variations from month to month, due perhaps to the shipments from various mines not being uniform from month to month.

Imports of Zinc Ore and Calamine—Gross Tons.

Year 1911	57,933	17,031	29.4%
" 1912	55,522	17,855	32.1
" 1913	28,050	12,051	42.9
" 1914	46,260	10,993	23.8
" 1915	141,832	49,704	35.0
January, 1915	1,892	677	35.8
February	7,600	2,646	34.9
March	5,417	1,418	36.1
April	12,988	5,563	42.8
May	12,286	4,144	33.8
June	19,175	6,751	35.2
July	10,496	4,381	41.7
August	7,614	2,464	32.2
September	15,753	3,940	25.0
October	9,652	3,979	41.2
November	5,943	2,153	36.1
December	33,016	11,232	34.1
January, 1916	43,049	17,580	40.9
February	36,956	13,888	37.6
March	32,511	12,646	39.0

THE TREATMENT OF AUSTRALIAN ZINC CONCENTRATES.

(By our Special Correspondent in London.)

While considerable plant developments are under way in Great Britain there seems to be very little likelihood of the zinc smelting capacity there being raised to anything like that necessary for treating the whole of the Broken Hill concentrates, the supply of which available before the war amounted annually to nearly half a million tons, averaging 47% metal. The English Crown, Dillwyns, Vivian, Williams, Foster, Central Zinc, and Brands are all extending their furnaces, and the United Alkali intend to lay down a pretty big acid plant, probably selling the roasted material to spelter works, but the sum total of these developments is really only a drop in the bucket when the total to be treated is considered. There is a certain amount of Australian production, of course, and sales of this are being regularly made in London by the Associated Smelters, the material going chiefly to France and Russia, but the total involved is only a few hundred tons a month. In

view of the hostility of the Hughes party in Australia to every non-British part of the world, and to the economic difficulties in the way of handling raw material out there on an adequate scale, it is a little difficult to see how matters are to pan out to the satisfaction of the Broken Hill mines. It is quite on the cards that concentrates will not be permitted to go to America for treatment, while shipments even for Japan, our ally, have been held up, notwithstanding the fact that the spelter contents had actually been sold by the Japanese buyers to Russia, who is in dire need of supplies. It is believed, however, that the Japanese position in this respect is being seriously considered, and Mitsui at all events has now got permission to ship some concentrates to Japan, while the Kuhara people have hopes of being accommodated similarly. Japan promises to be a factor of greatly increasing importance in the spelter trade, and it would not be surprising if the great bulk of her surplus output after home demands had been satisfied, did not come to the United Kingdom for some years, so closely are the Allied Powers working together. The following figures show the Broken Hill position up to the latest available date so far as exports of zinc concentrates are concerned.

To	Jan.-June 1914. Cwt.	July-June 1914-15. Cwt.
United Kingdom	303,756	404,553
Belgium	3,395,035	950,888
France	255,014	111,953
Germany	1,076,752	139,430
Netherlands	304,400	63,997
U. S. America	.....	738,994
States of Final Shipment:		
New South Wales ...	791,041	382,224
Victoria	.....	456
Queensland	.....	292
South Australia	4,543,789	2,026,719
Western Australia .	127	124
Total	5,334,957	2,409,815

It will be noted that the shipments for the twelve months ended June, 1915, were considerably less than half those for the first six months of 1914, while in Jan.-Dec., 1913, the total amounted to over 9½ million hundredweight.

SPELTER (Monthly Averages.)

	New York		St. Louis	
	1915.	1916	1915.	1916.
Jan.	6.52	18.18	6.33	18.01
Feb.	8.86½	20.09	19.92	19.92
Mar.	10.12½	18.09½	9.80	17.91
Apr.	11.51	18.61½	11.22	18.44
May	15.82½	15.93	15.52½	15.75½
June	22.62½		22.14	
July	20.80		20.54	
Aug.	14.45		14.19	
Sept.	14.49		14.10½	
Oct.	14.07		13.89	
Nov.	17.04		16.87½	
Dec.	16.91		16.72	
Av.	14.44		14.16	

QUICKSILVER PRICES.

Monthly average prices of Quicksilver in New York (flasks of 75 pounds).

	1913.	1914.	1915.	1916.
Jan.	40.00	38.05	50.90	214.76
Feb. ...	40.00	38.00	58.05½	288.50
Mar.	39.50	38.00	62.93½	223.91
April ...	39.14	38.00	65.71½	140.10½
May	39.19	38.00	72.65	96.95
June	39.67	37.73	87.91	....
July	39.00	35.87	93.33	....
Aug.	39.00	74.19½	91.79½	....
Sept. ...	39.00	73.57	89.09½	....
Oct.	38.59	50.59½	92.40	....
Nov.	38.00	51.72	102.25	....
Dec.	38.50	51.61	126.52	....
Average.	39.13	47.11	82.80	....

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Antimony In May.

Market Breaks Severely and Prices Collapse to the Extent of 14c per Pound, —And Still Declining.

Antimony suffered a serious collapse in May and the end is not yet. Spot metal, American and Oriental, broke 14c per pound from the end of April to the end of May, and from the highest point reached at the end of March, the break was 31c per pound. It will be remembered that the March maximum, 45c per pound, was the highest price established in the history of the industry, exceeding the highest point in 1915, by 5c per pound. On the other hand, the minimum price of record was 5.30c per pound, that prevailed in July just prior to the advent of the war.

The price of spot metal at New York to-day is nominally 24c per pound for wholesale lots, so it is only by comparison that the present level of the market seems a dolorous affair. The seriousness of the May reaction, however, is measured not by vanished profits but by the enormous losses sustained by operators and importers. Fortunes made during the rise have been replaced by bold staring figures on the debit side of the ledger. Antimony is not a pleasant subject, even in a market review, while grief in the trade is poignant.

The drop in prices of antimony, for shipment from the Orient to the Occident, was severe, 10c per pound, but the break since the highest point was reached in March, 34c, has been only 14c per pound —less than half of the collapse suffered by spot metal.

Lack of War Orders and Panic, the Cause.

The cause of the precipitous decline in May was two-fold, the dearth of shrapnel orders from the warring nations, and the panic among operators who would take counsel only with their fears. Rushing wildly into the market to sell when there was no demand only accelerated the downward movement, but financial responsibilities were heavy and depressing. Some importunate sellers welcomed even losses if by such they could only get out of their predicament. Toward the close of the month the pressure to sell was less evident but there was little if any improvement in the demand.

The higher prices prevailing for silver, the world over, last month, increased the productive cost of antimony in China, which country for many months has been furnishing the world with the bulk of its supply of antimony; but Eastern limits failed to indicate a desire to force buyers to shoulder the additional cost. On the other hand, there were offerings early in the month of 28c for May and June shipment from China and Japan, against limits of 30c per pound at the end of April. Most of these offerings went begging, however, as the American market was well supplied and there was small outlet for the stocks in hand. Importers and dealers here were offering prompt shipment at 35c to 36c. These prices were steadily reduced from day-to-day without attracting buyers. Consumers stocks were more than ample and there was no incentive to anticipate future requirements on a weak and declining market. By the middle of the month, prices of nearby metal had suffered a decline of 3c to 4c per pound.

Importers Overbought—Market Grows Weaker—Speculators Fear-Stricken.

Importers, apparently, had failed to interpret trade signs correctly and therefore had purchased from the Far East quantities far in excess of the ability of the domestic market to absorb. The error was in overestimating the war munitions contracts—especially of shrapnel—to be placed in the United States.

As the month advanced the feeling of weakness and distrust increased; the downward tendency being most marked during the third and fourth weeks. Speculators greatly alarmed, made frantic efforts to sell, which further unsettled the market and increased the intense caution of consumers. On the last two days of the month there was less open effort to force sales but the undertone continued weak, with spot metal available at 24c to 25c duty paid and with offerings of June shipment from the Far East at 20c in bond. It was intimated, too, that a firm offer might develop even further concessions.

Aluminum In May.

Market Dull Throughout the Month—Sales by the Aluminum Company of America Only Feature of Interest.

The main feature of interest in aluminum in May, was the selling by the Aluminum Company of America, for 1917 shipment. Contracts for No. 1 Virgin were taken at 35c at smelters and sheets were sold at 40c base f. o. b. mill for next year's delivery. These transactions gave rise to the report that contract prices were fixed on this basis for the whole of 1917. This mode of statement gives an erroneous impression for while sales were made as noted, contract prices for the whole of 1917 may vary according to developments. Regular consuming customers, however, continued to place contracts at various times during the month at these prices.

The outside market was dull throughout the month and prices fluctuated slightly. Most of the small sales for prompt shipment were made between 59c to 61c for No. 1; between 57c to 59c for pure 98-99% remelted, and between 48 to 50c for No. 12 alloy remelted.

The light supply of ingots and sheets in the outside market, as well as the extremely high prices prevailing for early shipments, confirmed such large consumers as automobile manufacturers in their determination to eliminate aluminum as much as possible from the building of motor cars and accessories until normal prices are re-established. Some manufacturers report having found excellent substitutes which probably will be continued permanently.

The importations of aluminum during the first quarter of 1916 have been 823 tons against arrivals during the first three months last year of 1,170 tons. Thus, there has been a decrease of about 30% in the supply of foreign metal available for American consumption.

CHINESE and JAPANESE ANTIMONY.

Average monthly price of **Chinese** and **Japanese** (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	32.20½
June	7.07	7.62	5.62½	36.53½	....
July	7.37	7.55	5.44	35.98	....
Aug.	7.58	7.48	13.05	32.57	....
Sept.	8.00	7.31	9.79½	28.50	....
Oct.	9.11	6.46	11.64	30.96	....
Nov.	9.11	6.28	14.14	37.88	....
Dec.	9.05	6.05	13.15	39.36½	....
Av.	7.63	7.43	8.53½	29.52	....

ALUMINUM, SILVER and ANTIMONY PRICES IN MAY.

	Aluminum.	— Silver —		Antimony.
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents.
1	60.00	72 7/8	35	38.00
2	60.00	74 7/8	36	38.00
3	60.00	77¼	37 1/8	37.50
4	60.00	76 7/8	36 11/16	37.00
5	60.00	76 7/8	37	37.00
6	.....	76¾	36 13/16	.....
8	60.00	74 1/8	35½	36.50
9	60.00	73¼	35 1/16	36.00
10	60.00	76¼	36½	36.00
11	60.00	76½	36 5/8	34.50
12	60.00	77¼	37	34.50
13	.....	77 1/8	36 13/16	.....
15	60.00	75½	36 1/8	33.50
16	60.00	75¾	36¼	31.00
17	60.00	75¾	36¼	31.00
18	60.00	75¾	36¼	30.00
19	60.00	75½	36 1/8	30.00
20	.....	75¼	36	.....
22	60.00	71¼	34	29.50
23	60.00	71 3/8	34 1/8	27.50
24	60.00	71½	34 3/16	27.00
25	60.00	71½	34 3/16	26.50
26	60.00	71 3/8	34 3/16	26.50
27	.....	71 1/8	34 1/16	.....
29	60.00	70 5/8	33¾	25.50
30	.....	....	32 7/8	.....
31	60.00	68¾	32 7/8	25.50
High .	61.00	77¼	37 1/8	38.50
Low .	59.00	68¾	32 7/8	25.00
Av'ge.	60.00	74.27	35.48	32.20½

Joplin Zinc And Lead Ore Markets.

The month of May showed a reversal of form from that exhibited during April. From a record tonnage the shipments dropped very materially and the price levels for zinc ores fell far below the average of the year. Naturally such a change has materially effected conditions from a stock standpoint as well as production.

The average price for all zinc ores during May was $90.15 as compared with $106.47 for April. The average base price was therefore much below $100 for 60% zinc. Calamine ores showed a similar drop, the average for all grades registering but $64.13 as compared with $81.61 the previous month. There has been a gradual recession in prices from week to week. Blende ore price averaged from $97.80 the first week in May to $75.10 the last week in May while calamine ranged from $71.90 down to $55.10. Each week has shown its drop and such reductions have been very depressing to the mine operators as it forecasted labor troubles which may or may not develop into a serious problem. This week sees a readjustment of the wage schedule on account of the lower average price for the month just closed and the cut in wages amounts to 50 cents on the day, one of the largest reductions since the present higher levels were inaugurated. Naturally the miners are not very good humored about accepting a reduction and especially has there been threats from the hoistermens' union of a possible strike. This strike has already made itself felt and has shown a tendency to reduce the output some. Just how far this will go remains to be seen.

The shipments of zinc ores fell from 8,750 tons of blende per week to 6,710 tons and calamine from 815 tons to 622 tons. Such a reduction in output has resulted in an accumulation of surplus stocks in spite of the tendency on the part of the producers to hold down their production and even counting the strike possibility. The surplus stocks at the beginning of the month were 9,200 tons of zinc ores and the month end saw them at 17,190 or nearly doubled during the month. The accumulation was at rate of practically 2,000 tons per week.

The month also showed a decline in lead ores but not to the same extent as that in zinc. There was a similar reduction in the sales and the month saw an increase in stocks. The average sales for the month was 1,102 tons per week. The average price dropped from $97 to $92 per ton for all grades. The stocks increased at the rate of 100 tons per week. The month opened with stocks at 850 tons and closed 1,250.

Notwithstanding the decrease in prices there was no change in the policy of those operators bringing into being new mines. Every effort is being put forth to get all new plants and mines into the active production stage. In the Miami camp especially is there going to be a great increase in production with each passing month. New mines and mills are reaching the stage of active production rapidly and in addition there is more active drilling than has ever before been attempted which means more new prospects and new mines. No prospecting era in the history of the zinc mining industry anywhere approaches that now in progress in the district. There is a demand for prospect drills far beyond the supply available. If it were possible to obtain them there is a demand for at least 200 more prospect churn drills. One can stand in the Miami camp on a high point of vantage and count the drill rigs by the score. There is but one comparison with the present condition and that is the number of drills sometimes working in parts of the Oklahoma oil fields.

One result of the lower ore prices and also from the threat of a general strike of the hoistermen is the better organization of the mine operators which took place the latter part of the month. Another result will be the strike which is already developing but the final reckoning is not yet in sight.

ALUMINUM AND SILVER PRICES.

New York

	—Aluminum—			—Silver—		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	18.86	19.01	54.33	57.56	48.89½	56.77½
Feb.	18.80½	19.20	57.50	57.50½	48.48	56.75½
Mar.	18.30	18.94½	60.52	58.07	50.24	57.92½
Apr.	18.08	18.83	60.00	58.52	50.25	64.37½
May	17.93	21.85	60.00	58.18	49.91½	74.27
June	17.82	29.66	.....	56.47	49.03	.....
July	17.59	32.50	.....	54.68	47.52	.....
Aug.	20.38	34.00	.....	54.34	47.18	.....
Sep.	19.28½	46.75	.....	53.29	48.68	.....
Oct.	18.25	54.17½	.....	50.65	49.38½	.....
Nov.	18.83	57.85	.....	49.10	51.71	.....
Dec.	19.02	56.80½	.....	49.38	54.97	.....
Av..	18.59½	34.13	.....	54.81	49.69	.....

The
Steel and Metal DIGEST

VOL. VI. NEW YORK, JULY, 1916. NO. 7.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer,
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Business Situation and Outlook.

How soon will the war end? and what are to be its economic effects the world over and particularly in the United States? are the two questions that all business men are thinking about and asking each other.

Recent developments have been of such importance that many who a month ago were of the opinion that the war would last another year or more, have been converted to the view that the struggle has reached its climax, and that the next six months will see its end.

Effects of War Must be Epoch Making.

As the war has been the greatest and most appalling in the history of the world, so also its after effects are to be most momentous. As has been said, this war has been in a class by itself and precedents therefore are not likely to signify much. The failure of so many predictions that were generally made at its beginning, makes for great caution in the expression of views, still we believe there are enough being disclosed during the war to provide a basis for the expectation of some of what is likely to take place when peace is restored. One thing is certain, that a sudden and radical change from business conditions and values created by the most extraordinary struggle which has been an economic as well as a physical one must take place, and as the war has been the most momentous in the history of the world, so also must be the after effects. It will mean the beginning, almost, of a new world in

economies, politics and human developments such as the world has never in the past been asked to contend with and solve.

What Has Been the Destruction of Property and Capital?

We do not take the view that the destruction of capital and property is to put the world back for generations, or that we are to face a long period of languid convalescence during which business and industry will be held up.

Real Wealth of the World Virtually Unaffected.

True, there has been an enormous loss in the accumulation of labor in the past, represented by property destroyed and capital dissipated,also in the loss of production, which has been engaged in the providing of equipment and munitions of war which have been destroyed in their use instead of remaining in some form for future benefit. But the wealth of the world is its land, forests, mines and other resources of nature, its plants, railways, machinery and equipment for making these resources, the scientific knowledge to use these physical things, and above all the human element of skill, enterprise and ambition and courage. This wealth remains untouched, in fact, as regards the human element we think we can show it has been increased in spite of the millions who have been killed or crippled. Also it has brought about a new productive force, the entranee in Europe of women into industry, which many think will more than offset the productive power of the men who have been killed or crippled for life. The remarkable adaptability women have shown is astonishing. Necessity has changed them in Europe from consumers into producers and they will remain an important feature in the industrial future.

Beneficial Effects Through Thrift, Economy, Improvements in Industry and Personal Conduct.

The war has not destroyed science, human skill or ingenuity, it has increased it. Also it has developed personal thrift and economy in the population of those involved in the disaster. It has created a control of personal conduct and especially so in the use of liquor. Lloyd George has said that the improvements in industry and the more effective control of the liquor traffic resulting from the war will compensate for all the economic loss. He might have added, we think, the tremendous benefit that will result from the personal equation, the kind of men and women that will take up the reconstruction of their countries. Their statesmen have had to abandon politics for economies, their business men have had their abilities stimulated as never before to contend with the situation, while the general population have found their souls in the trials, sorrows and hardships of the war. Patriotism, the most unselfish of human attributes has been increased as never before. It has been an inspiring spectacle, a mental and spiritual regeneration. We dwell on this feature as it seems to us most far-reaching and important.

Take the case of England. The writer, who lately had opportunity to study at first hand war conditions in that country was most impressed by what he saw in this particular. From all lines of life, from the highest to the most degraded, over five million men have put themselves into the discipline of the training camp and such training as the world has never seen, a training of body, mind and spirit.

The mixing in comradeship on an equality of all classes, the learning of control and respect, of obedience not to the individual, but to the uniform he wears as his superior officer. It may seem a degression, but in the regulation for the daily shave, the frequent ablutions of the training camp, the complete impossibility of dissipation or idleness of any kind, and the knowledge that they are giving a free will offering of patriotism, is creating a new type for that country and we believe it is true of the other nations at war. The change in the men is wonderful. Some of them may drop back again into their former position of dependant ignorance and "wasters," but the enormous majority will come back to civil life new and improved men.

The human equation in Europe is going to be increased in everything that makes for improvement in life,

Debt Created Not Necessarily Paralyzing.

prosperity and happiness. Great stress is laid on the debts to be paid and the heavy taxation that must follow the war. The payment of indebtedness does not extinguish the capital transferred, or become an economic loss. You cannot expend capital before it is created. The debts from the war are to a great extent due to those who compose the countries in question. Therefore, the capital raised by taxation will flow from the public into the treasury and from the treasury back to the people practically undiminished. We are not saying the war won't be felt for years to come, but we do say it wont be paralizing on the future of these countries to the extent that many imagine.

Peace Effects on U. S.

But what is to be the effect in America?

We have not had the cleansing and stimulating effects of war, the misfortunes of others have drowned us in a sea of prosperity. It remains to be seen if this prosperity has been a blessing, and the test will soon be on us.

There must be a serious and radical and perhaps very sudden shock to many industries, the output of which have, under the stimulus of war demand and sensationally high prices been extravagantly increased. Conditions have been created on output and prices that will necessitate a quick and radical adjustment. War demand will be cut off as with a knife and in this adjustment will come the first peace danger we must face. Will we bow to the inevitable, take the time that remains by the forelock and set our house in order, and by a gradual curtailment of output and lowering in prices be able to meet the change when it comes in an orderly way?

No Financial Panic in U. S. Possible.

There can be no financial panic in any event, but if this is not done we may face price panics, closed factories and general distress in the industries that have been flourishing by reason of the war.

We have made too much money in the past two years, and have not had time to enter into speculation and wildcat investments or schemes. Our profits are for the most part still in cash or in a fluid state. Our banks are bursting with deposits. Speculation in stocks and real estate is dormant to the astonishment of Wall Street, but the reason is plain. Those who have made fortunes are still too busy to have time for other things, and they realize their success has been caused by abnormal and ephemeral conditions. Sub-cellar for war profits is the order of the day, hence the demand for absolute safe securities paying low rate of interest and the high prices they command, and the billion dollars we have invested in foreign loans.

Liquidation of Labor.

Another danger is the adjustment of labor conditions and wages. The war will end in a day, the war wages won't without trouble and after a fight. Economy and efficiency has been greatly increased by the war abroad. We think exactly the opposite has been the case here and it applies not only to the workmen but in part to the employer. And while on this labor question, we must face a heavy increase even above normal anti-war years in emigration. There is every prospect of surplus labor in this country and that means lower wages, but not without great disturbed conditions in the interim.

Prosperity Sure for us for Some Time to Come.

Still America must remain prosperous for a long while, but we have reached the zenith of said prosperity and as we are careful to adjust ourselves to the new conditions to follow peace, so will we insure this prosperity. The future may be faced with confidence.

Changed Distribution of Iron And Steel Exports.

While it is generally recognized that the growth in our iron and steel exports has not been uniformly distributed among the different commodities, very little has been presented to show the divergences in distribution. We have just made a comparison which covers the principal items and shows clearly not only the change in distribution but also indicates the changes in values.

A comparison is of course properly made not with the exports in the dull times just preceding the war, but with the best times prior to the war, in 1912 and 1913. As the export statistics are available for the ten months ended April, 1916, it is convenient to make the comparison between the ten months ended April, 1913, and the ten months ended April, 1916.

Such a comparison shows that the weight of the iron and steel commodities that are returned by weight increased from 2,533,163 gross tons to 3,783,199 gross tons, or 49%, while the value of all iron and steel returned as such, including the tonnage items as well as hardware, cutlery, machinery, etc., increased by 86%. The increase in value was much the same in the tonnage as in the non-tonnage items, except for the influence of a new commodity coming into the non-tonnage category, that of unloaded shells. Loaded shells are not returned as iron and steel at all. The "all other manufactures of iron and steel", in which unloaded shells are included, increased from $16,765,902 to $106,268,753. There is no occasion here to figure the percentage increase; doubtless the increase is simply due to some $90,000,000 in unloaded shells being added, the ordinary miscellaneous items being presumably not materially changed.

The statement of changes in per cent., for the quantities when given, and for the values, is given below.

Changes in Iron and Steel Exports, Per Cent., Ten Months Ending April, 1913 and 1916 Respectively.

	Quantity.	Value.
Pig iron	— 14	+ 8
Scrap	+ 25	+ 46
Unfinished steel	+229	+470
Rods	+128	+163
Rails	+ 18	+ 29
Steel bars	+147	+226
Pipes and fittings	— 25	— 29
Steel plates	— 4	+ 18
Steel sheets	— 28	— 22
Tin plate	+182	+184
Galvanized sheets	— 40	— 25
Structural	— 24	— 25
Barb wire	+289	+394
Plain wire	— 72	+133
Wire nails	—111	+147
Enamelware	....	+ 32
Firearms	....	+302
Cutlery	....	+253
Hardware	....	+ 5
Tools	....	+ 16
Machinery	....	+ 29

Apart from the general large increases shown by certain items there are some interesting things to observe. One is that a few commodities, pig iron, pipes and fittings, structural iron and steel and galvanized sheets, actually decreased in quantity. These decreases are due in general to the fact that the materials are not used for war, and this carries the reasonable suggestion, borne out more or less by other data, that our exports to neutral countries are less than in the best times before the war, despite the fact that the exports of Germany and Belgium are shut off entirely while the exports from Great Britain are somewhat reduced.

The large decrease in galvanized sheet exports, 40% in tonnage and 25% in value, is to be attributed chiefly to the high cost produced by the high price of spelter, a result of the war. The average value per ton is seen to have increased, when the decrease in value is less than the decrease in quantity.

Another interesting point brought out by the table is that some commodities sold at slightly lower prices, or at only very moderate advance, in the ten months ended last April as compared with the same period three years earlier, a period in which domestic prices generally stood at a mod-

erate level, not especially low. Thus structural material averaged just a perceptible shade lower in average price, while plates, sheets and tin plates experienced practically negligible advances in values. Of course business accepted to-day would tell another story entirely. The material exported in the early months of the recent ten-month period had been sold when the entire market was on a relatively low basis. Tin plate, for instance, appears to have brought about $3.50 per 100 pounds in each period, but at present it is bringing nearly double that figure.

The commodities that show the large increases in tonnage are unfinished steel, wire rods, steel bars, the increase in which is due chiefly if not wholly to the exportation of shell rounds, tin plate, barb wire, plain wire and wire nails, the increases being due chiefly to the demand for material for war purposes, with the possible exceptions of tin plate and wire nails.

In all the commodities which showed large increases in quantity there were still larger increases in value, with the exception of tin plate. There is a method in this, for no doubt it was the extra heavy demand that caused the market to advance. In the case of unfinished steel there was a higher average quality, much of the steel exported being of shell quality, whereas three years ago only ordinary soft steel was being exported.

Firearms quadrupled in value, naturally enough. The large increase in cutlery exports might not have been expected by those not familiar with the cutlery trade, but is evidently chiefly in trade with neutral countries, supplies from elsewhere being so greatly reduced that even if the neutral countries have been buying much less in the aggregate they are forced to buy much more from us. The moderate increases in enamelware, hardware and tools may be explained in the same way.

The 29% increase in exports of machinery, for producing munitions of war, offset in part by decreased exports of various other classes of machinery.

Steel Freight Cars.

Railroad men appear to be reaching the conclusion that the average life of a steel freight car is to be about 16 years, which is quite different from the opinion entertained when they first came out, that they would be practically indestructible. Undoubtedly one influence in shortening the life of steel cars, as compared with the original expectations, is that steel cars are being much more roughly handled than were wooden cars, just because they are supposed to be able to stand it. They stand it in that they do not break at once, but their life is shortened.

Two interesting conclusions, of interest to the steel trade, are to be drawn from a dictum that steel freight cars are to last 16 years. One is that since there are over 2,400,000 freight cars in the country the annual requirements in new cars for replacement purposes are to be 150,000 cars a year. That will doubtless be found to be somewhat excessive, however, as when box cars have become steel they will probably last longer than the steel gondolas; to which experience thus far is necessarily confined. For years gondolas alone were made of all-steel construction.

Another conclusion is that there will be a new advent of old material in the market. Hitherto the great single producer of old material has been rails, as they come out of their service with say 85% of their original weight. Steel cars will not lose 15% in weight, or indeed any appreciable percentage. Whether they will come into the scrap market, however, is a question. If they did they would furnish at the rate of 150,000 cars a year weighing close to 20 net tons apiece, say 2,500,000 gross tons of iron and steel a year. If they are to wreck many steel freight cars the railroads will probably develop means of salvage whereby the material will be more useful, and bring more money, than as scrap. There will be opportunity for the railroads to do some good thinking along this line.

Business Trends.

THE STOCK MARKET.

The European war clouds having cleared away during May, June security markets were confronted with another war crisis in the Mexican situation. This became more acute during the past month than on any previous occasion, and caused unsettlement on the Stock Exchange where speculation was active and dull by turns.

While the market opened the month with transactions on a somewhat increased scale in comparison with a week previous the augmentation of trading did not result from any material development of outside interest, the bulk of the business from day to day originating in professional circles. Irregularity was a prominent characteristic of the market during the first two weeks, confused movements taking place; some issues advanced while others declined.

If commercial and industrial conditions alone were allowed full sway, progressive strength in stocks might logically have been expected yet international uncertainties with possibilities of daily surprise, and doubts as to the coming elections tended to check constructive tendencies. Therefore it is not strange that nervousness characterized stock trading when the President issued his order to mobilize the State troops. Offerings became quite heavy and the pressure increased sufficiently to force liquidation. Yet the break was short-lived, part of the losses being recovered when shorts began to take profits. However, varying reports and conjectures about Mexico caused further unsettlement, but after a sharp break in prices the undertone of the market became stronger, this being followed by a sharp advance, which featured the close of the month. This movement reflected the more favorable aspect of international affairs and demonstrated to what extent traders had committed themselves on the recent decline.

The all-important bullish feature of the situation is the fact that stocks are cheap, nearly all of the leading industrial and mining corporations are unprecedently rich in cash and quick assets and are earning stupendous profits. In spite of these conditions their shares are quoted lower than they were three or four years ago.

There is much of promise in the future. The political outlook is more reassuring and the business interests of the United States are preparing to grapple with whatever conditions may develop after the termination of the European war.

HEAVY INCREASE IN NEW INCORPORATIONS.

There are no indications of a falling off in the output of new enterprises from the exceptionally large totals covering previous months this year. Indeed, papers filed in June for new companies in the eastern States with a capital of $1,000,000 or over, represented $264,350,000. This total is about 26% larger than in the preceding month, and 46% greater than for June a year ago. The incorporations for six months aggregated $1,472,475,300. This is an increase of more than 200% as compared with the corresponding period in 1915. However, five companies contributed $83,250,000. Practically all industries are represented in the showing which suggests increased competition in the future.

The grand total of all companies, with an authorized capital of $100,000 or over, covering all States, including those of the East, for June, reached $327,871,000, against $230,859,000 a year ago, and for six months $1,880,487,600 against $749,375,000 a year ago.

Following are the comparative figures as specially compiled by The Journal of Commerce and Commercial Bulletin of companies incorporated in the eastern States during the last three years with an authorized capital of $1,000,000 or more:

	1916.	1915.	1914.
Jan.	$270,995,000	$51,150,000	$120,050,000
Feb.	365,995,300	53,950,000	51,575,000
Mar.	194,750,000	70,050,000	57,700,000
April	166,650,000	32,200,000	136,185,000
May	209,735,000	78,950,000	62,700,000
June	264,350,000	181,247,100	70,050,000
Total	$1,472,475,300	$467,547,100	$498,260,000
July	.....	71,100,000	68,700,000
Aug.	.....	67,100,000	50,600,000
Sept.	.....	286,625,000	54,800,000
Oct.	.....	208,695,000	35,487,500
Nov.	.....	190,075,000	81,650,000
Dec.	.....	135,125,000	105,450,000
Year	.....	$1,426,267,100	$894,947,500

Business Trends.

BANK EXCHANGES LAST MONTH HEAVIEST EVER SHOWN IN JUNE.

Little evidence of the quieting down in general business that is customary at this period of the year can be seen in June payments through the banks, as reflected in Clearing House transactions, exchanges being the largest ever reported for that month and, according to returns received by "Dun's Review" from 131 leading cities in the United States, amounting to no less than $20,515,438,480, an increase of 46.0% as compared with the same month last year and of 48.0% as contrasted with the corresponding month in 1914. Although there was no special activity on the Stock Exchange or in the other speculative markets, bank clearings at New York City continue to show gratifying improvement, the total at that centre being 56.4 and 60.0%, respectively, larger than in June last year or two years ago. Prosperous conditions in every part of the country are indicated by the favorable returns made by the cities outside of New York, the instances where decreases appear being exceptional and of little importance. Every section reports very satisfactory gains, and the total of all centres shows an increase of 30.6% over last year and 31.7% over 1914.

DESCENDING SCALE OF FAILURES.

June failures, as reported to Bradstreet's Journal, were the smallest in number reported in any month since August, 1914, the opening month of the European war, and liabilities were the smallest reported in any month for ten years past. Left-over liquidation, however, is reflected to a certain extent in the six months' returns as to number, which, while smaller than in the first and second six months of 1915 and the last half of 1914, exceed any previous first half-year on record. Liabilities for the first six months of 1916 are only about half those of the first six months of 1915, 1914 and 1908, and of the last half of 1914. Assets also show great shrinkages, and it may, in fact, be said of current failures and liabilities that they are well down to the normal of casaulties and failure damage.

There were 8,967 failures reported to Bradstreet's for the first half of 1916, a decrease of 16.3% from the like period of 1915, but 15.5% more than in the first half of 1914, and, owing to the large volume of year-end suspensions, were 7.8% larger than in the last half of 1915, which saw the turn for the better in business. Liabilities for six months of this year aggregate $94,584,095, a decrease of 47% from the first half of 1915, 1914 and 1908. The percentage of assets to liabilities in 1916 was only 48.6%, as against 60.5% a year ago and 54.7% in 1914. This percentage is, in fact, the smallest recorded in the first half of the year since 1910 and shows that the proportion of assets to liabilities is down to the normal of the best of years.

NEW HIGH RECORDS IN FOREIGN TRADE.

Foreign trade in May dwarfed that for any preceding month, both exports and imports surpassing the high record totals recorded by the former in March and by the latter in April, and in addition setting up a new monthly record of excess of exports over imports. Naturally, the cumulative totals for the elapsed portion of the fiscal year were additionally increased, with the result of a balance for that period in favor of exports almost equal to the total volume of import trade.

Our foreign trade in May and for the five months ended May 31st compare as follows:

May—	1915.	1916
Exports	$274,218,142	$471,829,456
Imports	142,284,851	229,134,097
Excess of exports	$131,933,291	$242,695,359

Five months ended May 31st:

	1915.	1916.
Exports	$1,433,261,089	$2,014,348,902
Exports	708,114,681	1,038,719,338
Ex. of exports...	$725,146,408	$975,629,564

Zinc and Spelter.

By Mr. W. A. Cook — Matthiessen & Hegeler Zinc Company

The question of spelter for the past two years has been very prominent and up to that time was not a factor in export but since the European troubles it has been one of the prominent factors, both as a raw material and in sheet and also as a component part of brass. The question of purity and impurities have been brought more prominently before the jobbing and manufacturing trade since the European troubles than ever before. The early specifications that this country received from England, France and Russia, made the brass manufacturers to be more particular as to the quality of their spelter.

While a number of authorities state that commercial zinc is known as spelter this is not altogether the real truth. The distinction that is most commonly made in the metal trade is to call the metal "spelter" when it is cast and "zinc" when rolled, stamped, drawn or spun. The word spelter is of doubtful origin, but it is likely that it comes from an Eastern word "Spiauter", which means to smoke or fume when hot. As spelter when heated above its melting point with excess of air gives off a heavy white smoke or cloud of zinc oxide the contraction of the word spelter from spiauter is most probable.

While zinc has evidently been known for a great many years it is doubtful if it was known as a separate metal to the Ancients. Bracelets of what were said to be zinc were found in the ruins of the ancient city of Cameros, which was destroyed in 500 B. C. The metal as zinkos was mentioned as early as 1500. So through the works of the pioneer metallurgists we can trace the attempts to isolate and develop the metal as one of the valuable elements until up to 1721 when Hinckel published his discovery that zinc could be obtained from Calamine, and he is named by Beckman as the first to intentionally carry on the process.

A patent for a process of distillation downward was granted to John Champion in 1739 and in 1740 he erected a works at Bristol, England and began the manufacture of spelter, but the production was small and the most of that used continued to come from India and China.

The principal upon which the modern process of zinc smelting is based was discovered in Silesia in 1799 or about that time. A similar discovery was made accidentally and independently in Belgium in 1805 by Abbe Dong, who does not appear to have been acquainted with the contemporary work of others in the same direction. The two processes of zinc smelting the Silesian and the Belgian, in use at the present time, have been developed from these beginnings.

Zinc Ores.

While zinc has been reported to have been found from time to time in native or metallic form there is considerable doubt that this is the case and it is certain that no large deposits have ever been found. The metal has to be smelted out from its ores, which are found widely distributed throughout the world, workable deposits occuring in nearly every country in Europe, and the north of Africa and in various parts of the United States. The term Calamine used so indiscriminately in respect to zinc ores now is understood to include the four mineral varieties, viz; carbonates and silicates, hydrous and anhydrous. The word originally was used by the Greeks to designate the peculiar kind of ore employed with copper in their brass making operations and also the accretions which formed in brass founders furnaces.

Zinc in The United States.

Zinc was first made in the United States about 1838 at the Government Arsenal at Washington, D. C., from the red zinc ore of New Jersey for the brass designs of the standard weights and measures ordered by Congress. The process was so expensive, however, as to preclude any idea of producing zinc commercially in the same manner. The regular manufacture of zinc was first undertaken in 1850 at Newark, N. J. by Richard Jones, the ore being charged into Belgian retorts just as it came from the mine. These experiments proved a failure due to the excessive breakage of the retorts, so attention was then turned towards the manufacture of the oxide and in 1851 Samuel Wetherill invented what is now known as the Wetherill process. The ore is mixed with anthracite coal and is thrown in a

layer three to four inches in thickness upon a hearth composed of perforated cast iron plates one inch thick. The door was closed and cold air blown into the grate, which passing through the charge, raised the temperature to such a point that the ore in contact with the carbon was reduced to metallic zinc, vaporized and oxidized, passing off as a white smoke to the collecting apparatus, where the products of combustion strained through the muslin, leaving the oxide inside the bags. This process proved so successful that it was immediately introduced and has remained in use without essential change up to present time.

Attempts to produce spelter were not given up, however, and in 1856 experiments with a Silesian furnace were made at Bethlehem, Pa., by the Lehigh Zinc Company. They proved to be unsuccessful, neither the anthracite fuel nor the retort clay being apparently adapted to the purpose. In 1857 Messrs. Matthiessen and Hegeler, who had just come to the United States from the School of Mines at Freiberg, Saxony, obtained permission from the Company to experiment on their own account at the abandoned plant. They did it on a small scale, using one muffler placed in a kiln altered for the purpose. They then and there demonstrated that anthracite as well a New Jersey clay, could be used and made some spelter in this experimental way, but failed to come to an agreement with the owners of the property for building a works largely on account of the finincial crisis prevailing at that time.

They then turned their attention to the West, where they studied the zinc deposit of Wisconsin, and late in 1858 began the erection of the present works at La Salle, Ill. La Salle was selected as the point where the Illinios coal fields approached nearest to the Wisconsin zinc mines. It is easier to bring the zinc ore to the coal mines than to take the coal to the zinc field, as it requires from three to four tons of coal to produce one ton of spelter.

In the meanwhile experiments were carried on in New Jersey and Pennsylvania by Samuel Wetherill, Joseph Wharton and others, who invented furnaces of various types, but the several undertakings failed and after all the Lehigh Zinc Company turned to the Belgian furnace and in 1860 erected works at South Bethlehem, Pa. These works have recently been dismantled and parts of them removed to the enormous plant of the New Jersey Zinc Company at Palmerton, Pa. After 1860 works were built in rapid succession at Newark, Jersey City and Bergen Point, N. J. and at Freidensville, Pa.

In Missouri zinc was not made until 1867 when a small works was erected at Potosi in Washington county. The Carondelet works were built in 1869. These works were supplied with Calamine ore mined in Southeastern Missouri. The mines of the Joplin district, now the great zinc center of the United States, became productive in 1873, their ore being shipped to Illinois. A little later zinc works were built at Weir and Pittsburg, Kansas, Robert Lanyon, who had been engaged previously in zinc smelting at La Salle, being one of the pioneers in Kansas.

About 1895 the discovery of natural gas at Iola, Kansas and the location of zinc smelters at that point began a change in the American zinc industry, which has become a radical one.

Physical Properties of Zinc.

Zinc is a white metal with a bluish grey tint. The fresh fracture of a cake of commercial zinc or spelter presents large and very bright cleavage planes, especially when the metal is free from iron. The fracture is more largely crystalline the higher the temperature of casting is above the melting point of the metal. This fact has long been taken advantage of by certain producers in promoting the sales of this metal. As a matter of fact spelter with a very appreciable amount of lead in it can be made to resemble in fracture spelter of virgin purity merely by regulation of pouring temperatures and rate of cooling in the mold. Spelter at ordinary temperatures is brittle but between 100 degrees Cent. or 212 F. and 150 degrees Cent. or 302 degrees F., it is sufficiently malleable to admit of being rolled into thin sheets, spun or drawn into wire; after cooling it then retains these properties.

The specific gravity of spelter varies according to the temperature at which it has been cast and the manner in which it has been cooled from 6.9 to 7.2. The gravity can be increased to 7.25 by rolling.

Spelter melts at 415 degrees Cent. or 779 degrees F. and is readily distilled at a bright red heat, it will burn in the air at as low as 932 degrees F. or 500 degrees Cent. The electrical conductivity is low as compared with silver at 100% being placed by several

observers at from 25.6 to 29.9. The atomic weight of spelter is 65.27.

Chemical Properties.

Zinc is not affected by dry air at ordinary temperature. In moist air a compact coating of basic zinc carbonate is formed which impedes the oxidization of the underlying metal. When molten, zinc is readily oxidized and burns when heated to the boiling point of the metal producing zinc oxide which gives rise to the familiar spelter smoke of the modern brass foundry. Zinc is soluble in most acids and also but less rapidly so in alkaline solutions, especially if it is placed in contact with iron or platinum.

Zinc possesses the property of precipitating all malleable heavy metals except iron and nickel from their solutions and on account of this property it is used in the form of dust in mining operations in precipitating gold from cyanide solutions as in the cyanide process.

Commercial Spelter.

Spelter, with one or two exceptions, always contains lead and iron these being the chief impurities. Cadmium is frequently present in small amounts. In still smaller quantities, usually little more than traces arsenic, antimony, sulphur and copper are also found. Tin may also occur in remelted spelter.

In some special brands of high grade American spelter the lead does not exceed .02% and iron .01 to .02%. In ordinary brands from 0.4 to 1.0% of lead and .03 to .05% of iron are usually found.

Various Grades of "Spelter".

As regards the grades of spelter in use at the present time, the classification as adopted by the American Society for Testing Materials in 1911 are as follows:

Standard Specifications for Cast Zinc.

1. Under these specifications Virgin Spelter, that is, spelter made from ore or similar raw material by a process of reduction and distillation and not produced from re-worked metal, is considered in four grades, as follows:

A ..... High Grade.
B ..... Intermediate.
C ..... Brass Special.
D ..... Prime Western.

2. A brand shall be cast in each slab by which the maker and grade can be identified.

3. The maker shall use care to have each carload of as uniform quality as possible.

4. A.—High Grade.—The spelter shall not contain over 0.07% lead, 0.03% iron, 0.05% cadmium.

It shall be free from aluminum.

The sum of the lead, iron and cadmium shall not exceed 0.10%.

B.—Intermediate.—The spelter shall not contain over 0.20% lead, 0.03% iron, 0.50% cadmium.

It shall be free from aluminum.

The sum of the lead, iron and cadmium shall not exceed 0.50%.

C.—Brass Special.—The spelter shall not contain over 0.75% lead, 0.04% iron, 0.75% cadmium.

It shall be free from aluminum.

The sum of the lead, iron and cadmium shall not exceed 1.20%.

D.—Prime Western.—The spelter shall not contain over 1.50% lead, 0.08% iron.

This classification corresponds substantially to the understanding among zinc smelters. Of the four grades mentioned above, A is usually used for brass of high ductilty and malleability such as wire and and cartridge cases, although C is used by some mills.

The effects of impurities on the metal are as follows:

Lead.—In spelter intended for rolling, a small percentage of lead is desirable, and up to 1.0% it has no injurious effects on the malleability or ductility of the metal. When the spelter, however, has to be used for making brass which as to undergo severe mechanical treatment, as, for example, the manufacture of cartridge cases, it should contain as little as possible, not exceeding 0.1%.

Iron.—The effects of iron are to increase the hardness and brittleness of zinc and reduce its malleability, but when the refining by liquidation has been properly conducted it effects these properties. When iron is present in excessive amounts the bright cleavage planes of the fresh fracture of a cake will show grey specks scattered over them.

For spelter intended for the manufacture of brass 0.05% of iron is often specified as the limit, but it is best lower for brass of high ductility and malleability. Zinc may be completely freed from iron by redistillation, the use of tools and appliances being avoided.

Cadmium.—I would like to say a word in

connection with cadmium as it is a material closely allied to zinc, with the ores of which it frequently occurs. It is tin white in color, malleable and ductile and brilliant in luster when fresh, but becomes dull on exposure to the air. Its malleability and ductility are such that it can be beaten out into thin foil and drawn into wire.

Cadmium is rarely present in injurious proportions. It is especially liable to occur, however, as Professor Ingalls claims in redistilled zinc. In two plates of a sample half ton of so-called pure redistilled spelter 3.08% of cadmium was found, but this is very exceptional. Muntz metal made with this spelter broke with a crystalline fracture closely resembling that produced antimony. However, no sensible effect on the properties of zinc is produced, even when 1% is present, and nearly always the percentage does not reach that amount. It is said to discolor "zinc white" made from zinciferous materials containing it.

Arsenic, Antimony, Copper, Sulphur and Carbon.—These elements are scarcely ever present in sufficient quantities in spelter to affect its properties either for rolling or the manufacture of alloys. Arsenic, however, should be absent in zinc intended for the precipitation of gold in the cyanide process.

Tin.—Tin tends to make zinc very hard and brittle in rolling, and although it is not of common occurrence, except in remelted spelter as Prof. Ingalls states, yet it should always be looked for.

I would like to call your attention to a paper that was prepared and handed to me by one of the best known metallurgists in the United States, in connection with the question of cadmium in brass mixtures. He has made extensive tests on this subject and it is fair to assume that his conclusions are right.

Effect of Cadmium in Zinc or Brass.

While this question has not been made the subject of very exhaustive researches by manufacturers of copper alloys and very little appears in scientific publications relating to it, at the same time it has been the cause of considerable discussion among metal users. The results of what might, at the present time be called incomplete investigations indicate that cadmium when present in spelter in amounts as high as 1% and over would be detrimental to the manufacture of high class brasses such as are used for cartridge metal or deep drawn stock.

In quantities less than one-half of 1%, however, personal experience has proved that cadmium need not be considered as having injurious effects on brass mixture. As a matter of fact the difference in volatilization points of cadium and zinc plays a most important part in the reaction which take place when the metals are heated. Zinc melts at 415 degrees Cent., or 779 degrees F., and boils at 940 degrees Cent. or 1,724 degrees F., so its volatilization point may be taken at somewhere near its boiling point. Cadmium melts at 320 degrees Cent., or 608 degrees F, and boils at 778.6 degrees Cent., or 1,433 degrees F. Therefore, it will be seen that there is sufficient difference between the two so-called volatilization points so as to enable a separation to be made of the two metals by heat and as a matter of fact this is what is done in the production of cadmium, per se.

This difference also in temperature, of course leads to the logical conclusion that cadmium will oxidize at a lower temperature than zinc and this is a fact. So it might be said, with entire accuracy, that in using a spelter containing an amount of cadmium up to one-half of 1% that this cadmium will act as an deoxidizer on the copper and form CDO or cadmium-oxide and come to the top of the pot of metal before the zinc performs the same office and it is the writer's personal experience that upon the analysis of such metal made with zinc carrying cadmium, that no cadmium was found in the brass so made.

Of course, cadmium that might remain in the brass and exist as a cadmium-copper alloy or cadmium-zinc-copper alloy would cause the resulting brass to be brittle and would not admit of the malleable properties that are required in commercial brass.

Now in the case of brass, we first melt copper at a temperature of approximately 1,100 degrees Cent., or 2,012 degrees F., and into this then we introduce the zinc which melts at 415 degrees Cent. or 779 degrees F. and consequently there is every chance for the cadmium to volatilize and oxidize and therefore our cadmium, as said before, is removed in this way.

As a summary then of what is said above it is the writer's experience that cadmium in zinc amounts anywhere up to one-half of 1% is not at all prejudicial for the use of such

zinc in the manufacture of brass.

Cadmium is used in electro-plating in connection with silver, properly proportioned, making a whiter, harder and more durable finish than pure silver.

To show its impervious nature two steel tubes were prepared, one for nickled, and one cadmium plated and they were exposed to conditions of rapid rusting. In a due time the samples were taken out and the steel nickel plated tubes were completely covered with rust and the tubes prepared and plated with cadmium were perfectly good and showed the impervious nature of the cadmium.

Cadmium, with a small percentage of silver, has been employed for a number of years in England for coating steel parts, with success.

Industrial Uses of Spelter.

By far the greater proportion of spelter is used in the process of galvanizing iron and steel. in normal peaceful times, over 60% of the total metal produced and imported into the United States being consumed for this purpose. A considerable but lower percentage is employed, about 18% in the manufacture of brass, and somewhat less in the manufacture of sheets. The war conditions makes radical changes in these estimates.

As a constituent of alloys it is of the greatest importance and value, even to those in which it is not the principal metal, as, for example, the various kinds of brass (Cu-Zn alloys). It is also frequently added in small quantities to the copper-tin alloys, the bronzes, especially statuary bronze, in order to ensure sound castings, and is a common component of the copper-nickel alloys, German silver, in which it is used to replace more or less of the more expensive metal nickel.

Zinc alloys readily, with tin and a useful metal for foundry patterns consists of zinc 75 and tin 25%. It also alloys with aluminum, silver, antimony, bismuth and nickel and forms amalgams with mercury. Of these, the Al-Zn alloys alone are of importance. They are largely used for light castings in the automobile industry.

The production of sheet zinc in the United States is consumed chiefly in the manufacture of miscellaneous articles such as the trade is familiar. Special sheets are made for paper and card makers who use them for glazing purposes. There is a large trade in the zinc plates for etchers and lithographers and in zincography. Galvanic batteries consume quite an amount of zinc rods. Boiler plates take a large amount of zinc.

Owing to the abnormal advance in the price of this material, many articles formerly made from zinc, have become a discard, but when zinc assumes its normal position and price again, it is fully expected that they will all come back.

It was necessary for the mills to introduce this valuable material into new channels of consumption, and they turned to strip or ribbon zinc in rolls, to be used on its own merits, and largely taking the place of sheet brass in the manufacture of various articles from dies, machines and automatics. This production is made in widths to suit the manufacturer, exact and various tempers and is well worth the while of the jobbers consideration of looking into this subject carefully.

It is interesting to note the tremendous increase in shipments abroad of spelter and zinc manufacture for the last portion of 1915 The figures from the Department of Commerce and Labor show for December, 1915, spelter from domestic ores, 8,070,980 pounds; spelter from foreign ores, 620,835 pounds and manufactured zinc products of 11,336,531 pounds. The figures for twelve months ending December, 1915, show spelter cast in pigs, plates and slabs:

1913.	1914.	1915.
15,565,324	129,694,022	1,128,735,815

Figures cover period since July 1.

While zinc manufactured for six months of 1915 from January to June, is placed at 81,553,116 pounds. These figures are obviously wrong as they actually represent more manufactured zinc than was made in 1915 by two of the largest mills combined. I have introduced them here to afford an opportunity to explain how they are in error. Owing to the shipping requirements, intending shippers must make out bills of lading covering all the metal, they intend to ship for each shipment, if for any reason either the whole or part of a shipment was not made at the appointed time, new papers must be made out and in the past there has been no allowance made in the customs reports for shipments that failed to go or for part shipments. In this way it is reasonable to suppose that there are many repetitions of shipments in the figures

I have just read but I am assured by the department, however, that steps have been taken to eliminate this duplication and more accurate figures will shortly be issued.

The best figures I can obtain relating to the total output in the United States, are these:

	Tons.
1914	250,000
1915	600,000
1916 (estimated)	800,000

The present situation of the spelter market, I do not refer to the immediate situation, can not help remaining high until the European War ends.

The future for spelter in this country is impossible to state but it is fair to assume, that owing to the education of the buying trade since the war, the demands will be based upon quality of recognized producers. When prices resume old standards, and the resumption of the imported spelter again is established, we all can draw our own conclusions.

At the Fifth Annual Meeting of the Metal Branch of the National Hardware Association.

Increased Activity In Manganese Mines.

There has been a greatly increased activity among the manganese mines of the United States during the first six months of 1916. This activity is shown by the operation of new mines, the reopening of old mines, and more regular production from the mines already active. There is a prospect that the production for the entire year, according to D. F. Hewett of the U. S. Geological Survey, will greatly exceed that for 1915, which was 9,651 tons, the largest since 1901. Several discoveries are reported from Arizona, California, Oregon, Utah and Virginia, and there are new operators in Arkansas, California, New Mexico, Utah and Virginia.

During the first quarter of 1916 the prices of all grades of manganese ore rose rapidly to the highest figures recorded in 30 years. Prices of 60 to 65 cents a unit for ore containing 45 to 50% of manganese and more than 1% of iron were freely offered about April 1, and it is reported that 70 cents a unit, or $35 a ton was paid for several lots. During the second quarter prices remained constant at these figures. Large quantities of Brazilian ore continue to be received, and there is a prospect that the imports will exceed those for 1915, which were the largest on record with the exception of one previous year.

Several new producers have entered the ferromanganese field, and although imports from England appear to be greater than last year, it appears that the domestic production for 1916 will be the largest in the history of the country. Prices for ferromanganese for immediate delivery in March reached the highest figure ever recorded—$425 a ton for small lots—and large quantities were sold for $350 to $400 a ton. For delivery within six months the price has remained constant at $175 a ton. During the second quarter prices receded to $350 a ton for immediate delivery.

As long as the present demand for steel continues there is little prospect for greatly reduced prices of either manganese ore or ferromanganese, and even if peace is declared during the winter prices can scarcely decline to normal for at least six months or a year.

Producers of manganese ore particularly should realize that never before for so long a period has there been a better opportunity for the profitable mining of manganese ore. They should realize also that this condition can not continue indefinitely.

Russian Railway Building.

There is a suggestion as to steel demand after the war in the plans for railroad building being carried out by Russia. Consideration of the orders placed and about to be placed in the United States and Canada by Russia, for rails, spikes, cars and locomotives leads to the conclusion that a large part of the work is to be completed after the war ends. It is hardly to be assumed that Russia has a positive opinion that the war will last much longer than is assumed elsewhere.

Late last year it was stated upon what appeared to be good authority that Russia's rail orders placed in the United States during the year totaled 335,000 tons. Our rail exports to Russia have been as follows, in gross tons:

	Russia in Europe	Russia in Asia
Second half 1915	82,509	117,386
January, 1916	4,653	19,136
February	9,963	4,597
March	9,076	6,315
April	8,280	857
Ten months	114,481	148,291
Total in both Russias	262,772	

This would indicate that somewhat less than 75,000 tons was unshipped May 1st last. Russia has lately been inquiring for 350,000 tons of rails and it is understood the Steel Corporation has received orders for about half this tonnage. This would make 685,000 tons altogether, the tonnage shipped up to May 1st being 38% of this total. Obviously the rails cannot all be expected to be used in the prosecution of the war.

These rails represent a great development. We understand they are of such a section that they would run about 100 tons to the mile of track, so that the orders represent about 7,000 miles of track, which is a great deal even for the great Russian empire. The air line distance from Petrograd to Vladivostock is less than 5,000 miles, and part of the Trans-Siberian road is already double track. The extreme dimensions of Russia, from the southwestern extremity of Poland to the northeastern extremity of Russia in Europe, is less than 2,000 miles, and the extreme distance from the northernmost Arctic coast to the southern corner of Trans-Caucasia is only a trifle more than 2,000 miles. Thus 7,000 miles of track, even for Russia, represents a great development.

There is some information available as to Russian buying of locomotives, but this is less conclusive than that, as to rails, since locomotives could be required merely to increase the carrying capacity of track already available. A year ago Russian orders for 400 locomotives, under negotiation for some time, were accepted. Locomotive exports to Russia, all made to Russia in Asia, have been as follows, in number:

Second half 1915	211
January, 1916	58
February	...
March	...
April	...
Ten months	269

Apparently there are left 131 locomotives to be shipped after May 1st. We do not know but that more locomotives were ordered. Of late Russia has been inquiring for 1,000, possibly 2,000 locomotives, and there is room for a guess that the orders for 400 locomotives placed a year ago were for lines already in operation while the locomotives now inquired for are against the track that is still to be built. Here in the United States we have one locomotive for every 5½ miles of track, and in the same proportion Russia would require 1,300 locomotives for 7,000 miles of track, so that the rail and locomotive figures do not hang together badly at all.

It is understood that Russia has been financing her purchases with some difficulty, and that makes the argument all the stronger, for if with a great war on her hands Russia can finance undertakings indicating the laying of 7,000 miles of railroad track, her allies may be able to do as much or more, and the neutral countries should come in for great developments also. What Russia is doing is suggestive at least as to what may be expected for several years following the war.

Character of British Steel Production During War Time.

British outputs of pig iron and steel have been as follows, in gross tons, beginning with the year of record pig iron output, 1910:

	Pig Iron.	Steel Ingots.
1910	10,217,022	6,374,481
1911	9,718,638	461,612
1912	8,889,124	6,795,144
1913	10,481,917	7,663,876
1914	9,005,898	7,835,113
1915	8,793,659	8,350,944

The figures for steel production do not include crucible and miscellaneous steel, only Bessemer and open-hearth, nor do they include castings. Crucible steel statistics are not gathered.

Since the dissolution of the British Iron Trade Association the statistics have been gathered by the Statistical Bureau of the Iron, Steel and Allied Trade Federation. For 1915 statistics of semi-finished and finished steel production have been gathered, the 1915 output being reported at 6,325,844 tons, including such products as are included in the American statistics, rails, plates, shapes, etc., but welded and seamless pipe and tubes are included, whereas in the American statistics skelp is reported as the regular rolled product. The figures for 1915 are as follows:

	Tons.
Bessemer rails	233,385
Open-hearth rails	139,789
Groved head tram rails	11,986
Light rails	61,242
Sleepers and fish plates	68,177
Plates ⅛-inch and up	1,160,327
Sheets, etc., under ⅛-in.	1,367,577
Angles, tees, channels and sections	762,717
Girders, joists and beams	343,617
Other general merchant steel	534,503
Hoops and strips	176,036
Wire rods	169,562
Tires and axles	62,603
Pipes and tubes (except seamless)	104,453
Seamless tubes	63,716
Forgings (in the rough)	118,102
Castings (in the rough)	177,071
All other	770,981
Total	6,325,844

Black sheets for galvanizing and black plates for tinning are included in the above table. The production of the coated product, galvanized sheets and tin and terne plates and sheets, is given as follows:

Galvanized sheets	353,593
Tin plates	603,386

British tin plate exports in 1915 were 368,602 tons, leaving 234,784 tons for domestic consumption. We understand the domestic consumption has been unusually large, on account of the war. The exports were unusually light.

An interesting point about the statistics of finished steel production is that one will look in vain for any large production of shell steel for British ammunition factories. There were exports of steel bars reported for 1915 amounting to 489,464 gross tons, of which 349,297 tons went to France, doubtless altogether for the French shell factories. If rolled rounds for shells are included in the "other general merchant steel" there is left only 45,039 tons for all home consumption of merchant steel bars, including that of the shell factories, while if included in the "all other" of 770,981 tons it would leave very little anyhow. The "forgings (in the rough)" amounted to only 118,102 tons, so there would not be much shell steel there. Also it is to be noted that the total production of ingots, billets, slabs and sheet bars, for sale either to domestic consumers or for export, amounted to 943,545 tons, and there were exports of 67,357 tons. There must certainly have been fairly large sales of sheet bars to sheet and tin mills, which do not produce all their steel by any means, and thus there can have been left no large tonnage of forging billets for shells. Altogether Great Britain appears to have produced no more than a very few hundred thousand tons of shell steel for home manufacture of shells, probably only a small fraction as much as we produced for export to that country and France.

The British were not idle by any means, however, since one observes there was produced 1,160,327 tons of plates, ⅛-inch and heavier, 762,717 tons of angles, tees, chan-

nels and sections and 4,343,617 tons of girders, joists and beams, making a total of 2,266,661 tons of these material. No one will suppose that any large portion of this tonnage was for steel structures on land, and the conclusion is that in 1915 Great Britain made many times as much steel for ships as for shells. The mistress of the seas pursues the war in her own particular way.

Record By-Product Coke Production.

Coke production in the United States (not counting gas house coke) has been as follows, in tons of 2,000 pounds:

	Beehive.	By-product.	Total.
1896	11,705,735	83,038	11,788,773
1897	13,027,072	261,912	13,288,984
1898	15,752,764	294,445	16,047,209
1899	18,762,035	906,534	19,668,569
1900	19,457,621	1,075,727	20,533,348
1901	20,615,983	1,179,900	21,795,883
1902	24,998,142	1,403,588	25,401,730
1903	23,391,887	1,882,394	25,274,281
1904	21,052,877	2,608,229	23,661,106
1905	28,768,781	3,462,348	32,231,129
1906	31,843,090	4,558,127	36,401,217
1907	35,171,665*	5,607,899	40,779,564
1908	21,832,292	4,201,226	26,033,518
1909	33,060,421	6,254,644	39,315,065
1910	34,570,076	7,138,734	41,708,810
1911	27,703,644	7,847,845	35,551,489
1912	32,868,435	11,115,164	43,983,599
1913	33,584,830	12,714,700	*46,299,530
1914	23,335,971	11,219,943	34,555,914
1915	27,508,255	14,072,895*	*41,581,150

*Record.

Thus the output of by-product coke made a new record in 1915, and reached the important proportion of 34% of the total coke output. That, however, is still a very small proportion when the great advantages of the by-product process are so well recognized. The answer of the iron and steel industry is that it is building by-product ovens with great energy. The ovens are not being completed rapidly, but a great many are under construction, more than 2,000, enough in themselves to make about one-fifth as much coke as has ever been made in a year.

The growth of the by-product coking industry is largely at the expense of the beehive coke industry. The consumptive requirements in coke have not been increasing with anything like the rapidity shown by the increase in by-product coke production, recent and prospective. Thus one finds that the maximum number of beehive ovens in existence was in 1910 at the close of which year there were 100,362 beehive ovens in operative condition, according to the reports of the Geological Survey. By the end of 1914 the number had decreased to 93,946 ovens. The decrease in the number of ovens in operative condition was due chiefly, of course, to the exhaustion of coal reserves upon which they were built but there has been scarcely any new construction of beehive ovens to replace those necessarily abandoned on account of the exhaustion of coal.

A great many beehive ovens that have not been formally abandoned are nevertheless inactive. While at the close of 1914 there were 93,946 beehive ovens, only 49,540 ovens were in operation at any time during 1915, representing only 53% of the total number of ovens in existence. The average number operated was, of course, materially less than 53%.

If, or when the coke market reaches so low a level that the beehive operator can do no more than obtain a new dollar for an old one, in other words when he is offered no return on his coke oven investment and no return on his coal other than what it would bring if sold as coal, there is still a product in by-product coke manufacture, on account of the economies of the process and the value of the by-products.

Analyses of Clays Suitable for Spelter Retort Manufacture.

(By our Special Correspondent in London.)

A very interesting paper has recently been read before The Royal Society of Arts on zinc, its production and industrial applications by Mr. J. C. Moulden. The paper was a prize essay, the second best being one by Mr. E. A. Smith of the Sheffield Assay Office, while another attempt came from an Indian Fellow of the Society, Mr. Ranji Das Vaishya of Gwalior, (who dealt with the treatment of zinc in the East Indies). The paper is much too long to quote in extenso but the course of it some very interesting information is collated. For instance, the following table showing analyses of clays suitable for spelter retort manufacture is given, this appearing below:

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
Silica	51.15	45.50	55.73	45.01	49.50	45.10	53.00	49.18
Alumina	31.97	37.29	42.69	36.02	34.46	36.16	41.76	31.70
Lime	.73	.27	.28	.10	.80	.29	.33	.98
Magnesia	.22	.24	.23	.24	.62	.16	.15	.58
Ferric Oxide	2.37	1.51	.37	2.03	2.39	1.75	2.84	.98
Alkalies								
K o N o	1.00	.66	.50	.31	..	..	.86	2.82
Titanium Oxide ...	..	..	..	..	..	1.33	..	2.77
Loss on Ignition..	12.61	14.56	..	16.64	12.86	15.21	1.07	10.87
	100.05	100.33	99.80	100.35	100.63	100.00	100.01	99.88
Refractoriness, Seger								
Cone No. and	35					33	33	34
Degree C.	1770C					1730C	1730C	1750C

I. Saarau blue clay (raw)
II. Typical Briesener clay (raw)
III. Neurode shale (burned) for chamotte. Ingalls' "Metallurgy of Zinc".
IV. Typical Stourbridge clay, suitable for retorts. Pricate analysis.
V. St. Louis, Mo., U. S. A. average composition. Ingalls "Metallurgy of Zinc".
VI. Raw clay of lean type (Mark Bjuf F.) Hoganas, Sweden, Analysis by Hoganas-Billesholms Aktiebolag. Fusing-point Seger Cone 33-1730dg.C.
VII. Swedish burnt shale for chamotte.
Analyses I, II, III, by S. J. Tweedy, Central Zinc Co., 1912.
VIII. Is an English clay of fluciatile origin, very plastic and dense when burned. The alkalies and titanic oxide are unusually high for so refractory a clay.

A typical composition of a good English spelter is given below, the material having been produced from Broken Hill ore by the Central Zinc Company at Seaton Carew in England.

	Per cent.
Zinc (by difference)	98.642
Lead	1.205
Iron	.060
Cadmium	.089
Copper	.004
.....	100.000

(Continued on next page.)

In dealing with zinc alloys a selection of representative materials is given, this being as follows:

	Alloy.	Zn.	Cu.	Sn.	Pb.	Fe.	Sd.	Ni.	Mn.	Al.	Remarks.
1	Tombac	2.8	97.8	....	....	....	....	....	....	....	Viennese, used for buttons.
2	Pinchbeck	6.4	93.6	....	....	....	....	....	....	....	.....
3	Tombac	8.0	92.0	....	....	....	....	....	....	....	Parisian red Tombac.
4	"	10.0	90.0	....	....	....	....	....	....	....	French Oreide
5	"	15.0	85.0	....	....	....	....	....	....	....	Imitation gold jewelry.
6	"	20.0	80.0	....	....	....	....	....	....	....	Dutch metal for imitation gold leaf.
7	Brass	25.0	75.0	....	....	....	....	....	....	....	Rolled sheet brass.
8	"	30.0	70.0	....	....	....	....	....	....	....	Cartridge brass
9	"	33.3	66.6	....	....	....	....	....	....	....	Common brass
10	"	34.6	65.4	....	....	....	....	....	....	....	For good brass wire
11	"	40.0	60.0	....	....	....	....	....	....	....	Muntz metal
12	"	32.5	65.0	....	2.5	....	....	....	....	....	Clock brass
13	"	38.0	60.0	....	....	2.0	....	....	....	....	Sterro metal
14	"	35.66	60.0	1.74	1.41	0.76	....	....	....	....	Delta metal
15	"	41.6	54.9	1.36	....	1.16	....	....	0.47	0.4	Good manganese bronze
16	"	38.0	60.0	....	....	....	....	....	....	2.0	Aluminum brass.
17	"	44.0	54.0	....	2.0	....	....	....	....	....	Very common brass, turns well, but quite unfit for rolling, etc.
18	Naval brass	37.0	62.0	1.0	....	....	....	....	....	....	Admiralty specification.
19	White brass	30.00	5.0	6.50	....	....	....	....	....	....	.....
20	German Silver	20.0	46.0	....	....	....	....	....	34.0	....	Finest German silver.
21	"	20.0	50.0	....	....	....	....	30.0	....	....	Fine white German silver
22	"	36.0	57.0	....	....	....	....	7.0	....	....	Low gr. "
23	"	28.0	56.0	....	....	....	....	16.0	....	....	Good Ger. "
24	"	25.0	50.0	....	....	....	....	10.0	....	....	With 15 of silver for Swiss nickel 20-centime coins.
25	Bronze	1.0	95.0	4.0	....	....	....	....	....	....	British bronze coinage.
26	Gun metal	2.0	88.0	10.0	....	....	....	....	....	....	Admir. No. 1
27	Mo. alloy	10.0	2.0	....	....	....	....	....	....	88.0	Light strong alloy for motor-car work.
28	Babbitt's Metal	60.0	4.0	19.0	5.0	....	3.0	....	....	....	For bearings.

Alloy.	Zn.	Cu.	Sn.	Pb.	Fe.	Sb.	Ni.	Mn.	Al.	Remarks.
29 Bearing Metal	20.0	76.0	3.0	1.0	....	....	....	....	....	Daimler motor-bus bearings.
30 Vauche's alloy for journal lining	75.0	....	18.0	4.5	....	2.5	....	....	....	Anti-friction alloy.

As bearing upon the general spelter position it is understood that the British producers are arranging to extend their capacities to deal with a further 100,000 tons of metal. Assuming that the extensions are carried out the capacity of the United Kingdom should be about 100,000 tons of spelter a year. It is probable that the excess quantities of Broken Hill concentrates available will be shared between Belgium and France, there being no doubt whatever that the governments of the Allied Powers are determined once and for all to smash German influences in the metal trade, so far as the raw material resources of the allied countries are concerned.

Big Year for Mines.

Geological Survey's Mid-Year Review Shows General Prosperity.

"The accomplishment of the mining industry in the six-month period just completed warrants the forecast that 1916 is to be a record-breaking year." With this statement the Director of the United States Geological Survey sums up his official mid-year review of the mineral industry as reported to him by the government geologists and statisticians covering the different subjects. "Active demands and good prices have furnished the mine operators with full opportunity for success in working developed properties, and this in turn has given added incentive and available funds for exploration, prospecting, and experimentation with new processes. The mining man is having his innings."

Summarizing the special reports which are now being made public, Director Smith continues his review:

The returns for six months furnish a basis for the belief that 1916 will set up a new record for the soft coal mines. Every coal mining State is sharing in this prosperity and of course this demand for coal is to be traced back to the increased business of the railroads and of the steel and other large industries.

Drilling activity throughout the oil-producing States has brought about a gratifying increase in production of crude oil that promises to make 1916 a record year for marketed petroleum. Already production and consumption are reported by the Survey's specialist as essentially in balance east of the Rocky Mountains, with a tendency to lower prices.

The Portland cement industry has had a busy six months and the manufacturers are optimistic. It is predicted that in both production and shipments of cement this year will show a gain over last year, if indeed it does not establish a new record for cement.

Among the metals copper is continuing the steady increase in production which began early last year, and the forecast for 1916 indicates not only the largest output ever known but also the largest profits.

"Shipments of iron ore from Lake Superior points for five months of 1916 exceeded by more than 80% those for the same months in 1915, and the indications for the year are favorable for a new high record on iron ore production, and of pig iron as well. Higher prices with a steady demand are stimulating the mining of manganese, with the result that this year's output of ore is expected to surpass the large production of last year.

The lead and zinc mines are producing ore at a rate even exceeding that of last year and the prevailing prices have made possible the working of large quantities of low grade ore.

Most precious metal mines are operating at full capacity. The gold production will probably fall below the high yield of last

year, but silver, the one metal last to benefit by the general domestic prosperity, is expected this year to break all previous records.

In quicksilver the outlook is for a continuance of the output of 1915, which was the largest for several years. Thus far in 1916 the average price has greatly exceeded the 1915 prices; and although the reaction in prices has come, conditions are favorable for steady and profitable operation of the quicksilver mines, some of which are newly opened.

The reports from the Survey's western offices are all optimistic. In Arizona mines and smelters are working at high pressure, and the production of metals already shows an increase that promises to make the value of the output nearly double that of last year. Arizona will maintain first place as a copper producer. New Mexico is continuing its rapid progress as a metal mining State, with increase in its output of lead, copper, zinc, gold and silver. The mines of Colorado in the six months just past have shown some changes in output as compared with last year; an increase of 30% in copper is indicated, together with small gains in lead and zinc, a 15% decrease in gold, and little change in silver. This output, however, represents a large gain in value of mine production. Mining has also been stimulated in Montana, and the forecast indicates an increase of 60% in the value of the mine product over that of last year. Here also record outputs may be expected for 1916. Idaho mines are increasing their shipments in all the metals, with higher wages and larger dividends as the result of better prices.

Utah is experiencing an ore production in excess of smelter capacity. The value of the 1916 output of copper is expected to be double that of last year. Throughout Nevada the old term "boom" best expresses the present mining revival. Old mines are being reopened and regular producers are working at full capacity. The chief gains in production will be in copper, lead, and zinc. The increased activity in the mining industry of California is finding expression largely in the reopening of mines that have been long idle and the opening of new mines for chrome, tungsten, manganese, antimony, and magnesite, rail shipments of these ores to the East being made possible by prevailing high prices. Washington is another State which shows increased production, the mining industry there being in better condition than for several years past. Alaska also is benefiting by the increased activity of its mines. Copper mining is showing great advances, and the output of both copper and gold promises to exceed that of last year.

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Topical Talks On Iron.

XXXIX. Electric Steel.

In 1910 there was produced in the United States 52,141 gross tons of "electric steel". In no subsequent year through 1914, with 1915 statistics yet to come, has three-fifths as much electric steel been made. In 1914 the production was equal to one-fourth of the capacity. The United States Steel Corporation is now building electric steel furnaces to have a capacity of 300,000 tons a year.

From these and other influences the layman is likely to have very confused ideas about electric steel. If electric steel is making good, it proceeds in a curious way when the production in one year is less than one-half the production of four years earlier, and less than one-fourth the capacity, but still there must be something in it or a concern like the Steel Corporation, run by hard headed business men, would not be engaged in installing capacity equal to about three times the existing capacity.

From one viewpoint electric steel pays the penalty for having been born in modern scientific times. In earlier times in steel making, progress was more by rule of thumb, and the progress was steadier for the simple reason that practically everything that was done was based purely upon the assurance of something already accomplished. Nowadays there is more theory, which encourages men to undertake things that are shown to be feasible, but are not always successful from the start.

It was long ago thoroughly established that extremely good steel could be made by electrical processes. There has been no question as to the steel being very good, though of course additional information, from practical use, is being sought and obtained as to precisely how good the steel is. As to the cost of manufacture, there has been a strikingly wide divergence between the costs the authorities on the subject thought should be possible and the costs actually arising in practice. Those who are developing electric steel manufacture have proceeded on the principle that this divergence was so much the worse for the practice, not so much the worse for the theory.

Electric steel as commonly known is in a general way material from one of the ordinary steel making processes which has been further refined by electricity. The refining process has absolutely no connection with the electric reduction of iron ore, which is a process to make pig iron by electricity, thus supplanting the ordinary blast furnaces. The two operations are as far removed commercially as they are metallurgically, for the electric smelting of iron ore is practiced where fuel, coke or charcoal, is scarce and water power for generating electric current is plentiful, as in Sweden. It requires only one-third as much carbon to smelt iron ore into pig iron by the electric process as by the blast furnace. By using still less carbon it is possible to produce what has been called "pig steel", a material containing 1.5 to 2.2% carbon.

The manufacture of electric steel, on the other hand, is naturally prosecuted in iron and steel making centers, where fuel is plentiful or the industry would not have grown up, and electric steel is usually metal from the straight Bessemer or straight open-hearth furnace or the duplex process, passed through an electric furnace for further purification. The metal taken from the regular steel making process is not necessarily of the precise composition that obtains in merchantable steel, but that is a technical detail. It may be as well to mention that there is another electric steel making principle, that of taking cheap scrap and melting and refining it in an electric furnace, but thus far this practice has not had much vogue.

While the electric furnace purifies steel of phosphorus and sulphur, farther than can be done conveniently in the Bessemer converter or open-hearth furnace, the high quality of electric steel is not due chiefly to such reduction of those impurities, but rather to the elimination of oxygen in various forms is injurious to steel, though present in extremely small proportions. Electric steel shows practically no tendency to segregation.

In 1909 and 1910 there was laid the first considerable quantity of rails made of electric steel, and at least 6,500 tons of electric steel rails have been under surveillance, in

actual use, for several years. There is practically no breakage, and the wearing quality is good, but not enough time has elapsed to prove precisely how good. The authorities have generally stated that the most useful application of electric steel would be in the manufacture of rails, but thus far only a small percentage of the electric steel made has been put into rails. As a cheaper but excellent substitute for crucible steel electric steel has been commended, but a much wider use is evidently planned, for with present construction work completed there will be capacity for making say four times as much electric steel as there has ever been crucible steel produced.

The United States Steel Corporation is building what will be the largest single electric steel installation in the world to comprise two 20-ton and one 15-ton Heroult electric furnaces. These will be a part of the new duplexing steel plant at the South Works South Chicago, comprising two 25-ton Bessemer vessels and three 200-ton rolling open-hearth furnaces. The three electric furnaces are rated as promising an output of electrically refined steel amounting to 800 tons of ingots a day, say 20,000 tons a month. That will be a real tonnage proposition, having an output more than one-third that of a regular Bessemer steel plant of two 10-ton vessels.

The World's Pig Iron Production.

Substantially accurate figures of pig iron production in 1915 are available for the following countries, the figures referring to gross tons in the case of the United States and Great Britain, and to metric tons of 2,204.6 pounds in the case of other countries:

United States	29,916,213
Germany	11,790,199
Great Britain	8,793,659
Russia	3,535,000
Sweden	767,600
Italy	379,909
Total	55,182,580

The output of Austria-Hungary, France, Canada, Spain and the miscellaneous producers we estimate at about 7,200,000 tons, so that the total production would be about 62,400,000 tons, or say an even 62,000,000 gross tons if the metric statements were reduced to gross tons as should be done when final figures are available.

This output compares as follows with our records for previous years, all reduced to gross tons:

1850	4,401,415	1912	72,719,002
1890	26,994,904	1913	77,892,412
1900	40,181,865	1914	59,804,897
1910	65,267,994	1915	62,000,000
1911	63,342,901		

Production at the present time is larger than the average in 1915. The United States is producing 10,000,000 tons more, Germany about 1,100,000 tons more, and there have probably been increases elsewhere enough to make the total increase about 2,000,000 tons, which would give a present rate for the world of about 74,000,000 tons. That, however, would be a rate 4,000,000 tons less than in 1913, while the United States is 9,000,000 tons ahead of its output in 1913, so that the rest of the world is 13,000,000 tons behind. The proportion of the American output has increased from a shade under 40% in 1913 to fully 54% at the present time.

Assuming that no capacity has been destroyed, or that enough new capacity has been developed outside the United States to make up, the present production of the United States plus the production in 1913 in the rest of the world makes a total of 87,000,000 tons, which is 20 times the output of 1850.

Steel Plants.

VIII.—The South Works.

So much is heard of the Gary steel plant that the impression might arise that it overtops anything else in the Chicago district. As a matter of fact Gary is merely an additional plant in that district. It may be considered a very modern one, but all steel plants that stay in the race must be kept modern, and the main outline of the Gary plant was made ten years ago. The Pittsburgh district is the greatest steel maker in the world. In recent years Allegheny County, which does not comprise the entire Pittsburgh district, has been making about three times as much steel as the State of Illinois, but in 1882 and earlier years Illinois made more steel than the Pittsburgh district and even in later years it made more rails. Additions to the productive capacity of the Chicago district merely tend to bring the district back to its former relative position.

The South Works, of the Illinois Steel Company, located at South Chicago, has ten blast furnaces, with a rated capacity of about 1,900,000 tons of pig iron a year, against eight furnaces at Gary, rated at about 1,300,000 tons. The South works is rated at about 2,000,000 tons of steel ingots a year, about three-fifths being open-hearth, against about 2,200,000 tons at Gary, all open-hearth. The South works has a much more variegated output than the Gary works, and averaging up all the tonnages, with their market value, it is probably a larger works than that at Gary.

As to improvements, the South works is moving rather well as it is adding a duplexing plant of two 25-ton converters and three 200-ton rolling open-hearth furnaces, together with two 20-ton and one 15-ton electric steel refining furnaces, supplementing a 15-ton electric furnace operated for several years. The South works will have by far the largest single electric steel plant in the world.

The Bessemer plant at the South works dates from 1882, and now contains three 15-ton converters. The open-hearth department dates from 1895 and now contains 26 open-hearth furnaces, of which six are 40-ton and the remainder 50-ton.

Prosperity in the Iron Industry.

The first six months of 1916 in the iron industry showed a continuation of the highly prosperous conditions that prevailed during the last four or five months of 1915, according to E. F. Burchard of the United States Geological Survey. In fact, activity was even greater in 1916 than in the first half of 1915. Large increases are shown in the output of both iron ore and pig iron. Shipments of ore from the Lake Superior region during the first five months of 1916 were more than 10,000,000 gross tons, or 83% greater than those of the corresponding period of 1915.

Ore prices at lower lake ports for 1916 were increased 75 cents a ton over those for the season of 1915, but lack of boats is reported to have forced concessions in the price of ore from some mines that do not control their Lake transportation facilities.

The production of coke and anthracite pig iron in the first five months of 1916 showed an increase of 66% over that of the corresponding period in 1915, and prices are from $5 to $7.25 per ton higher, or 33 to 40% above those in June, 1915.

Prices for steel bars and beams have increased 100 to 130% over those of a year ago, and if conditions are not adversely affected by miners' strikes now threatening and if the present strong demand for iron and steel continues, the total ore output from the Lake Superior region may possibly reach 60,000,000 gross tons.

Birmingham and other iron districts are not capable of such rapid increases in output at the Lake districts, and if 10,000,000 tons be estimated for the production of all other districts it indicates a possible total domestic production of iron ore of 70,000,000 gross tons for 1916. At any rate, there are good indications that a new high record of iron-ore production will be made this year.

The Foreign Pig Iron Situation.

There is a growing shortage of pig iron in England. This is due to increased requirements, rather than to decreased production, as is seen by the following statement of the average number of furnaces in blast by quarters, compiled from the quarterly reports of the Iron and Coal Trades Review, London:

	1914.	1915.	1916.
First	296	292	288
Second	292	294	
Third	281	287	
Fourth	293	288	

British pig iron exports to France and to all countries have been as follows, in gross tons, the exports to France referring to pig iron only, while the exports to all countries include spiegeleisen, ferromanganese and ferrosilicon:

	To France	T't'l Exports.
Year 1915	145,028	611,617
January, 1916	44,027	78,271
February	31,516	84,351
March	39,190	87,283
April	44,735	82,976
May	57,741	97,976
Five months	217,209	430,857

Comparing the five months with the first five months of 1915, the exports to neutral countries are doubled while the exports to France are multiplied by ten. The British Government has lately prohibited pig iron exports except by license, and these licenses are very difficult to obtain as to neutral countries, while it is stated to be increasingly difficult to obtain them even for export to France.

The stocks in public stores have decreased in a twelvemonth from 157,077 tons to 32,842 tons.

The following prices are quoted for the British market; warrants have become unquotable:

	Sterling	U. S.
No. 3 fdy Middlesbrough	100s 0d	$24.30
Bessemer, West Coast	127 6	30.98
Cold blast, S. Staffs.	177 6	43.13

It is stated that it is desired to blow in several additional blast furnaces, but that there is difficulty in securing the labor, from the ore and coke to the blast furnace. Prices above are under date of May 11th, and there have probably been advances since then; at any rate the quotations are largely if not wholly nominal, the government fixing the maximum price to be asked.

The French requirements in pig iron have increased in recent months, doubtless owing to additional steel making capacity being completed, and further increases may perhaps be expected, at a time when supplies from England are probably to diminish. The Italian consumption of pig iron may not have increased, but it has hardly diminished, and Italian supplies of pig iron and scrap from Germany are shut off, while the supplies from England are reduced.

In the circumstances the continued heavy demand for American Bessemer pig iron is readily understood.

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The Iron and Steel Situation.

June has marked a continuance of the quieting down in the steel market that first became apparent in April. In the fore part of June the condition was diagnosed as a commencement of the regular midsummer dullness two or three weeks ahead of the usual time, but at the beginning of July it is evident that the full measure of the midsummer dullness is only now realized.

The outstanding feature in the steel market situation is its strength in the face of such marked dullness. The conclusion generally reached by both buyers and sellers is that the fundamental position of the mills is even stronger than was apprehended.

The Mill Position.

Chairman Gary, of the Steel Corporation, states that of about 10,000,000 tons of unfilled obligations on the books of the subsidiaries about 6,000,000 tons is in the form of actual specifications. This is a very large tonnage and represents also a very large proportion of specific shipping orders. It is to be noted that it is not customary nor convenient for buyers to specify their tonnages so far ahead as has been done. It is difficult to determine so long in advance the precise materials that will be required under contract and the buyers certainly placed such a large volume of specifications only because they realized that otherwise they would not secure the desired deliveries. The business may be regarded as representing actual consumptive requirements already arranged. There is no occasion for particular doubt as to the 4,000,000 tons not yet specified. In the ordinary course of events the specifications would be forthcoming in ample time. Certainly a large part of the contract obligations call for specifications in equal monthly tonnages during the second half of the year, such specifications are not yet due. No doubt a considerable tonnage has been specified in advance of the periods named in the contracts.

The position of the large independent mills may be assumed to be substantially the same as that of the Steel Corporation. Thus the capacity of mills producing say 80% of the steel of the country may be taken as under contract into next January, as an average, and under actual specification into next October. With only slight additional bookings from month to month these dates will necessarily be materially extended

The position of the small mills, say those producing 20% of the steel, is not clearly defined. Some appear to be well sold up for several months, while others are believed to stand in need of tonnage after the next couple months. With absolutely no buying for two or three months some of the small mills would doubtless have occasion to go out and buy tonnage, but with the large mills so well filled it will be very easy for enough business to be picked up by the small mills, even in the dullest market, to carry them for some time beyond the period involved in their present obligations.

Export Business.

While the domestic market has been extremely dull the export market has maintained the increased rate of activity that first developed early in the second quarter of the year. The demand for shells and shell steel, supposed to have been satisfied some time ago for the second half of the year, is still in evidence, and there is some inquiry involving deliveries through the first quarter of next year. There have been various reports circulated, chiefly in stock market circles, of lessened demand for shells and shell steel, but in the steel market no evidence of any diminution is found, and there is room for suspicion that these reports were circulated for ulterior motives. It is more likely than not that the total production of shell steel, whether for fabrication in the United States or abroad, will be decidedly greater in the next six months than it has been in the past six.

The demand from the allies for steel other than for shells continues large, running chiefly to railroad and shipbuilding material. Russia has experienced great difficulty in placing orders with independents for the part of its 350,000 tons of rails not not taken care of by the Steel Corporation, the negotiations as to delivery even leading to the offering of Bessemer rails, apparently not acceptable.

The demand from neutral countries con-

tinues large, and for three months has been at a greater rate than at any time since 1913. Prospects for its continunce or further growth hinge chiefly upon ocean freights, which even with the large recent declines are so high that they affect delivered prices more than do the high prices asked f. o. b. American mill

Pig Iron.

Pig iron is extremely dull marketwise, but occupies a strong statistical position. There has been a slight decline in the average, continuing now for more than two months, the high point in our **composite** having been reached last April. The average decline, however, is only 50 cents and that may represent no more than the natural sagging that not infrequently occurs in a dull market. There is no proof that a continued decline has been inaugurated.

Pig iron production in June was at a slightly lower rate than in any of the three months preceding, representing poorer working of the individual furnaces on account of higher humidity of the atmosphere, a condition that will be accentuated in July and August. Stocks of pig in sellers' hands have been reduced in the past few months until they are practically negligible, and steel mill stocks have probably decreased also, but there has probably been some increase in stocks in the hands of foundries, due chiefly to labor troubles cutting down the melt. Altogether, however, it is probable that more pig iron has been consumed than produced in the past three or four months, and with prospects of slightly lessened production in the next two or three months, with all consumers striving for maximum operations, the statistical position of pig iron must be considered good. A great deal has been made of the fact that additional steel making units are being completed from time to time, requiring more pig iron. Only two new furnaces came into blast during the first half of the year, and nine are under construction, with prospects that more than half of them will not be completed and blown in until next year.

Finished Steel.

Premiums for early deliveries have been decreasing until they are unimportant except in the case of plates and blue annealed sheets, and for these commodities the premiums are almost as high as ever, plates being 2.90c for delivery at mill convenience, about 3.50c for delivery over the next few months, and about 3.75c for prompt ship-

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer,	Basic,	No. 2 fdy.	Basic,	No. 2X fdy.		No. 2 fdy —		Ferro-	Fur-
1915—	Valley			Phila.	Phila.	Buffalo.	Cleve-land.	Chi-cago.	Birm-ingham.	mangan-ese.*	nace coke†
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. ..	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916—											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.45
May ..	21.00	18.21	18.44	20.50	20.25	19.15	19.08	19.50	15.00	175.00	2.34
June ..	21.00	18.25	18.39	19.90	20.04	18.75	19.30	19.50	14.63	175.00	2.54

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

ment of small lots. Blue annealed sheets range at just about the same prices.

Scrap.

In the closing days of June the heavy melting steel market suddenly stiffened, and within a week or ten days there had been an advance of fully a dollar a ton in the Pittsburgh market. There was buying in the Chicago market, but the advance there was not so marked. The scrap market had been suffering a decline for three months and had grown ripe for an upturn. Whether the advance will continue far enough to affect pig iron favorably cannot be determined at this early date.

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved	—— Sheets ——					Comp.
						Wire	Steel			Blue	Tin	Fin.
1915—	Shapes.	Plates.	Bars.	Pipe.	Wire.	Nails.	Skelp.	Black.	Galv.	Annld.	plate.	steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3 60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.76	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5691
August	1.30	1.26	1.30	79	1.43	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916—												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2983
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.35	2.40	2.35	2.89	5.00	2.95	4.70	2.7166
May	2.50	2.83	2.50	70	2.45	2.50	2.35	2.90	5.00	3.00	5.46	2.8043
June	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.80	3.00	5.75	2.8300

LAKE SUPERIOR IRON ORE.

Shipments of iron ore down the lakes have been as follows, in gross tons:

	1911.	1912.	1913.	1914.	1915.	1916
April	331,645	204,042	866,386	269,686	503,832	1,658,411
May	3,684,819	5,919,074	7,284,212	3,852,063	5,012,359	8,449,580
June	4,819,996	7,567,555	7,974,444	5,502,367	6,005,091	.....
July	5,221,373	7,600,233	8,204,416	5,784,514	7,204,021	.....
August	5,548,311	7,760,248	7,677,601	5,869,477	8,081,117	.....
September	5,231,069	7,287,230	7,258,413	5,438,049	7,863,146	.....
October	4,769,965	7,010,219	6,526,103	4,242,392	7,146,873	.....
November	2,523,253	4,072,674	3,270,958	1,068,682	4,445,129	.....
December	.....	14,579	13,545	1,411	37,236	.....
Season Lake ..	32,130,411	47,435,777	49,070,478	32,021,987	46,318,804	10,107,991

Comparison of Metal Prices.

Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High	Low.	Range for 1916. High.	Low.	Closing, June 30, 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	20.00	21.00
Basic, valley	13.25	12.50	18.00	12.50	18.50	17.75	18.00
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.25	18.25
No. 2X fdy. Philadelphia.	1500	14.20	19.50	14.00	20 25	19.50	19.75
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	19.30	18.80	19.30
No. 2X foundry, Buffalo	13.75	12.25	18.00	11.75	19.00	18.00	18.50
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	19.00	18.50	19.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.50	14.00
Scrap Iron and Steel.							
Melting steel, Pittsburgh.	12.00	9.75	18 00	11.00	18.75	17.25	16.25
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	16.75	14.50	14.62
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	18.87
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.00	14.75	14.87
Heavy steel scrap, Phila	11.25	9.00	16.25	9.50	17.75	15.00	15.00
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.47
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.50	1.90	2.60
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.50	1.85	2.50
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	2.75	1.85	2.90
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	2.50	1.85	2.50
Grooved steel skelp, Pitts	1.20	1.12½	1.75	1.12½	2.35	1.75	2.35
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	2.90	2.60	2.90
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.75	4.75
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	6.00	3.75	6.00
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.40	2.10	2.50
Steel pipe, Pittsburgh	79½%	81%	79%	81%	70%	78%	70%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	2.60
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.75	3.35
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	39.00	39.62½
Lake copper	15.50	11.30	23.00	13.00	30.25	23.00	26.75
Electrolytic copper	14.87½	11.10	23.00	12.80	31.00	23.00	26.62½
Casting copper	14.65	11.00	22.00	12.70	28.25	22.00	24.12½
Sheet copper	20.25	16.50	27.25	18.75	37.50	28.00	37.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	7.00
Spelter	6.20	4.75	27.25	5.70	21.17½	11.05	11.17½
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	16.50	17.00
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	65.00	53.00	62.00
Silver	59¼	47⅝	56½	46¼	77¼	55⅞	65
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	6.65
Spelter	6.00	4.60	27.00	5.55	21.00	10.87½	11.00
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	17.00	17.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	205	171½	173¾
Standard copper, prompts	66¾	49	86⅜	57⅛	146	84¾	103
Lead	24	17⅜	30¼	18¼	36⅜	28¾	28¾
Spelter	33	21¼	110	28⅛	111	61	61
Silver	27¼d	23¼d	27¼d	22 7/16d	37⅛d	26 11/16d	31d

Comparison of Security Prices.

Railroads.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing. June 30, 1916.
Atchison, Top. & Sante Fe...	100⅜	89½	111¼	92½	108½	100¼	105
Atch. Top. & Santa Fe.. pfd.	101¾	96½	102⅛	96	102	97⅞	99
Baltimore & Ohio	95⅝	67	96	63¾	96	82⅞	88⅞
Canadian Pacific	220½	153	194	138	183¾	162½	178¾
Chesapeake & Ohio	68	40	64¾	35⅝	67¾	58	62
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¾	102½	91	98
Erie R. R.	32½	20⅜	45⅝	19⅞	43⅝	32	36¼
Great Northern, pfd.	134¾	111⅝	128⅜	112¾	127½	118	120½
Lehigh Valley	156¼	118	83⅜	64⅝	84¼	74½	78¾
Louisville & Nashville	141⅞	125	130¼	104½	135½	121⅛	134
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	7¼	3¼	4¾
Missouri Pacific	30	7	18¼	1¾	7⅜	3½	7
New York Central	96⅝	77	110½	81½	111½	100¼	104½
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	51	62¼
Northern Pacific	118½	97	119	99⅛	118⅞	109¾	113⅝
Pennsylvania R. R.	115½	102½	61½	51¾	59¾	55¼	57⅞
Reading	172¼	137	85⅝	69⅜	110¾	75⅛	97¾
Southern Pacific	99½	81	104⅛	81¼	104⅛	94¼	97⅝
Union Pacific	164⅜	112	141½	115¾	143⅜	129¾	138¼
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¼	94½	61¾	88
American Can	35⅛	19¼	68½	25	65⅜	50¼	52¾
American Can, pfd.	96	80	113½	89	113⅞	109	109½
Am. Car & Foundry	53½	42¼	98	40	78	53¼	55
Am. Cotton Oil	46½	32	64	39	57½	50½	54¾
Am. Locomotive	37¼	29¼	74¾	19	83¾	60¾	68
Am. Smelting & Refining	71⅛	50¼	108⅞	56	113⅜	88½	94
Brooklyn Rapid Transit	94¼	79	93	83¼	88⅞	83½	86¼
Chino Copper	44	31⅝	57⅜	32¾	60	47⅝	49¾
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	53	38⅛	41¾
Consolidated Gas	139½	112½	150½	113¾	144¾	130½	135¼
General Electric	150⅝	137½	185½	138	178½	159	167
International Harvester	113½	82	114	90	119¾	108½	113⅞
Lackawanna Steel	40	26½	94¾	28	86	64	67
National Lead	52	40	70¾	44	73⅞	60½	66
Ray Consolidated Copper	22½	15	27½	15¼	26	20	22½
Republic Iron & Steel	27	18	57¼	19	55¼	42	45½
Republic Iron & Steel, pfd...	91¼	75	112⅝	72	112	106⅞	107½
Sloss-Sheffield	35	19½	66⅞	22	63¼	46½	48
Texas Co.	149⅞	112	237	120	235½	177¼	188½
U. S. Rubber	63	44½	74¾	44	58½	47¾	54¼
U. S. Steel Corporation	67¼	48	89½	38	89	79¾	85¾
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	118½	115	117½
Utah Copper	59⅜	45⅜	81¾	48½	86¾	75	77¼
Va.-Carolina Chem.	34⅞	17	52	15	51	36	40
Western Union Telegraph ...	66⅞	53⅜	90	57	96⅞	87	93⅞

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1911:

Quarter.	1916.	1915.	1914.
1st	$60.713,624	$12,457,809	$17,994,382
2nd	.....	27,950,055	20,457,596
3rd	.....	38,710,644	22,276,002
4th	.....	51,277,504	10,935,635
Year	.....	130,396,012	71.663,615

	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38.450,400	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year ...	137.181.345	108,174,,673	104,305.466

Unfilled Orders.

(At end of the Quarter).

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	4,489,718
1907..	8,043,858	7.603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4.057,939	4,796,833	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304.841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4.032,857	3,787,667	3,836,643
1915..	4,255.749	4,678.196	5,317,608	7,805,220
1916..	9,331.001			

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

1914—	Shipments. %	Bookings. %	Difference. %	Difference. Tons.
June	63	66	+ 3	+ 34,697
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September ..	62	24	—38	—425,664
October ...	55	28	—27	—326,570
November .	45	32	—13	—136,505
December .	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February ..	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September .	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037
December .	102	152	+50	+615,731
January 1916	102	112	+10	+116,547
February ..	102	157	+55	+646,199
March	104	164	+60	+762,035
April	104	146	+42	+498,550
May	104	113	+ 9	+108,247

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000.000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January ..	1,021	795	226	939	718	221	1,131	797	336
February .	914	746	168	900	680	220	1,140	800	340
March ...	1.091	801	290	1,015	722	293	1,360	944	416
April	1,038	782	256	1,013	724	289	1,223	827	396
June	1.097	789	308	1,090	732	308			
May	1.047	800	247	1,040	730	360			

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1911.	1912	1913.	1914.	1915	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,530,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	58,300,297
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	58,722,411
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	.....
June	20,310,053	24,795,802	25,228,346	18,927,958	31,757,103	.....
July	17,454,772	24,917,953	24,170,704	16,737,552	35,891,575	.....
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822	.....
September ...	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$222,821,901

EXPORTS OF TONNAGE LINES—Gross tons.

	1909.	1910.	1911	1912.	1913.	1914.	1915.	1916
January	70,109	118,681,	152,262	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	139,946	368,867
March	94,519	124,980	216,360	218,219	257,519	159,998	174,104	438,058
April	100,911	117,921	228,149	267,313	259,689	161,952	223,587	384,924
May	109,808	135,306	178,589	307,656	242,353	139,107	263,649	.....
June	114,724	120,601	174,247	273,188	243,108	144,539	355,402	.....
July	100,850	127,578	162,855	272,778	237,159	114,790	378,897	.....
August	105,690	131,391	177,902	282,645	209,856	86,599	405,853	.....
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806-	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	1,548,971

IRON ORE IMPORTS.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,844
Feb. ..	188,734	112,574	78,773	93,315
Mar. .	164,865	68,549	88,402	93,383
April.	174,162	111,812	91,561	75,712
May .	191,860	125,659	98,974	.....
June .	241,069	188,647	118,575	.....
July .	272,017	141,838	119,468	.....
Aug. .	213,139	134,913	126,806	.....
Sept. .	295,424	109,176	173,253	.....
Oct. ..	274,418	114,341	138,318	.....
Nov. .	179,727	90,222	113,544	.....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	352,254

IRON AND STEEL IMPORTS.

	1912.	1913.	1914.	1915.	1916.
Jan. .	20,008	21,740	17,776	10,568	15,824
Feb. .	11,622	25,505	14,757	7,506	20,280
Mar. .	15,466	27,467	27,829	8,025	15,162
April.	12,481	25,742	30,585	16,565	20,175
May .	15,949	28,728	28,173	28,916	.....
June.	21,407	36,597	23,076	32,200	.....
July .	17,882	36,694	25,282	20,858	.....
Aug. .	20,571	18,740	28,768	27,556	.....
Sept..	18,740	19,941	38,420	23,344	.....
Oct. .	25,559	20,840	22,754	34,319	.....
Nov. .	24,154	25,809	24,165	37,131	.....
Dec. .	21,231	26,454	9,493	35,455	.....
Total	225,072	317,260	289,778	282,443	71,441

Price Changes of Iron and Steel Products From March 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our **composite finished steel.** In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the rates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 24	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galvanized sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30

1915—			
Aug. 31	Bars	1.30	to 1.35
" 31	Bars	1.30	to 1.35
" 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galvanized sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galvanized sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galvanized sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galvanized sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
Nov. 18	Shapes	1.60	to 1.70
" 18	Galvanized sheets	4.00	to 4.25
" 24	Galvanized sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galvanized sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80

"	15	Plates	1.70	to 1.80
"	15	Shapes	1.70	to 1.80
"	31	Wire nails	2.00	to 2.10
"	22	Sheets	2.50	to 2.60
1916—				
Jan.	3	Tin plate	3.60	to 3.75
"	3	Blue ann. sheets	2.25	to 2.35
"	4	Bars	1.80	to 1.85
"	4	Plates	1.80	to 1.85
"	4	Shapes	1.80	to 1.85
"	4	Pipe (with extra 2½%)	78%	to 77%
"	5	Blue ann. sheets	2.35	to 2.40
"	7	Boiler tubes	68%	to 66%
"	12	Blue ann. sheets	2.40	to 2.50
"	14	Boiler tubes	66%	to 64%
"	19	Blue ann. sheets	2.50	to 2.65
"	21	Bars	1.85	to 1.90
"	21	Plates	1.85	to 2.00
"	21	Shapes	1.85	to 1.90
"	21	Pipe	77%	to 76%
"	24	Wire nails	2.10	to 2.20
Feb.	7	Bars	1.90	to 2.00
"	7	Plates	2.00	to 2.10
"	7	Shapes	1.90	to 2.00
"	14	Wire nails	2.20	to 2.30
"	15	Pipe	76%	to 75%
"	21	Bars	2.00	to 2.25
"	21	Plates	2.10	to 2.35
"	21	Shapes	2.00	to 2.25
"	21	Tin plate	3.75	to 4.00
"	29	Pipe	75%	to 74%
"	29	Boiler tubes	64%	to 63%
Mar.	1	Wire nails	2.30	to 2.40
"	8	Black sheets	2.60	to 2.75
"	8	Blue ann. sheets	2.65	to 2.90
"	13	Bars	2.25	to 2.35
"	13	Plates	2.35	to 2.60
"	13	Shapes	2.25	to 2.35
"	15	Steel pipe	74%	to 73%
"	15	Boiler tubes	63%	to 61%
"	23	Bars	2.35	to 2.50
"	23	Shapes	2.35	to 2.50
"	28	Plates	2.60	to 2.75
"	29	Sheets	2.75	to 2.85
"	29	Steel pipe	73%	to 72%
"	29	Boiler tubes	61%	to 60%
April	5	Sheets	2.85	to 2.90
"	15	Boiler tubes	60%	to 56%
"	19	Tin plate	4.50	to 5.00
"	24	Pipe	72%	to 70%
May	1	Wire nails	2.40	to 2.50
"	3	Tin plates	5.00	to 5.50
"	16	Plates	2.75	to 2.90
June	7	Galv. sheets	5.00	to 4.75
"	16	Tin plate	5.50	to 6.00
July	7	Blue ann. sheets	3.00	to 2.90
"	7	Galv. sheets	4.75	to 4.50

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
September 1914	44,624	34,757	+ 9,867
October	45,241	39,410	+ 5,831
November ..	35,325	40,748	— 5,423
December ...	27,458	42,525	— 15,067
January, 1915.	20,684	31,556	— 10,872
February ...	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 .	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ...	31,096	33,061	— 1,965
October	31,215	26,338	+ 4,877
November ..	29,297	26,005	+ 3,292
December ...	23,173	23,743	— 570
January, 1916.	17,293	4,015	+ 7,303
February ...	30,244	10,824	+ 19,420
March	33,685	9,894	+ 23,791
April	36,999	10,856	+ 26,143

United States citizens arrived and departed, with change thereby effected in United States population:

	Arrived.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September ...	9,054	8,188	+ 866
October	8,991	8,329	+ 662
November ...	8,364	9,166	— 802
December	8,458	9,349	— 891
January, 1916.	8,257	9,469	— 1,212
February	11,082	12,908	— 1,826
March	15,065	10,867	+ 4,198
April	12,522	8,051	+ 4,471

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,237; July, 1915, +14,994; August, 1915, —15,128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461; January, 1916, +6,091; February, +17,594; March, +27,989; April, +30,614; ten months, +87,623.

COMPOSITE STEEL.

Computation of July 1, 1916:

Pounds.	Group.	Price.	Extension.
2½	Bars	2.50	6.250
1½	Plates	2.90	4.350
1½	Shapes	2.50	3.750
1½	Pipe (¾-3)	2.95	4.425
1¼	Wire nails	2.50	3.750
1	Sheets (28 bl.)	2.90	2.900
½	Tin plates	6.00	3.000
10 pounds			28.425
	One pound		2.8425

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7166
May	1.5590	1.7786	1.5078	1.5381	2.8043
June	1.5794	1.7719	1.4750	1.5312	2.8300
July	1.6188	1.7600	1.4805	1.5692	.....
Aug.	1.6784	1.7400	1.5241	1.6059	.....
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet Pitts.	No. 1 R. Wrought Pitts.	R. No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1914—						
July	11.75	8.50	11.75	11.50	10.60	9.75
Aug.	11.50	8.50	11.50	11.25	10.75	9.75
Sep.	11.25	8.70	10.50	11.25	10.75	9.25
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75
May	17.00	13.65	19.65	16.10	17.00	15.90
June	16.25	13.00	19.00	15.40	15.45	14.80

COMPOSITE PIG IRON.

Computation for July 1, 1916:

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.00)	36.00
One ton No. 2 foundry, valley	18.25
One ton No. 2 foundry, Philadelphia	19.75
One ton No. 2 foundry, Buffalo	18.75
One ton No. 2 foundry, Cleveland	19.30
One ton No. 2 foundry, Chicago	19.50
Two tons No. 2 Southern foundry, Cincinnati (16.90)	33.80
Total, ten tons	186.35
One ton	18.635

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.420	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	18.965
June	14.005	14.968	13.606	13.047	18.552
July	14.288	14.578	13.520	13.125	.....
Aug.	14.669	14.565	13.516	14.082	.....
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, deliv.— Phila.	Pitts.	Ch'go.
1914—						
Nov.	19.25	19.75	25.00	1.13	1.20	.96
Dec.	18.75	19.25	24.40	1.12	1.20	.91
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35
May	43.00	43.00	59.00	2.66	2.60	2.35
June	42.00†	42.00†	58.00	2.66	2.60	2.35

† Premium for open-hearth.

CAR BUYING.

Freight cars ordered:		
First half 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,210	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	
May	6,204	
June	3,470	
Six months		64,287

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.

January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,600,000
April	39,600,000
May	39,800,000
June	39,500,000
On July 1st	39,500,000

Actual production:

1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1913—			
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,745,913	134,169,807
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	193,935,117	402,991,118	209,056,001
Mar.	213,589,785	409,850,425	196,260,640
Apr.	217,705,397	399,861,157	182,155,760
May	*229,000,000	*472,000,000	*243,000,000

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April .	13.60	20.70	12.50	18.00
May ..	13.659	20.833	12.65	18.1607
June ..	13.75	21.00	12.724	18.00
July ..	13.991		12.959	
Aug. ..	15.064		14.364	
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

BAR IRON AVERAGES.

Average realized prices on shipments of base sizes of common iron bars by the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and Highland Iron & Steel Company, as disclosed by wage adjustments of Amalgamated Association of Iron, Steel and Tin Workers, prices realized in bi-monthly periods, governing wage rates for succeeding two months.

	1914.	1915.	1916.
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	*1.60
May-June	1.1257	*1.10	....
July-August	1.0928	*1.15	....
September-October	1.0847	*1.20	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.144	....

* Settlement basis.

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1912	2,053	81 694
1913	20,680	57,812
1914	15,411	59,549
1915	2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178
February	107	13,534
March	44	20,364
April	179	21,385

British tin plate exports have been as follows, in gross tons:

1913	494,921
1914	435,497
1915	368,602
January 1916	26,271
February	27,289
March	39,482
April	23,337
May	41,868

BRITISH IRON AND STEEL EXPORTS.

1914—	Pig Iron.	Rails.	Tin Plate.	Total.*
July ..	74,617	43,133	47,237	385,301
Aug. ..	28,342	22,763	21,414	211,605
Sept. ..	37,793	39,185	23,440	228,992
Oct. ..	47,188	37,005	26,950	263,834
Nov. ...	49,666	16,181	30,942	240,608
Dec. ..	31,705	16,315	30,254	212,667
Year ..	780,763	433,507	435,392	3,972,348
1915—				
Jan. ..	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	15,101	198,294
Mar. ..	20,172	17,572	36,170	239,341
April ..	35,209	21,602	40,135	265,244
May ...	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	33,224	39,528	351,984

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*
Aug. ...	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ...	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	87,283	3,366	39,482	307,488
April ..	82,976	10,510	23,337	293,897
May ..	97,967	4,103	41,868	395,750

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Tin in June.

Month Featured by Plethora of Supplies, Record-Breaking Deliveries Into American Consumption and the Lack of Stamina in the London Market—Three Causes of Heavy Break in Prices.

In the tin industry three features stood out prominently in June: The plethora of supplies, the record-breaking deliveries into American consumption and the lack of stamina in the London market. As a natural result prices here, suffered a heavy break. At the beginning of the month spot tin sold at 45¼c. On June 27th and 28th, it was difficult to sell at 39c—a drop of 6¼c per pound. The highest point touched this year was 50c, on March 10th, thus there was a break of 17c per pound up to June 28th. This was the minimum price this year. The previous lowest price was 40⅞c on January 18th. On the two closing days of the month there was an apparent recovery of ½c to ⅝c per pound.

Another interesting point was the elimination of the premium on spot over the prices current for future delivery. At the beginning of the month, spot commanded a premium of 4⅛c per pound. At the close of the month there was a difference of only 1 to 1⅛c per pound between the price of spot and the price asked for arrivals in October, November and December. This resulted from the large stocks carried by consumers and by importers, while the demand was mainly for future positions. The supply available during the month was enormous—8,860 tons—and the stock at New York and at outports at the end of June was 3,963 tons, being an increase of 495 tons during the month.

Future positions sustained declines of 3½c to 5c per pound from the end of May to the 27th of June, with recoveries of ½c to 1c per pound during the last three days of the month. At no time was there any sustained spirited buying but domestic consumers and importers bought liberally in the aggregate, of foreign shipments to arrive in September and in the later months of the year. In some instances purchases were made of metal to arrive as late as March, 1917 but the bulk of transactions were in October, November and December arrivals. No trumpets were blown and no red lights signalled the times of buying; business was quietly conducted. On many days the market was flat.

War Has Eliminated Speculation in Tin.

The conditions incidental to the war have made marvellous changes in the methods and manner of dealings in tin. The British Government has quenched the fire of speculation—which has always been the force to reckon with in tin dealings by granting or withholding permits to ship as well as by other restrictions to trade. The result was to greatly benefit American tin consumers and importers. While other metals have been skyrocketing, tin has been kept within reasonable limits in its rises and falls. The London market has been very tame for months and although the East Indies have proved restive and contrary for brief periods, sooner or later they have adjusted prices in harmony with London.

Under such conditions it has been pos-

TIN PRICES IN JUNE.

Day.	New York. Cents.	London £ s d Spot.	London £ s d Futures.
1	45.50	187 5 0	187 0 0
2	45.25	185 15 0	185 15 0
5	44.62½	183 10 0	183 10 0
6	44.25	183 0 0	183 5 0
7	44.50	184 10 0	184 15 0
8	45.00	187 10 0	187 15 0
9	44.75	187 15 0	188 0 0
12	44.25	184 15 0	185 0 0
13	43.50	181 10 0	182 0 0
14	43.50	183 5 0	183 15 0
15	42.75	181 5 0	181 15 0
16	41.75	178 0 0	178 10 0
19	41.25	178 0 0	178 5 0
20	40.75	177 0 0	177 5 0
21	39.87½	173 5 0	173 10 0
22	39.75	172 5 0	172 15 0
23	40.25	175 15 0	176 5 0
26	39.50	173 5 0	173 15 0
27	39.00	171 10 0	172 0 0
28	39.00	172 0 0	172 10 0
29	39.37½	173 10 0	174 0 0
30	39.62½	173 15 0	174 10 0
High ...	45.50	187 15 0	188 0 0
Low	39.00	171 10 0	172 0 0
Average .	42.18	179 9 4	179 15 10

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	19,614
June	12,920	11,101	16,027	15,927	19,363
July	13,346	12,063	14,167	16,084	.....
Aug.	11,285	11,261	14,452	15,127	.....
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	3,965
June	4,290	4,280	5,870	6,665	6,210
July	4,580	4,770	4,975	5,606	....
Aug.	5,210	6,030	3,315	4,712	....
Sept.	5,430	5,160	4,973	5,296	....
Oct.	4,450	5,020	4,610	4,441	....
Nov.	5,600	5,560	5,155	6,713	....
Dec.	4,980	5,110	6,435	5,301	....
Total	59,018	62,550	63,093	66,517	....
Av'ge	4,918	5,213	5,258	5,543	....

CONSUMPTION IN THE U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	5,455
June	2,850	3,800	3,650	3,900	6,398
July	5,150	3,900	3,900	5,300	....
Aug.	4,300	3,600	2,900	4,500	....
Sept.	3,600	3,100	3,600	4,300	....
Oct.	3,850	3,700	3,700	4,900	....
Nov.	4,300	2,800	2,600	2,975	....
Dec.	4,050	3,100	1,900	5,200	....
Total	49,500	43,900	41,700	48,750	31,621
Av'ge	4,125	3,658	3,475	4,062	5,270

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange

	June	May	June
Straits shipments:	1916.	1916.	1915.
To Gr. Britain..	3,665	1,415	2,730
" Continent ..	845	405	860
" U. S.	1,700	2,145	3,073
Total from Straits	6,210	3,965	6,663
Australian shipments:			
To Gr. Britain..	228	312	141
" U. S.	nil	nil	nil
Total Australian	228	312	141
Consumption:			
London deliveries	1,917	1,758	2,009
Holland deliveries	101	94	100
U. S.	6,398	5,455	3,900
Total	8,416	7,307	6,009
Stocks at close of month:			
In London—			
Straits, Australian	1,762	2,512	1,581
Other kinds ...	1,399	1,862	806
In Holland	.....	7	6
In U. S.	3,963	2,468	2,311
Total	7,124	6,849	4,761
Afloat, close of month:			
Straits to London	5,625	3,460	3,233
" to U. S. .	4,040	4,807	7 41
Banca to Europe.	2,574	4,498	52
Total	12,239	12,765	11,16
	June 30.	May 31.	June 30
Total visible supply	1916. 19,363	1916. 19,614	1915. 15,92

STRAITS TIN PRICES IN NEW YORK

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	49.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	49.15
June	47.77	44.93	30.65	40.37	42.18
July	44.75	40.39	31.75	37.50	.....
Aug.	45.87	41.72	50.59½	34.39	.....
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

sible for large consumers and dealers to help mold the foreign markets by giving orders to or withholding orders from London or the Straits. On several occasions during the month importers took orders for future positions here and held them for favorable opportunities before placing them abroad. London and Singapore, however, were subject to independent violent fluctuations for brief periods.

Foreign Market Trended Downward.

The general tendency of the foreign market in June was downward. The lowest prices were touched on June 27th and 28th when London quotations were within 10s of the minimum prices touched this year, January 3rd. June prices abroad fluctuated within a range of £15 to £18, spot Straits tin at London broke £15 10s but recovered £2 10s, making a net decline of £13 for the month. Spot Standard broke £16 5s and future Standard fell £15, followed by recoveries of £2 5s and £2 10s, respectively, resulting in a net decline of £14 on spot and £12 10s on futures. The Singapore market broke £17 15s but recover £4 15s, closing at a net decline of £13.

It is interesting to note that the highest price for spot Standard tin established this year, was £205 on April 10th. The lowest price since then has been £171 10s, made on June 27th, a break of £33 10s. The minimum price this year was £171 on January 3rd. The highest price for future Standard was £191 15s, recorded on April 11th. On June 27th, the price had dropped to £172, the same as on January 3rd, a break of £27 15s.

Record American Deliveries.

The deliveries into American consumption in June, 6,398 tons were the greatest of record. From Atlantic ports 4,200 tons were delivered while 2,198 tons were shipped from Pacific ports direct to Pittsburgh, including importations of Straits and Banca tin, direct from the Straits Settlements and from Batavia. In the last six months deliveries to home consumers have been 31,621 tons, a gain of 9,404 tons over the deliveries made during the first half of 1915.

European deliveries in June, were 2,018 tons and since January 1st only 8,531 tons, the latter being a decrease of 8,828 tons compared with the corresponding time in 1915.

Total consumptive deliveries in June were 8,416 tons and for the first half of the year, 40,152 tons. During the first half of 1915 total American and European deliveries were 39,576 tons. One significant point is that since January 1st the increase in American consumption—9,404 tons—has been 576 tons greater than the decrease in European consumption, 8,828 tons.

Arrivals at Atlantic and Pacific ports in June were 7,893 tons, exceeding the deliveries by 495 tons. Total arrivals in this country since January 1st, have been 34,213 tons, an increase of 12,605 tons over the arrivals during the first half of 1915.

Large Increase in Percentage of Straits Tin Received in United States.

Shipments from the Straits in June were 6,210 tons, and during the last six months shipments were 32,375 tons. In the first half of 1915, Straits shipments were 34,447 tons. Thus since January 1st, shipments from the East Indies have fallen off 2,073 tons. It is a notable fact that in the last six months the United States has received nearly 80% of the Straits shipments whereas during the first half of 1915 only about 49% of the Straits shipments came to this country, either directly or indirectly.

The visible supply of tin on June 30th, was 19,363 tons, a decrease of 251 tons during the month and an increase of 3,436 tons over the visible held at the corresponding time in 1915.

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Lead in June.

Lead Market Weak Throughout Entire Month.

Business in lead throughout June was unsatisfactory. The undertone of the market was weak and this fact came prominently to the surface as the month advanced.

From March 30th, when the Trust price was established at 7½c, New York, and at 7.43½c East St. Louis, to June 1st, prices in the open market declined from 8c to 7.15c East St. Louis and to 7¼c New York. The change in trade condition marked by this recession was ignored by the leading interest and independent producers found it hard to secure orders for July delivery except on a sliding scale basis. On June 3rd, however, the American Smelting and Refining Co. recognized the weaker feeling by reducing prices $10 per ton to 7c per pound at New York and to 6.92½c at East St. Louis, having booked some orders late on the previous day at a decline of ½c per pound. Otherwise, the lower price served only to unsettle buyers. The English market, however, developed a firmer tone on June 6th and 7th and 8th, with slight advances in prices. The domestic market continued dull, few orders resulting from concessions of 5 to 10 points made by second hands in the open market. On June 9th, there was increased pressure to sell, July, August and September deliveries being offered at 6¾c East St. Louis. The English market, too, reacted sharply to the equivalent of 6.60c to 6.70c per pound.

Anxiety of Sellers to Make Sales Weakens Market.

On June 12th, the heaviness of the home market was made more evident by the reported sale of a large tonnage on the basis of 6.80c per pound, New York, which was $4 per ton under the Trust price and even $1 to $2 per ton below the asking prices of most of the independent purchasers. On the following day, London receeded 10s on spot and 7s 6d on futures bringing the market back to prices current on May 26th. The domestic market continued to drag. Subsequently a firmer feeling abroad had no influence upon business or prices here where consumers anticipated a further prospective reduction in the Trust price because of increased pressure to sell by independent producers at $3 to $5 per ton below t nominal asking official price.

Most of the small current orders we going to the outside operators b these were not sufficient to sustain the ma ket which was heavy between 6.60c and 6.7 East St. Louis for spot, June and July shi ment.

Market Stiffens on Reports of Heavy Selli at Good Prices.

The Mexican situation served to furth unsettle sentiment but there was le anxiety displayed by independent produce to secure nearby orders while August a September deliveries were offered $6 to per ton under the Trust price about Ju 20th. On the following day a strong tone developed because of the report large sales of prompt and June shipmer by independent producers at 6.70c to 6.8 delivered in the East. The general mark was advanced about five points but t

LEAD PRICES IN JUNE.

Day.	New York.* Cents.	St. Louis. Cents.	Londo £	s
1	7.25	7.15	31	15
2	7.25	7.15	32	0
5	7.00	6.875	31	10
6	7.00	6.875	32	0
7	6.95	6.875	32	5
8	6.95	6.85	32	7
9	6.90	6.825	31	15
12	6.875	6.775	31	15
13	6.875	6.775	31	5
14	6.85	6.775	31	10
15	6.775	6.675	31	10
16	6.775	6.675	31	7
19	6.775	6.675	31	7
20	6.775	6.675	31	7
21	6.80	6.70	31	0
22	6.80	6.70	30	0
23	6.90	6.725	29	10
26	6.90	6.675	29	15
27	6.90	6.65	29	15
28	6.90	6.65	29	0
29	6.90	6.65	29	5
30	6.90	6.65	28	15
High	7.30	7.20	32	7
Low	6.75	6.625	28	15
Average	6.91	6.77	30	18

* Outside market.

lower foreign market on the two following days was disappointing to hopes for more substantial export orders. The recovery in the outside market, however, dissipated expectations of a further reduction in the Trust price for the time being.

Increased Demand For Desilverized Lead.

At the beginning of the fourth week of the month a stronger tone prevailed for desilverized lead as a result of a better demand in comparison with the small sales of soft Missouri brands. During the week previous desilverized metal was at a discount; later, it commanded a premium of five points with a good demand for small lots for prompt shipment. The fact that the American Smelting & Refining Co., the largest producer of desilverized, was holding at 7c helped the independent producer to maintain a premium on desilverized over soft Missouri, although the latter is a pure metal. The demand, however, was mainly for desilverized because it is better suited to the manufacture of shot, indicating larger orders for this kind of ammunition.

A recession in the London market on June 28th, failed to affect the home market which continued firm with fair orders reported by producers. The open market, however, remained dull with concessions made on soft Missouri to attract buyers.

Month Closes Showing Net Decline of 3/8c to 1/2c at N. Y. and St. Louis.

London recovered somewhat on the following day. At the close of the month, while the Trust price remained 7c New York, independent producers were selling desilverized at 6.90c to 6.95c and soft Missouri at 6.80c to 6.90c New York. Large sales of desilverized placed independent producers in a much better position than they had occupied a fortnight previous. This competition, too, affected the Trust adversely and it was expected to result in change of policy in the near future.

The result of the fluctuations in prices in June was a net decline of 3/8c to 1/2c per pound at New York and at East St. Louis while the London market dropped £3 net on spot and £4 on futures from the end of May to the end of June.

LEAD (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19	7.50	3.70	4.11	7.67
May	3.90	4.23½	7.50	3.81	4.16	7.28
June	3.90	5.86	7.04	3.80	5.76	6.77
July	3.90	5.74		3.75	5.52	
Aug.	3.90	4.75		3.73½	4.59	
Sep.	3.86	4.62		3.67	4.53	
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 11, 1915, have been as follows:

June 11, 1915		6.50
June 12	Advanced	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	Reduced	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	.10c to 5.00
November 10	"	.15c to 5.15
November 15	"	.10c to 5.25
December 14	"	.15c to 5.40
December 31	"	.10c to 5.50
January 4, 1916	"	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	.05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60
March 14	"	.40c to 7.00
March 30	"	.50c to 7.50
June 2	Reduced	.50c to 7.00
July 5	"	.50c to 6.50

Spelter in June.

Month Opens With Renewed Activity but Develops Weakness and Closes With Net Decline in Prices of 1¼c to 2¼c.

The renewed demand for spelter that began on the last day of May continued with increasing energy during the early part of June resulting in a steady recovery in prices on all nearby positions. Although a drop to £2 to £5 at London on June 1st was disconcerting and a further break of £5 to £7 on June 2nd, caused a quiver in the home trade, a large volume of business was transacted in all positions for delivery throughout the year.

Buying Movement Strengthens Market.

The market had been barren from the middle of April to the end of May and prices had suffered a decline of over 6c per pound when buyers suddenly found their necessities to purchase urgent and apparently simultaneously entered the market with new-found confidence. Producers were willing to meet buyers at the lower level, but as each succeeding day brought more eager purchases, producing interests became more conservative and advanced prices fractionally from day to day; stimulating rather than checking the ardor of consumers and dealers. It seemed that a real buying movement was developing and that producers were preparing for a very sharp recovery in prices. It was notable, however, that the demand was confined to prime western brands. There was no important call for brass special and there were signs that producers were more desirous to move an increasing surplus of the higher grades.

The reviving strength of prime western metal was militated against by a decline in ore prices and the unsettled labor conditions at mines and smelters in the Joplin district with a strike impending because of the refusal of operators to meet the demands of the hoistermen for higher wages.

Export Demand Improves.

An improved export demand on June 6th, convinced producers that the previous break in prices abroad had been simply a maneuver for position and they became correspondingly confident asking a further advance of ¼c per pound. The sheet galvanizers were prominently in the market, buying liberally of July and August shipments, while consumers and operators gave more attention to second half and to fourth quarter deliveries of prime western, making moderate purchases at fractionally higher prices. Brass special, however, dragged at 1¼c to 2c per pound premium over prime western. The most encouraging feature was the evidence of a resuscitation of the galvanizing industry that had been prostrated by the long continued prevalence of high prices for spelter. Sheet mills that had been waiting for months, prepared to utilize galvanizing pots when the price hovered around 13c per pound.

Decline in London Fails to Check Demand Here.

Another decline of £3 at London on June 7th, failed to check the domestic demand and a significant fact was that prominent operators were actively in the market for nearby positions, paying higher prices than were the consumers. This evident effort to quicken buyers and to cause a further advance on nearby positions proved a dangerous expedient as it revealed an artificial stimulus. The upward movement culminated on June 8th, after a rise of ½c to ¾c per pound. The advance of 1c per pound asked by producers for prompt shipment was not realized. Indeed the buying movement ended on June 8th, as abruptly as it had begun suddenly at the end of May. The ominous cessation of buying at home was emphasized by a break of £2 to £5 at London but producers, believing it only a temporary lull, would make no concessions to attract buyers.

Market Loses Strength—Price Cutting Develops.

Operators, however, were more sensitive to the shifting currents of sentiment and required only a few days of dullness to change their attitude but concessions offered failed to restore confidence among consumers. As buyers remained unresponsive, holders became more eager to sell, cutting price ¼c to ¾c per pound from day to day. By June 14th, all the previous rise had been lost and the market was unsettled. Small producers, dealers and operators were pressing sales but consumers were obdurate. Sheet galvanizers, disconcerted by the turn of events, postponed attempts to revive the

industry. By the middle of the month there was no demand except from bargain hunters at ½c per pound under the lowest prices asked.

On June 16th, there was less pressure to sell and some few export orders were placed at the lowest prices current but domestic business continued dull throughout the following week with free offerings by small producers and by middlemen at steadily declining prices. A few more foreign orders were placed but without influencing the general unsatisfactory situation. Large producers became distracted by the long absence of buying orders from consumers but refused to book substantial contracts at 10c for fourth quarter delivery.

On June 23rd, the London market had receeded to £66 for spot and £56 for futures equivalent to 14.02c for spot and 11.90c for futures. Making allowance for ocean freight and for insurance and war risk, the decline placed the spot English market a little above and the future market slightly below the American parity. Domestic buyers exhibited no interest in nearby deliveries but were willing to make some commitments at 10½c for shipment in the second half and at 10c for fourth quarter delivery but the pressure to sell was for prompt and July shipments.

Anxiety of Consumers to Resell Causes Further Decline.

A few sporadic sales of nearby delivery were made during the last three days of the month. Producers and dealers were most anxious to sell brass special, the premium on which had dropped to 1¼c over the price of prime western without developing any interest by the brass founders or mills. In fact, some consumers were anxious to resell indicating an overbought state, disappointment in securing munition orders or cancellation of war contracts. On the closing day of the month spot had dropped to 11c per pound which was within ¼c per pound of the price at which the historic break in August 1915, was checked but there were no signs of a similar recovery in June; indeed, the prospect was for a further steady decline if not for a precipitous drop. The net decline in the spot domestic price in June was 2⅛c on prompt and 1½c to 1¾c on futures. From the highest spot price touched this year the break was 10c per pound. Since June, 1915, when the maximum price of 27c was established, the break has been 16c per pound, but the spot price at East St. Louis was still 5.45c per pound higher than the minimum price touched in January 1915.

The net result of the fluctuations in June prices at London was a drop of £19 on spot and £14 on futures.

SPELTER PRICES IN JUNE.

	New York.	St. Louis.	London.		
Day.	Cents.	Cents.	£	s	d
1	13.30	13.12½	75	0	0
2	13.30	13.12½	70	0	0
5	13.42½	13.25	73	0	0
6	13.67½	13.50	76	0	0
7	13.67½	13.50	73	0	0
8	13.92½	13.75	76	0	0
9	13.92½	13.75	71	0	0
12	13.80	13.62½	70	0	0
13	13.55	13.37½	68	0	0
14	13.30	13.12½	68	0	0
15	13.30	13.00	68	0	0
16	13.05	12.87½	68	0	0
19	12.80	12.62½	68	0	0
20	12.42½	12.25	68	0	0
21	12.17½	12.00	67	0	0
22	12.05	11.87½	67	0	0
23	12.05	11.87½	66	0	0
26	11.92½	11.75	65	0	0
27	11.80	11.62½	65	0	0
28	11.55	11.37½	63	0	0
29	11.40	11.18¾	63	0	0
30	11.17½	11.00	61	0	0
High	14.05	13.87½	76	0	0
Low	11.05	10.87½	61	0	0
Average	12.80	12.62	68	11	10

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc since Nov. 22nd together with the price of spelter ruling on the same day.

	Sheet Zinc.	Spelter St. Louis.
1915—		
November 22	21.00	18.75
November 23	22.00	18.75
December 31	23.00	17.25
1916—		
January 26	24.00	19.00
February 17	25.00	20.87½
April 22	25.50	18.75
May 15	24.50	15.50
May 23	23.50	14.87½
May 26	22.50	14.12½
June 2	21.00	13.12½
June 13	20.00	13.37½
June 21	19.00	12.00
June 28	18.00	11.37½
July 6	17.00	9.37½

Joplin Zinc And Lead Ore Markets.

The month of June showed a heavy decline in prices paid for zinc ores. A very material rise in lead ores and an increase of surplus stocks in both.

From an average of $90.15 for zinc blende during the month of May the average price dropped to $74.30 for the month of June. The total tonnage shipped also fell off 200 tons a week. The base price offerings range from $60 to $90 throughout the month. Practically the only variation in price was in the low and intermediate grades of ore.

Calamine ores dropped from $64.13 average in May to $53.57 in June, and shipments from 622 tons to 540 tons per week. The average price for calamine ore did not vary to any great extent throughout the month. The surplus stock of zinc blende ores rose from 17,190 tons to 23,650 tons and increased equivalent to very nearly 25% of the monthly shipment. In this connection, it is well to call attention to the productive conditions that have prevailed during the month. When the previous month's ore price averages were made and called for reduction in wages, there was a precipitated strike by the hoistermen of the field. Practically all of the union hoistermen of the district walked out, demanding an increase of 25c per day, instead of accepting a cut of 50c per day. This shut down a number of the mines for a period of from ten days to two weeks' time, but most of the operators immediately put on new hoistermen, and while many of them were green, their efficiency low, and interference in some cases, the operators did keep their mines going. There was, of course, a considerable reduction in output on this account. The third week of the month witnessed the most severe flood the district has seen in years. Many of the mines are flooded and still out of commission. Heavy water in others caused a shut-down of several days. It is believed this cause alone has curtailed the production about 3,000 tons per week for the last two weeks of the month. Had it not been for these two causes of curtailment, the growth in surplus stocks would have been very much greater; the total probably would have reached 30,000 tons of ore.

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	21.20
June	7.25	5.50	5.37	25.60	17.40
July	7.46	5.61	5.26	24.90	
Aug.	7.34	5.99	5.66	19.30	
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

Lead.

The decline in lead prices which started at the end of May continued throughout the month of June, receding from $85 the first week to $77.50 the last week. With such a decline in the market it was natural that stock would accumulate, and the shipments grow less. The average price of all ore sold for the month was $89.21, as compared with $92, for the previous month. The average weekly shipment was 968 tons compared with 1,102 tons for the previous month. The stocks increased from 1,250 tons at the end of May to 2,000 tons at the end of June.

One of the other features which marked developments in the field was the absorption of the Granby Mining & Smelting Company by the American Zinc, Lead & Smelting Company. This transaction was the largest single movement in zinc circles that has taken place in years, and makes this combination one of the biggest factors in the zinc industry.

SPELTER (Monthly Averages.)

	New York		St. Louis	
	1915.	1916	1915.	1916.
Jan.	6.52	18.18	6.33	18.01
Feb.	8.86½	20.09	19.92	19.92
Mar.	10.12½	18.09½	9.80	17.91
Apr.	11.51	18.61½	11.22	18.44
May	15.82½	15.93	15.52½	15.75½
June	22.62½	12.80	22.14	12.62
July	20.80		20.54	
Aug.	14.45		14.19	
Sept.	14.49		14.10½	
Oct.	14.07		13.89	
Nov.	17.04		16.87½	
Dec.	16.91		16.72	
Av.	14.44		14.16	

Lead and Zinc Mines Promise Largest Output On Record.

Reports received by the United States Geological Survey show that the mine production of lead and zinc ores during the first six months of 1916 was much larger than that of any preceding six months. The lead and zinc mines have been able to produce all the ore needed to supply the increased capacity of the smelters. The ore and concentrates were sold at prices which yielded large profits, notwithstanding increased costs of production and the working of large quantities of low-grade ore which could not be mined at a profit under normal conditions. High-grade zinc concentrates free or nearly free from lead and iron continued to be in demand, and the base price offered for such concentrates was generally much higher than that offered for low-grade concentrates.

The shipments of sphalerite concentrates from the Joplin region during the first six months of 1916 amounted to about 180,000 tons, valued at more than $17,000,000, as against 296,000 tons, valued at $23,419,000 for the calendar year 1915. The demand was not as active during the last month of the year, when the base price for concentrates decreased nearly $20 a ton. Unless the base price declined to a point which will prevent the mining of lean "sheet ground" the production of zinc concentrates from the Joplin region in 1916 will probably be 60,000 to 70,000 tons more than in 1915.

Development in the Miami, Okla., camp continues to be favorable, and the production should be much larger during the last half of 1916. The increase from Kansas will not be large, for excessive rains have hampered operations. The "soft ground" mines in southwest Missouri have not shown any largely increased yield, but the "sheet ground" has been actively mined and many new mills put in operation. The strike of the hoistermen in the Joplin district reduced the output in June, though few of the mines were closed down for any great length of time. Some of the mine owners seized the opportunity to make much needed repairs or additions to their plants.

The stock of zinc concentrates unsold in June was larger than usual but probably was not much more than two weeks' production. The production of zinc carbonate and silicate showed no great increase, and the galena concentrates sold indicate a production of about 56,000 tons in 1916, or 11,000 tons more than in 1915. The selling price of the lead concentrates was nearly double the average price in 1915. The large mines in the disseminated lead district of southeastern Missouri were operated steadily, and although no figures are available for 1916 the output was larger than it was during the first or the last half of 1915.

The number of producing zinc properties in Arkansas increased rapidly and many new mills were operated. The output of sphalerite concentrates was negligible but that of zinc carbonate increased more than 100%. The zinc carbonate is of high grade, and the production of such ore in 1916 in Arkansas being exceeded only by that of the Joplin region.

The zinc ore mined in New Jersey in 1916 was at least as large as in 1915, and the production from Tennessee and Virginia was larger than in the first six months of 1915.

The shipments of raw sphalerite from mines in the Upper Mississippi Valley region steadily increased, and the capacities of the roasting and separating plants were much greater than in 1915. A number of new mines were opened and concentrating plants constructed.

The New Diggings camp was especially active, though development was active in all the other camps.

The shipment of raw sphalerite concentrates amounted to more than 100,000 tons, compared with shipments of 162,000 tons during the calendar year 1915.

In the Western States small increases of both lead and zinc were made in Arizona, Colorado, New Mexico, and Washington. In Nevada an increased quantity of zinc ore was shipped from Clark County and the lead ore shipments from the Pioche, Goodsprings, and Eureka districts indicate a considerably large output of lead from Nevada for 1916.

In Utah the Bingham district made a record output of lead during the first six months of 1916. The zinc production of Utah will probably be only slightly more in 1916 than it was in 1915.

Copper in June.

Marvelous Showing Made by Copper Industry During First Half 1916—Curtailed Consumption and Belief End of War is Near Causes Further Decline in Prices.

The achievements of the copper industry during the first half of 1916 were no less marvelous than were the performances of the great American steel manufacturing plants. The production of refined copper since January 1st has fallen only slightly under 1,100,000,000 pounds, which is at the rate of 2,200,000,000 pounds for the year; whereas the previous maximum annual output in trade history, realized last year, was 1,634,204,448 pounds. In the last six months metal has been smelted and refined at the rate of 182,000,000 pounds per month against an average monthly output last year 135,-350,000 pounds. In June the refined output was approximately 200,000,000 pounds.

The deliveries into domestic consumption during the half year have been record-breaking also, 700,000,000 pounds, which is at an average monthly rate of 117,000,000 pounds. The maximum monthly deliveries made in April and May were between 125,000,000 and 130,000,000 pounds, but the June consumption was cut sharply and many requests made to producers to hold back shipments on contracts, resulted in deliveries of scarcely more than 110,000,000 pounds, but even the latter amount exceeded the average monthly consumption in 1915, by 23,-000,000 pounds.

Heavy Exports in June Compensate for Poor Record of May.

Exports in the past six months have aggregated 328,655,040 pounds, exceeding the foreign shipments during the first half of 1915 by 23,000,000 pounds. The June exports, 85,731,520 pounds, the largest of any month since December, 1915, compensated for the minimum exports in May, which were the smallest of any month since September, 1915. The average monthly exports in the past sixty days has been a little over 27,000 tons, equivalent to 60,926,-080 pounds. Unless there is a further sharp gain in the average monthly foreign shipments during the next six months the total exports for the current year will fall nearly 30,000,000 pounds under the exports in 1915, which were the smallest annual exports since 1907.

Six Months Consumption of Copper Breaks All Records.

The total deliveries into domestic and foreign consumption during the first half of 1916 have been approximately 1,028,-000,000 pounds, the largest deliveries in the history of the industry, being at the rate of 171,000,000 pounds per month which, if continued to the end of the year, indicates a total yearly consumption of 2,052,-000,000 pounds.

According to the U. S. Government reports, surplus stocks of refined copper at the beginning of the year, in the hands of producing interests, were 82,429,666 pounds. The supply available for consumption since January 1st, thus, has been in excess of 1,182,000,000. As total deliveries during the same time have been 1,028,000,-000 pounds, the indication is that the surplus in the hands of producers to-

COPPER PRICES IN JUNE.

	—— New York ——			London.
	Lake.	Electro.	Casting.	Standard.
Day.	Cents.	Cents.	Cents.	£ s d
1	28.25	28.50	26.25	120 0 0
2	28.25	28.50	26.06	120 0 0
5	28.25	28.50	26.06	124 0 0
6	28.25	28.50	26.00	124 0 0
7	28.25	28.50	26.00	124 0 0
8	28.00	28.00	28.875	123 10 0
9	28.00	28.00	25.875	123 10 0
12	28.00	28.00	25.75	121 10 0
13	27.875	27.875	25.625	121 0 0
14	27.50	27.625	25.25	118 0 0
15	27.50	27.625	25.25	118 0 0
16	27.25	27.25	25.125	113 0 0
19	27.00	27.00	24.875	110 0 0
20	27.00	27.00	24.625	106 0 0
21	26.875	26.875	24.50	98 0 0
22	26.75	26.75	24.375	97 0 0
23	26.75	26.75	24.125	98 0 0
26	26.75	26.75	24.125	102 0 0
27	26.75	26.75	24.125	102 0 0
28	26.75	26.75	24.125	103 0 0
29	26.875	26.75	24.125	104 0 0
30	26.75	26.625	24.125	103 0 0
High .	28.50	28.875	26.50	124 0 0
Low .	26.50	26.375	24.00	97 0 0
Av'ge.	27.44	27.495	25.10	112 8

LAKE COPPER PRICES.

Monthly average prices of **Lake Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	29.28½
June	17.43	15.08	14.15	19.92	27.44
July	17.37	14.77	13.73	19.42	.....
Aug.	17.61	15.79	12.68	17.47	.....
Sept.	17.69	16.72	12.43½	17.76	.....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av.	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Monthly average prices of **Electrolytic Copper** in New York.

	1912.	1913.	1914.	1915.	1916
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	29.81
June	17.29	14.85	13.81	19.71	27.49½
July	17.35	14.57	13.49	19.08	....
Aug.	17.60	15.68	12.41½	17.22	....
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av.	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Monthly average prices of **Casting Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	27.37
June	17.08	14.72	13.65	18.74½	25.10
July	17.09	14.40½	13.34½	17.76½	.....
Aug.	17.35	15.50	12.37	16.46	.....
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av.	16.29	15.33	13.18	16.76	....

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper so far this year are given below together with the price of Lake Copper on the same dates:

1916—	Sheet Copper.	Lake Copper.
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 19	36.50	29.75
May 5	37.50	29.75

WATERBURY COPPER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.50	17.00	14.75	14.12½	24.75
Feb.	14.50	15.50	15.12½	15.25	27.75
Mar.	15.00	15.12½	15.00	15.75	28.00
Apr.	16.00	15.75	14.87½	18.50	29.00
May	16.37½	15.87½	14.75	22.50	29.87½
June	17.50	15.37½	14.37½	22.30	28.25
July	17.75	14.75	14.12½	22.25	....
Aug.	17.75	15.62½	13.00	19.50	....
Sept.	17.87½	16.87½	12.87½	18.50	....
Oct.	17.75	16.87½	12.25	18.25	....
Nov.	17.75	16.25	12.25	19.37½	....
Dec.	17.75	15.00	13.50	20.75	....
Av.	16.71	15.83	13.91	18.94	....

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January	25,026	36,018	26,193	23,663
February	26,792	34,634	15,583	20,648
March	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	21,654
May	38,601	32,077	28,889	16,062
June	28,015	35,182	16,976	*38,373
July	29,596	34,145	17,708	.....
August	35,072	16,509	17,551	.....
September	34,356	19,402	14,877	.....
October	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December	30,653	22,166	42,426	.....
Totals	382,810	360,229	276,344	146,721

* Includes only exports from Atlantic ports.

day is 154,000,000 pounds. The accumulation in the half year has been 70,000,000 pounds. Stocks to-day, therefore, are equivalent to less than 24 days production and to less than one month's consumptive requirements.

Output of Refineries Well Sold Up.

It will be recalled that early in the second quarter of the year, it was reported that the producing interests had made sales on domestic and foreign account equivalent to nine months output of the refineries at that time. Production has since increased but some additional substantial sales were made early in May. Since the middle of May, producers have sold very little metal for either nearby or for future shipments. It is therefore estimated that producers contracts booked to July 1st including some large tonnages sold during the last two months of 1915, aggregated a little over 1,635,000,000 pounds. As deliveries to the end of June have been over 1,028,000,000 pounds, it is indicated that unfilled orders to-day are something more than 600,000,000 pounds, equivalent to three months production at the maximum rate of output. There is also a surplus of 154,000,000 pounds available for delivery on contracts. Orders booked were not evenly distributed so that some producers may need orders in September, while others have capacity well sold through the year.

Smaller Consumption Weakens Market.

One of the most significant developments in June was the decrease of melting by domestic consumers, resulting from the smaller orders for war munitions, in conjunction with the demands of labor for shorter hours of work and for higher pay followed by a decrease of efficiency. With smaller consumption, supplies accumulated and stocks becoming burdensome, consumers either sold the surplus in the open market or asked for delay in shipments on contracts. As the month advanced, the pressure to sell in the open market became more pronounced and prices yielded more and more, the decline for the month being 1¼c to 2c per pound. Since early in May, when the rise culminated, the decline has been between 3 and 4c per pound on nearby months and 3 to 3½c on shipments over the last quarter of the year. To-day spot Electrolytic is difficult to sell at 26¾c to 27c; July 26¼c to 26½c; August at 26c to 26¼c; September at 25¾c and later months at 25½c per pound.

Freer Offerings by Second Hands Offset Good Effect of Inquiries.

During the last week of June, large selling interests were encouraged by more numerous inquiries from abroad and by somewhat better demand for fourth quarter shipments from small domestic consumers but with freer offerings by second hands the decline was only temporarily checked. A few supplementary orders were placed to cover belated munitions contracts but the demand was quickly satisfied.

Belief that the European war will be over by the end of the year gained ground throughout the trade during the month which, in the open market, increased the desire to sell.

Foreign Market Dull and Weak.

The European market was dull, heavy and weak most of the month and during the first three weeks prices of American Electrolytic at London suffered a drop of £14 from £144 to £130, with a subsequent recovery of £2. The Standard market broke £24 by June 22nd, and later reacted £6 on spot and £5 on futures with sales of small lots of spot on the closing day of the month at £103 and sales of futures at £100, being a net decline of £18 on spot and of £19 on futures.

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since Nov. 22, 1915, are given in the following table together with the price of Lake Copper on the same dates:

1915—	Sheet Copper.	Lake Copper.
November 22	24.50	19.87½
November 23	25.00	19.87½
December 22	25.50	20.50
December 23	26.00	20.75
December 24	27.00	21.50
December 30	27.50	22.37½
1916—		
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 19	36.50	29.75
May 5	37.50	29.75

An Optimistic View Of The Copper Situation.

"Walker," Boston, discusses the copper situation as follows:

In the year 1912 Germany and Austria-Hungary imported 576,448,320 pounds of copper, and in 1913 587,623,680 pounds. Presumarbly, therefore, these countries would have imported approximately 600,000,000 pounds in 1914 and 615,000,000 pounds in 1915, had there been no war. An examination of the statistics shows that the United States exported 251,117,440 pounds less copper in 1915 and consumed only about 225,000,000 pounds more than in 1913. In order to make it appear that the war demand equalized the loss of Germany and Austria's markets, therefore, it would be necessary to show that nearly three-quarters of all the copper taken by the manufacturers of the United States last year was converted into war munitions. Consumers declare that the proportion was much smaller than this.

The consumption, production and imports of the various countries of Europe for the years 1912 and 1913 are given in the following tabulation in pounds of copper:

	—1912.—			—1913.—		
Country.	Consumed.	Produced.	Imported	Consumed.	Produced.	Imported.
England	330,514,240	672,000	329,842,240	330,252,160	940,800	329,311,360
France	239,126,720	.....	239,126,720	240,313,920	.....	240,313,920
Russia	86,952,320	73,942,400	13,009,920	88,424,000	74,457,600	13,966,400
Italy	77,006,720	5,152,000	71,854,720	69,195,840	3,584,000	65,611,840
Total	733,600,000	79,766,400	653,833,600	728,185,920	78,982,400	649,203,520
Belgium and Holland	29,120,000	.....	29,120,000	29,120,000	.....	29,120,000
Scandinavia ..	16,800,000	27,948,480	*11,148,480	19,040,000	28,246,400	*9,206,400
All others† ..	5,600,000	132,003,200	*126,403,200	6,720,000	120,590,400	*113,870,400
Total	51,520,000	159,951,680	*108,431,680	54,880,000	148,836,800	*93,956,800
Germany	544,707,520	56,492,800	488,214,720	574,707,840	55,798,400	518,909,440
Aust'a-H'ng'ry	113,321,600	25,088,000	88,233,600	91,887,040	23,172,800	68,714,240
Total	658,029,120	81,580,800	576,448,320	666,594,880	78,971,200	587,623,680
Grand total	1,443,149,120	321,298,880	1,121,850,240	1,449,660,800	306,790,400	1,142,870,400

* Excess exports. † "All others" figures include Spain and Portugal, where the Rio Tinto, Tharsis and other leading producing mines of Europe are located.

The detailed figures of 1915 are not yet available and those for 1914 are of little or no value, covering as they do seven months of peace and five months of war. Contrast the total imports of these countries in 1913, namely 1,142,870,400 pounds, with United States exports for the same year of 857,494,400 pounds, and it will be seen that nearly 80% of their surplus requirements were supplied by this country. It will be noted also that about 56% of Europe's total imports were taken by Germany and Austria-Hungary.

The statistics show that about 820,000,000 pounds of copper was consumed in the United States in the year 1912 and about 767,500,000 pounds in 1913, and that 1,044,400,000 pounds was taken by our manufacturers in 1915, the increased home consumption being less than the decrease in exports. Unless there was a very much greater reduction in the industrial demand for copper than anyone so far has estimated, the munitions consumption for 1915 could not have equalled the 615,000,000 pounds that Germany and Austria would have taken last year had their peaceful industrial progress continued.

The statistics collected from various sources by the **American Metal Market** of New York, when reduced to pounds and summarized, show the following:

	1913.	1915.	
United States production	1,224,484,098	1,365,500,000	Increase 141,015,902
United States imports	405,410,000	301,640,000	Decrease 100,800,000
United States supplies	1,629,924,098	1,660,140,000	Increase 30,215,902
United States exports	857,494,400	606,376,960	Decrease 251,117,440
Left for home consumption	772,429,698	1,053,763,040	Increase 281,333,342

Of the 281,333,342 pounds increase in the amount left for home consumptnon it is probable that at least 150,000,000 pounds was added to the quantity in process of electrolytic refining, the refineries having been running at about 60% capacity at the beginning of the year and full at the end. Consideration of this point makes it appear that the estimate of 1,044,400,000 pounds as the consumption of the United States in 1915 was too high rather than too low.

When one analyzes the production, consumption, imports and exports statistics of the various countries of the world during the several years preceding the outbreak of the European war he is forced to the conclusion that in the event of a world-wide industrial revival following the re-establishment of peace the annual consumptive demand will approximate 3,000,000,000 pounds of copper, or 700,000,000 pounds more than ever has come from the mines in a single year. Germany and Austria apparently will have reclaimed from wires, roofs, hardware, cooking utensils, etc., approximately 1,000,000,000 pounds during the two years of warfare, the armies and navies of those countries having fired as many shells as have the allies. This copper should, an naturally will be replaced. That half the amounts so used will be picked up and recovered from the battlefields would be a generous estimate. If those countries are 500,000,000 pounds short on copper in use, 1,200,000,000 behind on imports and have no supplies in their manufacturing plants when the war ends it must be assumed that they will import 850,000,000 pounds or more for each of the first three years following the restoration of peace and 750,000,000 or 800,000,00 pounds annually thereafter.

There are other factors which indicat that the world-wide demand for copper fo industrial uses will increase very much mor rapidly in future years than it did prior t the outbreak of the European war. For in stance, the annual convention of the Amer can Railway Master Mechanics' Associatio and affiliated bodies at Atlantic City de voted an entire day revently to the dis cussion of the electrification of the entir railroad systems of the United States. A though the steam locomotive had its stron dependers, all of the speakers are declare to have admitted the growing favor of elec tric power. It seemed to be the concensu of opinion that the change, not alone fo the passenger service, but for freight a well, would prove ultimately an economi measure.

If the railroad systems of the Unite States are on the way to electrification may be put down as certain that those o the whole world are also. Of course suc a change would not be accomplished in decade or hardly in a score of years, an once the undertaking is under way it wi be retarded seriously by inability of th mines to supply the required amount of cop per for this in addition to the world's othe industrial needs.

The outlook for the copper producing an manufacturing industries is very much mor promising, therefore, than ever heretofor In view of all the facts it is most surprisin that either consumers or producers shoul entertain hopes or fears that the price o the metal will decline again to 15 cent or less per pound.

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Antimony In June.

Absence of Ammunition Orders Makes Market Dull and Lifeless.

The lifeless market for antimony for many weeks was, and now is, due to the absence of ammunition orders, just as the previous great activity, and the accompanying high prices, resulted from the heavy war orders for shrapnel shells—each shell requiring 12 pounds of antimony. Last year many large shrapnel orders were placed with American manufacturers. More recently most of the Allies Government's ammunition contracts placed here, were for high explosive shells. Shrapnel is still being used extensively on the firing line but most of such shells are being manufactured in Europe.

In ordinary times the American antimony trade is confined to jobbing lots of from one to five tons. Seldom are large future contracts executed in times of peace and importers carry only moderate stocks commensurate with consumptive requirements. Large war orders, of course, placed here for some months stimulated speculation and in the face of the recognized danger of such operations, many dealers, new to the trade, took hazardous chances. The large profits, at first secured, increased the desire to plunge deeper. When large buying suddenly ceased, the trade generally was caught with heavy future commitments with small opportunity to pass on the burdensome surplus. Losses and disappointment replaced profits and optimism.

Continued Decline in Prices.

In June, the trade was painfully readjusting to the changing conditions and as a result prices dropped 10c per pound making the full break from the highest point—45c for Oriental reached in March—29c for spot. The average price for Japanese and Chinese antimony in normal times is in the neighborhood of 6c to 7c per pound. The present price of 15½c of course is relatively high because of the absence of other brands because of the absence of other brands which usually are given preference. In the last sixty days the domestic spot price for American and Japanese has fallen 23½c per pound.

The free offerings to America from the Orient in May were attributed to the cancellation of large Russian contracts placed in Japan. The metal thus suddenly released was pressed for sale here increasing the competition in an already congested market.

Free offerings of Metal Cause Further Concessions.

At the beginning of June, jobbing lots of spot metal were freely offered at 24c to 25c for which there was scarcely any demand. Requirements of consumers generally were well covered either by contracts or by metal in stock. Even had consumers been in need, they would have deferred purchases while the pressure to sell was plainly evident. The anxiety for orders was made more apparent about June 7th, when a fair-sized inquiry brought out offerings

ALUMINUM, SILVER and ANTIMONY PRICES IN JUNE.

	Aluminum.	— Silver —		Antimony.
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents.
1	60.00	68¾	32⅞	24.50
2	60.00	64⅞	31	24.50
3	.....	64¾	31	.....
5	60.00	66½	31¾	24.50
6	60.00	66⅞	31⅝	24.00
7	60.00	66⅝	31 13/16	22.50
8	61.00	66⅛	31⅝	22.50
9	61.00	62¾	30	22.00
10	.....	63¼	30¼	.....
12	61.00	64⅞	31	21.50
13	61.00	63⅞	30½	20.50
14	62.00	63	30⅛	20.50
15	64.00	62⅞	30 1/16	20.00
16	64.00	63⅛	30 1/16	20.00
17	.....	63⅞	30½	.....
19	64.00	64¾	30 1/16	19.00
20	64.00	64⅛	30⅝	19.00
21	64.00	64¼	30 1/16	19.00
22	64.00	65	31	18.50
23	64.00	65⅜	31 1/16	18.50
24	.....	66⅜	31 1/16	.....
26	63.00	65¾	31⅜	18.25
27	63.00	66	31½	18.00
28	62.00	66¼	31⅝	17.50
29	62.00	65⅞	31 1/16	17.00
30	62.00	65	31	17.00
High .	65.00	68¾	32⅞	25.00
Low ..	59.00	62¾	30	16.50
Av'ge .	62.09	65.02½	31.06	20.40

at 22c but no business resulted. The weakness of sellers was demonstrated day by day by prices dropping ½c per pound. Greater concessions would have been granted had any serious intention been shown to place a desirable order. By the middle of the month, prices had dropped 4c to 5c per pound. Importers' stocks were large and burdensome, although not excessive, but it was felt that consumers' supplies were decreasing.

Lowering of Prices Continues But No Business Results.

On June 22nd, some inquiries for future delivery, to cover an ammunition contract, it seemed, developed keen competition and brought out offers to sell at 15½c duty paid for Aug. and Sept. delivery in 25-ton lots. Jobbing lots of spot were offered at 18½c or less. Little if any business resulted. No improvement was apparent during the last week of the month and more pressure to sell caused a further drop to 16½c per pound for small spot lots. No interest in future contracts was evident. The month closed upon a depressed and inanimate market with dealers mentally at sea and with prices of a nominal character.

MONTANA MINES ACTIVE IN 1916.

The unusually high prices of metals in 1916 have stimulated mining to a marked degree in Montana, especially at Butte. At the present rate of production, there will be notable increases in the output of all metals, and a marked increase in the total value of the output. According to reports received by the United States Geological Survey from its Salt Lake representative, V. C. Heikes, the output is now being made at a rate which will give a total value of about $140,000,000 to the year's metals instead of about $87,000,000, the value in 1915. The production of gold from precious metal bullion is showing a large increase and will be augmented by gold from a much greater output of copper ore. The production of silver will doubtless keep pace with that of copper and with the increased output of zinc. The production of copper, though below the normal in January and February, has been increased toward the middle of the year by both the Anaconda and East Butte companies. This gain indicates that the output of copper for the year may be 350,000,000 pounds against 275,000,000 pounds in 1915. The East Butte mine was averaging 1,300,000 pounds a month the first five months and the Anaconda about 26,000,000 pounds a month, with a better rate in April and May. The latter company has been busy remodeling its big concentration plant at Anaconda and constructing a zinc plant, as well as building a new refinery at Great Falls.

An increase of about 30% in the output of zinc during the year is indicated. For the first quarter of 1916 the Butte & Superior mine produced nearly 48,000,000 pounds of gross zinc in concentrates, or at the rate of 192,000,000 pounds a year. The Elm Orlu mine has also increased shipments of zinc concentrates to about 5,000 tons a month and may increase this rate. The lead production will probably be increased because of the great amount of concentrates derived from lead-zinc ores. High prices of metal have given better wages and unusual profits, and may result in record outputs of all metals.

CHINESE and JAPANESE ANTIMONY.

Average monthly price of **Chinese** and **Japanese** (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	32.20½
June	7.07	7.62	5.62½	36.53½	20.40
July	7.37	7.55	5.44	35.98	....
Aug.	7.58	7.48	13.05	32.57	....
Sept.	8.00	7.31	9.79½	28.50	....
Oct.	9.11	6.46	11.64	30.96	....
Nov.	9.11	6.28	14.14	37.88	....
Dec.	9.05	6.05	13.15	39.36½	....
Av.	7.63	7.43	8.53½	29.52	...

Aluminum In June.

Aluminum was steady but quiet during the first week of June with some small sales of ingots made in the open market at approximately the prices current during May. At the beginning of the second week, a stronger tone was developed by an improved domestic demand at 59½c to 60c per pound for No. 1 Virgin and by some export sales at 61c per pound. Sales of cable wire, also were made at 52c to 55c following small orders at 56c placed during the preceding week.

In June, as in April, the Aluminum Co. of America fell behind in making deliveries on contracts, which checked a disposition among purchasers, to resell metal received on contracts for specific dates of delivery. The difficulty of obtaining supplies caused a firmer feeling and slightly higher prices prevailed for jobbing lots.

More prospective foreign orders also helped the upward tendency. Before the export inquiries were generally known, however, most of the floating supply in the open market had been concentrated in a few hands. The foreign negotiations were on future shipments for which positions holders asked a premium over the prices current for spot, the latter being advanced to 60c to 62c for Virgin No. 1 and 58c to 60c for 98-99% remelted but No. 12 alloy remelted was in more ample supply and relatively easier at 48c to 49c per pound. Quiet buying continued for several days and prices advanced 1c to 2c per pound. By the middle of the month most of the supplies available in the open market, had been absorbed and while small lots of No. 1 Virgin sold at 63c to 64c, carload lots were held at 65c and 98 to 99% remelted, was difficult to buy under 63c. In fact, the small supplies available for resale, were practically cornered and prices were arbitrarily held at 63c to 65c for No. 1 Virgin and at 61c to 63c for 98-99% remelted but no attempt was made to control supplies of No. 12 alloy, remelted.

As usual, however, under such circumstances, the sharp advance in asking prices brought out invisible supplies and offerings to sell from unexpected sources at concessions of 1c to 2c per pound from the prices demanded for the cornered supplies. No domestic buyers could be found even at these prices and the budding export orders were withdrawn. Home buyers were offered a few small lots of spot Virgin at 63c but scarcely any sales resulted.

During the last week of the month this latter price was shaded 1 to 1½c and even 2c per pound with buyers still holding aloof. Before the end of the month there was a further reaction to about 61c for jobbing lots of No. 1 Virgin ingots. Exporters were no longer in the market but a further recession may encourage new foreign inquiries with hope of better success in securing moderate amounts in the open market.

ALUMINUM AND SILVER PRICES.

	New York					
	—Aluminum—			—Silver—		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	18.86	19.01	54.33	57.56	48.89½	56.77½
Feb.	18.80½	19.20	57.50	57.50½	48.48	56.75½
Mar.	18.30	18.94½	60.52	58.07	50.24	57.92½
Apr.	18.08	18.83	60.00	58.52	50.25	64.37½
May	17.93	21.85	60.00	58.18	49.91½	74.27
June	17.82	29.66	62.09	56.47	49.03	65.02½
July	17.59	32.50	.....	54.68	47.52	.....
Aug.	20.38	34.00	.....	54.34	47.18	.....
Sep.	19.28½	46.75	.....	53.29	48.68	.....
Oct.	18.25	54.17½	.....	50.65	49.38½	.....
Nov.	18.83	57.85	.....	49.10	51.71	.....
Dec.	19.02	56.80½	.....	49.38	54.97	.....
Av..	18.59½	34.13	.....	54.81	49.69	.....

QUICKSILVER PRICES.

Monthly average prices of **Quicksilver** in New York (flasks of 75 pounds).

	1913.	1914.	1915.	1916.
Jan.	40.00	38.05	50.90	214.76
Feb. ...	40.00	38.00	58.05½	288.50
Mar.	39.50	38.00	62.93½	223.91
April ...	39.14	38.00	65.71½	140.10½
May	39.19	38.00	72.65	96.95
June	39.67	37.73	87.91	73.04½
July	39.00	35.87	93.33	....
Aug.	39.00	74.19½	91.79½	....
Sept. ...	39.00	73.57	89.09½	....
Oct.	38.59	50.59½	92.40	....
Nov.	38.00	51.72	102.25	....
Dec.	38.50	51.61	126.52	....
Average.	39.13	47.11	82.80	....

Continued Demand for Quicksilver.

The domestic quicksilver industry has continued active during the first six months of 1916, and the average price for the period has been about double the exceptionally high average for the entire year 1915.

Figures just compiled by the United States Geological Survey show that the total production of quicksilver in the United States in 1915 was 21,031 flasks of 75 pounds each, having a marketed value of $1,826,912, or an average of $86.86 per flask. Of this output 14,283 flasks, selling for $1,174,881, came from California, and the remainder almost entirely from Texas and Nevada. The actual average sales value for the whole country exceeded the average market value in San Francisco—which was $85.80 for the year. In 1914 the domestic output was 16,548 flasks, valued at $811,680, and therefore the production for 1915 showed an increase of over 27% in quantity and 125% in value.

The increased domestic demand for quicksilver in the last 18 months has been due mainly to war requirements for fulminate and drugs. Early in 1915 domestic stocks began in be drawn upon and production became more active, but as foreign embargoes left the field clear and domestic output was unable to meet the rapidly increasing call for the metal, prices continued to rise throughout the year and into the early months of 1916, the high mark of $300 a flask being passed in February. Naturally every mine and prospect became of interest. The reaction set in, however, as the high prices drew out quicksilver supplies in Mexico and elsewhere that had been originally purchased for amalgamation of gold and silver ores, and finally as the British Government permitted exports to America under certain limitations. The average monthly domestic price in San Francisco, which had climbed from $51.90 in January, 1915, to $295 in February, 1916, dropped to $219 in March, $141.60 in April, $90 in May, and about $72 in June.

The market remains steady and in general highly profitable, and as domestic prices have dropped below London quotations exports rather than imports of the metal may be expected. There is probably no great quantity of metal stored, and consumption is undoubtedly abnormally large.

Favorable markets have brought out great activity in search for new prospects, and discoveries near Morton, Wash., and Beagle, Ore., in 1916 have led to some development and construction of reduction plants. Also in the Skull Valley deposits, Ariz., referred to many years ago by W. P. Blake, and at Black Pine, Idaho, some activity is reported. Many old furnaces have been repaired or enlarged in California, Nevada, and Texas, old workings have been reopened, and new discoveries have been developed.

Very likely the exceptionally high prices of the last few months have led to gouging and robbing many mines of their best ore, and the average tenor of the ore worked by the larger mines during the first half of 1915 may prove considerably below that of previous years. Moreover, some mines have undoubtedly passed their maximum productivity. These conditions are probably offset to some extent by the fact that more furnace capacity is now working on quicksilver ores than at any previous time in the history of the industry. On the whole the midyear outlook is for an output in 1916 fully equal to that of 1915.

BRANDS OF COPPER IN UNITED STATES.

LAKE.

	Refined at:	Branded.
Adventure	Hancock, Michigan.	Adv. C. Co.
Atlantic	Houghton, Michigan.	A.
Calumet & Hecla	Hubbell, Michigan.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	B. L.
Centennial	Hancock, Michigan.	C. C. M. Co.
Copper Range	Houghton, Michigan.	C. R.
Franklin	Hancock, Michigan.	F. M. Co.
Isle Royale	Dollar Bay, Michigan.	I. R. C. Co.
Mass.	Hancock, Michigan.	Mass.
Michigan	Houghton, Michigan.	M. C.
Mohawk	Houghton, Michigan.	M. M.
Osceola	Dollar Bay, Michigan.	T. O.
Quincy	Hancock, Michigan.	Q. M. Co.
Tamarack	Dollar Bay, Michigan.	T. O.
Victoria	Hubbell, Michigan.	V. C.
Winona	Hubbell, Michigan.	W. A.
Wolverine	Houghton, Michigan.	W.

ELECTROLYTIC.

	Refined at:	Branded.
American S. & R. Co.	Perth Amboy, N. J.	P. A.
Balback S. & R. Co.	Newark, N. J.	Bb.
Baltimore Copper Works	Baltimore, Md.	B. E. R.
Boston & Montana Co.	Great Falls, Mont.	B. & M.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Copper Queen	Laurel Hill, L. I.	C. * Q.
Miami	Laurel Hill, L. I.	A. L. S.
Nichols Copper Co.	Laurel Hill, L. I.	L. N. S.
Orford Copper Co.	Chrome, N. J.	O. E. C.
Raritan Copper Works	Perth Amboy, N. J.	N. E. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. R. W.
United Metals Selling Co.	Laurel Hill, L. I.	R. M. C.

CASTING.

	Refined at:	Branded.
Balbach S. & R. Co.	Newark, N. J.	N. B. C.
Boston & Montana Co.	Great Falls, Mont.	M. A.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Duquesne Reduction Co.	Pittsburgh, Pa.	D. E. C.
Nichols Copper Co.	Laurel Hill, L. I.	C. N. C.
Phelps, Dodge & Co.	Laurel Hill, L. I.	P. D. Co.
Tottenville Copper Co.	Tottenville, N. Y.	C. T. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. S.
Philadelphia, Pa.	White & Bro., Inc.	W. B.

Gold and Silver In 1916.

The precious-metal mining industries continued active during the first six months of 1916 practically all important mines and mills operating at full capacity, according to a statement just issued by the United States Geological Survey. Shortage of cyanide supplies, feared in 1915, was obviated by increased output of domestic sodium cyanide, which has practically replaced potassium cyanide in the leaching of precious metals. Flotation has begun to increase saving of gold from tailings. There may have been some decrease in gold prospecting during the last eight or ten months, as many gold prospectors have been giving attention to deposits of tungsten, antimony, quicksilver, and other mineral products whose value has enhanced since the outbreak of the war. There was also some labor shortage at mines and mills owing to high wages paid in factories making war supplies.

Final figures of the Geological Survey and the Bureau of the Mint give a total domestic production for 1915 of $101,035,700 in gold, and 74,961,075 ounces of silver, valued at $37,397,300, against $94,531,800 in gold and 72,455,100 ounces of silver in 1914. These figures include the gold production of the Philippines, which has been steadily on the increase.

The total output both of gold and silver reported for 1915 was the highest ever recorded under the American flag, but if the Philippine output be eliminated the production of gold in the United States proper was but little above the previous record year of 1909. The output of silver for 1915 was materially above the preceding record yield of 1914. For 1916, from the midyear point of view, the output of gold which is apparently falling off somewhat as compared with 1915, in Colorado, California, Nevada, and some other States, and increasing possibly in Arizona, Oregon, the Philippines, Idaho, Montana, New Mexico, and elsewhere, will probably reach a total somewhat below the high output of 1915. The production of silver, however, will undoubtedly again break all previous records, as the output of silver ores and of the copper, lead, and zinc ores which produce silver in notable quantities will exceed that of any preceding year, owing to steady demand and high prices for all metals.

Prices of silver were low in the greater part of 1915. The monthly average commercial price at N. Y., which rose to about 52 cents an ounce in November, however reached 55 cents in December, and climbed steadily to over 74 cents in May, 1916, but fell to about 65 cents in June. The sharp increase in prices resulted from strong demand for the Far East at the end of 1915 and abnormally large requirements by the belligerent countries for coinage for the troops in the field. These demands found available stocks low, largely because of the great falling off in the Mexican output due to the long continued disturbance there. With the consequent inevitable rise in prices domestic producers of silver profited greatly, notwithstanding the increased cost of labor and of mining supplies. Silver is in demand not only for coinage but also for sterling and other silver wares, as well as for drugs and chemicals. The manufacture of silver salts used in photography, particularly in films for hand cameras and cinematographs, has vastly increased in recent years. The midyear outlook indicates continued demand for silver, the metal last to benefit by the general domestic prosperity.

COMMODITY PRICES SHOW YIELDING TENDENCIES.

Yielding tendencies became more pronounced in some of the leading commodity markets last month, and on July 1 "Dun's Index Number" of wholesale quotations stood at $145,142, against $145,397 on June 1. The present total compares with $124,953 a year ago, but is $1.055 below the recent high level, which was $146,197 on May 1. That the readjustment of prices is not yet general, however, is evidenced by the further rise in several important articles of consumption, while premiums are still offered in cases where needs are particularly urgent. But these are the exception and, with most requirements largely covered ahead, competitive buying has abated. In contrast to former conditions, declines now predominate and such advances as have occurred are, in the main, much less striking than previously.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, AUGUST, 1916. NO. 8.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer,
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Business Situation and Outoook.

War the Predominating Factor.

The war, as might be expected, continues to occupy the stage in the business mind to the elimination of almost everything else. Other factors such as the labor situation, the crops, the coming Presidential election, the Mexican troubles from the prominence given in the public press would seem to be the features considered of greatest present interest to the American business world. But these are only on the surface. What really grips the attention and thoughts of business men are the developments in the War situation. Their constant effort is to calculate the duration of the struggle. How long is the War to last, and what is to be the effect of its end on our economic situation is a subject that dominates all other discussion when business men meet. They know too well that on a correct diagnosis and forecast will depend the success of their business operations. It is no exaggeration to say that since our overwhelming prosperity has come as result of War orders, the termination of War orders would end our enormous profits and the sharp adjustment of business operations to other conditions would tax all our business ability. Furthermore unless this were carefully handled the adjustment might result in trouble and severe loss.

The Peace Scare a Month Ago.

About a month ago there came over the public mind a feeling that the War might reach a sudden termination, and

a chill swept over many of the trades that had been wallowing in prosperity due to the war orders. Looking back to-day, it is difficult to see what there was in the situation to warrant this opinion, but nevertheless it was very real and was intensified by what seemed to be a suspension of buying by the Allies. Our shipments on old contracts were larger than ever but we were getting no new orders. Prices that had been inflated in many commodities started to decline and there developed in many industries considerable apprehension. There was a feeling that the game was over; chances of future profits were too dangerous to permit a further effort to exploit the situation. Many felt better to devote their energies to keep what they had made, while the other fellow continued the game if he were rash enough to do so. "Get out and deliver orders on your books as quickly as possible, and buy no raw materials except on actual orders that would stick" was the slogan no matter what future developments might be.

Peace a Long Way Off.

There has, however, been a gradual change in this attitude of late although the effect previously caused has remained in many commodities. Instead of an early peace there has grown the firm conviction that the War is a long way from being over. No signs of exhaustion are seen, either in money, men, or determination of the combatants. If there was any chance of a patched up peace, a compromise on the ideals for which the Allies are fighting, it has disappeared with the two years of struggle and in its place has come a greater determination and intense resolve to fight out to a finish, win or lose. The long preparation that has been going on with the Allies is now being demonstrated in the late successes that seem to be attending their efforts. They undoubtedly feel each day brings them nearer to victory. The "deaf adder that stopped its ears" is the Allied attitude to any talk of peace until the attainment of what they have set out to accomplish.

Germany Still Strong—Revolution Very Unlikely.

But how about Germany? Granted we may see continued weakening of h allies, Austria, Turkey and Bulgari but while Germany stands fast the W will go on. Germany may crack in t inside from exhaustion or revolutic but this seems very unlikely. As regar the former while we know very little internal affairs there is no basis for t belief that Germany will be economi ally exhausted for a year or more. R garding a revolution, who is there make a revolution? The military trai ing of the German soldiers make su a possibility unthinkable, and it appli not only to the men in the field but their other army engaged under mi tary control in the economic necessiti of the nation. If a situation arises fro distress to sweep those outside t ranks into rebellion, who is there make it successful since it would be the hands of old men, women and ch dren and the male wastage of the wa The authorities would quickly kno how to deal with any attempt of t kind.

Will Germany crack on the outside, other words, on their front to the e emy? Not in our opinion for some ti to come!

German patriotism is too great, h armies too powerful and she is still the enemy's country. If she has to treat to her own borders her resistan will be greater than it is to-day.

The terms the Allies have set are drastic and uncompromising that th are quite impossible of acceptance Germany until she has been beaten her knees. As the fight is for the eli ination of the Hohenzollerns and wh they stand for, and as these War Lor power is enormously increased by r son of the War it is certain they w fight to the end.

Another Year or More of War.

No, the War seems certain for ano er year or even more. If this is to the case we are facing a continued w demand and with it must come a turn in part at least of war mark for commodities. The Allies have ma preparations to make a great deal the commodities they need, but th cannot develop to any extent any n sources of the raw materials that th must have, hence must draw from

They have undoubtedly accumulated a supply of these raw materials, as the Allies have bought nothing to speak of during the past two or three months. Buy they must if the war is continued another year. Enter the American market they must before long and for heavy purchases. It would seem as though this has already begun as shown in the demand for steel and the remarkable position in that market which has lately developed. It is on this expectation that the entire strength of the copper market is based and which is holding it from declining from even its present inflated price basis. To speak of the metal trade we believe the war demand will be felt in the next few months in spelter, lead and antimony which have so sensationally declined in fears of war demand being shut off. The other prominent metal, tin, not being a war demand metal may be expected to fluctuate as it is influenced by the sentimental effects of the other metals, and risks of ocean transportation, also British regulations, as it is the only metal we do not produce. Tin is almost entirely produced in British dominions under the control of the British Government. Neither do we see any falling off in general consumption for home needs. Even if the crops are disappointing and the labor question troublesome and the Presidential Election disturbing to business as it usually is, we are flooded with an accumulation of fluid wealth, and this wealth and prosperity must and will show itself in a heavy home consumption. If labor demands are extravagant they will nevertheless be temporarily granted. If crops are disappointing the lessened wealth will hardly be felt while the War lasts. If we are to change our President, there has seldom been a time when it is likely to be productive of less change in domestic affairs in spite of all the talk of change of policies. Whatever party wins, the policy that will dwarf all others will be to keep America prosperous and at peace. Any risk of our being involved in War is each day getting more remote.

Confidence and Business Activity Returning.

What we will have to worry over is when the War ends and with it our great profits and prosperity, but if that is a year or more off it will not cast its real shadow for some time to come. Our view is, the shadow shown a few weeks ago is now disappearing. It is well we have had these shadows in the past. They tend to keep us duly warned.

To sum up, we believe we have been unduly affected of late by peace talk, for which there is no real basis, and that a reaction to restored confidence and business activity has begun.

We must not take Wall Street as a guide under present conditions. While the Street has been depressed on war stocks, it is a continued War that is really at the bottom of Wall Street's inability to move up prices of securities because they know continued War will cause heavy foreign purchases of American commodities. As we are not making presents, but receiving pay for all we sell, we must receive, to a great extent, this pay in our European-held securities, or by purchasing of their securities, foreign loans, etc., all which must find an investment buyer here.

———o-O-o———

Business Trends.

STOCK PRICES SINCE THE WAR.

During the two years of war, stock values have made a great deal of progress forward and have suffered a considerable reaction, the net result being, however, substantial improvement. On this subject "Bradstreet's" latest issue says in part as follows:

"Retrospects of the two years during which the greatest war in all history has been in progress are now in order. Great and in many particulars unparalleled changes have occurred in all fields of business activity during that period. In no department have events moved more rapidly or afford greater contrasts than those witnessed in the financial markets. The American securities market in particular has passed through a series of highly interesting and at times exciting episodes. Even before the actual break between the European powers, the stock market was subjected to a flood of selling from abroad which, before the end of the New York Stock Exchange's session on July 30, 1914, brought prices at that institution to the lowest levels they had reached for some time. As the Stock Exchange did not open for business on the following day, it has been customary to date the war market from July 30, 1914, and accordingly the quotations as of that date are regarded as the record level from which the war market began its course. How the market hesitated and even receded after the reopening of the Stock Exchange, but finally began to respond in the early spring of 1915 to the stimulating influence of Europe's purchases of supplies and war munitions in this country, are matters of financial history."

OUR ENORMOUS FOREIGN TRADE.

Exports for the fiscal year just ended with June amounted to $4,333,698,604 and the imports were valued at $2,197,984,842, making a total foreign trade for the year of over $6,500,000,000, which is much larger than any previous total in the history of American commerce.

While June showed a slightly smaller total of exports than did May, the decrease of about $10,000,000 was more apparent than real, and was due to there being one day less in June. Actually, the daily exports in June were $15,400,000 as against $15,200,000 in May, and June, the day less considered, really saw export trade at the highest point yet reached. This showing for a summer month is significant, and, coupled with the steady rise of exports month by month since January, renders it an open question whether, with shipping room more abundant and an increased movement of domestic products in the fall, we may not look for still higher levels of export trade during the coming autumn.

Our foreign trade in June and for the fiscal year ended June 30th, compare as follows:

June—	1915.	1916.
Exports	$268,601,599	$464,824,057
Imports	157,746,140	245,896,770
Exc. of exports	$131,933,291	$242,695,559
Fiscal year ended July 31st:	1915.	1916.
Exports	$2,768,589,340	$4,333,698,604
Imports	1,674,169,740	2,197,984,842
Ex. of exports	$1,094,419,600	$2,135,713,762

FEWER FAILURES—LIGHTER LIABILITIES.

There were only 1,164 failures reported to Bradstreet's Journal for the month of July a decrease of 7.8% from June, of 19% from July, 1915 and of 4.5% from July, 1914. Compared with July, 1913 and 1912, however, a increase of 9% is shown. July liabilities aggregate $10,158,246, an increase of 22% over June, but a decrease of 33% from July last year, and the smallest recorded in any month but June for five years past.

"Failures and liabilities of failing traders alike reflect the existence of exceptionally good conditions in trade and the possession by the general public of plenty of money," says "Bradstreet,s," "despite the continued high level of all values, due to the abnormal conditions brought about by the European war. Failures are on a slowly descending scale, and liabilities indicate that big and 'little' business alike are prosperous, notwithstanding the concededly large number of new ventures in commercial and industrial pursuits. July failures, in fact, reveal the smallest total in two years, while liabilities for that month were, with the exception of those for June, the smallest recorded since July, 1911."

Business Trends.

PIG IRON OUTPUT LESS.

The effect of the high temperatures and humidity is plainly seen in the July returns of pig iron production. The report of the "Iron Age" shows an output of 3,226,719 tons last month, or 104,088 tons a day, against 3,211,588 tons, or 107,053 tons daily, in June. Thus, the rate per day was reduced about 3,000 tons and there was a net loss of six furnaces during the period, 319 being active on August 1, as compared with 325 a month earlier. It appears, therefore, that weather conditions were not the only factor tending to cut down production, some furnaces finding it imperative to go out for relining.

The daily average production of coke and anthracite pig iron in the United States by months since January, 1913, is given as follows by the "Iron Age".

	1913.	1914.	1915.	1916.
January ..	90,172	60,808	51,659	102,746
February .	92,369	67,453	59,813	106,456
March ...	89,147	75,738	66,575	107,667
April	91,759	75,665	70,550	107,592
May	91,039	67,506	73,015	108,422
June	87,619	63,916	79,361	107,053
July	82,601	63,150	82,691	104,088
August ...	82,057	64,363	89,666	.....
September	83,531	62,753	95,085	.....
October ..	82,123	57,316	100,822	.....
November	74,453	50,611	101,244	.....
December.	63,787	48,896	103,333	.....

BIG CAPITAL INVESTED IN NEW ENTERPRISES.

That promoters of new enterprises continue active is plainly indicated in the returns for the month of July. The papers filed for new companies in the Eastern States with a capital of 1,000,000 or over disclose a total of $217,662,500. This is about 206% larger than in July a year ago, and 217% greater than for July two years ago. But more than 50% of the total was furnished by two concerns. In keeping with the monthly showing for quite a while all lines of industries are represented.

The grand total of all companies with an authorized capital of $100,000 or over, covering all States, including those of the East for July, reached $320,057,500, an increase of 141%.

The incorporations since January 1 of companies with a capital of $100,000 or over reached the huge total of $2,200,545,100, an increase of 103% over the same period a year ago. Of this amount concerns that took out charters in the Eastern States with a capital of $1,000,000 or over furnished $1,690,137,800, an increase of almost 215% over 1915.

Following are the comparative figures as specially compiled by The Journal of Commerce and Commercial Bulletin of companies incorporated in the eastern States during the last three years with an authorized capital of $1,000,000 or more:

	1916.	1915.	1914.
Jan.	$270,995,000	$51,150,000	$120,050,000
Feb.	365,995,300	53,950,000	51,575,000
Mar.	194,750,000	70,050,000	57,700,000
April	166,650,000	32,200,000	136,185,000
May	209,735,000	78,950,000	62,700,000
June	264,350,000	181,247,100	70,050,000
July	217,662,550	71,100,000	68,700,000
Total	$1,690,137,800	$538,647,100	$566,960,000
Aug.	.....	67,100,000	50,600,000
Sept.	.....	286,625,000	54,800,000
Oct.	.....	208,695,000	35,487,500
Nov.	.....	190,075,000	81,650,000
Dec.	.....	135,125,000	105,450,000
Year	.....	$1,426,267,100	$894,947,500

JULY BANK CLEARINGS.

"Dun's Review" reports that the total of exchanges during July broke all previous records for that month and says in part as follows:

"With commerce and industry continuing remarkably active for the season, bank clearings during July set a new high record for the period. The total at 131 leading centers in the United States was $19,288,204,828, a reduction of about 6.5% from the June aggregate, but an increase of 29.7% over last year and of 32.7% as compared with July, 1914. In spite of the material contraction in stock market dealings, exchanges at New York showed gains of 31.6 and 39.8%, respectively, while at outside cities there were similar differences of 27.1 and 25.6%. The expansion in clearings last month, in comparison with the two immediately preceding years, was country-wide, every section reporting improvement, notably the Middle Atlantic States."

The Effort to Make Finished Steel Contract Binding.

The National Association of Sheet and Tin Plate Manufacturers has been organized with a membership comprising almost all the independent sheet steel manufacturers, one of the chief objects being to establish a trade practice whereby contracts for the sale of sheets will be binding. In other branches of the finished steel trade more thought than ever is being given to this subject and definite reforms may be undertaken.

The sheet manufacturers now propose to do away with the trade practice of regarding a sheet contract as more or less of an option, whereby the mill must deliver if the market remains strong or advances, but the so-called contract being thus rather an option.

There are two questions of responsibility in connection with the practice which the manufacturers now expect to kill, one as to its origin and the other as to its discontinuance. As to the origin there has been little disposition to mention individual men or individual producing companies, and the actual source of the practice has seldom been questioned, not, we think, from a lack of insight but rather from a lack of frankness. We do not hesitate to express our long standing conviction that the practice arose from the cotrolled market which was the rule rather than the exception for quite a number of years. In a controlled market a price guarantee, expressed or implied, is quite natural. The buyer, fearing a break at any time when there is an artificial element in the market, naturally demands the guarantee, while the seller is moved to give the guarantee demanded for two reasons, first because that is the only way in which he can sell and second because if the situation is plastered with guaranteed contracts there is the strongest compelling force to prevent his competitors from cutting prices. All this is perfectly obvious, and the condition complained of in recent years is due simply to the fact that the controlled market disappeared while its attendant feature chanced to be preserved in a period for which it was in no wise fitted. It is well to interject the observation here that such an analysis is in itself sufficient, apart from the plain statement of the mills involved, to indicate that the movement to make contracts specific and binding, instead of options, carries with it no suggestion that any effort can be undertaken to restore a controlled market, but rather suggests a movement still farther away from a controlled market.

As to the responsibility for the discontinuance of the practice, this has clearly rested with the manufacturers. The buyers have simply taken conditions as they found them and if it is a custom in the trade to revise contract prices the individual buyer simply contends strenuously that he should be treated as others.

It would be superficial to regard the establishment of a practice of making binding contracts, instead of giving options, from the viewpoint of the market as it has hitherto devloped, i. e., no buyer or seller should picture to himself a market in which contracts are made at prices and with delivery periods such as have obtained in the past, with the simple difference that these contracts are to be enforced instead of being carried or disregarded at will. If it becomes established that the contracts written will be enforced as to tonnage, delivery and price, then obviously the making of these contracts will be entirely different. When the buyer and seller come to negotiate the making of a binding contract the attitude on both sides will be entirely different, and the contracts in their general terms, as to prices, tonnages and delivery periods, will undoubtedly be quite different. In one set of market conditions the sellers may be much more ready to sell and the buyer much less ready to buy. In another set of conditions the positions may be reversed, the buyer then being the anxious party and the seller the reserved party. The markets would be made altogether differently. It is difficult to conjecture precisely what changes would occur, but it is certain that there would be changes. In general, the average period for which contracts would be written would probably be shortened.

An additional responsibility would be

placed upon the buyer, for his decision to buy or not to buy at a specific time would be attended by more important consequences. As the practice hitherto common has resulted in practically everybody being taken care of, the buyer who considers his judgment better than that of the majority of his competitors should welcome a change of this sort, as it would give him the advantage of his superior ability.

The Proposed Sheet Contract.

The contract proposed by the sheet association is in substance that just formulated by the contract committee of the American Iron and Steel Institute, this contract being intended for general use in the finished steel trade, for the sale of bars, plates, shapes, etc., etc., as well as sheets. The contract involves various improvements over the forms now in common use, but the most vital of all is provision for liquidating damages in case of failure by either party to carry out the contract in full. Many contracts used in the past have been impossible of legal enforcement for two reasons. First, they did not make the obligation mutual. Second, they provided no means of proving actual loss and assessing a definite measure of damages. The proposed contract meets these legal objections and in a manner that has been approved by excellent legal talent. The measure of damages, if the buyer fails to specify or the seller fails to deliver, is the difference between the contract price and the market price at the time the failure occurs, but with the added provision that in no case shall the liquidating damages be less than 10% of the contract price. In determining whether or not to make a given contract, both buyer and seller must have a quantitative conception of the liability involved, and the parties will have the definite conception of the liability involved, and the parties will have the definite conception that the liability in case of failure will not be less than 10%. If the contract price for 28 gauge sheets is 3.00c, then the minimum liability for failure will be $6 per ton in the case of 28 gauge common sheets.

The sheet trade has not been reformed, but a formidable effort has been seriously undertaken. Information as to the manner in which the associaton has been organized indicates that the manufacturers are in dead earnest, and that any failure, after what they have done already, would be a momentous one that should not be regarded at this time as even a moderately remote contingency.

The question naturally arises what will now be done in other branches of the finished steed trade. There has been a great deal said in the steel trade in recent years about a contract being a contract, and the motto, in big type, "A CONTRACT IS A CONTRACT" hangs on the wall of many finished steel selling offices. Perhaps that motto is true, but we believe only in the sense a contract is a contract; but—what kind of a contract? This is a new kind of contract proposed by the Instiute. The sheet manufacturers have had to air their grievances in order to bring the evil in the limelight and create the enthusiasm necessary for its correction. Several other branches of the finished steel trade are subject to substantially the same conditions. The fact has simply not been advertised so extensively.

What is now going to be done in those other branches? A policy of watchful waiting is not to be commended. The sheet manufacturers are firmly convinced that there movement has been started at precisely the psychological moment to insure success. Watchful waiting, until such time as the movement may be proved to have been a success, would be to a time when the psychological moment would have passed.

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Remarkable Steel Earnings.

Steel Corporation Earnings Per Ton.

In only two years in the United States Steel Corporation's history has it reported as large earnings, for the year, as it has now reported for the first half of this year. In two years, 1904 and 1914, it earned less in the whole year than it has earned in the quarter just ended.

At $81,126,048 for the second quarter the earnings were at the rate of $324,500,000 a year. The average earnings in the 14 years, 1902 to 1915 inclusive, were $117,000,000 a year, so that the earnings in the last quarter were at a rate 178% greater than the previous average.

The extra 1% dividend declared on the common stock absorbs only about $5,000,000 or one-quarter of the increase in the earnings over those of the first quarter even though that quarter has shown a surplus of $32,854,172. At the beginning of the year the corporation had $94,083,805 in cash. Since that date it has earned more than $80,000,000 over all dividends and other items and the bulk of this increase probably exists in cash. While the corporation has a new construction program at present of $140,000,000 it is impossible to spend the money rapidly as men and materials cannot be found. Spending money as fast as it can, and taking the funds entirely from surplus earnings, the corporation is still accumulating in current assets, while the book surplus increases beyond this to the extent that the improvements are entered in the capital account.

While the second quarter's earnings show a large increase over those of the first quarter the progressive increase month by month is equally startling. The increases both from March to April and from April to May were the largest monthly increases ever shown. There were four factors involved. A small increase in tonnage output, a considerable increase in average realized prices, the inception of Lake Superior ore movement and the wage advance which became effective May 1st. The large April increase in earnings was due chiefly to higher realized prices, while the still larger May increase was due to this factor plus the added earnings from ore transportation, despite the wage advance. In June, however, there was but a slight further increase in ore transportation, hence the June increase in earnings was less than that o May.

A forecast of the third quarter earning is naturally based on the June showing o $28,000,000 earned for the month.

The ore movement will be substantially a large while realized prices will be highe On the other hand shipments in July an August will be smaller. After a caref estimation of these factors we conclude th as things are going the third quarter shou show only a very slight gain over the se ond quarter but the fourth quarter cou easily show a material gain.

Earnings Per Ton.

Enough is known about the Steel Co poration's operations to permit of approx mate computations being made of the ear ings per ton. The corporation's ton, by t way, is a combination, the statement tonnage shipped, for instance, being ma of gross tons for most products, but of n tons in the case of wire products and fi ished structural work.

The Corporation's shipments grew qu steadily during the first half of the ye partly by harder driving month by mon as mill managers found ways by expe ence to reach and maintain new rates production, and partly by the completion new capacity. The shipments, of produ in the form in which sold to outsiders, m be taken at 47,000 tons a day in Janua increasing to 51,000 tons in June. The ea ings by months were as follows:

January	$18,794,912
February	19,196,396
March	22,722,316
April	25,423,676
May	27,554,899
June	28,147,473

The computations necessary to deriv statement of profits per ton by months somewhat tiresome and it is not necess that they be referred to in detail. All ance is made for the number of busin days in the respective months, for instan and deductions must be made for the mo ment of Lake Superior ore, beginning April and increasing to June. While profits arising from producing ore are h as intercompany profits until the steel m

from the ore passes to outsiders, the profits from transporting ore, independent ore as well as corporation ore, are necessarily taken as really earned when the transportation is accomplished

To eliminate the disturbing element of the wage advances that occurred February 1 and May 1 we have made allowances, whereby the monthly profits per ton are shown for the whole six months as if the wage rates obtaining February 1 to May 1 had been paid throughout the period. The figures come out as follows, though of course they are by no means accurate to the last cent, possibly not to the last dime:

January	$14.30
February	16.05
March	17.20
April	20.20
May	21.15
June	21.15

Thus there was a sharp progressive increase to April, a small one in May, and apparently none in June. The interesting point about such comparisons is to determine, if possible, how nearly the earnings per ton are approaching the maximum, through the working off of old orders taken at lower prices than those recently ruling. One might take the figures as suggestive that the top point has been reached, but they are not accurate enough for such a close comparison. There is the vital fact that the unfilled obligations the corporation reported for the beginning of this year, 7,-932,164 tons, are almost precisely equal to the estimated shipments for first six months of the year. Of course not the precise orders included in that statement were shipped during the six months. Some of the orders are still to be filled, while some orders taken after January 1 were filled before July 1. The conclusion is just the same, however, that as the steel market advanced very materially after January 1 there should be further increases in profits per ton. If the corporation shipped any of the highest priced steel in May and June it must have lower priced orders still to fill and when those are out of the way it should, barring accidents, ship still more high priced steel. Our **composite finished steel**, representing quite accurately the general steel market, outside of rails, has stood as follows:

January 1	2.075
February 1	2.190
March 1	2.455
April 1	2.695
May 1	2.770
June 1	2.818
July 1	2.843

Thus there were advances of $12.40 per net ton in the first quarter and $2.96 in the second, equal to about $13.50 and $3.25 on the corporation's ton, or nearly $17 per ton altogether. With the wage rates actually paid, eliminating the adjustment involved in our first table, the apparent profits per ton of steel shipped in June were about $20.50 per ton. Theoretically, then, the profits might rise to above $30 a ton, but not to $37.50, because allowance must be made for the fact that the average realized price on rails will advance but little, and it is doubtful also whether there has been so much of a rise on export material, in the past six months, as has occurred in the domestic market. The export market was well above the domestic market at the beginning of this year.

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Steel Production in 1915.

The production of pig iron in 1915 was reported by the American Iron and Steel Institute about the first of March, and a month later the year's rail production was reported. Now nearly all the statistics are made public. As statistics for many preceding years are given in our **Metal Statistics**, we shall here review chiefly the new statistics. The production of steel was as follows in 1915, in gross tons:

	Ingots.	Castings.	Total.
Bessemer ..	8,194,737	92,476	8,287,213
Basic O. H..	21,975,622	333,103	22,308,725
Acid O. H..	968,148	402,229	1,370,377
Crucible	99,026	14,756	113,782
Electric	46,348	23,064	69,412
Miscellaneous	331	1,196	1,527
Total	31,284,212	866,824	32,151,036

On the whole, production in the iron and steel industry in 1915 was approximately the same as in 1913, while 1914 was an off year, pig iron production being 23% less and steel production 26% less, than the mean of the preceding and following years.

Comparing 1913 and 1915, there was a slight decrease in pig iron and a slight increase in steel ingots, while there was a considerable decrease in steel castings. There was a very trifling decrease in the production of rolled steel, and a material decrease in the production of rolled iron.

A significant point is that the production of steel ingots was unusually large in proportion to the rolled steel output, confirming what was already known in a general way that the production of shell steel, involving heavy discards from the total amount of works scrap unusually large.

While the production of steel ingots and castings is usually regarded as "the production of steel," the more illuminating statistics are those of the production of rolled steel, the production of ingots is merely the record of the ingot scales, millions of tons being lost from the ingot to the steel in the form in which it is sold. Only an almost negligible part of the apparent loss is a permanent one. A small part is a loss in scale, which goes back to the blast furnace, while by far the major part of the loss is scrap which goes into the open-hearth furnace and is weighed in the ingot over again. The production of rolled iron and steel has been as follows, in gross tons:

	Iron.	Steel.	Total.
1904	1,760,084	10,253,297	12,013,381
1905	2,059,990	14,780,025	16,840,015
1906	2,186,557	17,401,911	19,588,468
1907	2,200,086	17,664,736	19,864,823
1908	1,238,449	10,589,744	11,828,193
1909	1,709,431	17,935,259	19,644,690
1910	1,740,156	19,881,123	21,621,279
1911	1,460,615	17,578,556	19,039,171
1912	1,637,582	23,019,259	24,656,841
1913	1,678,257	23,112,986	24,791,243
1914	1,167,776	17,202,420	18,379,196
1915	1,294,833	23,098,091	24,392,924

The product in 1915 was distributed by items as follows:

	Iron.	Steel.	Total.
Rails		2,204,203	2,204,203
Plates and sheets ..	20,253	6,057,441	6,077,694
Nail and spike plate	4,984	26,945	31,929
Wire rods .	2,236	3,093,671	3,095,907
Structural shapes ..	1,858	2,435,145	2,437,003
Merchant bars	657,107	3,474,135	4,131,242
Bars for reinforced concrete work		353,408	353,408
Skelp, flue, and pipe iron or steel	262,198	2,037,266	2,299,464
Long angle splice bars, tie-plate bars, etc.	54,678	480,937	535,615
Hoops	300	281,459	281,759
Bands and cotton ties.	200	437,787	437,987
Rolled sheet piling, not including fabricated		24,026	24,026
Railroad ties		42,269	42,269
Rolled forging blooms, forging billets, etc. ..	570	649,975	650,545
Exports of blooms billets, sheet bars, etc.	1,231	561,187	562,418
All other finished rolled products*	289,218	938,237	1,227,455
Total ...	1,294,833	23,098,091	24,392,924

* Includes spike and chain rods, bolt and nut rods, horseshoe bars, strips, etc.

Production of plates and sheets by size and mode of manufacture, gross tons, 1915.

	Iron.	Steel.	Total.
Universal plates, including flats or bars over 6-in. wide:			
¼ in. and over in thickness	1,525	903,501	905,026
Under ¼-in. thick		49,826	49,826
Total univer. plates	1,525	953,327	954,852
Sheared plates:			
¼-in. and over in thickness	562	1,458,860	1,459,422
Under ¼-in. thick	200	463,577	463,777
Total sheared plates	762	1,922,437	1,923,199
Black sheets, made on either sheet or job mills:			
No. 12 gauge and thicker	1,152	159,057	160,209
No 13 gauge and thinner	14,776	1,661,801	1,676,577
Black plates for tinning			
Black plate rolled on tin mills:			
Black plates for tinning	2,038	1,091,307	1,093,345
Other black plate specialties		269,512	269,512
Total black plates rolled on tin mills	2,038	1,360,819	1,362,857
Grand total of plates and sheets	20,253	6,057,441	6,077,694

Production of sheared plates, according to mode of manufacture, gross tons, 1915.

	Iron.	Steel.	Total.
Sheared plates, rolled on single stands of rolls:			
¼-in. and over in thickness	562	1,409,479	1,410,041
Under ¼-in. thick	200	216,318	216,518
Total rolled on single stands	762	1,625,797	1,626,559
Sheared plates, roughed and finished on sep. stands:			
¼-in and over in thickness		49,381	49,381
Under ¼-in. thick		247,259	247,259
Total roughed and finished on separate stands		296,640	296,640
Total sheared plates	762	1,922,437	1,923,199

Production of universal plates by widths, showing iron and steel separately, gross tons, 1915.

	Iron.	Steel.	Total.
Under 30 in. wide	1,509	801,490	802,999
30 in. wide, but under 48 in. wide	16	145,512	145,528
48 in. wide and over		6,325	6,325
Total	1,525	953,327	954,852

Summary of Plate and Sheet Production—Gross Tons.

	1913.	1914.	1915.
Plates, ¼-inch and heavier	2,542,328	1,738,229	2,364,448
Plates under ¼-inch	460,442	374,192	513,603
Sheets, 12 gauge and heavier	252,337	125,272	160,209
Sheets, 13 gauge and lighter	1,464,631	1,302,355	1,676,577
Black plate specialties	204,033	241,017	269,512
Black plates for tinning	827,266	938,181	1,093,345
Total plates and sheets	5,751,037	4,719,246	6,077,694

Iron and Steel Statistics.

(Issued by the American Iron and Steel Institute.)

Tin Plate Production.

(Gross tons.)

	Terne Plate.	Tin Plate.	Total.
1906	86,324	491,238	577,562
1907	69,842	444,933	514,775
1908	68,830	468,257	537,087
1909	85,237	526,722	611,959
1910	75,082	647,688	722,770
1911	70,733	713,227	783,960
1912	85,445	877,526	962,971
1913	61,136	762,583	823,719
1914	65,266	865,975	931,241
1915	72,977	982,958	1,055,935

Galvanized Sheet Production.

Sheets galvanized flat and sheet products formed or stamped and then galvanized:

Gross tons—	1913.	1914.	1915.
Sheets	824,047	806,994	706,058
Formed products	57,674	58,752	50,119
Total	881,721	865,746	756,177

Wrought Pipe Production.

Wrought pipe production, gross tons:

1914—	Iron.	Steel.	Total.
Black std. pipe..	102,244	562,263	664,507
Galv. std. pipe ..	31,896	233,133	265,029
Total std. pipe	134,140	795,396	929,536
Oil country goods	50,824	568,467	619,291
O. D. pipe, etc. ..	343	111,042	111,385
Boiler tubes	26,840	50,652	77,492
Total welded..	212,147	1,525,557	1,737,704
1915—			
Black std. pipe..	112,470	711,297	823,767
Galv. std. pipe..	27,702	253,242	280,944
Total std. pipe	140,172	964,539	1,104,711
Oil country goods	39,753	563,167	602,920
O. D. pipe, etc. ..	108	115,005	115,113
Boiler tubes	26,480	70,450	96,930
Total welded..	206,513	1,713,161	1,919,674

Seamless tubes, gross tons:

	1913.	1914.	1915.
Hot finished	42,740	36,939	63,488
Cold drawn	65,827	53,656	76,180
Total seamless.	108,567	90,595	139,668

Nail Production.

(Kegs, 100 pounds.)

	Cut nails.	Wire nails.	Total
1906	1,189,239	11,486,647	12,675,886
1907	1,109,138	11,731,044	12,840,182
1908	956,182	10,662,972	11,619,154
1909	1,207,597	13,916,053	15,123,650
1910	1,055,233	12,704,902	13,710,135
1911	967,636	13,437,778	14,405,414
1912	978,415	14,659,700	15,638,115
1913	842,038	13,559,727	14,401,765
1914	769,665	13,132,814	13,902,479
1915	775,327	14,583,026	15,358,353
Maximum cut nails, 1886			8,160,973
Maximum wire nails, 1912			14,659,700

Production of Rail Joints and Fastenings.

(Gross tons.)

Articles—	1914.	1915.
Angle splice bars	86,775	119,658
Tie plates	197,158	283,509
Fish plates	29,707	10,836
Other rail joints	58,902	56,721
Total	372,542	470,724

Production of Cast Iron Pipe.

(Net tons.)

	1914		
Kinds of pipe.	Pipe.	Fittings.	Total.
Gas and water*.	891,646	46,651	938,297
Soil & plumbers'	164,866	57,617	222,483
Total	1,056,512	104,268	1,160,780
	1915		
Gas and water*.	911,901	44,471	956,372
Soil & plumbers'	184,968	73,629	258,498
Total	1,096,770	118,100	1,214,870

* Includes culvert pipe. Manufacturers able to separate their production report 18,900 tons of culvert pipe in 1914 and 25,140 tons in 1915.

PRODUCTION OF IRON AND STEEL IN CANADA.

According to statistics issued by the American Iron and Steel Institute the production of pig iron in Canada in 1915 amounted to 825,420 gross tons, as against 705,972 tons in 1914, or an increase of 119,448 tons. While the production is more

than it was in 1914 it is still well below the high record in 1913 or 1,015,118 tons.

The following table shows the production during the past two years according to grades:

Grades.	1914.	1915.
Basic	331,456	660,369
Bessemer	184,053	13,714
Foundry	174,346	125,769
All other	16,117	25,568
Total	705,972	825,420

The following table shows the total Canadian production since 1901:

Years.	Coke.	Charcoal.	Total.
1901	228,893	16,083	244,976
1902	302,712	16,845	319,557
1903	247,905	17,513	265,418
1904	251,671	19,271	270,942
1905	432,870	35,133	468,003
1906	525,716	16,241	541,957
1907	572,025	9,121	581,146
1908	556,671	7,001	563,672
1909	660,856	16,234	677,090
1910	724,174	16,036	740,210
1911	799,716	24,652	824,368
1912	886,506	26,372	912,878
1913	986,848	28,270	1,015,118
1914	690,880	15,092	705,972
1915	803,646	21,774	825,420

* Includes pig iron made with charcoal and coke, electricity, etc.

Of the 825,420 tons produced in 1915, 450,174 tons were made in Ontario and 375,246 tons in Nova Scotia. The capacity of the Canadian blast furnaces, December 31st, 1915, was 1,576,000 tons as follows:

	Tons.
Ontario	901,000
Nova Scotia	675,000

The production of steel ingots, castings and miscellaneous finished rolled iron and steel products is shown below:

Steel Ingots and Castings.

Years.	Gr. Tons.	Years.	Gr. tons.
1900	23,577	1908	509,957
1901	26,084	1909	678,751
1902	182,037	1910	741,924
1903	181,514	1911	790,871
1904	148,784	1912	853,031
1905	403,449	1913	1,042,503
1906	570,889	1914	743,352
1907	646,754	1915	912,755

Finished Rolled Products.

Years.	Gr. tons.	Years.	Gr. tons.
1900	100,690	1908	496,517
1901	112,007	1909	662,741
1902	161,485	1910	739,811
1903	129,516	1911	781,924
1904	180,038	1912	861,224
1905	385,826	1913	967,097
1906	571,742	1914	659,519
1907	600,179	1915	653,318

Progress in By-Product Coke.

Since the first of the year there have been completed the following by-product plants or plant additions: Lehigh at South Bethlehem, Republic at Youngstown, Laclede Gas & Light Company, St. Louis, and Kentucky Solvay Company at Ashland, Ky. There may have been more, but these count up 400 ovens, which at 4,000 tons a year per oven, a rate the new ovens will closely approach if they do not exceed, would be 1,500,000 tons of coke a year.

The present new construction, according to the notes we have, represents a trifle under a thousand ovens by the Steel Corporation and a trifle over a thousand by independents, making over 2,000 in all, with close to 8,000,000 tons annual capacity. Fully half the ovens now under construction should be completed before the end of this year, even allowing for all the delays in construction work that occur in a period like the present, and all the ovens can be counted upon by the middle of 1917 at the latest. There will then be at least 25,000,000 tons of annual by-product coking capacity. The capacity at the beginning of this year was easily in excess of 15,000,000 tons, the actual production last year having been 14,072,895 tons. Two important plants are to come in during the month of August, those of the Youngstown Sheet & Tube Company, Youngstown, and Corrigan, McKinney & Company (River Furnace Company), Cleveland, each comprising 204 ovens.

The great bulk of the new construction is for supplying consumptive requirements that have hitherto been met with Connellsville coke. By no means does all the capacity involved represent buying requirements taken out of the merchant market, for much more than half the new construction is by interests that have been making Con-

nellsville coke of their own. One might suppose that those who did not have ovens of their own would be the first to build by-product ovens, but this has not been the case, for the reason that those who had beehive ovens in the Connellsville region were largely those who could readily finance the building of by-product ovens, and who could use the gas to advantage in steel mill operations. It is only quite lately that the merchant blast furnaces, which have been the chief buyers of coke in the open market, have started to build by-product ovens. In such a list are now such interests as M. A. Hanna & Company, while Corrigan, McKinney & Company fall between, since they have recently completed a steel plant.

It has been clear for several years that the last of the Connellsville coal would be shipped instead of being made into coke at the point of production, and thus the Connellsville operators are at last making strong representations to the Interstate Commerce Commission looking to their being given on their coal the same rates as apply on Pittsburgh district coal. Hitherto the Connellsville coal has been at certain freight disadvantages. Hitherto the Connellsville operators have not been interested in a reduction in coal freights. There is a tradition that years ago they rather favored the freight differential against them, as compared with the Pittsburgh coal district, because it clinched their non-unionism, the union district being defined as that taking the Pittsburgh rate of freight. Now they are willing to take their chances as to unionism, particularly as they have the leading interest with them.

Inasmuch as nearly all the by-product ovens are attached to blast furnaces that are more or less tributary to the Connellsville coke region, although they do not all secure their coke invariably from Connellsville, it may be of interest to compare the prospective by-product capacities with the current shipments of the Connellsville region. The maximum shipments according to the Connellsville Courier's weekly reports, appear to have occurred in March and April, with about 450,000 tons per week, dropping to an average of about 415,000 tons per week in the latter part of July, largely no doubt on account of the completion of the by-product ovens already mentioned. These included the additional 75 ovens for the Republic Iron & Steel Company and the additional 214 Lehigh ovens at South Bethlehem. These ovens certainly cut off a corresponding tonnage of Connellsville coke.

The Youngstown and Cleveland by-product ovens, to come in this month, would represent perhaps 140,000 tons a month, or nearly 8% of the current Connellsville coke shipments. The remaining 1,600 ovens to come in at various times in the future, would represent about four times as much, or fully 30% of the current shipments by the Connellsville region, if they had all been taking tonnage from that district, but that is not the case.

The Steel Corporation ovens will, on the whole, come in much more slowly than the independent ovens. The corporation, it seems, has too much work on hand for the number of men available, though not for the amount of money available, and it is concentrating more of its efforts on steel works additions, though two or three of the by-product plants are to be completed with all possible speed.

The extent to which the transfer of coke making from the Connellsville region to the site of the blast furnaces will affect the mining of Connellsville coal depends largely upon the Connellsville interests themselves. It is for them to fix prices at which they will sell their coal for by-product coking. If they secure lower freight rates on coal as a result of the case they have lately brought before the Interstate Commerce Commission their position will be materially improved.

To an extent, however, the question of the use of Connellsville coal is already determined. Three cases may be cited as more or less illustrative. The Youngstown Sheet & Tube Company is now using Connellsville coke, purchased on contract, and these same contracts provide that when the by-product ovens are completed the sellers will simply ship their coal instead of their coke. On the other hand, the La Belle Iron Works, which has hitherto used Connellsville coke, has already made a contract for coal with the Pittsburgh Coal Company, so that its by-product coking coal will come from the Pittsburgh coal district and not from the Connellsville region. A third case, typical of the producer-consumer class, is that of the Brier Hill Steel Company. It has a complete plant in the Connellsville region, and when its by-product ovens, scheduled for November 1st, are completed it will ship its coal instead of its coke, though it will doubtless use a small percentage of coal from other districts to mix with its Connellsville coal. The Steel Corporation will in general be in much the same position.

Manufactures in the United States.

Washington, D. C.—A preliminary statement of the general results of the census of manufactures for the United States has been issued by Director Sam. L. Rogers, of the Bureau of the Census, Department of Commerce. It consists of a summary comparing the figures for 1909 and 1914, by totals, prepared under the direction of Mr. William M. Steuart, chief statistician for manufactures.

The figures are preliminary and subject to such change and correction as may be found necessary from a further examination of the original reports.

The census of 1914, like that of 1909 with reference to manufactures, excluded the hand trades, the building trades, and the neighborhood industries, and took account only of establishments conducted under the factory system. In the last census also, as in that for 1909, statistics were not collected for establishments having products for the census year valued at less than $500, except that reports were taken for establishments idle during a portion of the census year, or which began operation during that year, and whose products for such reason were valued at less than $500.

The word "establishment" as used in the census reports may mean more than one mill or plant, provided they are owned or controlled and operated by a single individual, partnership, corporation, or other owner or operator, and are located in the same town or city.

The reports were taken for the calendar year ending December 31, 1914, wherever the system of bookkeeping permitted figures for that period to be secured, but when the fiscal year of an establishment differed from the calendar year a report was obtained for the operations of that establishment for its fiscal year falling most largely within the calendar year 1914.

Percentages of Increase.

The population of the United States at the census of 1910 was 91,972,266, and it is estimated that it was 98,781,000 on July 1, 1914.

The summary shows increases at the census of 1914, as compared with that for 1909, for all items except proprietors and firm members, for which a slight decrease is shown.

In the order of their importance, from a percentage standpoint, the increases for the several items rank as follows: Salaries, 37.2%; capital, 23.7%; salaried employees, 22%; primary horsepower, 20.7%; wages, 19%; materials, 18.3%; value of products, 17.3%; value added by manufacture, 15.8%; wage earners, 6.4%; and number of establishments, 2.7%.

Capital Invested.

The capital invested, as reported in 1914, was $22,790,880,000, a gain of $4,362,610,000, or 23.7% over $18,428,270,000 in 1909. The average capital per establishment was approximately $83,000 in 1914 and $69,000 in 1909. In this connection it should be stated that the inquiry contained in the census schedule calls for the total amount of capital, both owned and borrowed, invested in the business, but excludes the value of rented property, plant, or equipment which was employed in the conduct of manufacturing enterprises. In the final bulletins and reports the rental paid for such property will be shown separately.

Cost of Materials.

The cost of materials used was $14,368,089,000 in 1914, as against $12,142,791,000 in 1909, an increase of $2,225,298,000, or 18.3%. The average cost of materials per establishment was approximately $52,000 in 1914 and $45,000 in 1909. In addition to the component materials which enter into the products of the establishment for the census year there are included the cost of fuel, mill supplies, and rent of power and heat. The cost of materials, however, does not include unused materials and supplies bought either for speculation or for use during a subsequent period.

The census inquiry does not include amounts paid for miscellaneous expenses, such as rent of officers, royalties, insurance, ordinary repairs, advertising, traveling expenses, or allowance for depreciation.

Value of Products.

The value of products was $24,246,323,000 in 1914 and $20,672,052,000 in 1909, the increase being $3,574,271,000, or 17.3%. The

average per establishment was approximately $88,000 in 1914 and $77,000 in 1909.

The value of products represents their selling value or price at the plants as actually turned out by the factories during the census year and does not necessarily have any relation to the amount of sales for that year. The values under this head also include amounts received for work done on materials furnished by others.

Value Added by Manufacture.

The value added by manufacture represents the difference between the cost of materials used and the value of the products manufactured from them. The value added by manufacture was $9,878,234,000 in 1914 and $8,529,261,000 in 1909, the increase being $1,348,973,000, or 15.8%. The value added by manufacture formed 40.7% of the total value of products in 1914, and 41.3% in 1909.

Salaries and Wages.

The salaries and wages amounted to $5,367,249,000 in 1914 and to $4,365,613,000 in 1909, the increase being $1,001,636,000, or 22.9%.

The number of salaried employees was 964,217 in 1914, as compared with 790,267 in 1909, making an increase of 173,950, or 22%.

The average number of wage earners was 7,036,337 in 1914 and 6,615,046 in 1909, the increase being 421,291, or 6.4%.

The maximum number of wage earners (7,242,752) for 1914 were employed during March, while the maximum number (7,006,853) for 1909 were employed during November. The minimum number of wage earners (6,640,284) reported for 1914 were employed during December and the minimum number (6,210,063) for 1909 were employed during January.

A Comparative Summary for the United States for 1909 and 1914 follows:

	Census.		Percent. of increase 1909-1914.*
	1914.	1909.	
Number of establishments	275,793	268,491	2.7
Persons engaged in manufactures	8,265,426	7,678,578	7.6
Proprietors and firm members	264,872	273,265	–3.1
Salaried employees	964,217	790,267	22.0
Wage earners (average number employed during the year)	7,036,337	6,615,046	6.4
Wage earners, by months:			
January	7,075,682	6,210,063	....
February	7,141,594	6,297,627	....
March	7,242,752	6,423,517	....
April	7,217,320	6,437,633	....
May	7,148,650	6,437,279	....
June	7,100,368	6,517,469	....
July	7,018,867	6,486,676	....
August	7,020,682	6,650,933	....
September	7,086,804	6,898,765	....
October	7,006,342	6,997,090	....
November	6,736,699	7,006,853	....
December	6,640,284	6,990,652	....
Primary horsepower	22,537,129	18,675,376	20.7
Capital	$22,790,880,000	$18,428,270,000	23.7
Services	5,367,249,000	4,365,613,000	22.9
Salaries	1,287,917,000	938,575,000	37.2
Wages	4,079,332,000	3,427,038,000	19.0
Materials	14,368,089,000	12,142,791,000	18.3
Value of products	24,246,323,000	20,672,052,000	17.3
Value added by manufacture (value of products less cost of materials)	9,878,234,000	8,529,261,000	15.8

* A minus sign (-) denotes decrease.

Steel Plants.

IX. The Brier Hill Steel Company.

In 1897, when Bessemer pig iron sold at less than $9, valley furnace, and foundry iron at still lower prices, it began to be said "The day of the merchant furnace in the valleys is over." The Carnegie Steel Company had bought the Carrie furnaces, merchant stacks near its steel works, and had built the Duquesne furnaces. Less than two years later the valley furnaces sold Bessemer iron at $24 and obtained a new lease on life. The general trend continued, however, of steel works providing pig iron of their own. The steel works had several reasons. There was a saving of nearly a dollar a ton in "direct" metal, the iron not being allowed to cool from the blast furnace to the converter or open-hearth furnace, the furnace could be operated as an adjunct to the steel works, its rate of operation and the analysis of the iron being largely dictated by the steel works, and it was desirable for any steel interest to secure its future by holding a reserve of iron ore in the ground, and that of course would be a lame policy if the ore had to be farmed out for smelting.

The foundry iron trade would of course remain in any event, but 20 years ago the valley furnaces shipped pig iron to almost every point in the compass, often to great distances, as to New England, since then an iron ring has been built around them, with furnaces at Detroit, Toledo, Cleveland, Erie, Buffalo, Adrian, Josephine, etc., whereby valley iron cannot go nearly so far afield.

Concurrent with this development there were striking developments in the manufacture of steel sheets adapted to particular uses, whereby the sheet mill desiring to make special sheets found it advantageous to have a steel mill of its own, there being the other important advantage that thus it would be able to regulate sheet bar supplies to a nicety.

As a result of these developments a strong force of attraction arose between two merchant furnaces in the Mahoning valley and two sheet interests in the same district. They were consolidated and a steel plant was built to convert the pig iron into sheet bars. The Brier Hill Steel Company was incorporated January 29, 1912, and formally organized February 1st, taking over the following companies:

Brier Hill Iron & Coal Company, operating Grace furnace, 90x20½ feet, with 470 beehive coke ovens in the Connellsville region and important iron ore holdings in the Lake Superior region.

The Youngstown Steel Company, operating Tod furnace, 80x20½ feet, with a 10-ton Pernot revolving furnace for the manufacture of washed metal. This washed metal is a specialty, made in four grades with phosphorus limits ranging from .010 to .030% and sulphur limits ranging from .015 to .030%.

The Empire Iron & Steel Company, operating the Empire works at Niles, with seven sheet mills, a tin mill and four galvanizing pots.

The Thomas Steel Company, operating the Thomas works at Niles, with 12 sheet mills and six galvanizing pots.

The Gary Iron & Steel Company, making sheet metal products at Niles.

Three months after the organization of the company construction work was started on a steel plant of seven 75-ton basic open-hearth furnaces, the first steel being made November 1, 1913, room being left for seven additional furnaces. In November, 1915, an eighth furnace was added and in the late spring of 1916 two more, of 90 tons capacity, making a total of ten furnaces in the plant, with a steel ingot capacity of 500,000 tons a year. There is a 600-ton metal mixer. The blooming mill is a two-high 40-inch reversing, taking an ingot 19x21 inches and weighing 5,800 pounds, delivering a bloom 7½ inches square in 13 passes. The mill can also roll slabs up to 6x30 inches, and can convert blooms as large as 16 inches square into 4x4 billets. There is a continuous billet mill of six stands of rolls, 24-inch two-high and a tandem merchant mill of six stands of 24-inch two-high rolls, the difference between a continuous mill and a tandem mill being that in the latter the piece is in only one stand of rolls at a time.

As an illustration of the refinements in a modern steel mill, the six stands of the continuous mill are driven by one engine through gears, the gears being enclosed in

gear boxes and running in oil. Sheet bars are always rolled to weight, not to size, since the sheet mill regulates the gauge of sheets rolled by ordering the sheet bars of a certain weight per foot. Accordingly, the mill runs its sheet bars, after shearing to 30-foot lengths, to a weighing table, the weighing table automatically signalling the weight to the roller in charge of the mill.

The Brier Hill Steel Company is building a by-product coke plant of 84 ovens, under contract to be completed November 1, 1916. The product will supplant that of the beehive ovens owned by the company in the Connellsville region and the major part of the coal consumed will be the same coal now used in the beehive ovens. The output will be 300,000 tons or more of coke a year, just sufficient to supply the two blast furnaces, whose combined rating is about 300,000 tons.

Topical Talks On Iron.

XL.—Alloy Steels.

Alloy steels have lately come greatly into vogue, the chief single consumer being the automobile industry. Carbon steel is not considered an alloy, but on theoretical grounds a steel containing one alloy metal is called a ternary alloy, and one containing two alloy metals is called a quaternary steel.

Extensive investigation into alloy steels was prompted by the publication, in 1888, of the results of Hadfield's remarkable discoveries in manganese steel. Previous to Hadfield's researches it had simply been known that a small quantity of manganese in steel was very beneficial, whereas a few per cent. of manganese made the steel useless. Hadfield increased the proportion of manganese whereby he discovered that a fresh influence obtained in the higher ranges, a steel containing say 10 to 13% manganese being of great commercial use.

Next came James Riley, who in 1889 showed that ordinary soft steel when alloyed with say 3 to 4% nickel became stronger but without loss in ductility. The first important use of nickel steel was in armor plate. Discoveries followed rapidly after that. The commercial use of alloy steel has been greatly facilitated by the discovery, about 1900, of high speed steel, whereby heat treated alloy steels can be machined with facility.

Ordinary carbon steel usually reaches its limit at about 1.50% carbon, there being also present in such steel elements with approximately the following limits: Manganese, 1%; silicon, .35%; phosphorus, .05%; sulphur, .05%. Usually the alloy steels are of much lower carbon content. Their character can be improved greatly by heat treatment, while the quality of carbon steel is improved to a much smaller extent by heat treatment.

As a rule alloy steels are heat treated to bring out their best qualities. After the steel has been worked at the high temperatures required the steel is not in its best condition by any means, and heat treatment is required to refine the grain and develop the desired proportions of strength, hardness and toughness.

Apart from manganese, already mentioned, the ordinary alloy metals are silicon, nickel, chromium, tungsten and vanadium. Alloys are made not only with a single metal, in varying proportions, but also with two or more metals, so that there is an endless variety. The various simple alloys thus produced may be referred to briefly.

Manganese.—Steel with 1% carbon and 10 to 13% manganese is non-magnetic and strongly resistant to abrasion, being used in crushing and grinding machinery and for railroad frog and crossing work. It can be forged and rolled, with sufficient care, but is machined only with the greatest difficulty. It reverses the experience with ordinary carbon steel in that it is softened by quenching in water, and this treatment is always applied to remove brittleness.

Silicon.—There are two silicon steels. One, containing usually carbon .45 to .65%, silicon 1.50 to 2% and manganese .50 to .80%, develops fiber through heat treatment and is brittle at right angles to the direction in which rolled. It is used largely for automobile springs. The other silicon steel, containing 3 to 5% silicon and below in carbon and manganese, is useless structurally but very valuable for electric

transformer sheets, having high permeability and electric resistance.

Nickel.—A wide range of more or less valuable nickel steel alloys can be made, but the favorite is what is known as 3½% nickel steel, with the carbon low or medium, and manganese .50 to .80%, the manganese content being very important. It has high strength and is quite ductile.

Chromium.—An alloy of 1% chromium is usually used, with about 1% carbon, and is adapted to balls, ball races, stamp mill shoes, etc. Alloys with both chromium and nickel are used extensively, there being a number of varieties, for armor plate, projectiles, forgings, etc.

Vanadium.—Vanadium is added to steel in relatively limited quantities, generally .15 to .25%. It greatly increases the resistance to repeated shocks and stresses, and also increases the breaking strength by about 30% or more. Vanadium steel is particularly susceptible to heat treatment.

Tungsten.—A simple tungsten alloy is used chiefly for magneto magnets. Robert Mushet's steel, patented in 1860, contained: Carbon, 2%; manganese, 1.75%; silicon, .75%; chromium, .40%; tungsten, 5.50%. The late Mr. F. W. Taylor brought out, about 1900, his famous high speed steel, the point of a tool heating up to blue color without losing its cutting edge. A typical Taylor steel is as follows: carbon, .60%; manganese, .20%; silicon, .10%; chromium, 4%; tungsten, 18%.

The Shipping Bill.

Public interest in "the shipping bill," about to become a law, has been very largely of a political character, whereby the relative importance of different provisions of the bill has been greatly distorted. Incidentally it may be remarked that it is very unfortunate indeed that so many matters are looked at through political glasses, for that is not the way to make progress, and it is particularly out of place at this time, when the party that is historically the strict-constructionist party is criticized chiefly for so-called "socialistic" tendencies. The whole thing is rather absurd, and will amuse future generations if they take the trouble to read the history of these times.

The actual fact is that the provision to spend $50,000,000 in the purchase of ships to be sold or leased to citizens of the United States for operation in the merchant service is a very minor feature of the bill. If the laws establishing the present powers of the Interstate Commerce Commission had included a provision that the government should build a railroad between Washington and Annapolis that feature would have about the same relative importance to the rest of the legal structure as the ship purchase provision bears to the remainder of the shipping bill. In the first place, there is only $50,000,000, which does not go far in ships, at least at this time. Then there are only certain ships that are permitted to be bought, perhaps none, and to build ships takes a long time. The bill requires that ships acquired are to be sold or leased to citizens and it is only in case nobody will lease or buy them that the government is to operate them. In any event, the chief object seems to be to furnish an auxiliary to the navy in case of war.

On the other hand the shipping bill creates a shipping board with substantially as broad powers over American shipping rates as the Interstate Commerce Commission has over railway. Discrimination against shippers, giving of rebates, cut-throat competition and various other practices, that one does not need to be a Progressive, or even a Republican, to regard as undesirable, are prohibited, and the Federal Shipping Board is given power to enforce.

It is quite obvious that it is highly desirable that ocean freight rates be made stable and that all shippers should have equal rights as shippers. It may be that the shipping bill does not provide for these things in the best possible manner. If that is the case—we do not know whether it is or is not—the fault lies very largely with those who have misdirected the attention of the public to the little detail in the bill of the $50,000,000 for ships. Perhaps, however, the disproportionate fuss that has been raised over that almost insignificant provision is the best testimony to the good qualities of the bill in its other and really important features.

The Iron and Steel Situation.

July probably marked the culmination of the dulness in the steel trade. The general buying movement was distinctly marked through March, when the steel price advances practically stopped, and each month since then has seen lessened activity, at least in the domestic market. Conditions could hardly grow more dull than they were in July, but apart from that there is observed, at the beginning of August, some distinct signs of increasing interest in the market.

Reduced Output.

The rate of pig iron production in July was 3% less than that of June and about 4% less than that of May, the month showing the highest rate, about 39,800,000 tons a year. The production of finished steel decreased from June to July by between 10 and 15%, June having been probably the month of heaviest production.

The decreased steel output in July was due of course to the hot weather, weather that was even unreasonably hot, but the influence worked through a particular channel, that on account of the general prosperity the men failed in performance more than they would have done under similar weather conditions but under the conditions of less prosperity, and there is also the fact that there was no surplus of men, in point of numbers, but rather a deficiency, so that the places of men indisposed to work could not readily be filled.

The decreased steel production no doubt had an effect in stiffening the market, as the weather did not sensibly diminish the disposition to consume steel.

The Market in July.

There is little to be said about the course of the market in July and it is more to the point to consider the interesting prospects at beginning of August. Throughout July the buying of steel was of desultory character. There was no disposition to take hold for the far forward deliveries and not much fresh demand arose for prompt deliveries. There was fairly heavy specifying against contracts but as many buyers had had relatively low priced contracts for the first quarter or first half of the year, while their third quarter contracts were on a relatively high level, there was much less occasion to specify heavily in July. In tin plate there was very heavy pressure for deliveries, seasonably enough, while in wire, which is usually very dull in July, there was considerable pressure. Sheets were rather sluggish, as were the so-called "heavy products" while pipe showed a continuance of the decline in activity following the extremely heavy buying in April.

Export Business.

The demand for shell steel has been a surprise. The heavy buying of April and May had been supposed to represent about all the tonnage to be expected, until, perhaps, there should be buying for the first half of 1917, but there was fairly heavy buying in June and still heavier buying in July. It may be estimated that the shell steel business placed in the last fortnight of July, plus business pending at the end of the month and certain to be placed, represented about 500,000 tons. This was in the form of rounds and forging billets for export and of large forging billets for making shells in the United States. The buying of rounds for the manufacture of small shells in the United States is about over, the manufacture of small shells having been transferred largely to the other side. The total amount of American steel going into shells appears to be increasing, more being exported direct and somewhat less being converted into shells in this country.

There was also a good demand for soft steel for export, in billet and sheet bar form, apparently by reason of British steel capacity being turned more to the manufacture of shell steel, whereby more American soft steel is required to maintain finishing mill operations in England.

The heavy buying of unfinished steel caused the market to firm up after the slight weakening it experienced about the middle of June, and July closed with approximately the strongest billet market ever seen. If billets are stronger than at any previous time in the history of the billet market, the nearest approach having been in 1899, when large lots were sold at close to $40 while small lots for immediate shipment brought up to $44, strictly a "premium" price. The market is now quotable strong at about $45, Bessemer steel being worth almost if not quite as much as open-hearth.

Steel Price Advances.

A curious chapter was written in the steel bar market. About the middle of July statements were made upon what still is believed to have been adequate authority that some 80,000 or 100,000 tons of steel bars had been sold to agricultural implement makers, for first half 1917, at 2.35c, representing a cut of $3 a ton from the recognized market. Publication of the statements was followed by denials, on the part of steel mills that they had sold or would sell at less than 2.50c, and on the part of implement makers that they had bought or would buy at as high as 2.35c. The writer believes the business was done. At any rate the implement makers would buy no more at 2.35c, in their present mood. Just as some holders of contracts at 2.50c, in the general trade, were making representations to the mills that such contracts should be revised to 2.35c, the Carnegie Steel Company calmly announced, on the afternoon of August 1 that effective immediately its price was advanced $2 a ton to 2.60c. The independents then began to "try on" the 2.60c quotation. They got little if any business, but for 48 hours following the Carnegie announcement they were in receipt of many inquiries and many offers to resume negotiations at 2.50c. The independents are disposed to cover their regular trade at 2.50c, in a limited way, and then advance to 2.60c. At this writing it appears likely that the market will be squarely on the basis of 2.60c when this report reaches the reader.

The bar advance, it now appears, is to be followed by an advance in structural shapes from 2.50c to 2.60c, and later an advance in plates from 2.90c to 3.00c appears to be on the program.

These developments, past and in prospect, may be viewed in different lights by different observers. That advances in prices at this time are prompted by heavy market demand cannot be maintained. They come in a dull market. That the pressure for steel deliveries, particularly with the reduced production of the past few weeks, might be responsible for price advances is a matter that can be argued. The most attractive explanation, the psychological effect, the impression produced upon the minds of buyers, such as mills falling farther behind in deliveries, or prices advancing. The general view three months ago was that, the buying movement being over, the market future was simply a matter of how long the mills

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer, Valley	Basic, No. 2 fdy. Valley		Basic, No. 2X fdy.		No. 2 fdy		Ferro-manganese*	Furnace coke†
1915—			Phila.	Phila.	Buffalo.	Cleveland.	Chicago.	Birmingham.	
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. ..	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.18	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916—											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.45
May ..	21.00	18.21	18.44	20.50	20.25	19.15	19.08	19.50	15.00	175.00	2.34
June ..	21.00	18.25	18.39	19.90	20.01	18.75	19.30	19.50	14.63	175.00	2.51
July ..	21.00	18.00	18.25	19.15	19.45	18.45	18.80	19.30	14.00	175.00	2.65

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

could run on their accumulation, reinforced by such sporadic buying as always develops. The mills felt themselves to be in strong position, but there was needed a demonstration of the strength. If holders of bar contracts at 2.50c wanted a revision to 2.35c. an advance in the market to 2.60c. if the mills were strong enough to compass it, would clear the situation. We are therefore disposed to conclude that August starts with an attempt on the part of the mills to demonstrate their strength, and it looks as though they would succeed. If no great amount of fresh buying occurs there will at any rate be a stimulus to specifying against contracts already on books. It is true, no doubt, that the major portion of these contracts are specified, but the specifications are of course against the lower priced contracts.

Pig Iron.

The pig iron market was extremely dull throughout July and August does not open with any better prospect. We estimate that the curtailment in steel production was greater than the curtailment in pig iron production, hence if it is true that the general trend is for pig iron to become scarce through steel making capacity increasing more than blast furnace capacity, the time of the pinch is deferred somewhat. There are no predictions of a livening up in the pig iron market in August, but in some quarters greater activity is expected by September.

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved	—— Sheets ——					Comp.
						Wire	Steel			Blue	Tin	Fin.
1915—	Shapes,	Plates,	Bars,	Pipe,	Wire,	Nails.	Skelp.	Black.	Galv.	Annld.	plate.	steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3 60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.76	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5694
August	1.30	1.26	1.30	79	1.43	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.59	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916—												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.25	2.40	2.35	2.89	5.00	2.95	4.70	2.7166
May	2.50	2.83	2.50	70	2.45	2.50	2.35	2.90	5.00	3.00	5.46	2.8042
June	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.80	3.00	5.75	2.8300
July	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.40	2.90	6.00	2.8425

LAKE SUPERIOR IRON ORE.

Shipments of iron ore down the lakes have been as follows, in gross tons:

	1911.	1912.	1913.	1914.	1915.	1916.
April	331,645	204,042	866,386	269,686	503,832	1,658,411
May	3,681,819	5,919,074	7,284,212	3,852,063	5,012,359	8,449,580
June	4,819,996	7,567,555	7,974,444	5,502,367	6,005,591	9,507,576
July	5,221,373	7,660,233	8,204,416	5,784,514	7,204,021	9,759,157
August	5,548,311	7,760,248	7,677,601	5,869,477	8,081,117	.....
September	5,231,069	7,287,230	7,258,413	5,438,049	7,863,146	.....
October	4,769,965	7,010,219	6,526,103	4,242,392	7,146,873	.....
November ...	2,523,253	4,072,674	3,270,958	1,068,682	4,445,129	.....
December	.....	14,579	18,515	1,411	57,236	.....
Season Lake ..	32,130,411	47,435,777	49,070,478	32,021,987	46,318,804	29,365,724

Tungsten Production.

(From the U. S. Geological Survey.)

The tungsten production of the United States during the first six months of 1916 exceeded the production of this or any other country in any previous 12 months. Prices were even more phenomenal than production and reached more than ten times their ordinary level. The output was equivalent to about 3,290 short tons of concentrates carrying 60% WO_3, valued at $9,113,000, according to an estimate made by Frank L. Hess, of the United States Geological Survey, Department of the Interior. Statistics are valuable only so far as their accuracy is known, and this estimate is believed to be correct within 10% and to be under rather than over the true figures.

These figures are no less noteworthy when it is known that in 1915 much the larger part of the production was in the second half of the year, so that the total domestic output for the 12 months ending June 30, 1916, probably amounted to about 5,000 tons.

Colorado has regained its lead in the production of tungsten ores and, between January 1st and June 30th, marketed 1,505 tons, valued at $3,638,000, of which the Boulder field furnished 1,494 tons. California sold 984 tons, valued at $3,005,000. The reason for the higher value of the California ore was that it was nearly all sold as high grade concentrates, but a large part of the Colorado ore sold was of low percentage and had to be milled and concentrated, with consequent expense and loss.

From Nevada 461 tons, valued at $1,432,000, and from Arizona 175 tons, worth $565,000, are estimated to have been shipped. Smaller quantities were mined in Alaska, Connecticut, Idaho, Missouri, New Mexico, South Dakota, Utah, and Washington.

Not only were the output and prices unique, but the ratio of the several tungsten minerals produced was different from that of other countries of large production. The quantities and values were approximately as follows: Ferberite, 1,495 tons, $3,590,000; scheelite, 1,404 tons, $4,322,000; wolframite, 201 tons, $613,000; and hnnberite 185 tons, $587,000.

In most countries the prevailing mineral is wolframite, and no other country approaches the United States in the quantity of ferberite or scheelite produced. The scheelite comes mostly from Atolia, Cal., but significant quantities are mined in Nevada, Arizona, Idaho, and Connecticut.

The tremendous increase of prices caused by the need for "high speed" tools to cut war steel ordered by the governments of Europe of course caused the great increase in production. Prices at the beginning of the year were irregular and depended on the buyer's need of the ore and probably on his fear of the possibility of not being able to get it when he might need it even more. Ores carrying 60% tungsten trioxide brought at that time as much as $66 a unit, but by the last of March some ferberite sold for $93.50 a unit at the mills, and even higher prices were quoted in the newspapers, though they could not be confirmed. The prices of the same ore in the New York market would naturally be somewhat higher. Under the stimulus of these high prices production, not only in this country, but in the world at large, has been at the highest point ever known. At first the sudden demand created by the orders for war steel were far ahead of the instant productive power of the country. The rapid increase in prices, starting last fall at a time when tungsten mining was at a low ebb and culminating in the undreamed maximum mentioned, caused prospecting and consequent discoveries of new deposits, increase of development of known deposits, the operating at high tension of old mills, and the hasty building of new mills. As a result, the production increased faster than the consumption and soon overran the demand that would absorb the output at the extremely high prices prevailing, so that a drop in prices was inevitable. June closed with the price around $25 a unit, which was still much higher than any price known before this year. The highest price previously reported to the Geological Survey was $15 a unit, paid in 1907. The normal price has been $6 to $7.

Comparison of Metal Prices.

Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing, July 31, 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	20.00	21.00
Basic, valley	13.25	12.50	18.00	12.50	18.50	17.75	18.00
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.25	18.25
No. 2X fdy. Philadelphia	15.00	14.20	19.50	14.00	20.25	19.50	19.75
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	19.30	18.50	18.50
No. 2X foundry, Buffalo	13.75	12.25	18.00	11.75	19.00	18.00	18.50
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	19.00	18.50	19.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.50	14.00
Scrap Iron and Steel.							
Melting Steel, Pittsburgh	12.00	9.75	18.00	11.00	18.75	16.00	16.12
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	16.75	14.50	14.50
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	18.62
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.00	14.75	15.37
Heavy steel scrap, Phila.	11.25	9.00	16.25	9.50	17.75	15.00	15.00
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.25	1.25	1.47
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.50	1.90	2.60
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.50	1.85	2.50
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	2.75	1.85	2.90
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	2.50	1.85	2.50
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	2.35	1.75	2.35
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	2.90	2.60	2.90
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.25	4.25
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	6.00	3.75	6.00
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.40	2.10	2.50
Steel pipe, Pittsburgh	79½%	81%	79%	81%	70%	78%	70%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	2.65
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.75	3.35
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	37.50	38.50
Lake copper	15.50	14.30	23.00	13.00	30.25	23.00	25.50
Electrolytic copper	14.87½	14.10	23.00	12.80	31.00	23.00	26.50
Casting copper	14.65	14.00	22.00	12.50	28.25	22.00	24.37½
Sheet copper	20.25	16.50	27.25	18.75	37.50	28.00	35.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	6.50
Spelter	6.20	4.75	27.25	5.70	21.17½	8.80	9.67½
Chinese & Jap. antimony	18.00	5.30	40.00	13.00	45.00	13.00	13.00
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	65.00	53.00	60.00
Silver	59¼	47⅝	56½	46¼	77¼	55⅞	64⅛
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	6.02½
Spelter	6.00	4.60	27.00	5.55	21.00	8.62½	9.50
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	15.00	15.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	205	163	168½
Standard copper, prompts	66¾	49	86⅜	57⅛	146	84½	111
Lead	24	17⅞	30¼	18¼	36⅜	27¾	28½
Spelter	33	21⅛	110	28⅛	111	44	60
Silver	27¼d	23¼d	27½d	22½d	37⅛d	26½d	30⅜d

Comparison of Security Prices.

Railroads.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing. July 31, 1916.
Atchison, Top. & Sante Fe...	100⅜	89½	111¼	92⅛	108½	100¼	103
Atch. Top. & Santa Fe,. pfd.	101¾	96¼	109⅛	96	102	97⅞	99
Baltimore & Ohio	95⅝	67	96	63¾	96	82⅞	85⅝
Canadian Pacific	220½	153	191	138	183¾	162⅛	177
Chesapeake & Ohio	68	40	64¼	35⅝	67¾	58	60½
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¼	102½	91	94⅞
Erie R. R.	32½	20⅝	45⅝	19⅞	43⅝	32	34¾
Great Northern, pfd.	134¾	111⅝	128⅜	112¾	127½	118	117¼
Lehigh Valley	156¼	118	83⅜	64⅝	84¼	74½	77¼
Louisville & Nashville	141⅞	125	130¼	104½	135½	121⅛	...
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	7¼	3¼	...
Missouri Pacific	30	7	18¼	4¼	7⅜	3½	5¼
New York Central	96⅝	77	110½	81½	111½	100¼	...
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	51	...
Northern Pacific	118½	97	119	99⅛	118⅞	109¾	110⅛
Pennsylvania R. R.	115½	102½	61½	51¾	59¾	55¼	56½
Reading	172¼	137	85⅝	69⅛	110¾	75⅞	95¼
Southern Pacific	99½	81	104⅛	81¼	104⅛	94¼	97⅝
Union Pacific	164⅜	112	141½	115¾	143⅜	129¼	136¾
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¼	94½	61¾	89
American Can	35⅛	19¼	68½	25	65⅜	50¼	55¾
American Can, pfd.	96	80	113½	89	113⅞	109	110¼
Am. Car & Foundry	53½	42¼	98	40	78	53¼	58¼
Am. Cotton Oil	46½	32	64	39	57½	50½	....
Am. Locomotive	37¼	29¼	74¾	19	83¾	60¾	66½
Am. Smelting & Refining	71⅛	50¼	108⅞	56	113⅜	88½	94
Brooklyn Rapid Transit	94¼	79	93	83¼	88⅞	83½	84¾
Chino Copper	44	31⅝	57⅜	32¾	60	47⅝	47½
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	53	38⅛	43⅞
Consolidated Gas	139½	112½	150⅛	113¾	144¾	130½	133¼
General Electric	150⅝	137½	185½	138	178½	159	169
International Harvester	113½	82	114	90	119¾	108⅛	...
Lackawanna Steel	40	26½	94¾	28	86	64	45
National Lead	52	40	70¾	44	73⅞	60½	63⅛
Ray Consolidated Copper	22½	15	27½	15¼	26	20	23
Republic Iron & Steel	27	18	57¼	19	55¼	42	47⅛
Republic Iron & Steel, pfd...	91¼	75	112⅝	72	112	106⅞	109¼
Sloss-Sheffield	35	19½	66⅞	22	63¼	46½	...
Texas Co.	149⅞	112	237	120	235½	177¾	195
U. S. Rubber	63	44½	74¾	44	58½	47¾	54¼
U. S. Steel Corporation	67¼	48	89½	38	89	79¾	86⅝
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	118½	115	116½
Utah Copper	59⅜	45⅜	81¾	48½	86¼	75	76½
Va.-Carolina Chem.	34⅞	17	52	15	51	36	39⅝
Western Union Telegraph ...	66⅞	53⅜	90	57	96⅞	87	92⅞

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1911:

Quarter.	1916.	1915.	1914.
1st	$60,713,624	$12,457,809	$17,994,382
2nd	81,126,018	21,950,055	20,457,596
3rd	38,710,644	22,276,002
4th	51,277,504	10,935,635
Year	130,396,012	71,663,615

	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38,450,400	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year	137,181,345	108,174,673	104,305,466

Unfilled Orders.

(At end of the Quarter).

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	4,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,342,590	4,057,939	4,796,833	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220
1916..	9,331,001	9,640,458		

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column

1914	Shipments. %	Bookings. %	Difference. %	Difference Tons.
July	64	75	+11	+125,732
August	67	72	+ 5	+ 54,742
September	62	24	−38	−425,664
October	55	28	−27	−326,570
November	45	32	−13	−136,505
December	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February	57	66	+ 9	+ 96,800
March	67	60	− 7	− 89,622
April	71	63	− 8	− 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	− 2	− 20,085
September	98	133	+35	+409,163
October	103	172	+69	+847,834
November	102	186	+84	+1,024,037
December	102	152	+50	+615,731
January 1916	102	112	+10	+116,547
February	102	157	+55	+646,199
March	104	164	+60	+762 035
April	104	146	+42	+498,550
May	104	82	−22	−297,340
June	104	82	−22	−297,340

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000. this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January	1,021	795	226	939	718	221	1,134	797	336
February	914	746	168	900	680	220	1,140	800	340
March	1,091	801	290	1,015	722	293	1,260	844	416
April	1,058	782	256	1,013	724	289	1,223	827	396
May	1,047	800	247	1,040	732	308			
June	1,097	789	308	1,090	730	360			

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1911.	1912	1913.	1914.	1915	1916.
January ..	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,5: 0,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	58,300,297
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,619	58,722,111
May	20,616,795	28,050,247	26,718,970	19,734,015	26,536,612	72,918,913
June	20,310,053	24,795,802	25,228,346	18,927,958	31,757,103	.....
July	17,454,772	24,917,952	24,170,701	16,737,552	35,891,575	.....
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822	.....
September ...	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,195,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	25,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$295,740,814

EXPORTS OF TONNAGE LINES—Gross tons.

	1909.	1910.	1911	1912.	1913.	1914.	1915.	1916
January	70,109	118,681,	152,762	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	139,946	368,867
March	94,519	124,980	216,360	218,219	257,519	159,998	174,104	438,058
April	100,911	117,921	228,149	267,313	259,089	161,952	223,587	384,924
May	109,808	135,306	178,589	307,656	242,353	139,107	263,113	540,549
June	114,724	120,601	174,347	273,188	243,108	144,539	355,402	.....
July	100,850	127,578	162,855	272,778	237,159	114,790	378,897	.....
August	105,690	131,391	177,902	282,645	209,856	86,599	405,853	.....
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,542	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	184,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,166	2,730,681	1,549,543	3,532,432	2,089,520

IRON ORE IMPORTS.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,841
Feb. ..	188,734	112,574	78,773	93,315
Mar. .	164,865	68,549	88,402	93,383
April.	174,162	111,812	91,561	75,712
May .	191,860	125,659	98,974	148,599
June .	241,069	188,647	118,575	.....
July .	272,017	141,838	119,468	.....
Aug. .	213,139	134,913	126,806	.....
Sept. .	295,424	109,176	173,253	.....
Oct. ..	274,418	114,311	138,318	.....
Nov. .	179,727	90,222	113,541	.....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	500,853

IRON AND STEEL IMPORTS.

	1912.	1913.	1914.	1915.	1916.
Jan. .	20,008	21,540	17,776	10,568	15,824
Feb. .	11,622	25,505	14,757	7,506	20,280
Mar. .	15,466	27,467	27,829	8,025	15,162
April.	12,481	25,742	30,585	16,565	20,175
May .	15,949	28,728	28,173	28,916	32,113
June.	21,407	36,597	23,076	32,200	.....
July .	17,882	36,694	25,282	20,858	.....
Aug. .	20,571	18,740	28,768	27,556	.....
Sept..	18,740	19,941	38,420	23,344	.....
Oct. .	25,559	20,810	22,754	34,319	.....
Nov. .	24,154	25,809	24,165	37,131	.....
Dec. .	21,231	26,151	9,493	35,455	.....
Total	225,072	317,260	289,778	282,443	103,554

Price Changes of Iron and Steel Products From March 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our **composite finished steel.** In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the rates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 24	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galvanized sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30

1915—			
Aug. 31	Bars	1.30	to 1.35
" 31	Bars	1.30	to 1.35
" 31	Blue ann. sheets	1.40	to 1.50
Sept. 15	Plates	1.30	to 1.35
" 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galvanized sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galvanized sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galvanized sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galvanized sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
Nov. 18	Shapes	1.60	to 1.70
" 18	Galvanized sheets	4.00	to 4.25
" 24	Galvanized sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galvanized sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80

"	15	Plates	1.70 to 1.80
"	15	Shapes	1.70 to 1.80
"	31	Wire nails	2.00 to 2.10
"	22	Sheets	2.50 to 2.60
1916—			
Jan.	3	Tin plate	3.60 to 3.75
"	3	Blue ann. sheets	2.25 to 2.35
"	4	Bars	1.80 to 1.85
"	4	Plates	1.80 to 1.85
"	4	Shapes	1.80 to 1.85
"	4	Pipe (with extra 2½%	78% to 77%
"	5	Blue ann. sheets	2.35 to 2.40
"	7	Boiler tubes	68% to 66%
"	12	Blue ann. sheets	2.40 to 2.50
"	14	Boiler tubes	66% to 64%
"	19	Blue ann. sheets	2.50 to 2.65
"	21	Bars	1.85 to 1.90
"	21	Plates	1.85 to 2.00
"	21	Shapes	1.85 to 1.90
"	21	Pipe	77% to 76%
"	24	Wire nails	2.10 to 2.20
Feb.	7	Bars	1.90 to 2.00
"	7	Plates	2.00 to 2.10
"	7	Shapes	1.90 to 2.00
"	14	Wire nails	2.20 to 2.30
"	15	Pipe	76% to 75%
"	21	Bars	2.00 to 2.25
"	21	Plates	2.10 to 2.35
"	21	Shapes	2.00 to 2.25
"	21	Tin plate	3.75 to 4.00
"	29	Pipe	75% to 74%
"	29	Boiler tubes	64% to 63%
Mar.	1	Wire nails	2.30 to 2.40
"	8	Black sheets	2.60 to 2.75
"	8	Blue ann. sheets	2.65 to 2.90
"	13	Bars	2.25 to 2.35
"	13	Plates	2.35 to 2.60
"	13	Shapes	2.25 to 2.35
"	15	Steel pipe	74% to 73%
"	15	Boiler tubes	63% to 61%
"	23	Bars	2.35 to 2.50
"	23	Shapes	2.35 to 2.50
"	28	Plates	2.60 to 2.75
"	29	Sheets	2.75 to 2.85
"	29	Steel pipe	73% to 72%
"	29	Boiler tubes	61% to 60%
April	5	Sheets	2.85 to 2.90
"	15	Boiler tubes	60% to 56%
"	19	Tin plate	4.50 to 5.00
"	24	Pipe	72% to 70%
May	1	Wire nails	2.40 to 2.50
"	3	Tin plates	5.00 to 5.50
"	16	Plates	2.75 to 2.90
June	7	Galv. sheets	5.00 to 4.75
"	16	Tin plate	5.50 to 6.00
July	7	Blue ann. sheets	3.00 to 2.90
"	7	Galv. sheets	4.75 to 4.50
Aug.	1	Tin plate	6.00 to 5.50

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
1912	1,017,155	615,292	+401,863
1913	1,427,227	611,924	+815,303
1914	1,403,081	633,805	+769,276
December ...	27,458	42,525	— 15,067
January, 1915.	20,684	31,556	— 10,872
February ...	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 .	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ...	31,096	33,061	— 1,965
October	31,215	26,338	+ 4,877
November ..	29,297	26,005	+ 3,292
December ...	23,173	23,743	— 570
January, 1916.	17,293	4,015	+ 7,303
February ...	30,244	10,824	+ 19,420
March	33,685	9,894	+ 23,791
April	36,999	10,856	+ 26,143
May	37,925	13,217	+ 24,708

United States citizens arrived and departed, with change thereby effected in United States population:

	Arrived.	Departed.	Change.
1913	286,604	347,702	— 61,098
1914	286,586	368,797	— 82,211
1915	239,579	172,412	+ 67,167
July, 1915	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September ...	9,054	8,188	+ 866
October	8,991	8,329	+ 662
November ...	8,364	9,166	— 802
December	8,458	9,349	— 891
January, 1916.	8,257	9,469	— 1,212
February	11,082	12,908	— 1,826
March	15,065	10,867	+ 4,198
April	12,522	8,051	+ 4,471
May	10,989	8,968	+ 2,021

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,237; July, 1915, +14,994; August, 1915, —15,128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461; January, 1916, +6,091; February, +17,594; March, +27,989; April, +30,614; May, +26,729; 11 months, +114,352.

COMPOSITE STEEL.

Computation for August 1, 1916:

Pounds.	Group.	Price	Extension.
2½	Bars	2.50	6.250
2½	Bars	2.50	6.250
1½	Plates	2.90	4.350
1½	Shapes	2.50	3.750
1½	Pipe (¾-3)	2.95	4.425
1½	Wire nails	2.50	3.750
1	Sheets (28 bl.)	2.90	2.900
½	Tin plates	5.50	2.750
10 pounds			28.175
	One pound		**2.8175**

Averaged from daily quotations.

	1912.	1913.	1914.	1915.	1916
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7165
May	1.5590	1.7786	1.5078	1.5381	2.8043
June	1.5794	1.7719	1.4750	1.5312	2.8300
July	1.6188	1.7600	1.4805	1.5692	2.8425
Aug.	1.6784	1.7400	1.5241	1.6059	.....
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet Pitts.	No. 1 R. Wrought Pitts.	R. No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1914—						
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75
May	17.00	13.65	19.65	16.10	17.00	15.90
June	16.25	13.00	19.00	15.40	15.45	14.80
July	16.70	12.50	18.80	15.30	15.00	14.30

COMPOSITE PIG IRON.

Computation for August 1, 1916:

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.00)	36.00
One ton No. 2 foundry, valley	18.25
One ton No. 2 foundry, Philadelphia	19.75
One ton No. 2 foundry, Buffalo	18.75
One ton No. 2 foundry, Cleveland	18.70
One ton No. 2 foundry, Chicago	19.50
Two tons No. 2 Southern foundry, Cincinnati (16.90)	33.80
Total, ten tons	185.75
One ton	**18.575**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916
Jan.	13.240	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	18.965
June	14.005	14.968	13.606	13.047	18.552
July	14.288	14.578	13.520	13.125	18.585
Aug.	14.669	14.565	13.516	14.082	.....
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, Phila.	deliv. — Pitts.	Ch'go.
1914—						
Year	20.06	20.82	25.50	1.20	1.27	1.07
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35
May	43.00	43.00	59.00	2.66	2.60	2.35
June	42.00†	42.00†	58.00	2.66	2.60	2.35
July	42.50†	42.50†	58.00	2.66	2.60	2.35

† Premium for open-hearth.

CAR BUYING.

Freight cars ordered:		
First half, 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,120	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	
May	6,204	
June	3,470	
Six months		64,287
July	1,723	

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.

January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,600,000
April	39,600,000
May	39,800,000
June	39,500,000
July	38,350,000
On August 1st	38,300,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1913—			
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,745,913	134,169,807
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	193,935,117	402,991,118	209,056,001
Mar.	213,589,785	409,850,425	196,260,640
Apr.	217,705,397	399,861,157	182,155,760
May	229,188,957	*474,881,255	*245,692,298
June	*245,896,770	464,824,057	218,927,287

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April .	13.60	20.70	12.50	18.00
May ..	13.659	20.833	12.65	18.1607
June ..	13.75	21.00	12.724	18.00
July ..	13.991	21.00	12.959	18.00
Aug. ..	15.064		14.364	
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

WAGE SCALE AVERAGES.

Sworn averages of prices obtained by mills for shipments in months named, used in fixing wages under Amalgamated Association sliding scales. The figures represent the rates used, the actual ascertained averages lying between the figure given and the one five points higher. Base sizes of iron bars; average of 26, 27 and 28 gauges black sheets; tin plate per base box, 100-pound.

	Bar Iron.		
	1914.	1915.	1916.
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	*1.60
May-June	1.1257	*1.10	*1.85
July-August	1.0928	*1.15	....
September-October	1.0847	*1.15	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.144	....

* Settlement basis.

Sheets and Tin Plates.		
1916.	Sheets.	Tin Plates.
January-February	2.25	3.50
March-April	2.50	3.70
May-June	2.60	3.90

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1913	20,680	57,812
1914	15,411	59,549
1915	2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	8,024
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178
February	107	13,534
March	44	20,364
April	179	21,385
May	39	25,585

British tin plate exports have been as follows, in gross tons:

1914	435,497
1915	368,602
January 1916	26,271
February	27,289
March	39,482
April	23,337
May	41,868
June	30,351

BRITISH IRON AND STEEL EXPORTS.

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*
Jan. ..	21,138	24,411	29,216	230,204
Feb. ..	21,934	14,877	15,101	198,294
Mar. ..	20,172	17,572	36,170	239,341
April ..	35,209	21,602	40,135	265,244
May ..	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	33,224	39,528	351,984
Aug. ..	73,283	32,962	22,572	295,260
Sept. .	53,068	15,800	20,002	249,501
Oct. .	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	87,283	3,366	39,482	307,488
April ..	82,976	10,510	23,337	293,897
May ..	97,967	4,103	41,868	395,750
June ...	77,487	3,243	30,351	310,595

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Tin in July.

Tin Market Mysteriously Depressed in First Half of Month, Prices Declining Steadily —Later Market Recovers Slightly and Then Recedes—Net Decline for Month ⅞ to 1⅞c Per Pound Here, £5 5s on Standard and £5 15s on Straits in London.

Something mysteriously depressing seemed to hang over the tin trade during the first nineteen days of July. It was an intangible something that hung like a pall over the market. Importers and dealers were equally in the dark as to whence it came or what it was. Foreign advices threw no light upon the cause of the weakness that was apparent only in a steady downward movement of prices. There were frequent temporary recoveries in the daily quotations made at London and at Singapore but the succeeding declines carried the market to lower and lower levels. Consumers who at first bought moderately and cautiously on the recessions and who expected to continue to buy whenever the market reached 38c became most distrustful.

Arguments Against Bearish Sentiment.

Dealers and operators kept reiterating that American consumption was never so large, that no great increase in production was in sight and that prices of tin in all positions here and abroad were relatively and intrinsically low. Consequently there was no reason for the bearish sentiment that prevailed. The weakness abroad must be due to psychological causes.

Not satisfied with this view, consumers —having present and future needs well covered either by stocks in hand or by previous purchases for future delivery—waited and looked deeper for the cause of the depression. It was pointed out that under the trade supervision exercised by the English Government speculation is almost impossible and hence sellers at London or producers in the East Indies lack the ability to carry stocks for a rise. As current supplies must be marketed and as consumers are loth to buy except sparingly on a declining market the natural drift of prices must be steadily downward while the absorption for consumption is less than current offerings.

American importers and dealers are in much the same position as are the foreign operators—they buy to resell at a profit—but they are better situated to finance and to carry stocks during the war than are their confreres in Europe.

Upon the resumption of business here, after Independence Day, New York dealers bought future positions at 38c, a decline of ½c per pound from the prices current on the closing day of June. A rise of ¼c in the next two days seemed to justify the purchases but evidence of renewed weakness abroad caused a further decline here while consumers reduced their purchase limit on the fourth quarter position to 37½c. Late on July 11th, however, purchases of November-December arrivals were made at 37⅝c and some round lots to arrive in July were sold at 38⅛c, a decline of 1c to 1½c per pound from the prices current June 30th. Some improvement abroad in the next few days resulted from American buying orders and an unsuccessful effort was made to force the New York market to respond to the rise at London.

Enforced Liquidation Abroad Ascribed as Main Cause for Depression.

On July 18th, the domestic trade was compelled to adopt the belief of enforced liquidation abroad as the main cause for the mysterious depression during the preceding fortnight. On the following day it became known that an outside foreign interest for several days had been forcing sales upon American dealers at steadily declining prices. A round tonnage of such metal was finally taken here at something under 36½c, acceptance being made by cable. This transaction seemed to clear the trade atmosphere. Immediately preceding these negotiations the New York market had dropped to 37½c for spot, 37¼c for August, 37c for September, 36¾c for October and 36½c for November-December. Prices had thus dropped from June 30th to July 19th, 2⅛c on spot, 2c on December and ⅞c to 1¾c on all intermediate positions. During the same period the London market had dropped £10 5s on spot and £11 on future Standard; spot Straits at London also had dropped £11 while the Singapore market had broken £12 10s net.

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	19,614
June	12,920	11,101	16,027	15,927	19,363
July	13,346	12,063	14,167	16,084	18,404
Aug.	11,285	11,261	14,452	15,127	.....
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	3,965
June	4,290	4,280	5,870	6,665	6,210
July	4,580	4,770	4,975	5,606	5,410
Aug.	5,210	6,030	3,315	4,712	....
Sept.	5,430	5,160	4,973	5,296	....
Oct.	4,450	5,020	4,610	4,441	....
Nov.	5,600	5,560	5,155	6,713	....
Dec.	4,980	5,110	6,435	5,301	....
Total	59,018	62,550	63,093	66,517	....
Av'ge	4,918	5,213	5,258	5,543	....

CONSUMPTION IN THE U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	5,455
June	2,850	3,800	3,650	3,900	6,398
July	3,150	3,900	3,900	5,300	4,432
Aug.	4,300	3,600	2,900	4,500	....
Sept.	3,600	3,100	3,600	4,300	....
Oct.	3,850	3,700	3,700	4,900	....
Nov.	4,300	2,800	2,600	2,975	....
Dec.	4,050	3,100	1,900	5,200	....
Total	49,500	43,900	41,700	48,750	36,053
Av'ge	4,125	3,658	3,475	4,062	5,150

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	July 1916.	June 1916.	July 1915.
Straits shipments:			
To Gr. Britain..	1,860	3,665	2,316
" Continent ..	1,020	845	785
" U. S.	2,530	1,700	2,505
Total from Straits	5,410	6,210	5,606
Australian shipments			
To Gr. Britain .	119	228	171
" U. S.	nil	nil	nil
Total Australian	119	228	171
Consumption			
London deliveries	1,467	1,917	1,915
Holland deliveries	104	101	148
U. S.	4,432	6,398	5,300
Total	6,003	8,416	7,363
Stocks at close of month:			
In London—			
Straits. Australian	2,264	1,762	1,573
Other kinds ...	1,595	1,399	1,409
In Holland	.....	.....	41
In U. S.	5,028	3,963	991
Total	8,887	7,124	4,014
Afloat, close of month:			
Straits to London	4,140	5,625	4,025
" to U. S...	3,917	4,040	7,700
Banca to Europe.	1,460	2,574	345
Total	9,517	12,239	12,070
	July 31, 1916.	June 30, 1916.	July 31, 1915.
Total visible supply	18,404	19,363	14,167

STRAITS TIN PRICES IN NEW YORK.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	49.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	49.15
June	47.77	44.93	30.65	40.37	42.18
July	44.75	40.39	31.75	37.50	38.46
Aug.	45.87	41.72	50.59½	34.39	.....
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

Discharging of Banca Tin on S. S. Rotti Held Up.

One distressing episode during the first half of the month was the procrastination indulged in the discharge of the steamship Rotti from the East Indies that arrived here June 22nd with 1,200 tons of Banca tin. This cargo was valued at $1,000,000 and interest charges alone fell heavily upon importers. Not until July 13th did this tin become available to consumers who had contracted for the metal at 43c to 44c and they were receiving the tin after the market had dropped to 38c—Banca metal being about 3¼c below the price of Straits. It thus required 21 days after the vessel arrived to secure the tin. There was naturally much dissatisfaction, with rumors of legal steps to be taken to assess damages against the vessel. Early in the month it was reported that the Dutch Government had withdrawn from the market and would accumulate supplies of Banca tin until after the war is over. Two other ships with supplies from Batavia, however, were afloat and prices of Banca continued to decline with Straits.

London Advances Sharply.

On July 20th, London, much relieved by the unloading of the burdensome supplies upon America, advanced sharply £3 to £3 10s and foreign limits on future positions were up 1c per pound. A further advance on July 21st carried London up to £169 5s for spot Straits while Singapore responded the next day by a rise to £171 10s a gain of £6 in three business days. American orders sent abroad encouraged foreign operators but the recovery was too extreme to attract American dealers or consumers at once. The reaction brought an advance of ¾c to 1c per pound on the various positions here, with a rise of £5 to £5 15s at London and a jump of £7 10s at Singapore, by the end of the month.

The lack of support from large American consumers, however, modified the new found confidence but considerable business was done in nearby positions with consumers at 37½c to 37¾c on July 26th, dealers covering their sales by purchasing October to December positions at 36½c. Consumers also bought October, November, December arrivals. As a result, orders for 200 tons went abroad followed by a sudden rise of ½c per pound on July 28th. Some of the cheaper sellers withdrew adding strength to the undercurrent. The market closed dull but firm. The net decline for the month was ⅞c to 1⅞c per pound on the various positions at home while the result of the fluctuations abroad was a net decline of £5 5s on Standard and £5 15s on spot Straits at London and a recession of £5 at Singapore.

Visible Supply Decreases 959 Tons.

In the last few days of the month there were considerable offerings of other than Straits tin at more than the usual concessions. No. 1 Chinese 99% sold at 36¼c. On July 28th, the s.s. Medan from Batavia, arrived with 1,300 tons Banca. On July 31st, four ships came in from London and the Straits making total arrivals 4,665 tons. Deliveries into American consumption were 4,432 tons of which 3,600 tons were shipped from Atlantic and 832 tons from Pacific ports. Stocks at New York were increased from 3,963 tons at the end of June to 5,028 tons at the end of July. Of the latter 2,178 tons were in store and 2,850 were on dock or landing. It is evident that there is plenty of tin here but it is not pressed for sale. The total visible supply was decreased 959 tons during the month, the total on July 31st, being 18,404 tons against 19,363 tons at the end of June and 16,084 tons on July 31, 1915. Shipments from the Straits were 5,410 tons, a decrease of 195 tons compared with the corresponding month in 1915 and 800 tons less than the shipments in June this year.

TIN PRICES IN JULY.

	New York.	London						
Day.	Cents.	£	s	d	£	s	d	
		Spot.			Futures.			
3	39.37½	172	10	0	173	0	0	
4	.....	170	5	0	171	0	0	
5	39.12½	172	5	0	172	10	0	
6	39.25	173	0	0	173	5	0	
7	39.25	173	0	0	173	10	0	
10	38.62½	170	0	0	170	10	0	
11	38.50	168	10	0	169	0	0	
12	38.50	169	10	0	170	0	0	
13	38.75	159	15	0	170	15	0	
14	38.50	169	0	0	169	15	0	
17	38.12½	166	10	0	167	5	0	
18	37.75	163	10	0	164	5	0	
19	37.50	163	0	0	163	10	0	
20	38.25	166	10	0	167	0	0	
21	38.50	168	5	0	168	15	0	
24	38.12½	.....			.....			
25	38.00	166	0	0	166	10	0	
26	38.00	165	10	0	166	5	0	
27	38.00	165	15	0	166	10	0	
28	38.50	168	0	0	168	15	0	
31	38.50	168	10	0	169	5	0	
High ...	39.37½	173	0	0	173	10	0	
Low	37.50	163	0	0	163	10	0	
Average .	38.46	168	7	2	168	19	1	

Lead in July.

Outside Market Firm at Opening of Month With Large Sales—Lead Trust Demoralizes Market by Suddenly Reducing Its Price $10 Per Ton—Month Closes With Total Decline of $18.50 Per Ton.

Lead was stronger in the open market at the beginning of July than for a fortnight; prices recovering to within 5 or 10 points of the Trust level, with sales of several thousand ton lots, within a few days, and more inquiry promising further business of importance. There was no prospect of foreign orders, however, as on July 3rd, the London market dropped below 6c, removing hope of support from abroad. Canada, however, bought several hundred ton lots.

This was the condition of the market on July 5th, when out of an apparently clear sky, came the sudden action of the American Smelting & Refining Co. reducing the price ½c per pound to 6.50c New York, and 6.42½c East St. Louis. Although the trade was puzzled and the decline unexpected by independent producers, the latter immediately became aggressive for business, making concessions from the current market that had seemed especially attractive, now represented a loss; consequently instead of stimulating buying, the lower prices withheld consumers and dealers from the market, in anticipation of a further decline. Confidence was badly shaken and the trade awaited further developments.

Outside Market Weak.

In the next few days, outside interests yielded $1 to $2 per ton more, prompt shipment from the West being offered down to 6.10c East St. Louis. The more pacific outlook in Mexico and the improved prospect of freeing French and Belgium territory from control of the German armies was regarded as a bearish element by the trade at large and consequently buying was restricted to the covering of mandatory requirements. Sympathetically, a weaker tone was developed in lead ore and on July 11th, there was a reduction of $2.50 per ton. In the next few days a still weaker tone prevailed in the New York and western markets for the metal, with September and October shipments from the West offered at 6c East St. Louis. The foreign market up to July 11, while not very important as affecting prices here, had declined 15s on spot and £1 10s on futures.

Munitions Orders.

About the middle of the month some ammunition contracts placed here called for the purchase of several round lots of lead and antimony. The lead orders aggregated 3,000 to 4,000 tons for July and August shipment; the price was reported to have been 6.10 to 6.12½c East St. Louis. Otherwise the market was dull.

Strike of Spanish Operators Precipitates Moderate Advance in London.

The strike of operators in the Spanish lead districts was reflected in a moderate advance at London—10s to 15s on spot and futures. American producers were not unmindful of the foreign developments but even the sympathetic influence upon the domestic situation was negligible; in fact, outside producers and operators became more anxious to sell as the month advanced. On 19th, more ammunition orders were taken

LEAD PRICES IN JULY.

	New York.*	St. Louis.	London.		
Day.	Cents.	Cents.	£	s	d
3	6.90	6.65	28	5	0
4	....	....	28	0	0
5	6.50	6.42½	28	0	0
6	6.45	6.30	28	5	0
7	6.40	6.25	28	0	0
10	6.40	6.25	28	0	0
11	6.40	6.25	28	0	0
12	6.40	6.25	28	0	0
13	6.40	6.22½	28	5	0
14	6.40	6.22½	28	5	0
17	6.40	6.22½	28	5	0
18	6.40	6.20	28	10	0
19	6.35	6.20	28	10	0
20	6.35	6.20	28	10	0
21	6.35	6.12½	28	12	6
24	6.30	6.10	.....		
25	6.25	6.05	28	5	0
26	6.25	6.05	28	0	0
27	6.25	6.05	28	0	0
28	6.25	6.02½	28	5	0
31	6.22½	6.02½	28	10	0
High	6.95	6.67½	28	12	6
Low	6.20	6.00	27	15	0
Average ...	6.38	6.20	28	3	11

* Outside market.

at small change in price. Demand from other sources was light and the pressure to sell increased. By July 24th, spot had receded to 6.10c, August to 6.05 and September was more freely offered at 6c in the open market.

The St. Louis market was very unsettled with orders few and far between. Consumers, constantly anticipating an official decline, habitually waited until the last moment to place orders and then, requirements being urgent, placed orders for the little metal needed, without great regard to the prices paid for quick delivery.

It was pointed out that the statistical situation was encouraging to producers; stocks were low and there was small tendency toward accumulation. The latter fact, however, was due to the vigilance of producers who did not hesitate to cut prices if necessary to keep the metal moving. The dearth of large orders, though, called for frequent shaving of prices. It was this policy that made it evident, on July 28th, that the most alert producers had accumulated no stocks. Some lead was sold almost every day but at the close of the month spot and August positions had dropped to 6c and September delivery could be bought at 5.90c and 6c East St. Louis. Thus the decline for the month was 93½ points, equivalent to a drop of $18.50 per ton.

The London market on July 24th had receded £1 on spot and £2 on futures; spot being quoted at £29 15s and futures at £26. From that time there was a recovery of 15s on spot and £1 on futures so that the net decline for the month was only 5s on spot and £1 on the three months position.

LEAD (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19	7.50	3.70	4.11	7.67
May	3.90	4.23½	7.50	3.81	4.16	7.28
June	3.90	5.86	7.04	3.80	5.76	6.77
July	3.90	5.74	6.52	3.75	5.52	6.20
Aug.	3.90	4.75		3.73½	4.59	
Sep.	3.86	4.62		3.67	4.53	
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

LEAD PRICE CHANGES.

The changes in the Trust price at New York since June 11, 1915, have been as follows:

June 11, 1915		6.50
June 12	Advanced	.50c to 7.00
June 17	Reduced	.75c to 6.25
June 18	"	.25c to 6.00
June 19	"	.25c to 5.75
July 30	"	.25c to 5.50
August 2	"	.25c to 5.25
August 7	"	.25c to 5.00
August 9	"	.25c to 4.75
August 10	"	.25c to 4.50
August 25	Advanced	.10c to 4.60
August 26	"	.10c to 4.70
August 27	"	.20c to 4.90
September 9	Reduced	.20c to 4.70
September 14	Reduced	.20c to 4.50
October 21	Advanced	.25c to 4.75
October 29	"	.15c to 4.90
November 4	"	.10c to 5.00
November 10	"	.15c to 5.15
November 15	"	.10c to 5.25
December 14	"	.15c to 5.40
December 31	"	.10c to 5.50
January 4, 1916	"	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	.05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60
March 14	"	.40c to 7.00
March 30	"	.50c to 7.50
June 2	Reduced	.50c to 7.00
July 5	"	.50c to 6.50
August 2	"	.50c to 6.00

Spelter in July.

Opening Days of July Ushers in a Sensational Bear Attack, Smashing Prices £17 on Spot, £13 on Futures—Later Market Recovers, Making Total Decline for Month Only £1 on Spot, £3 on Futures.

The position of spelter proved vulnerable to a strong bear attack from abroad early in July. The local market, already weakened by the crumbling of prices during the latter part of June, readily yielded to pressure. There was an absence of support at home, few buyers being in the market, but just before Independence Day, some small sales on first half of July delivery were made at 10½c E. St. Louis. The morale of traders suffered a severe shock during the first five days of the month when the London market broke £15 on spot and £10 on futures, carrying prices one cent below the New York parity. The home market had dropped 1c to 1½c per lb. on nearby positions during the same time without developing any business of importance.

Sellers, in need of orders and hoping for a foreign outlet, were extremely disappointed by the unexpected developments at London, but it was significant that a test of the market by home consumers, before the end of the first week, proved that while there was plenty of metal offered for prompt shipment there was less pressure to sell future deliveries. In the next two days, prices yielded ½c per pound more. The returns to the smelters on the current market were less than half what they had been ten weeks before. The outlook was serious and with wages and ore prices relatively high and recovery from the ore smelted, reduced to 75 to 80% several of the smaller smelters shut down. Not only was it difficult to exchange an old dollar for a new one but an actual severe loss was impending

Still the market continued to decline at home and abroad. Consumers and dealers with stocks suffered as did producers from the continuous downward movement. Large producers believing that the sensational decline was not justified by the facts, prepared to withstand the siege against their position. On July 10th, galvanizers put out inquiries for July, August, September and October deliveries but failed to make specific bids and there was no demand from brass founders. It became more evident that production was increasing and smelters gained something when ore was sold in the St. Louis district below the agreed price of the mine operators.

Apex of Depression Reached.

On July 11th, the London market reached the point of greatest depression with a decline of £17 on spot and £13 on futures from the prices that prevailed at the end of June. The market was in a critical state with indications of a turn for the better but the momentum of the domestic trade carried prices downward for two or three days longer when spot was sold at 8½c, July at 8¼c, August at 8⅛c, September at 8c and last quarter delivery at 7⅞c.

Market Firmer With Large Foreign and Domestic Inquiry.

These prices revealed a decline of 1⅞ to 2¾c on prompt to September shipments inversely, from June 30th. Small producers, however, refused to entertain offers except on prompt and July shipment but large producers accepted some future contracts; in fact, considerable business was done in August to December positions. Galvanizers were especially active but brass interests were conspicuous by their absence from the market. More buying at home and some export inquiry caused a stronger tone and producers demanded and obtained a fractional advance on July 14th. The London market in the meantime had advanced several pounds. A flood of inquiries now came from galvanizers but actual buying was confined within relatively narrow limits as producers became reluctant to sell except at a further advance.

Up to July 17th, the English market was still relatively below the prices here and hence no export orders were placed but there was renewed inquiry from domestic consumers that resulted in a satisfactory volume of business at rising prices. Foreign buyers came in the next day irrespective of London quotations and helped the rise. It was the first real live business transacted in over six weeks. Upward of half of the producers refused to sell expecting still higher prices which came in the next few days with large domestic orders. Heavy curtailment of ore output also gave added strength to the market for metal. The sharp

recovery in prices also prompted large trading interests, said to be on the short side, to negotiate privately for round tonnages. Europe also bought liberally and actively through several channels. As a result the upward movement was accelerated. Some of the large producers had previously sold one half of their capacity and it soon developed that large quantities were not available at low prices. Foreign inquiries became more active and pressing and for larger tonnages.

Market Here Recovers 2c to 2½c Per Pound.

By July 24th, the domestic market had recovered from 2 to 2½c per pound on all positions up to and including September. Last quarter delivery had advanced 1⅝c. Sales of prompt and July were made at 10½c August at 10¼c. Sept. at 10c and fourth quarter at 9½c. Some sellers were excited and demanded a further advance of ⅛c to ¼c per pound. London failed to have all of its inquiries satisfied. Some large domestic contracts may have been closed quietly but it became evident on the following day that would-be-buyers, discouraged by the rapidly advancing prices, withdrew and an easier tone was developed. The remaining inquiries, mainly for futures and last quarter contracts, were taken at concessions—under 9⅜c. Spot was scarce.

Dealers and middlemen were more anxious for orders during the last few days of the month but domestic consumers were reserved and concessions failed to stimulate purchases of importance. England continued to buy small lots, however, as the market receded. The reaction caused sellers to yield ⅞ to 1c per pound on all positions, making the net decline for the month ⅞ to 1⅛c per pound.

Munitions Orders.

Munitions orders, placed with American manufacturers during the last week of the month were mainly for large sized shells with steel rather than with brass casings but some orders were also placed for 3-inch shells and for steel fuses that indicate a necessity for brass; yet up to the close of the month the brass mills bought little copper or spelter as many of them had previously overbought supplies.

The rise in London market that began July 11th, continued up to July 25th, followed by some reaction and a later recovery. On July 28th, spot had advanced £16 to £60 and futures were up £13 to £53. The net decline for the month was only £1 on spot and £3 on futures.

SPELTER PRICES IN JULY.

Day.	New York. Cents.	St. Louis. Cents.	London. £	s	d
3	10.92½	10.75	51	0	0
4	.....	.....	48	0	0
5	10.17½	10.00	46	0	0
6	9.55	9.37½	46	10	0
7	9.22½	9.00	44	0	0
10	9.17½	9.00	44	0	0
11	8.92½	8.75	44	0	0
12	8.92½	8.75	45	0	0
13	8.80	8.62½	45	5	0
14	8.80	8.62½	47	0	0
17	9.05	8.87½	48	0	0
18	9.30	9.12½	48	0	0
19	9.55	9.37½	50	0	0
20	9.92½	9.75	51	0	0
21	10.42½	10.25	54	0	0
24	10.67½	10.50	.....		
25	10.42½	10.25	60	0	0
26	10.30	10.12½	59	0	0
27	10.17½	10.00	59	0	0
28	10.05	9.87½	60	0	0
31	9.67½	9.50	60	0	0
High	11.17½	11.00	60	0	0
Low	8.80	8.62½	44	0	0
Average	9.70	9.52½	50	15	0

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc since Nov. 22nd together with the price of spelter ruling on the same day.

	Sheet Zinc.	Spelter St. Louis.
1915—		
November 22	21.00	18.75
November 23	22.00	18.75
December 31	23.00	17.25
1916—		
January 26	24.00	19.00
February 17	25.00	20.87½
April 22	25.50	18.75
May 15	24.50	15.50
May 23	23.50	14.87½
May 26	22.50	14.12½
June 2	21.00	13.12½
June 13	20.00	13.37½
June 21	19.00	12.00
June 28	18.00	11.37½
July 6	17.00	9.37½
July 13	15.00	8.62½

Promise and Performance in American Spelter Production.

The semi-annual spelter report of the United States Geological Survey, compiled by Mr. C. E. Siebenthal appeared on August 7th as follows:

Production of Spelter in the U. S. 1916.

The following figures are not final and may be revised a small fraction of one per cent. The regular mid-year statement will be issued by the United States Geological Survey, Department of the Interior, in about ten days.

Spelter Statistics Jan. 1.—June 30, 1916.

Supply:	Short tons.	
Stocks on hand Jan. 1	14,253	
Production from domestic ores	267,449	
Production from foreign ores	48,756	
Imports	464	
		330,922
Withdrawn:		
Foreign exports	20,197	
Domestic exports ..	58,007	
Stocks June 30th	24,000	
		102,204
Apparent consump. approx...		228,700
No. retorts June 30, 1916		193,696
New retorts building or contemplated		22,188
		215,884

The above statistics now issued for the first six months of 1916 show a total production of 316,205 tons, or at the rate of say 632,410 tons for the year as against the capacity to produce about 885,000 tons for 1916 as previously estimated by this authority. From the advantages the U. S. Geological Survey possesses in obtaining correct reports from all the producers we have fullest confidence in these statistics of actual production, which is more than we have for the estimated production made by this authority last April 17th.

After stating the American production in the past three years as follows:

	1913.	1914.	1915.
Illinois	106,654	127,946	159,958
Kansas	74,106	44,510	100,983
Oklahoma	83,214	91,367	109,208
Other States	82,702	89,226	118,930
Total	346,676	353,049	489,519

It will also be remembered this authority's report at the time read as follows:

"The number of retorts at zinc smelters has been greatly enlarged in the last year as compared with the year before, increasing from 111,458 at the end of 1913 to 115,114 at the close of 1914, to 130,642 at the middle of 1915, and to 156,658 at the close of 1915. At the beginning of 1916 there was under construction or contemplated additional capacity amounting to 26,992 retorts, which has now been increased to 49,612. When these are completed the total number of retorts will be 206,270 capable of an annual yield under average conditions of approximately four tons each, equal to a total of 825,000 tons, if we neglect the number of retorts employed in refining prime western spelter by redistillation. To this capacity will be added the capacity of the electrolytic zinc plants listed above, over 60,000 tons a year, giving a capacity for the country of about 885,000 tons annually. As if this were not enough, there are reports of still other zinc smelters to be built in Illinois, Missouri, Arkansas, and Oklahoma.

"The abnormal demand for high-grade spelter at present has resulted in the employment of a considerable proportion of the retort capacity of the country in the redistillation of prime western spelter to improve its grade, but with the resumption of normal conditions these retorts, if operated, will necessarily be put back upon ore. This production is rendered certain by the growth in number and size of the plants, a list which is given above. Electrolytic spelter is of high grade, and the recovery is high compared with the production of high-grade spelter by two distillations. The output of electrolytic

zinc in the United States in 1915, the initial year of its production, was only 252 tons, but the production is rapidly increasing and by the end of 1916 will undoubtedly reach the rate of over 60,000 tons a year, which, with the output of high-grade spelter from lead-free zinc ores of the Eastern States will be ample to supply the demands for high-grade spelter in ordinary times, thus releasing for ore smelting the retorts engaged in redistilling prime western spelter.

"At the close of 1916 the spelter-producing capacity of the country, taking into account the capacity for primary spelter listed above, the output of secondary spelter by large special retorts, and the output of remelted spelter, will apparently be considerably more than 900,000 tons, or nearly three times the the probable domestic demands."

For this promise we now find the first six months has shown a performance of only 316,205 tons or if continued at the same rate a yearly output of 632,410 tons as against predicted capacity of close to 900,000 tons.

What has been the cause of this great difference? It is a very simple one. This authority made his estimates by his own statement by giving the output per retort at four tons per annum, whereas an estimate of between three to three and a half tons per retort would have been a most generous one.

The bulk of the metal produced this year has not averaged three and a quarter tons per retort and only in those plants in which from size and experience the best practice exists has it averaged three and a half tons. Besides this on account of the high prices low grade ores have been largely used in which the result per retort is diminished considerably.

Of course it was not to be expected that the U. S. Geological Survey estimate should apply to the first half of the year as the estimate was made for the entire year, also they stated "capacity" not "output."

In their present statement they give number of retorts June 30th at 193,696 and we believe this is positively correct as they have facilities of obtaining from smelters the exact facts, also that 22,188 retorts are building or contemplated.

On account of the change in prices, we think these contemplated retorts may be dismissed.

Taking above 193,698 retorts and giving three and a quarter tons per retort as yearly output we find American capacity to-day is 629,512 tons.

Our capacity has been driven during the past six months to its utmost limit and we produced 316,205 tons, even taking three and a half tons per retort the amount would be a yearly capacity of 677,936 tons.

Unless there is a great change to higher prices it is quite safe to predict the output for last six months of this year will fall below the first six months.

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	21.20
June	7.25	5.50	5.37	25.60	17.40
July	7.46	5.61	5.26	24.90	15.20
Aug.	7.34	5.99	5.66	19.30	
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

SPELTER (Monthly Averages.)

	——New York——		——St. Louis——	
	1915.	1916	1915.	1916.
Jan.	6.52	18.18	6.33	18.01
Feb.	8.86½	20.09	19.92	19.92
Mar.	10.12½	18.09½	9.80	17.31
Apr.	11.51	18.61½	11.22	18.44
May	15.82½	15.93	15.52½	15.75½
June	22.62½	12.80	22.14	12.62
July	20.80	9.70	20.54	9.52½
Aug.	14.45		14.19	
Sept.	14.49		14.10½	
Oct.	14.07		13.89	
Nov.	17.04		16.87½	
Dec.	16.91		16.72	
Av.	14 44		14.16	

Copper in July.

Copper Weak and Declining the First Three Weeks of Month, Electrolytic Declining 2¾ to 3¼c Per Pound—Electrolytic in London After Recovering Slightly Shows Net Decline of £7 for Month—Net Rise in Standard £8 on Spot and Futures.

It was quite evident in July that sentiment rather than actual transactions dictated the fluctuations in prices of copper here, as well as abroad. During the first 20 days of the month, depression in trade was expressed in almost daily declines. In the home market second hands were increasingly anxious to sell late future deliveries as well as nearby positions and offered concession after concession to attract buyers but to small purpose during the first week. Later, some of the more venturous operators were emboldened to make short sales and succeeded in disposing of probably 15,000,000 to 20,000,000 pounds of Electrolytic for September and for last quarter delivery before sentiment changed.

Large Business Quietly Put Through.

Business was conducted so quietly that few not in close touch with the situation realized the magnitude of the transactions. In fact, from the standpoint of producers, business was light in volume and they paid small heed to the steady declines in prices in the open market until about the middle of the month when some of the larger selling interests endeavored to clear the market of the small disturbing lots offered for sale through brokerage channels, either by consumers or by speculators. Probably about 10,000,000 pounds of Electrolytic were absorbed by producers before it became clearly evident that operators were making short sales. Then buyers, other than small consumers, withdrew. Depression continued and prices receded further until July 20th, when the decline in Electrolytic from the end of June ranged from 2¾c to 3¼c per pound, the greatest recession being on nearby positions.

Sharp Drop in Standard and Electrolytic.

The foreign market for American Electrolytic during the same time, had been equally heavy. On July 20th, spot Electro had dropped £11 to £121. Standard copper suffered severely during the first ten days of the month, the decline being £19 on spot and £17 10s on futures on small transactions. At that time, July 10th, spot had fallen to £84 and futures had dropped to £82 10s while American Electrolytic at London had receded only £4 to £128. In the next ten days while Electro continued to decline, there was a steady improvement in Standard but business was too small to attract much attention outside of operators who are sensitive to slight changes, as indicating a turn of sentiment.

Spelter as a Substitute for Copper.

During the period of weakness and depression when there was small expectation of additional large war orders there was evidence of less confidence entertained by producers because of the growing belief that the enormous production will be more than ample to meet consumption requirements of the world even after the war is over. For many years Germany has been the largest foreign consumer of American copper and the belief that the Teutonic nations must have copper, no matter what happened, has been fondly cherished by the Entente as well as by the American copper producers. The war has made it evident, however, to the Germans as well as to the rest of the world, that the Teutonic Allies are less dependent upon copper than had been supposed. Necessity and ingenuity have made spelter take the place of copper in Germany to a very great extent and after peace has been restored German industries are likely to be less dependent upon American copper than heretofore.

Market Recovers on Large Munitions Orders.

In the last ten days of the month, especially in the last four or five days, the domestic market, stimulated by the release of large orders for high explosive shells given by the Allied Governments to American manufacturers, has rebounded, recovering most of the decline sustained during the three preceding weeks. No large transactions in copper have come to the surface as a result of the recent heavy war munition orders but it is only a question of time when more copper, and spelter will be purchased for this purpose, as some of the contracts for shells are for delivery up to April and others for shipment up to

LAKE COPPER PRICES.

Monthly average prices of **Lake Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	29.28½
June	17.43	15.08	14.15	19.92	27.44
July	17.37	14.77	13.73	19.42	25.81
Aug.	17.61	15.79	12.68	17.47	.....
Sept.	17.69	16.72	12.43½	17.76	....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av. .	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Monthly average prices of **Electrolytic Copper** in New York.

	1912.	1913.	1914.	1915.	1916
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	29.81
June	17.29	14.85	13.81	19.71	27.49½
July	17.35	14.57	13.49	19.08	25.60
Aug.	17.60	15.68	12.41½	17.22	....
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av. .	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Monthly average prices of **Casting Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	27.37
June	17.08	14.72	13.65	18.74½	25.10
July	17.09	14.40½	13.34½	17.76½	23.61
Aug.	17.35	15.50	12.27	16.46	.....
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av. .	16.29	15.33	13.18	16.76	....

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper so far this year are given below together with the price of Lake copper on the same dates:

1916—	Sheet Copper.	Lake Copper.
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 20	36.50	29.75
May 5	37.50	29.75
August 2	35.50	25.50

WATERBURY COPPER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.50	17.00	14.75	14.12½	24.75
Feb.	14.50	15.50	15.12½	15.25	27.75
Mar.	15.00	15.12½	15.00	15.75	28.00
Apr.	16.00	15.75	14.87½	18.50	29.00
May	16.37½	15.87½	14.75	22.50	29.87½
June	17.50	15.37½	14.37½	22.50	28.25
July	17.75	14.75	14.12½	22.25	27.25
Aug.	17.75	15.62½	13.00	19.50	....
Sept.	17.87½	16.87½	12.87½	18.50	....
Oct.	17.75	16.87½	12.25	18.25	....
Nov.	17.75	16.25	12.25	19.37½	....
Dec.	17.75	15.00	13.50	20.75	....
Av.	16.71	15.83	13.91	18.94	....

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	23,663
February .	26,792	34,634	15,583	20,648
March ...	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	21,654
May	38,601	32,077	28,889	16,062
June	28,015	35,182	16,976	39,595
July	29,596	34,145	17,708	*35,048
August ..	35,072	16,509	17,551	.....
September	34,356	19,402	14,877	.....
October .	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December	30,653	22,166	42,426	.....
Totals ..	382,810	360,229	276,344	146,721

* Includes only exports from Atlantic ports.

July, 1917.

Thus far, large domestic consumers of copper, with requirements well covered through September and partially covered for October, November and December, have made few, if any new purchases. In the main, buying during the last week of the month was by operators to cover short sales but small domestic consumers were in the market also and a few export sales to Italy were made. Second hands, so anxious to sell earlier in the month, encouraged by the prospect of renewed buying of importance had largely retired from the market to await the anticipated further rise in prices.

It is interesting to note that while the English Standard market was declining rapidly, the Allied Governments' agents were charged with depressing the market to secure supplies at lower prices but since the London market has been rising there have been few such comments. After July 10th, the price of Standard copper advanced £27 on spot and £25 10s on futures with few reactions and the net rise for the month was £8 on spot and on futures. American Electrolytic at London, however, recovered only £4 after July 20th and the net decline for the month was £7.

Large Purchases by Allies.

The most interesting development at the close of the month was the opening of negotiations for the purchase of round tonnages of copper by the Allied Governments for shipment over the first half of 1917. The fact that war munitions contracts have been placed in this country for the same deliveries lends credence to the statements that copper purchases for export are under negotiation.

Exports of copper in July were 34,005 tons against foreign shipments of 17,708 tons in July last year and 34,145 tons in July, 1914. Since January 1st, exports have been 182,000 tons against shipments during the first seven months last year of 154,235 tons. Deliveries into American consumption in July are estimated to have been 115,000,000 pounds and total deliveries slightly under 200,000,000 pounds. Refined production during the month is estimated at about 200,000,000 pounds, after making allowance for a decrease in output at some of the refineries because of hot weather and of labor difficulties. July imports are estimated at between 18,000 and 20,000 tons against arrivals in July last year of 13,000 tons.

COPPER PRICES IN JULY.

	—— New York ——			London.
	Lake.	Electro.	Casting.	Standard.
Day.	Cents.	Cents.	Cents.	£ s d
3	26.50	26.25	24.00	102 0 0
4	.....	.....	.....	98 10 0
5	26.25	26.00	23.87½	96 10 0
6	26.25	26.00	23.87½	97 0 0
7	26.25	26.00	23.87½	91 0 0
10	26.25	25.75	23.62½	84 10 0
11	26.25	25.75	23.62½	88 0 0
12	26.25	25.62½	23.50	93 0 0
13	26.25	25.43¾	23.43¾	90 10 0
14	26.25	25.43¾	23.43¾	91 0 0
17	25.75	24.87½	23.25	88 0 0
18	25.75	24.75	23.00	88 0 0
19	25.75	24.75	23.00	89 0 0
20	25.25	24.75	22.75	90 10 0
21	25.25	24.87½	22.75	91 0 0
24	25.25	25.25	23.75	.....
25	25.25	25.75	23.75	98 0 0
26	25.25	26.00	23.87½	100 0 0
27	25.25	26.00	24.12½	105 0 0
28	25.50	26.25	24.37½	111 0 0
31	25.50	26.50	24.37½	111 0 0
High .	26.75	26.75	24.50	111 0 0
Low .	25.00	24.50	22.50	84 10 0
Av'ge	25.81	25.60	23.61	95 2 5

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since Nov. 22, 1915, are given in the following table together with the price of Lake Copper on the same dates:

1915—	Sheet Copper.	Lake Copper.
November 22	24.50	19.87½
November 23	25.00	19.87½
December 22	25.50	20.50
December 23	26.00	20.75
December 24	27.00	21.50
December 30	27.50	22.37½
1916—		
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 19	36.50	29.75
May 5	37.50	29.75
August 2	35.50	25.50

Aluminum In July.

Aluminum Weak and Declining Throughout the Month.

Business in aluminum in July was confined to jobbing lots in the open market. Offerings were more ample during the first ten days of the month and buyers being reluctant to purchase, concessions were made from day-to-day until the decline from the close of June was 3c per pound.

Just before the "Fourth of July" holiday, No. 1 Virgin, ingots were offered at 61 to 62c, pure 98-99% remelted at 58c to 60c and No. 12 alloy remelted at 47 to 49c per pound, this being a decline of 1c per pound from the prices asked on June 30th.

Holders were disappointed in the absence of export inquiries and by the 7th, prices had receded 1c more. On the 10th, another concession of 1c was granted without stimulating the demand. Apparently, deliveries against contracts were made more regularly and satisfactorily by the largest interest and there was less need to seek supplies in the open market.

Throughout the remainder of the month, trading was confined within narrow limits but prices were better sustained. Toward the close of the month an easier undertone was evident and further concessions would doubtless have been made but there was scarcely enough inquiry to indicate the temper of consumers and prices were largely nominal.

Antimony In July.

Market Unsettled and Depressed—Total Decline for Month 4½ Cents Per Pound.

Antimony in July suffered a further decline of 4½c per pound. The drop, however, was less precipitous than during the two preceding months. The market, if it can be called such, was unsettled and depressed. For the last 90 days, importers have been anxiously seeking an outlet for burdensome stocks and have made painful reductions in prices whenever there was an indication that sales might be made. As previously pointed out the placing of few orders for shrapnel shells recently with manufacturers of war munitions in this country, was a severe blow to sellers of antimony. Huge importations had been made predicated upon expected large need of shrapnel makers in this country; but most of such ammunition has been manufactured in Europe in the past four months. The recent orders placed by the Allied Governments have been for six-inch and larger sized shells, requiring little or no antimony. It is almost needless to note, but a few orders for 3-inch shells were given out here in July which called for purchase of moderate amounts of lead and antimony. Competition for business among importers was so keen, however, that these prospective orders were the signal for further concessions in the price of antimony.

Jobbing lots were almost unsalable at 16c per pound early in July but soon after Independence Day some fair sized sales were made to consumers, being the first encouraging sign for over a month. The buying was over quickly, however, and dullness again prevailed. Abroad there was some temporary improvement also upon the report that Russia had renewed purchases after retiring from the Oriental market.

Some American operators conceived the brilliant idea of selling a part of the surplus here to Great Britain as London quotations of £95, equivalent to 21c per pound, seemed most attractive. This was the nominal maximum price of the Government but not the minimum. Had there been an open foreign market there would have been a speedy adjustment of prices here to those prevailing abroad.

About the middle of the month, while jobbing lots were offered and sold in a small way at 14½c, duty paid, 400 tons were sold by an importer at 11½c in bond for prompt, July and August shipment to a manufacturer of ammunition. Some large lots a few days

later, 10 to 25 ton lots, were offered on the same terms unsuccessfully, and jobbing lots were seeking sale at 13 to 14c. On July 26th, a few lots of 10 to 25 tons were sold by importers at 12c duty paid for prompt, August and September shipment, while dealers offered jobbing lots at 13c duty paid.

Value of Metal in Bonded Warehouses Shows Shrinkage of Over 62½%.

It is an interesting fact that on July 14th, the New York Custom House reported 4,605,177 pounds of antimony in bonded warehouses here, valued at $1,711,941. This is at the rate of a little over 37c per pound. The real value to-day is not much over $500,000 indicating a shrinkage of over 62½%, an enormous loss to American importers or operators.

At the close of the month, small lots of antimony were available at 12½c to 13c while a round tonnage could probably have been bought between 11c and 12c per pound.

ALUMINUM, SILVER and ANTIMONY PRICES IN JULY.

	Aluminum.	— Silver —		Antimony.
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents.
1	.....	65	....	.....
3	61.00	65	31	16.50
4	.....	....	30¾	.....
5	61.00	63⅞	30½	16.50
6	61.00	63⅜	30¼	16.00
7	60.00	62¾	29 13/16	16.00
8	.....	62	29⅝	.....
10	60.00	00	28⅝	16.00
11	60.00	61	29⅛	15.50
12	60.00	61⅞	29½	15.50
13	60.00	62⅞	30	15.00
14	60.00	62⅝	29⅞	14.50
15	.....	61⅞	29 5/16	.....
17	60.00	62⅞	29 15/16	14.50
18	60.00	62⅜	29¾	14.50
19	60.00	62⅛	29⅝	14.00
20	60.00	62¾	29⅞	14.00
21	60.00	63⅜	30 1/16	13.50
22	.....	63⅜	30 1/16	.....
24	60.00	63¼	30⅛	13.50
25	60.00	62⅞	29 13/16	13.50
26	60.00	63¼	30⅛	13.00
27	60.00	63¾	30⅜	13.00
28	60.00	63⅝	30 1/16	13.00
29	.....	63½	30¼	.....
31	60.00	64⅛	30 1/16	13.00
High	62.00	65	[illegible]	17.00
Low	59.00	60	28⅝	13.00
Av'ge	60.15	62.94	30	14.55

CHINESE and JAPANESE ANTIMONY.

Average monthly price of **Chinese** and **Japanese** (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	32.20½
June	7.07	7.62	5.62½	36.53½	20.40
July	7.37	7.55	5.44	35.98	14.55
Aug.	7.58	7.48	13.05	32.57	....
Sept.	8.00	7.31	9.79½	28.50	....
Oct.	9.11	6.46	11.64	30.96	....
Nov.	9.11	6.28	14.14	37.88	....
Dec.	9.05	6.05	13.15	39.36½	....
Av.	7.63	7.43	8.53½	29.52	....

ALUMINUM AND SILVER PRICES.

	New York			
	Aluminum.		— Silver —	
	1915.	1916.	1915.	1916.
Jan.	19.01	54.33	48.89½	56.77½
Feb.	19.20	57.50	48.48	56.75½
Mar.	18.94½	60.52	50.24	57.92½
April	18.83	60.00	50.25	64.37½
May	21.85	60.00	49.91½	74.27
June	29.66	62.09	49.03	65.02½
July	32.50	60.15	47.52	62.94
Aug.	34.00	.....	47.18	.....
Sept.	46.75	.....	48.68	.....
Oct.	54.17½	.....	49.38½	.....
Nov.	57.85	.....	51.71	.....
Dec.	56.80½	.....	54.97	.....
Av'ge.	34.13	.....	49.69	.....

QUICKSILVER PRICES.

Monthly average prices of **Quicksilver** in New York (flasks of 75 pounds).

	1913.	1914.	1915.	1916.
Jan.	40.00	38.05	50.90	214.76
Feb.	40.00	38.00	58.05½	288.50
Mar.	39.50	38.00	62.93½	223.91
April	39.14	38.00	65.71½	140.10½
May	39.19	38.00	72.65	96.95
June	39.67	37.73	87.91	73.04½
July	39.00	35.87	93.33	80.95
Aug.	39.00	74.19½	91.79½	....
Sept.	39.00	73.57	89.09½	....
Oct.	38.59	50.59½	92.40	....
Nov.	38.00	51.72	102.25	....
Dec.	38.50	51.61	126.52	....
Average.	39.13	47.11	82.80	....

Joplin Zinc And Lead Ore Markets.

Both prices and shipments showed marked reduction for month of July while the surplus stocks gained a very considerable tonnage even in the face of determined action on the part of the operators to reduce the output and stop the growth of stocks.

Zinc prices fell from an average of $74.30 in June to $67.73 in July while calamine sold on an average of $46.27 as compared with $53.57 in June. These reductions in price have seriously affected many of the mines' profits and many have closed down unable to show a balance on the right side of the ledger with supplies at the present levels. The curtailment of output has brought down the weekly production at the close of the month to slightly under 7,000 tons and even this figure is likely to show a further falling off with a continuance of present prices.

The month opened with an average price of $71 for blende ores and $52 for calamine ores. By the middle of the month the average had receded to $65 for blende ores and $45 for calamine. The last week of the month showed slight reaction in the lower and medium grades so that the average of the week was $66 and $44 respectively.

The average shipment of blende ores weekly was reduced to 5,389 tons while calamine fell to 185 tons. Naturally even with the curtailment mentioned the stocks went up by leaps and bounds until from a tonnage estimated at 25,150 tons the first week of the month there was a growth to 32,250 tons the last of the month or a gain of 7,100 tons or about 1,400 tons weekly. One fact helped materially in preventing even a greater growth in the stocks of ore accumulating. The big electric plant of the Empire Electric Power Co. broke down one of its largest power units and shut off the power from many of the mills of the field for a period of nearly two weeks. The break down came at a fortunate time for many of these mills would have continued running had the accident not occurred and since they were forcibly closed down many of them are remaining down until there is a readjustment of prices, wages and other conditions which are operating to the disadvantage of the mine owners. The lower average price for ores during July means a further reduction in the wage schedule of 25 cents per day but there is no such reduction in the price of powder, hard iron or other supplies which have advanced from 20 to 100% from the previous levels.

The lead ore market also suffered during July, the price level going down from an average of $89.21 for June to $73.27 for July. This reduction was even more drastic than that in zinc ores. With lower prices ore producers again returned to the policy of selling less lead and the shipments for the month were 878 tons weekly as compared with 968 tons in June. The ore stocks rose to 2,633 tons as against 2,000 tons the first week of July. Naturally the same reduction in output has taken place in lead ores as have been manifested in zinc ores.

The month closes with a desire on the part of the operators to still further reduce the output during August. The weather conditions are conspiring to aid them in this desire as the shortage of water at the mill ponds is causing plants that are trying to operate to be down from 25 to 50% of the time. Unless the present draught is soon broken this condition will grow worse.

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Trade Notes.

The National Art Bronze Works, 4537 Pope Ave., Philadelphia, Pa., formed with a capital of $100,000 by F. C., J. C., and F. B. Schmidt, will operate a brass and bronze foundry.

The Comstock Manufacturing Company, Evanston, Ill., has been incorporated with a capital of $10,000 by W. A. Bockius, Wilmette, Ill., E. J. Clampitt and H. M. Byall. It will manufacture air compressors and other machinery.

The recently organized Mahoning Valley Steel Company, of which J. D. Waddell is president, is making good progress in the building of its sheet mills at Niles, Ohio. The main building will be 140x575 feet and will be so constructed that it can be extended later to accommodate more mills. This company recently bought the entire equipment of the Atlanta Sheet & Tin Plate Company, Atlanta, Ind.

The Grassensbacher Manufacturing Company, Overland, Mo., has been incorporated, with a capital stock of $15,000, by H. E. Grassensbacher, A. W. Jaeger, and others, to manufacture metal specialties.

The Southwark Bronze Co., Pittsburgh, Pa., has been incorporated with a capital stock of $5,000 by A. R. and J. G. Basset and others.

The Manufacturers Brass Foundry Co., Detroit, has been incorporated with $3,000 capital to manufacture small brass castings. The stockholders are L. C. Vecelius, G. J. Rink and Richard Agricola.

The Canadian Conley Frog & Switch Company, Ltd., Port Arthur, Ont., has been incorporated with a capital stock of $150,000 by William F. Langworthy, Gerald A. McTeigue, Jarvis L. McComber and others to manufacture frogs, switches, tools, machinery, etc.

The Stevens Metal Products Co., Niles, O., has been incorporated with $50,000 capital by Edward D. Thompson, William H. Stevens, H. M. Scriven, C. C. McConnell and H. A. Burgess.

The Steel Improvement & Forge Company, Cleveland O., has been incorporated with $150,000 capital by J. T. Scott, M. G. McAllenan, M. C. Byrnes, C. M. Burke and David L. Johnson.

The Ford-Davis Manufacturing Company, St. Louis, Mo., has been incorporated with a capital stock of $30,000 by E. W. Oelfcken, W. C. Kleine, George H. Allan, T. D. Davis and James J. Masterson to manufacture metal products, including piston rings, etc.

The Richardson Hardware Manufacturing Company, St. Louis, Mo., has been incorporated with a capital stock of $50,000 by Carl N. Richardson, D. Murray Foley and J. Carter Carstens to manufacture hardware specialties.

The American Machine Products Company, Marshalltown, Iowa, has been incorporated with a capital of $100,000 by E. A. Francis, J. W. Hook and J. Sidney Johnson.

The Stevens Metal Products Company, Niles, O., has been organized with a capital stock of $50,000. It will make a line of metal products such as conductor pipe, eaves trough, etc.

Gilbert T. Mason, formerly secretary and treasurer of the Atkinson Co., Rochester, N. Y., has become a member of the bronze department sales force of the Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

The Indiana Tank & Boiler Works, Indianapolis, has been incorporated, with $10,000 capital stock, to manufacture steel plate and sheet-iron products. The directors are J. E., R. R., and H. E. Bossingham.

The West Newark Range & Furnace Company, Newark, Ohio, has been organized by C. W. Cunningham and others to erect a foundry for the manufacture of stoves, ranges and heaters.

The Penn Iron & Steel Company, Peterson, Pa., recently organized, plans to build a plant to manufacture bar-iron products.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, SEPTEMBER, 1916. NO. 9.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer,
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Business Situation and Outlook.

Contending with labor shortage and scarcity of material, business continues at a record-breaking pace, under the stimulation of the new wave of war orders which has developed during the past month, and also as result of a condition of mind, ready to quickly and excitedly respond to favorable conditions and optimistic views, and slow to listen, or be influenced by anything of an opposite character. This state of mind is the result of the overwhelming activity and prosperity of the past 18 months under which influences the business of the country continues. Speculative fever is now in evidence and people who judge the situation simply by present conditions are, we think, showing signs of undue optimism. Developments in many directions have been distinctly unfavorable. A disappointing crop, a serious labor situation, increased costs of living, disturbed political developments, all have failed to make any impression. One hears these discussed and fears expressed, but when actions are examined it would seem as if they were regarded only as academic questions, with no bearing on actual business conduct or the future. The motto in business seems to be "sufficient to the day is the evil thereof," exploit the present for all it is worth. Orders and money talk, and there seems no limit to either at present.

The War.

The developments in Europe would seem to say plainly and positively that

we have entered into the closing phases of the great war. But business acts as if it was to continue another two years, in fact this seems to be the view held in the Pittsburgh steel trade. In nonferrous metal trades much more conservative views are held, but no one seems to be preparing for a period short of at least a year. That developments taking place may, in a few months, make the result of the war so certain that the central powers may see the uselessness of continuing the struggle, does not seem at present to have any believers. The fact that we are making so few preparations to adjust conditions to such a contingency, is likely to make the shock greater when it comes. Not only is the possibility, and to our mind it is more than a probability, that the war may end before next spring, ignored, but also that the recent unfavorable developments elsewhere are also ignored.

Prosperity Not Entirely Now Independent on War.

Of course the extraordinary activity in business has other grounds than war orders, namely the overwhelming prosperity and increase of capital in this country during the past 18 months. Increasing profits means more capital seeking investment and it takes the form of enlargement of industries and new construction of every kind. Capital is the surplus above living expenses no matter who owns it. There is no nation in history who has had, in such a short period, such an increase of real wealth as we have enjoyed. But it has not destroyed the laws of political economy. The war that has brought us this windfall of wealth cannot continue indefinitely. It is therefore timely to be reminded of some of the unfavorable conditions that confront us, and those to follow the end of the war.

The Labor Question.

This has been threatening for a long while, but this danger has been increased by the action of Congress in a semi-panic under the dictation of the President in the eight-hour railroad law. With the championship of the President on one side in a public controversy, when common decency demanded he should be impartial, disingenuously exploiting a demand for higher wages as request for shorter hours of work, and falsely proclaiming that society had declared itself in favor of such change, the railroad strike has been avoided by the surrender to the representatives of four utterly irresponsible labor unions. We say irresponsible as they are, by a recent law, exempted from responsibilties and potential penalties to which all other corporations are subject. It is a shameful and cowardly abdication of the fundamental functions of government, the repudiation of the principle of arbitration But it is much more, it is the beginning of untold trouble in the future, and already in all directions can be heard the rumble of future troubles to come Labor agitators have become more confident of their power.

How can we hope to compete for foreign trade after the war if we are to handicap ourselves in this way? We have reached a point where we must find an outlet in foreign countries for our surplus manufactures, the result of labor or our prosperity will vanish The day of a balance of trade in our favor by export of food and raw material is past.

Why should Congress legislate an eight-hour day for railroad labor alone Does anyone believe the other industries of the country, most of whom have even more arduous work, will be content to stay outside? Why should they? We regard the shortening of hours of labor as a greater danger in the future than the raising of wages as it is exactly opposite to the movement abroad, where, on account of the war, hours of labor are being increased, and if the losses caused by the war are to be recovered, must be continued after peace comes.

One of the things that accompany and distinguish civilization from the uncivilized is work. Back of the idea of socialistic dreamers stand the fundamental laws of the universe, (confirmed by man's experience) that man did not create, and man cannot change and that "by the sweat of his brow shall man eat bread"—Why stop at eight hours, why not make it six With wages the highest on record, labor is still dissatisfied.

Disappointing Crops.

The crops are a disappointment. It is estimated the wheat crop will not exceed the requirements of the country for food and seed. The corn crop has been cut by drought to about 2,500,000,000 bushels and this means dear meat. The cotton crop has further deteriorated, and is estimated at not over 13,000,000 bales. All this means further increase in cost of living, and decrease in the buying power of the farmer.

Extravagance and the Increase in the Cost of Living.

Capital is the surplus above living expenses, no matter who owns it. The war that has made for this increase of wealth and capital will end in a day, the extravagance and increased cost of living that it has created will be corrected very slowly. The only hope for afflicted and debt-burdened Europe after the war is economy and producing more and buying less. This extraordinary war will be followed by an extraordinary putting into effect of these absolutely necessary things, and we are certain to feel its effect in curtailed sales abroad.

Our poor crops means no relief in cost of food for another year, the increase in wages means increased cost of other items that enter into cost of living. There is no relief in sight on manufacturing labor costs, rather the opposite. As said before, the end of the war will cut off our flood of wealth under which has grown our present extravagance. How long will it take us to adjust our extravagance to the change?

We all know in our personal experience how difficult and slow such an operation is.

Transportation Shortage.

It is evident that the productivity of our mines and factories has outstripped the country's transportation facilities and strikes or no strikes, we are facing, with the crop movement, a serious car shortage and freight blockade. Our policy to the railroads has prevented their expansion in facilities and we will soon reap the fruits.

Politics.

The election in November may result in a change of government and policy of which the tariff will only be one item. Should this take place between election day and the taking over of the government by another party in March, it must be a time of great business caution. No matter whether the change will be favorable or not for business, until the program is known, hesitancy is sure to be exhibited.

Also retaliatory powers towards the Allies on the trade restriction given the President in the late legislation if used is pregnant of trouble, and might result in a trade war. In such a war we have some very weak spots and to mention three of them, we need tin, nickel and rubber. The cargo of the Deutschland showed that Germany, like ourselves, is entirely dependent on England and her possessions for a supply.

Should the President find the dignity of the country requires him to act along the lines Congress has suggested and given him the power, not only great troubles might be precipitated in some industries, but a tense international situation created that would be absolutely serious.

But granted all these unfavorable features are nullified by their failure to develop or where they are certain, crops, etc., that they are overcome by the extraordinary accrued wealth of the country, how about after the war and the trade situation then, and the collapse in the basis of our prosperity war orders?

Every effort should be made in the intermediate time to prepare for peace conditions. It will take all the wisdom and ability we can command to meet the conditions that will surely have to be faced.

Business Trends.

FAILURES AND LIABILITIES INCREASE.

Several reasons may be and have been assigned for the increase both in number and liabilities of commercial failures in August as compared with July this year and August a year ago. As "Bradstreet's" journal observes, "somewhat similar ebb-and-flow movements have been shown in other months and years which have robbed great swing movements of some of their uniformity." "The increase in the number of small retail failures." "Bradstreet's" continues, "may have its source in the bad turn taken by crops in that month, the insufficient equipment of many of those who have embarked in business on the present prosperity wave, the decision of creditors to withdraw support from some manifestly unsuccessful enterprises, the heavily increased cost of conducting business at the present record high level of values which restricts profits, the extension of the chain store idea, or a variety of other causes operating, in spite of the concededly good general trade which was done in that month in the country as a whole. It will however, require a fuller examination of present and near future failure statistics to determine whether the tendency noted in August is a continuing one before any hard and fast deductions can be drawn."

Whatever the cause or causes, the fact remains that failures in August, which number 1,309, exceeded those of July by 12% and those of August a year ago by 2.6%, while the liabilities, which aggregated $15,890,478, exceeded those of July by 57% and those of August a year ago by 16%. Compared with July there were increases in failures and liabilities in every section of the country but New England, while compared with August a year ago the Northwest and the South furnished practically all of the increase in number, while increases in the West, Northwest, South and Far West helped to swell the liabilities.

FEWER NEW INCORPORATIONS.

There is a perceptible falling off in the volume of charters issued last month, which perhaps is not unnatural after the exceptionally heavy output of new enterprises for almost a year. The August incorporations in the Eastern States with a capital of $1,000,000 or over represented $113,472,000, which is much below the monthly total for quite a while. But an increase is shown as compared with the August figures a year ago of almost 50%. As might naturally be assumed few really large companies figure in the returns. Nevertheless practically all lines of industry are represented.

The grand total of all companies with an authorized capital of $100,000 or over covering all States, including those of the East, reached 8174,933,000 against $320,057,500 in July and $148,186,000 in August a year ago.

OUR FOREIGN TRADE DURING TWO YEARS OF WAR.

Export and import returns for July, which month completed the second year of the great war, showed shrinkages from recently preceding months. This is not unnatural or unusual because foreign trade always decreases in the summer months. In one respect, however, that is in the excess of exports over imports, July broke all records, because imports shrunk much more heavily than did exports, and the excess of exports for that month was the greatest ever recorded. In the following table will be found the total of exports and imports for the month of July; for the seven months ended July 31st and for the two year period of the war:

July—	1915.	1916.
Exports	$270,660,437	$454,956,945
Imports	160,507,675	244,830,603
Exc. of exports	$110,152,762	$210,126,342

Seven months ended July 31st:

	1915.	1916.
Exports	$1,980,051,469	$2,935,675,850
Imports	1,171,241,992	1,716,906,386
Exc. of exports	$808,809,477	$1,218,769,464

Summary of trade during two years of war:

Exports	$7,716,985,984
Imports	4,683,824,367
Excess of exports	$3,033,161,617

Business Trends.

COMMODITY PRICES STILL YIELDING.

Again the general levels of commodity prices have gone lower, both "Dun's" and "Bradstreet's" most recent index numbers showing decreases as compared with the month before.

"Dun's" index number disclosed a recession to $143,930 on August 1st from $145,142 a month earlier. The present total is $2,267, or 1.6%, under the top point reached on May 1st, but is much above the $125,079 shown a year ago, when an upward tendency was in progress. "Dun's" comments on the situation in part are as follows:

"Considering the striking advance that occurred in previous months this year, the recent reaction seems decidedly moderate and, though declines have predominated of late, several important articles of consumption have gained still further in valaue and are likely to go even higher."

"Bradstreet's" report says that "prices continue to move downward, the tendency being accompanied by considerable evidence of power to resist marked decreases." But the index number compiled by that journal shows that on August 1st the level was $11,441, representing a decline of seven-tenths of one per cent from July 1st and at the same time the fourth successive drop in as many months. Comparison with August 1st of last year reveals a rise of 16.4%, and contrast with the like date in 1914 discloses an advance of 31%.

EXTRAORDINARY BANK CLEARINGS.

Well-maintained business activity in every part of the country continues to be indicated by heavy payments through the banks, as reflected in bank exchanges, the total of which, according to returns received by "Dun's Review" from 131 leading cities in the United States, amounted to $19,602,312,490, an increase of 38.0% as compared with the same month last year and of 98.5% as contrasted with the corresponding month of 1914. New York City reports gains of 37.8% and 154.7%, respectively, as compared with the same weeks in the two immediately preceding years, but the abnormal expansion over two years ago is in large part attributable to the closing of the principal exchanges and the interruption to business occasioned by the outbreak of the war. The exhibits of the cities outside New York, where, as a rule, speculative operations have comparatively little influence on bank clearings, are eminently satisfactory, marked improvement appearing at practically every important center, while the total of all points is 38.3% larger than last year and 48.0% more than in 1914.

IRON OUTPUT AGAIN SMALLER.

That pig iron output in August fell below that of July indicate the handicaps under which the industry is trying to meet the present unparalleled demands upon it, says the "Iron Age". Last month's total was 3,203,713 tons, or 103,346 tons a day, against 3,224,513 tons in July, or 104,017 tons a day. Heat and humidity counteracted the effect of a slight increase in active furnaces. September should show some gain, as 320 furnaces were in blast at the opening of the month, with a daily capacity of 140,502 tons, as against 316 furnaces on August 1st, representing a capacity of 103,624 tons a day.

The daily average production of coke and anthracite pig iron in the United States by months since January, 1913, is given as follows by the "Iron Age".

	1913.	1914.	1915.	1916.
January ..	90,172	60,808	51,659	102,746
February .	92,369	67,453	59,813	106,456
March ...	89,147	75,738	66,575	107,667
April	91,759	75,665	70,550	107,592
May	91,039	67,506	73,015	108,422
June	87,619	63,916	79,361	107,053
July	82,601	63,150	82,691	104,017
August ..	82,057	64,363	89,666	103,346
September	83,531	62,753	95,085	.....
October ..	82,123	57,316	100,822	.....
November	74,453	50,611	101,244	.....
December.	63,987	48,896	103,333	.....

LABOR MARKET.

In the metals, machinery and conveyances group the number of employees was one per cent less in July than in June according to the report of the Bureau of Statistics and Information.

The Rate of Increase in Pig Iron Consumption.

There is considerable discussion as to prospects for pig iron consumption in the next few years. Our production this year has been at a rate close to 40,000,000 tons a year, except in the past three months when hot weather reduced the rate, and this compares with a trifle less than 31,000,000 tons produced in 1913, the best previous year. There is new capacity in prospect to the extent of about 4,000,000 tons. In substance there is a double expansion in output, due to the separate influences of the old furnaces making more pig iron per stack, on an average, and additional stacks being built. Spread over a period of years either influence might not be out of line, but question is raised whether the two together are too much.

In the past pig iron production doubled every ten years, on an average, but the rule seemed to break down after 1907. Reduced to its simplest terms the question is whether the breakdown is permanent. Now that we can see at longer range it is not altogether so certain that something broke. The fluctuations year by year have been so wide that it is rather an intricate matter to compare one year with that of ten years or twenty years earlier, and totals for ten years at a time are easier to handle. Taking 39,100,000 tons for this year we have the following totals for decennial periods:

Ten years ended	Gross tons.
1886	38,133,663
1896	79,001,426
1906	165,342,076
1916	271,500,000

Inasmuch as production from the ten years ended 1896 to the ten years ended 1906 increased by almost 110%, thus more than doubling, it would hardly be fair to expect production in the ten years now ending to be double that of the preceding ten years. If we take it that there is to be an average doubling we may quadruple the production in the ten years ended 1896 to find what we might expect for the ten years now ending. That would be 316,000,000 tons, and we are only 14% short of that total. That is not bad at all.

Everyone must recognize that an increase in geometrical ratio cannot be maintained indefinitely. There has been absolutely no reason for expecting such a thing, except the practical one that it has occurred. In particular, a commodity that is put into more or less permanent use, instead of being currently consumed, is the last one that should experience, for any considerable period of time, a geometrical increase. Even an arithmetical increase might be difficult to maintain. It might be difficult to have any increase in production, for the store of iron decreases but little from year to year, and a year could be conceived in which no fresh pig iron at all would be required, the urgent needs being so small as to be met by reworking old material.

Here, then, is a conclusion which will probably startle many of our readers, that if we admit frankly that the geometrical rule of increase has broken down already, and fall back on an arithmetical rate of increase, we have 106,000,000 tons more produced in this ten years than in the preceding ten, meaning that on an average each year produced 10,600,000 tons more than the year ten years previous. Just at the moment we are doing much better than this, for 10,600,000 tons added to the 1906 production, regarded as astonishingly large in its time, would be only 36,000,000 tons, whereas we are doing at least 10% more than that. Thus the arithmetical rate of increase would really be rather a large one, and yet from one viewpoint we are doing much better than that even at this moment.

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Three Years of Iron and Steel Exports.

The immediate effect of the war was to curtail our iron and steel exports, already at the lowest rate for nearly four years. The exports in August, 1914, the first month of the war, were the smallest for more than five years. In June, 1915, the eleventh month of the war, our iron and steel exports broke all records. Comparison of exports by fiscal years, therefore, are not illuminating, on account of the wide swing. For the total exports by months for a period of years reference may be made to our regular table, presented on another page.

A comparison of exports by products, given below for the past three fiscal years, is very interesting. In only two important commodities, structural material and pipe and fittings, have the exports decreased since the war started, but in the other commodities there are wide divergences in the amount of increase, due largely to the adaptability of the material to war purposes. The increases do not measure precisely the demand for war purposes, for two reasons. In some commodities the usual exports to neutral countries have decreased, whereby the increase in the total does not fully represent the war demand. On the other hand there are some increases in exports of material for peace purposes, to belligerent countries because on account of their making war munitions they are less able to produce these peace commodities.

The recent scrap exports include large tonnages of axles for Italy, to be rolled into shell rounds. The rail exports are chiefly to Russia, for building roads for military purposes and as preliminary to industrial expansion after the war. The steel bar exports are largely of shell rounds. The wire rods exports lately are probably chiefly for catching submarines.

While exports in the past fiscal year totaled 4,850,300 gross tons, the exports in May and June were at the rate of 6,400,000 tons a year.

Iron and Steel Exports, Fiscal Years, Gross Tons.

	1914.	1915.	1916.
Scrap	69,282	29,830	154,709
Pig iron	201,995	130,597	286,728
Billets, blooms, etc.	46,926	220,416	962,206
Wire rods	56,493	98,441	171,529
Rails	338,613	159,587	540,919
Structural	296,282	168,664	269,928
Steel bars	149,113	230,275	625,586
Iron bars	10,300	12,345	70,520
Steel plates	160,390	123,914	266,816
Iron sheets and plates	11,476	9,526	42,630
Steel sheets	146,856	96,066	98,307
Galvanized sheets	53,740	54,955	79,203
Tin plate	47,277	80,010	230,472
Pipe and fittings	240,735	.....	.....
Wrought pipe and fittings	.....	117,695	125,628
Cast pipe and fittings	.....	62,390	52,609
Hoop, band and scroll	11,507	10,633	41,256
Railroad spikes	8,734	5,486	26,404
Plain wire	84,318	146,065	251,518
Barb wire	79,775	147,592	364,243
Wire nails	35,853	55,472	128,698
Cut nails	4,525	2,643	4,425
Other nails, and tacks	3,184	5,455	9,634
Bolts, nuts, rivets and washers	19,827	13,500	30,844
Horse shoes	1,216	13,017	13,125
Radiators, etc.	5,467	2,669	2,363
Total	2,083,884	1,997,240	4,850,300

Settlement of Our Trade Balance.

Probably the average observer has obtained no very clear concept of what our foreign trade means to us in these war times. The figures simply appear huge. When one attempts to analyze them he is beset with difficulties, there being so many unseen elements that would affect the final result as to how much additional wealth accrues to us by reason of the merchandise movement. Among the factors for which allowance must be made are the debit that had accumulated against us just before the war and in the early months of the war, when the monthly trade balance instead of being in our favor to the amount necessary to equalize the unseen and unfavorable balance, was unfavorable in the gross. Then one must estimate to what extent the unseen balance has changed, the freights that we pay to foreign vessel owners, the money that American tourists spend abroad, etc., etc.

Without setting down the details we may say that after careful computation and estimate it appears reasonable to set the accumulation to September 1 at about two billion dollars, this being approximately the amount that should be settled by a movement of gold or securities. The excess imports of gold have been about a quarter billion, while loans floated in this country by foreign governments are computed at close to one and a half billion dollars, this including the quarter billion British loan now being negotiated. According to our estimates there would be left about a quarter billion to be settled otherwise, and this may have been settled by the return of American securities held abroad.

The figures here given are not precise but they seem to represent fairly well what has occurred to date. The country is richer, in gold and securities, by about two billion dollars. For many years prior to the war there was question whether the country was growing richer probably it was not. We kept our gold production but we sent securities abroad and as we also paid interest and dividends on the securities it would be debateable whether the accumulation of material wealth in this country against those securities represented, all told, an increase in our wealth in this respect. The accumulation since the war started of some two billion is distinct. One can put his finger on by far the major part of it, as just indicated.

The Volume of War Steel Business.

One is hearing a great deal all the time about the orders placed for shells and shell steel, but the information, often apparently supplied in great detail, is really not illuminating at all. The stock market may be interested in whether a $15,000,000 order for shells went to this particular listed stock company or that, but the question asked in the steel trade is "How many tons?" It is quite impossible to gauge the volume of business by the reports of orders from time to time. There is some other information, however, which may tend to throw just a little light on the situation. It may be noted, for instance, that in 1906 there was almost 4,000,000 tons of rails rolled in the United States, and some capacity has since been added, and yet this year's rail output may be in the neighborhood of 2,500,000 tons, it being scarcely conceivable that even with the large export trade it will reach 3,000,000 tons. Yet the rail mills are completely filled, and orders if placed at all are only for the latter part of 1917. The rail mills are rolling rounds for small shells, shrapnel and high explosives, and presumably they are quite busily engaged. If so they are rolling perhaps as much as two or three million tons a year of the rounds. That, however, would

not represent all the shell steel business, as rounds cannot be rolled large enough for the large shells, and forging billets are furnished instead. This tonnage is still more difficult to estimate, because it is so widely distributed, for even small mills can make forging billets. Some of the steel foundries even are using their steel making capacity to cast ingots for shell purposes.

There may be some suggestions derived from the export statistics. On account of certain curious changes that have occurred we select the following months for comparison:

Exports of Ingots, Blooms, Billets and Sheet Bars—Gross Tons.

	1915.	1916.
May	48,391	142,782
June	48,999	116,425

Exports of Steel Bars—Gross Tons.

	1915.	1916.
May	37,260	77,669
June	58,453	61,017

By this arrangement certain facts, understood in the trade, are brought out in a statistical way. The allies early started to buy shrapnel bars from us, and the exports of late have shown only a moderate increase over those of a year earlier. The increase is due to a much larger consuming capacity of the foreign munitions factories. Recently there has been a greatly enlarged demand for unfinished steel for two purposes. In the first place there is more shell steel required, in the form chiefly of forging billets, for direct use abroad, and in the second place there is more soft steel required, to release more steel making capacity abroad for the manufacture of shell steel.

It may be taken that practically all the steel bars exported are shell rounds, hence on the basis of the May and June figures the business is running say 750,000 tons a year. If two-thirds the unfinished steel exported is shell quality that business is running 1,000,000 tons a year. We are now making in the United States fewer small shells, from rolled rounds, and more large shells, from forging billets. If we take it that we are using one-third as much tonnage of shell rounds as we export there is 250,000 tons more, and if we take it we are using as large a tonnage of the large shell material as is being exported we have 1,000,000 tons more. The entire tonnage of shell steel made in this country would then be 3,000,000 tons a year.

We hardly think the tonnage can be much more or much less than 3,000,000 tons at present, but it certainly looks as though the business is growing, that the production will be larger in the next six months than it has been in the past six, for we seem to gain more in the demand for steel for large shells than we lose in the demand for steel for small shells.

From this comparison it would seem that the idea that the rail mills are kept going at anything like their capacity on rails and shell rounds, must be dismissed. The explanation may be that the rail plants are kept going, stopping the manufacture of much of their steel at the large billet stage instead of carrying the steel through to the finished rail or round. Obviously that is where the large billets should first be made. Steel plants that have other finishing departments would naturally give their steel to those departments.

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The New Steel Capacity.

So much new construction is going on in the steel industry, and there are such delays at various points in the construction work, that it is difficult to make a close estimate of the new capacity in prospect at any particular date. It may be convenient to divide the new construction into two classes, that which has already been completed this year or is practically certain of completion this year, and that which will probably run into next year, possibly in some cases even the year after. Such a division suits also the nature of the work, some of the new construction being by way of additions and some representing complete new plants.

In the first category is a total of 15 regular open-hearth furnaces by the Steel Corporation, as various plants, and a duplexing addition at Donora, the former representing about 750,000 tons annually of ingot capacity and the latter about 400,000 tons, or say 1,100,000 tons altogether, to be conservative. New construction by independents, Brier Hill, Pittsburgh Steel, Donner Steel, Chattanooga, Youngstown Sheet & Tube, Inland, Lackawanna, Cambria and Corrigan, McKinney & Company, covers a total of about 33 furnaces, with a capacity of about 1,500,000 tons annual ingot capacity.

The total is about 2,600,000 tons of ingot capacity for this year. It may be estimated roughly that between one-third and one-half of this is already completed. It may be noted that a few hundred thousand tons of capacity was completed in the late months of last year by independents, together with the Steel Corporation plant at Duluth, making perhaps three-quarters of a million tons for late last year, but this is only approximate.

Of projects that may fairly be set for dates after January 1, 1917, are to be included four additional furnaces for Corrigan, McKinney & Company, the duplexing plants at South Chicago and Gary, the National Tube Company's Bessemer plant at Gary, the single converter for the Iroquois Iron Company, without rolling equipment, and the Mark Manufacturing Company's Bessemer plant. These would total about 1,900,000 tons annual ingot capacity for the Corporation and about 900,000 tons for the independents, a total of about 2,800,000 tons.

The new construction late last year, that for this year and that for next year totals fully 6,000,000 tons of ingot capacity. This may seem large, but it must be set against fully four years of development of the demand for steel. Demand for steel grows while it sleeps, that is, when it is awakened after a period of dull industrial conditions it is larger than when it left off. The last new construction was in 1913.

It is generally estimated that the production of ingots the past three or four months has been at a rate well in excess of 40,000,000 tons a year. Here is a complication in the statistics inasmuch as the actual production reported for 1913 was only a trifle above 30,000,000 tons, yet the steel works appeared to be operating in the year at an average of close to, if not quite, 90% of capacity, and even allowing for some new capacity to have come in during the year, the capacity on January 1, 1914, would hardly have been estimated at more than about 35,000,000 tons. Thus there has been, apparently, a much greater increase in output than would be represented by the known additions to capacity. Evidently means have been found for increasing the output of individual furnaces.

The estimation of prospective capacity, through the addition of strictly new units, is fairly safe when the new capacity is to be added to a rate of production attained when there is pressure to obtain the maximum output, but it is never safe to assume that year after year a plant will not increase its output, even though no important additions are made to it. While the output sometimes grows more rapidly than would be expected, the same is to be said of the demand for steel. It is a remarkable industry all around.

Government Spelter Statistics.

First Half 1916 Figures Of Production, Consumption, Imports, Exports and Smelter Capacity.

(By C. E. Siebenthal.)

The U. S. Geological Survey's complete report on the spelter industry during the first half of 1916 and the figures of the production, etc., closely conform with those given in the preliminary report issued on August 7th.

The statistics are given below in comparison with those for the first and second half of 1915:

	1915		1916.
Supply.	1st half.	2nd half.	1st half.
Stock at beginning	20,095	5,884	14,253
Production:			
Domestic ore..	207,634	250,501	267,696
Foreign ore ...	8,898	22,486	48,756
Imports	489	415	464
Total available ..	237,116	279,286	331,169
Withdrawn:			
Foreign exports ..	5,959	8,016	20,197
Domestic exports.	64,368	54,235	58,007
Stock at close	5,884	14,253	23,879
Total withdrawn	76,211	76,504	102,083
Apparent consumption	160,905	202,782	229,086
Spelter made in:			
Illinois	74,982	84,976	90,082
Kansas	35,247	66,176	74,592
Oklahoma	51,172	58,036	73,298
All other States	55,131	63,799	78,480
Total	216,532	272,987	316,452
Zinc ore imported	66,683	92,169	231,845
Zinc content...	23,997	33,672	93,907
Zinc ore exported	678	154	34

Production, Consumption, Stocks.

Figures issued by C. E. Siebenthal, of the United States Geological Survey, Department of the Interior, from reports submitted by all zinc smelters operating during the first six months of 1916 show that the production of spelter from domestic ore in that period was 267,696 short tons and from foreign ore 48,756 short tons, a total production of 316,452 tons, compared with 272,987 tons for the last half of 1915 and 216,532 tons for the first half.

The output of spelter by Illinois smelters increased over 5,000 tons for the six-month period, and of Kansas over 8,000 tons, but the gain in Oklahoma was the greatest of all—over 15,000 tons—a result of the completion of a part of the large contemplated increase in smelter capacity announced early in the year. The remaining spelter-producing States also made a large gain, principally in Pennsylvania, where the new smelter at Donora was put into complete operation. The output of primary electrolytic spelter, amounting to 1,697 tons, is also included in the production of these States.

The stocks of spelter held at smelters on June 30, 1916, amounted to 23,817 tons, against 14,253 tons at the beginning of the year and 5,884 tons at the middle of 1915. This shows a gain over stocks at the close of the year, part of which was doubtless due to the accumulation of working stocks at new smelters which started during the period.

From the foregoing figures and the records of the Bureau of Foreign and Domestic Commerce it is calculated that the apparent consumption for the period was 229,086 tons, which compares favorably with 203,588 tons for the last half of 1915 and 160,906 tons for the first half. This consumption was not altogether domestic, however, for it must include the zinc content of the exports of brass and brass articles, which, as will be seen from the table of exports by classes, were largely increased during the first half of the present year.

In addition to that produced from ore, 15,800 tons of spelter was distilled or recovered electrochemically from zinc ashes, skimmings, and drosses. Probably one-fourth of this output of secondary spelter, including the considerable quantity of electrolytic secondary spelter, was of high grade. No statistics were obtained of the spelter produced by remelting skimmings, drosses, etc., but it was probably not less than 12,000 tons. The total output of spelter from both ore and skimmings was therefore about 344,000 tons, or at the rate of 688,000 tons a year.

Imports and Exports.

The imports of spelter were 464 short tons, compared with 415 tons during the last half of 1915 and 489 tons during the first half. The exports of spelter of domestic origin were 58,007 tons, against 54,235 tons in the last half of 1915 and 64,368 tons in the first half. The exports of spelter of foreign origin, including spelter exported from bonded warehouse, as well as articles manufactured from spelter of foreign origin and exported with benefit of drawback, were 20,197 tons, compared with 8,019 tons in the last half of 1915 and 5,959 tons in the first half.

The imports of zinc ore were 231,845 short tons, containing 93,907 tons of zinc, and valued at $7,449,068, compared with 92,169 tons of ore, containing 33,672 tons of zinc, in the last half of 1915, and 66,683 tons of ore, containing 23,997 tons of zinc, in the first half. The exports of domestic zinc ore were 34 tons, compared with 154 tons in the last half of 1915 and 678 tons in first half.

The source of the foreign zinc ore imported into the United States during the first half of 1916 is shown in the following table:

Zinc Ore Imported, January-June, 1916.

From—	Quantity. (short tons)	Zinc content. tons)	Value.
Canada	12,863	5,187	$314,524
Mexico	79,663	25,471	3,254,004
Spain	38,239	16,006	1,051,315
Italy	7,525	3,283	213,275
Australia	83,775	38,133	2,225,790
Other countries*	9,780	5,827	390,160
	231,845	93,907	7,449,068

* Including China and Japan.

Prices and Value.

The price of spelter at St. Louis started at 17.3 cents a pound, but a sharp rise in the latter half of February carried it to 21 cents. The price broke sharply to 17.1 cents a pound by the middle of March, but a partial recovery brought spelter to 19 cents by the middle of April, after which a long decline continued until the midyear, the half year closing with spelter at 12.1 cents. The average price of a pound of spelter for the first six months of 1916 was 17 cents.

The price of spelter at London followed a parallel of course to that at St. Louis, but averaged about 2½ cents a pound higher. The opening price was £90 a long ton (19.48 cents a pound). The rise in February carried spelter to £111 a long ton (24.02 cents a pound) by March 1st, after which came the decline that, except for the partial recovery in April, brought the price down to £61 a long ton (13.20 cents a pound) at the midyear. The average for the half year was £90 8s 7d a long ton (19.6 cents a pound).

The foregoing prices are for the ordinary commercial grades of spelter. High-grade spelter suitable for cartridge spinning has been in such great demand that it has commanded a good premium.

At the average price for immediate delivery at St. Louis the value of the spelter produced from domestic ores during the six months was $91,016,640, and that of the spelter produced from foreign ores $16,577,040, a total of $107,593,680.

As most of the spelter sold during the six months was sold under contract for future delivery at considerably lower prices than those quoted for immediate delivery, it is certain that the forgoing values are in excess of the real sales values.

Smelter Changes.

The number of retorts at zinc smelters at the close of 1915 was 156,568, and there were building or planned 49,612 additional retorts, a total of 206,270. The number at smelters June 30, 1916,, was 196,640, and 24,812 additional retorts were building or planned, a total of 221,452. Some of the smelters listed earlier in the year as planned were abandoned, and a number of other plants not listed never got beyond the promotion stage. On the other hand, work was begun on two smelters not listed, on the plant at Quinton, Okla., and on that at Weir, Kans., both small. Since June 30th ground has been broken for a large zinc smelter at Moundsville, W. Va. All the additions to plants were made as planned.

The United States Smelting Company has traded its plant at Iola, Kans., for the plant of the J. B. Kirk Gas & Smelter Company at Checotah, Okla., the exchange dating from August 15, 1916.

The decline in the price of spelter has caused the temporary closing of some of the smaller smelters and the reduction of operations by several others. A canvass by the Survey showed not over 180,417 retorts in active operation August 15th, out of a

possible 199,328. Some of them were being used to treat secondary materials, such as zinc ashes and drosses, and an unknown number of others were engaged in refining the ordinary grade of spelter by redistillation. It will be noted that the number of retorts on August 15th was somewhat larger than that on June 30th, owing to the completion of some of those under construction at the earlier date.

The Mammoth Copper Mining Company, of Kennett, Cal., after operating an experimental plant in 1915-1916, has announced that it will build a commercial electrolytic zinc plant. The capacity of the electrolytic plant of the Anaconda Copper Mining Company, at Anaconda, Mont., was increased to 25 tons and the plant was operated steadily throughout the half-year. The 100-ton plant of the same company at Great Falls, Mont., is expected to go into operation before September 1st.

Total Smelter Capacity.

On the basis that 156,568 retorts were already in existence at the beginning of 1916, that the 49,612 additional retorts then planned, and electrolytic plants aggregating 60,000 tons annual capacity, also then planned, were completed and that the smelters of secondary spelter kept their usual capacity, the United States, as was estimated in the spelter statement of April 4th, would have the capacity at the close of 1916 to produce spelter at the rate of over 900,000 tons a year. This estimate was plainly stated to be one of the capacity under normal conditions at the close of the year—in other words, it pertained to capacity which might be exercised during 1917—and it was in no sense an estimate of output for either 1916 or 1917.

It need have occasioned no surprise that the production during the first half of 1916 failed to equal half the capacity indicated for 1917 in the Survey's estimate of capacity, could not. During half-year 25% of retorts There are evident reasons, of course, why it on which the estimate of capacity was based were only under construction or planned; in fact, one-sixth of the 25% had not been completed at the close of the half-year. These could not contribute to the output. Also a very considerable number of retorts was engaged in redistilling spelter of ordinary grade to make it of high grade. These retorts not only did not add to the output of spelter, but they diminished it, because there was a loss of 7 to 10% of zinc in the redistillation. Allowance was made for the above factors in the estimate of capacity because it was there considered that the capacity for high-grade electrolytic spelter at the close of 1916 plus the output of high-grade spelter from the lead-free ores of the Eastern States would relieve these retorts of such redistilling.

The average capacity per retort, estimated by the Survey at four tons, was somewhat fully considered on pages 892-893 of the chapter on zinc in Mineral Resources, 1914, to which the reader is referred for the data on which the estimate is based. By reason of great demands and high prices it has been claimed that the retorts were so crowded that the ores were "butchered." This, if true, would reduce the percentage of recovery but not the output. Smelters would certainly not crowd the retorts if they would thereby lower the average total output per retort. In times of great demand it would be expected, rather, that percentage of recovery might be sacrificed to capacity.

It does not seem likely that the grade of ore smelted in 1915 and 1916 was materially lower than in previous years. Practically all zinc sulphide ores are concentrated before being smelted. If the average grade of zinc concentrates was in fact lower it would, of course, lower the average capacity per retort. But zinc smelters, forced by the lack of smelting capacity in 1915, paid a premium for higher grade concentrates and refused to buy the lower grade. It is improbable that the grade of concentrates from Franklin Furnace or from the East Tennessee zinc mines during 1915-1916 was lower. The grade of the small output of Wisconsin carbonates in 1915 was 2½ points lower than in 1914, and that of the green sulphide concentrates was 1½ points higher, but sphalerite concentrates from Wisconsin are mostly re-treated by roasting and magnetic separation, and average grade as delivered to the smelter is not definitely known, but was higher than in 1914, because a larger part of the ore was roasted and magnetically concentrated before being smelted. In the Joplin district as a whole the average grade of sphalerite concentrates was 0.6 of a point higher, and the grade of carbonates and silicates more than 0.9 of a point higher, in 1915 than in 1914. The following quotation from J. P Dunlop, of this Survey, referring to conditions in the Joplin district, is of interest:

"The significant feature of the ore market during the year was the wide margin between the base prices offered for the high and for the medium and lower grades of concentrates. The spread had usually been comparatively small, but in 1915 it was generally $10 to $15 a ton and frequently the difference was as great as $15 or $20 a ton. This was due to the imperative demand by the smelters for concentrates free from lead or containing less than 1% lead. Some weeks it was difficult to sell the low-grade ore even at the quoted low base price."

Zinc sulphide concentrates from the Butte & Superior mill assayed on the average half a point higher in 1915 than in 1914. The spread of flotation treatment during 1915 must have operated to raise the grade of zinc sulphide concentrates in other Western States. In fact, so far as domestic zinc concentrates are concerned, the grade must have been raised instead of lowered in 1915. But large quantities of zinc concentrates from Australia have been received and treated in 1915—1916. If these were sufficiently lower than the average grade of domestic concentrates to overcome the increase in grade of domestic concentrates, then the average grade of all concentrates may have been lowered. W. R. Ingalls says 848,776 tons of sulphide concentrates and 349,299 tons of carbonate concentrates were smelted in the United States in 1915. Assuming 40% as the average zinc content of the carbonates, 58% as the zinc content of the Joplin sulphides, and 50% as the average zinc content of all other sulphides, we get an average zinc content of 49% for all zinc ores smelted. Mr. Ingalls estimates it at 50%. As the Australian concentrates have for several years averaged a little over 47% and as probably the higher grade concentrates only were brought to the United States in 1915, it does not appear that the Australian imports have materially lowered the general grade of concentrates smelted.

Exports.

The following tables of exports, taken from the records of the Bureau of Foreign and Domestic Commerce, show the exports both domestic and foreign, by classes and destination for five six-month periods, beginning with the six months just before the European war. Another table shows the exports of lead and zinc by months, covering the same time. The table of exports by classes shows strikingly the increase in value of total exports of lead and zinc for these periods, the total value increasing from $9,409,251 in the six months just before the war to $185,687,787 during the first six months of 1916. The most striking increases were in exports of domestic spelter and sheets, zinc manufactures, brass, brass articles, and cartridges.

Exports of Spelter and Sheet Zinc from the United States, by Six-Month Periods, 1914-1916, by Destination in Short Tons.

	1914			
	Jan.-June		July-Dec.	
To	Dom.	Foreign.	Dom.	Foreign.
Canada..		167	3,383	539
G. Britain	45	.....	40,802	2,897
Netherlands	.....		.....	.....
France	.....		8,463	1,902
Italy	.....		1,651	.....
Germany ..	84	.....	.....	.....
Russia	667	.....	4,152	.....
Japan	.....		456	.....
Other countries.	34	.....	5,070	75
	830	167	63,977	5,413

	1915			
	Jan.-June		July-Dec.	
To	Dom.	Foreign.	Dom.	Foreign.
Canada ..	2,918	382	6,561	203
G. Britain	31,100	3,477	23,452	1,644
Netherlands	.....		12	.....
France ...	15,849	1,396	9,406	4,668
Italy	2,717	448	6,051	504
Germany	.....		.....	.....
Russia	6,671	.....	5,420	.....
Japan	187	.....	470	.....
Other countries	4,926	1	3,063	997
	64,368	5,704	54,235	8,016

	Jan.-June 1916.	
	Domestic.	Foreign.
Canada	4,634	638
Great Britain	19,188	6,481
Netherlands	6	.....
France	18,804	11,177
Italy	5,807	1,901
Germany	.....	.....
Russia	3,219	.....
Japan	610	.....
Other countries	5,739	.....
	58,007	20,197

Exports of Spelter and Sheet Zinc from the United States, by Months, 1914-1916, in Short Tons.

	1914			1915			1916		
	Domestic.	Foreign.	(a)	Domestic.	Foreign.	(a)	Domestic.	Foreign.	(a)
Jan.	230	28		15,299	84		10,483	3,531	
Feb.	18	.....		15,002	2,016		10,328	3,919	
Mar.	146	.....		8,120	1,136		8,171	575	
April ...	60	.....		8,842	77		9,133	1,902	
May	107	112		7,635	1,104		8,583	4,811	
June	269	27	*1,881	9,470	1,286	*255	11,309	5,459	*.....
July	157	.....		6,492	1,876		.....	.....	
Aug. ...	3,448	319		7,274	757		.....	.....	
Sept. ...	19,045	1,120		8,653	2,122		.....	.....	
Oct.	10,259	1,140		12,093	608		.....	.....	
Nov. ...	12,747	957		10,019	2,343		.....	.....	
Dec. ...	18,321	1,877	*3,100	9,704	310	*.....	.....	.....	*.....
	64,807	5,580	4,981	118,603	13,726	255	58,007	20,197	.....

(a) Foreign zinc used in articles exported with benefit of drawback. * Six months.

Pig Iron Production in the United States in the First Half of 1916.

Official statistics issued by the American Iron and Steel Institute give the pig iron production in the first half of 1916 at $19,619,522 tons. Details are presented herewith.

Half-Yearly Production of All Kinds of Pig Iron.

States.	Blast furnaces In blast Dec. 31, 1915.	Blast furnaces —June 30, 1916— In.	Out.	Total.	(Includes spiegeleisen, ferro-mang., ferro-silicon, ferro-phosphorus, etc.) Production—Gross tons First half of 1915.	Second half of 1915.	First half of 1916.
Massachusetts ...	0	1	1	2	3,087	4,715	4,700
Connecticut	1	0	3	3			
New York	18	20	7	27	921,566	1,183,214	1,214,037
New Jersey	1	1	4	5			
Pennsylvania	125	132	25	157	5,199,421	7,591,247	8,286,076
Maryland	3	4	1	5	85,673	165,875	243,895
Virginia	7	9	12	21	105,244	146,102	202,777
Georgia	0	0	4	4	.....	.....	.....
Texas	0	0	2	2			
Alabama	27	31	16	47	868,341	1,181,112	1,366,728
West Virginia	3	4	0	4			
Kentucky	3	4	2	6	79,228	211,812	268,859
Mississippi.....	0	0	1	1			
Tennessee	6	12	6	18	82,992	94,737	162,009
Ohio	62	67	9	76	2,964,211	3,948,751	4,250,790
Illinois	21	23	1	24	801,951	1,645,269	1,938,152
Indiana	10	10	0	10	854,375	1,132,403	1,073,768
Michigan	11	12	2	14			
Wisconsin	7	6	2	8	130,514	242,452	417,542
Minnesota	2	3	0	3			
Missouri	1	1	1	2			
Colorado	2	4	2	6			
Oregon	0	0	1	1	137,188	134,733	190,189
Washington	0	0	0	0			
California	0	0	0	0			
Total	310	344	102	446	12,233,791	17,682,422	19,619,522

Pig Iron Made For Sale Or For Use Of Makers In The First Half Of 1916.

Grades.		For sale.	For maker' use.	Total Gross tons.
1,244,907	7,585,178	8,830,085	Basic	
801,592	6,037,585	6,839,177	Bessemer and low phosphorus	
3,037,646	48,764	3,086,410	Foundry, including ferro-silicon	
460,839	.....	460,839	Malleable	
87,595	81,711	169,306	Forge or mill	
23,510	76,441	99,951	Ferro-manganese	
74,886	14,209	89,095	Spiegeleisen	
29,410	15,249	44,659	All other grades	
5,760,385	13,859,137	19,619,522	Total	

In the 18 months the production of pig iron in the United States has almost doubled, that is, the production in the first half of this year was 81.6% greater than the production in the second half of 1914. That had been the smallest half year's production since 1908. Production by half years has been as follows in gross tons, beginning with 1913, when a new half year's record was made:

	First half.	Second half.
1913	16,488,602	14,477,550
1914	12,536,094	10,796,150
1915	12,233,791	17,682,422
1916	19,619,522	

As the total production was well known in advance, our forecast printed July 3rd being 19,600,000 tons, interest in the official statistics for the half year centers upon the grades produced and the relation between merchant and steel works production.

The production of merchant pig iron to total production was 28.69% in 1915 and 29.36% in the first half of this year, showing a slight relative gain by the merchant furnaces.

The distribution of production by grades has been as shown below. Bessemer including low phosphorus, while foundry includes ferrosilicon:

	Year 1915.	First half. 1916.
Basic	43.77%	45.01%
Bessemer	35.17	34.86
Foundry	16.26	15.73
Malleable	2.77	2.35
Forge	1.06	.86
Ferromanganese	.43	.51
Spiegeleisen	.33	.45
All other	.21	.23
Total	100.00	100.00

The Aluminum Industry.

(By W. C. Phalen, U. S. Geological Survey).

Bauxite Production.

The production of bauxite in the United States in 1915 was 297,041 long tons, valued at $1,514,834, an increase of 77,723 long tons, or 35%, in quantity and of $445,640, or 42%, in value as compared with 1914. The increase for 1915 is abnormal in the bauxite industry and is accounted for by the increased activity in the production of metallic aluminum. The great bulk of the bauxite from which aluminum is produced comes from Arkansas, which in recent years has produced about 80% of all the bauxite mined in the United States and in 1915 produced more than 90%.

Other States which produced bauxite in 1915 were Alabama, Georgia, and Tennessee. The output in Alabama and Georgia was larger than in 1914, but that in Tennessee declined.

The average price of bauxite per long ton at the mines was $4.81 in 1912, $4.75 in 1913, $4.87 in 1914, and $5.10 in 1915.

The Domestic Aluminum Industry.

In a recent speech in Detroit, Mr. A. V. Davis, president of the Aluminum Company of America, stated that it is the desire and intention of the American producer to make enough metallic aluminum to supply the requirements of the United States, but that it is obviously difficult to maintain establishments large enough to supply domestic needs, while supplies from outside are cut off, and then during normal times, while imports are coming in, to store supplies or

to close down plants altogether until another period comes on during which imports may again be cut off. There is only one cure for the present shortage in metallic aluminum, and that is to make more metal. This the American producer is preparing to do. A schedule has been planned that calls for the expenditure of $20,000,000 during 1915 and 1916. To carry out a plan of such magnitude takes time, and Mr. Davis reported that it would probably be May, 1916, before results could be obtained from the first of the company's work and probably be December, 1916, before the work was finished.

Toward the end of 1915 the Aluminum Company of America was making nearly twice as much metal as in the same period in 1914, and when the new projects are in working order there will be so great an increase in production that the company will be able to supply the domestic demand even though no foreign metal is imported.

One of the most important developments of 1915 in the aluminum industry was the taking over of the property of the Southern Aluminum Company by the Aluminum Company of America. The Southern Aluminum Company, as reported in Mineral Resources for 1914, was forced to abandon work on its project at Whitney, N. C., on account of the war in Europe. The Aluminum Company of America now (May, 1916) has a large force of men on the ground pushing operations forward as rapidly as possible. It is expected that a production will be made from this plant late in 1916 or early in 1917. The present power house at Whitney is to be dismantled and will be replaced by another of later type on the west side of the river. Further plans are reported for a steel-reinforced concrete building to cover a considerable acreage.

The large rolling and stamping mill which the company is erecting on Hudson River at Edgewater, N. J., will be not only the largest mill owned by the Aluminum Company of America but the largest mill of its kind in the world.

It is reported that the erection of dams for the company's project on Little Tennessee River, near the border line between North Carolina and Tennessee, will be begun in 1916, and already preparations are being made for a cement plant at Chilhowee six miles from Alcoa, the company's headquarters in this part of Tennessee. A statement as to the projected developments in this region was given in Mineral Resources for 1913. These developments will be pushed as fast as the market will take the product.

The water-power project on St. Lawrence River is also being developed.

New Aluminum Plant.

It is reported that the Mineral Products Corporation is to build a plant in Utah for the production of metallic aluminum from alumina produced in making potassium sulphate from alunite. Some research work is reported as having been done on this alumina to produce a refractory material capable of withstanding high temperatures—for example, 2,500 degrees C.

The Aluminum Market.

The aluminum market in 1915, like that for most of the metals, went through a series of very radical changes. According

Bauxite and Aluminum.

Aluminum produced or consumed in the United States, 1885-1915, in pounds.

1885	283	1902	7,300,000
1886	3,000	1903	7,500,000
1887	18,000	1904	*8,600,000
1888	19,000	1905	*11,347,000
1889	47,468	1906	*14,910,000
1890	61,281	1907	*17,211,000
1891	150,000	1908	*11,152,000
1892	259,885	1909	*34,210,000
1893	333,629	1910	*47,734,000
1894	550,000	1911	*46,125,000
1895	920,000	1912	*65,607,000
1896	1,300,000	1913	*72,379,000
1897	4,000,000	1914	*79,129,000
1898	5,200,000	1915	*99,806,000
1899	6,500,000		
1900	7,150,000		556,672,546
1901	7,150,000		

The secondary aluminum produced in 1915 was 5,700 short tons; the recovered aluminum contained in alloys was 2,800 short tons.

* Consumption. The figures for 1915 do not include the weights of imported leaf aluminum, valued at $1,294; table, kitchen, and hospital utensils, and other similar hollow ware, valued at $32,435; wire, valued at $39,021; and "All other manufactures" of aluminum, valued at $42,083.

Exports.

Value of aluminum of domestic production exported, 1910-1915.

1910	$949,215	1913	$966,094
1911	1,158,603	1914	1,546,510
1912	1,347,621	1915	3,682,117

to Mr. Davis, president of the Aluminum Company of America, this company, the only American producer, had been stocking metal for a long period prior to the revival of business in April, 1915. At that time it had the largest stock of metal in the history of the company and perhaps the largest stock of aluminum that the world has ever known. The consumption of the metal then began to increase materially, and the war, cutting off imports to a large degree, also became a factor in the scarcity which ensued. The company has a Canadian plant from which a substantial quantity has come into this country during recent years, but in 1915, as well as in 1916, imports from this source have been stopped, owing to an embargo placed by the English War Office on the exportation of aluminum from Canada. The effect of this embargo, as well as the difficulty in getting other foreign aluminum, is plainly indicated in the statistics of imports into the United States during 1915. The price per pound ranged approximately from 19 cents at the beginning of the year to nearly 60 cents at the end.

Process of Producing Metallic Aluminum.

Grenville Mellen has pattented a process for extracting aluminum from clay, kaolin, or aluminum silicates in general, which is as follows: The clay is fused with sodium sulphate in the presence of sulphuric acid, or with its equivalent of acid sodium sulphate, in such proportion as to form aluminum sulphate and free silica. The fusion product after cooling is dissolved in water, filtered, and treated with sodium fluoride. The aluminum fluoride which separates is fused with common salt and is electrolyzed.

Alloys.

A. Wilm has found that a valuable improvement in aluminum alloys results from the combination of small quantities of manganese with aluminum, magnesium, and copper. The properties of the alloys with these four metals may be modified according to the proportions of manganese in combination. Different proportions of the metals which may be used are mentioned.

W. A. McAdams has invented an aluminum alloy that is particularly adapted for casting. It consists of aluminum, 82 parts by weight; silver, 1 part; copper, 12 parts; and cadmium 5 parts. In forming the alloy the aluminum is first melted, copper is then added, and the two metals are melted together. Then the silver is added and the temperature is lowered, but kept high enough to allow the cadmium to melt when it is introduced. The mixture is thoroughly stirred and then poured into molds to form the articles to be cast or ingots for shipment.

Aluminum Solder.

J. F. Gross has invented a solder for use with aluminum or with aluminum and other metals. The composition of the solder is as follows: Block tin, 80 parts; lead, 16 parts; aluminum, 8 parts; zinc, 16 parts; and phosphorus tin, 8 parts. These elements are fused or melted together in the usual manner and molded into any desired shape.

J. Cayocca has invented a solder designed for use with metallic aluminum without the use of an acid or flux. The solder is claimed to be noncorrosive and to have the appearance of the metal treated. It consists of tin, 12.8 ounces; lead, 3.2 ounces; and aluminum, 1 ounce. The ingredients are melted in the proportion stated and molded into bars of convenient size for handling.

E. Thaulow has invented a compound to be used in welding aluminum and alloys containing aluminum. It has been found that a mixture of borax and sodium bisulphate is well adapted for this purpose, and the general claims made include these two chemical compounds.

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Steel Plants.

X.—The Tennessee Company.

The Tennessee Coal, Iron & Railroad Company is a subsidiary of the United States Steel Corporation, the stock having been purchased in the stress of the panic of October, 1907. The company had had an interesting and rather checkered career. It had been taken in hand by successive groups of financiers who poured capital into it without getting back the expected returns.

The original concern was the Tennessee Coal & Railroad Company, Nashville, Tenn., chartered March 24, 1860. About ten years later work was started on the construction of a blast furnace at Tracy City, a few miles across the line from Alabama, but this project was not a success. Later it was decided to build at South Pittsburg, Tenn., still nearer the Alabama line, and three stacks were blown in, May, 1879, March, 1882, and March, 1888. Nos. 2 and 3 are still in physical existence, as alternate stacks, but are not considered on the active list. Sewanee Furnace in Tennessee, completed in 1880, was operated for a dozen years or so and then abandoned. Thus the word "Tennessee" in the corporate name has become altogether a misnomer.

The Tennessee Company, eventually absorbed by the Steel Corporation, had done its share of absorbing, its chief acquisitions having been the DeBardeleben Coal & Iron Company and the Eureka Company, in 1892.

The oldest surviving furnace is one of the two alternate Oxmoor stacks, it having been put in blast in March, 1876, (by the Eureka Company), its companion having been completed in July, 1877, but apparently not blown in until 1885, when it had been rebuilt. The furnaces were subsequently re-arranged to operate as alternate stacks. Next in order of age comes the Alice stack at Birmingham, blown in July 24, 1883. Its companion, blown in November 23, 1880, has since been abandoned. Next in order of age comes the Bessemer furnaces, now five in number, the first having been put in blast in 1888. The No. 5 has been idle for ten years and the capacity of the group is figured at 270,800 tons annually.

The most important furnaces of the Tennessee Company are the six Ensley stacks. The first of these was built in 1887, but the furnaces have been successfully rebuilt, the last rebuildings having been from 1907 to 1914. The six furnaces are rated at 737,100 tons annually.

The Bessemer Rolling Mills, with 24 puddling furnaces, were completed and put in operation in September, 1888, but passed out of commercial existence at the beginning of the depression of 1893-98. At the conclusion of the depression the Tennessee Company bought the plant, and it still survives as a mill for rolling steel, the puddling furnaces having been abandoned.

The preceding sketch includes enough of the history of the company to illustrate the vicissitudes of iron making in the South. Even the Ensley steel plant, now so successful, had quite a portion of troubles. First the plant was financed separately, as the Alabama Steel & Shipbuilding Company, this company building the plant and leasing it to the Tennessee Company. It contained originally ten 50-ton tilting open-hearth furnaces, the first steel being poured November 30, 1899. Operations were not very successful, and through various changes the plant now comprises eight 100-ton tilting furnaces, with two 20-ton converters for duplexing and two mixers of 250 and 600 tons capacity respectively. The plant is rated at 700,000 tons of ingots annually. The rolling capacity comprises a rail mill and a billet mill. Billets are shipped to the Fairfield works, near Birmingham, of the American Steel & Wire Company, which rolled its first rods February 12, 1914.

Topical Talks On Iron.

XLI. Lake Superior Iron Ore.

William A. Burt, United States deputy surveyor, was the inventer of the solar compass. On September 16, 1844, when running a township line in Michigan, Mr. Burt noticed by means of his solar compass some remarkable variations in the magnetic needle and then and there he and his party looked for iron ore, finding numerous outcroppings. That was the discovery of iron ore in the Lake Superior region. It was a case of every man to his trade. Although nearly 400,000,000 tons of pig iron have since been made from Lake Superior iron ore, Mr. Burt's interest was not in the discovery of the ore as a valuable product, but in the fact that the presence of the iron ore made his solar compass the only available instrument for running his lines.

During the next few years various attempts were made to develop the deposits—they represented what is now the Marquette Range—and there was some consumption by forges nearby. In 1850 A. L. Crawford, of New Castle, Pa., took ten tons of ore from the Jackson mine, the first mine opened, and converted the ore in a forge into blooms. Accounts vary as to the first employment of the ore in a blast furnace. It appears that the first shipments to a blast frunace occurred in 1853, something like a hundred tons, to furnaces at Sharpsville and Sharon, in the Mahoning valley. The ore arrived by the Beaver and Erie canal, the last section of which was abandoned in 1870. The accepted statistics of Lake Superior iron ore shipments begin with 1855, which year is credited with 1,449 tons shipped down the lakes. A real commercial movement had awaited the completion of the Sault Ste. Marie canal. The side wheel steamer Illinois made the first passage of the canal, June 18, 1855.

The furnaces of the Shenango and Mahoning valleys had been using local ores, and the new Lake Superior ore did not find much favor at the start. Furnaces were operated by rule of thumb and to put better ore into a furnace did not necessarily conduce to its working better. The record kept by John J. Spearman, manager of Sharpsville furnace, has been preserved. On July 20, 1859, the furnace was ready for operation. Three cords wood were fed from below and nine barrows of coke from the "trunnel head". Next day there was charged 70 barrows of coke and two cords wood and at 5 P.M. the furnace was lighted. Next day after filling in 74 barrows of coke and two cords of wood the pump shaft broke and the furnace was at once stopped up tight. Five days later, with the shaft replaced, the furnace was cleaned out and filling of fuel resumed, but the supply of coke filled the furnace only two-thirds full, and raw coal was used to eke out. Next day, the furnace being filled to within ten feet of the trunnel head, they began charging in the following proportions: 500 pounds coke, 150 pounds native ore, 35 pounds lime and 35 pounds furnace cinder. When 25 such charges had been fed the blast was put on and charging began in the following proportions: 500 pounds coal, 100 pounds native ore, 100 pounds Lake Superior hematite ore, 35 pounds lime and 35 pounds furnace cinder. After 34 such charges the top of the hot blast oven blew off. When this had been repaired the first cast was made, and up to that time the ore charged had been in the proportion of 61% native and 39% Lake Superior ore. Later of course, it was possible to use more Lake Superior ore, but the interesting fact is that 15 years after the discovery of Lake Superior ore native ore in the Shenango valley was depended upon for blowing in a blast furnace.

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The Iron and Steel Situation.

The Month's Developments.

Our review a month ago opened with the suggestion "July probably marked the culmination of the dulness in the steel trade." August developments have proved that diagnosis to be correct, for the month has shown more activity in steel products, though really no great activity, and an advancing tendency in prices, and in pig iron a buying movement developed, though one of quite modest proportions.

Steel Price Advances.

On August 1st the Carnegie Steel Company announced an advance in its price of bars from 2.50c to 2.60c. On August 7th it announced corresponding advances in plates and shapes, shapes from 2.50c to 2.60c and plates from 2.90c to 3.00c. These price advances were followed by the independents at a respectful distance — respectful to their customers—as they permitted their regular customers, for a time, to close additional tonnage at the old figures, while promptly advancing their quotations to new inquirers, particularly to buyers known to be regular Carnegie customers. Before the middle of the month the general market was established at the higher levels, for delivery at mill convenience.

Effective August 7th the American Steel & Wire Company advanced its prices $2 a ton, making carloads to jobbers 2.55c on plain wire and 2.60c on nails. The price previously made of 2.65c on wire for manufacturers for fourth quarter was allowed to stand, and this perhaps marks the inception of a new policy, to charge more for manufacturers' wire than for ordinary wire for jobbing purposes. This would accord with the claim always made by wire mills, that the former is more costly to make. The wire advance was promptly concurred in by the independents.

A Pig Iron Movement.

Before the month of August was half over it developed that there was a considerable volume of buying of foundry and malleable grades of pig iron, all in a quiet way. The movement was certainly on a larger scale than appeared on the surface. In some quarters the quiet character of the buying was attributed to a mental attitude on the part of buyers, that they feared active inquiry in the open market would result in price advances. It has since developed, however, that certain sellers, few in number, went forth with characteristic activity to book a certain volume of business by making the price attractive, and as the market was well established it was possible for them to effect large sales at fractional cuts, without hawking their wares generally. Thus there appear to be two reasons for the quietness of the buying. Just after the middle of the month large purchases of basic iron developed, in nearly all territory, at substantially the going prices. The buying of foundry iron has continued to the end of the month, with prices stiffening in some directions. The Chicago market yielded perforce to the low price of Southern iron, declining $1 a ton to $18 at Chicago furnace, whereby it reached a fair degree of harmony with southern iron, quotable at $14, Birmingham, as minimum.

War and Other Export Steel.

There was continued heavy buying of war steel, both in large rounds and large billets for export, and in large billets for the manufacture of shells in this country. The buying for the remainder of 1916 far outran expectations previously entertained, while there was also a very fair measure of buying for the first half of 1917, all at substantially as high prices as have obtained at any time in this movement.

Other export buying was on a reduced scale, perhaps surely because deliveries desired could not be arranged. There was anxious inquiry for soft unfinished steel for export, particularly in the form of sheet bars. A thorough canvass of the entire trade on the part of a prominent British consumer developed only very small tonnages of sheet bars, very much less than it was desired to purchase.

Production and Requirements.

Hot weather continued almost throughout August, and with the indifference of labor to putting in full time restricted production of steel fully as much as had been the case in July. The production of steel in the two months was probably fully 15% less than in May and June, when maximum output was attained.

The requirements of consumers appear-

ed insistent throughout the month and the mills did not seem able to arrange deliveries any more satisfactorily than formerly. It hardly appeared, however, that the reduced output resulted in the development of any greater tension as to the volume of shipments failing to meet the requirements of buyers.

Analysis of the Situation.

What has thus far been said in this review of a month of the iron and steel market has been by way of stating the concrete facts as closely as they can be stated in general terms. The analysis of the situation is a very difficult one. In the first place there is lacking that concensus of opinion between buyers and sellers that so strikingly characterized the market of six months or more ago. Then the buyers were quite as hopeful for the steel market's future as were the sellers. At times indeed there was what may be called, reversing the usual nomenclature, a "buyers' market" in that the buyers made the market not by dictating prices but by encouraging advances through their insistent purchases.

To-day that concensus of opinion is quite lacking. There may be many buyers, but only a few of them are content with present prices. A great many, including nearly all jobbers, are very much dissatisfied, claiming that steel cannot be moved to its ultimate consumption in the full volume that has characterized the movement of the past year, because prices are too high. When the advances are passed on to the ultimate consumer, as they may be when the buyer from the mill eventually finds them on his invoices, the ultimate consumer, so it is strongly urged, will reduce his purchases. Less agricultural machinery and tools of all descriptions will be bought. Investors will not consider hotel and office buildings. The railroads will not buy except in a limited way. Municipal and other public improvements will be halted.

The mills in rejoinder to these complaints simply refer to their well filled order books and the present clamor on the part of many buyers for better deliveries. They are not dealing with theory or argument, but with plain facts as to tonnage demand and tonnage capacity.

The rejoinder does not close the argument, however. It opens up the ques

PIG IRON PRICES.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered).

	Bessemer, Valley	Basic, No. 2 fdy. Phila.	Basic, No. 2X fdy, Phila.	Buffalo.	No. 2 fdy Cleveland.	No. 2 fdy Chicago.	Ferro-manganese.* Birmingham.	Furnace coke†
1915—								
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. ..	13.60	12.50	12.75	13.50	14.35	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916—											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.45
May ..	21.00	18.21	18.44	20.50	20.25	19.15	19.08	19.50	15.00	175.00	2.34
June ..	21.00	18.25	18.39	19.90	20.04	18.75	19.30	19.50	14.63	175.00	2.54
July ..	21.00	18.00	18.25	19.15	19.75	18.75	18.80	19.50	14.00	175.00	2.65
Aug. ..	21.00	18.00	18.27	19.00	19.75	18.75	18.57	19.17	14.00	175.00	2.75

* Contract price, f.o.b. Baltimore; † Prompt, f.o.b. Connellsville ovens.

tion whether mill order books mean the same thing now as they did a few months ago. Then the buyers had specified very freely against their contracts, which were at relatively low prices, and of course at prices well below those currently quoted on new business. With the lapse of time a new condition is arising, the cheaper steel being shipped and passed on to the ultimate consumer while the steel that is to be moved in future is much higher priced steel, and it does not follow that specifications will come in as freely in future. The mills may easily close the present year with as large a volume of contract business on books as they had on July 1st, but as large a proportion may not be in the form of actual shipping orders. On July 1st the proportion was between 55 and 60%, in the case of the large mills, a remarkably large proportion when the total obligations represented a tonnage equal to about seven months to full production.

There is no concrete evidence, however, that the buyers will not specify. They made the contracts with the expectation of specifying. Nothing unfavorable, for instance, has developed since the market advanced to 2.50c on bars and shapes and 2.90c on plates, but indeed a great deal of that is favorable. The advances of $2 a ton on these products, made early in August, may have been for the primary purpose of inducing buyers to specify. According to the accounts of the mills they are, indeed, sold up farther ahead on these products than on almost all other products, excepting rails, and they are perhaps the products the consumption of which would be affected most by high prices. Sheets, wire products, tin plates, tubular goods, etc., would likely be less affected by high prices, for they enter lines of consumption, as a rule, in which the original cost of the steel is but a small part of the cost of the finished product, whatever it may be, ready for the ultimate consumer.

The Influence of Stocks.

A much clearer insight into the situation would be obtained were it possible to have even approximate estimates, from month to month, of the volume of steel in stocks in the hands of buyers, the jobbers and the manufacturing consumers. Even the steel interests do not know, since for prudential reasons the buyers keep the information to themselves, and if the steel mills did know they would not tell except perhaps

FINISHED STEEL PRICES.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved —— Sheets ——						Comp.
						Wire	Steel			Blue	Tin	Fin.
1915—	Shapes,	Plates,	Bars,	Pipe,	Wire,	Nails.	Skelp.	Black.	Galv.	Annld.	plate.	steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3 60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.76	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5691
August	1.30	1.26	1.30	79	1.43	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916—												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.25	2.40	2.35	2.89	5.00	2.95	4.70	2.7166
May	2.50	2.83	2.50	70	2.45	2.50	2.35	2.90	5.00	3.00	5.46	2.8043
June	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.80	3.00	5.75	2.8300
July	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.40	2.90	6.00	2.8425
Aug.	2.54	2.94	2.56	70	2.53	2.58	2.35	2.90	4.20	2.90	5.54	2.8588

when it was to their advantage. Undoubtedly in the closing months of 1915, when low priced contracts were still in force, buyers were disposed to gather up all the steel they could, but whether they accumulated anything beyond their current requirements is a question. The mills were so far behind that even in the past three or four months there has still been shipped a considerable tonnage of relatively cheap steel. We do not know whether in the past four months buyers have been drawing upon their stocks or increasing them by taking in cheap steel.

Thus no convincing statement can be made as to the character of the steel business in the next ten months, to the middle of 1917. According to the testimony of the steel mills, they are assured of being under high pressure for deliveries during the whole period, having already placed under contract at least two-thirds of the steel they can make in the period. According to the majority of jobbers the future, even in the next few months, is beset with doubts, on the ground that the ultimate consumer will not take as much material as formerly, on account of the high prices. The manufacturing consumers are divided into many shades of opinion. The automobile makers are quite willing to buy for the first half of 1917. Some of them are even willing to place contracts with the price left open, to be fixed by the mills later. Building projects involving large quantities of structural steel are very rare. The railroads are buying very little. Thus the outlook is somewhat mixed. The observation may be appended that the observer has not only the verbal testimony of the steel mills as to their confidence in the future. He has also their testimony in the money they are spending on extensions, additions to capacity, pursuing construction work which costs about 50% more than it did before the war. Much of it will not be productive for another twelvemonth, and yet the steel mills spend the money, and they say "money talks".

LAKE SUPERIOR IRON ORE.

Shipments of iron ore down the lakes have been as follows, in gross tons:

	1911.	1912.	1913.	1914.	1915.	1916.
April	331,645	204,042	866,386	269,686	503,832	1,658,411
May	3,684,819	5,919,074	7,284,212	3,852,063	5,012,359	8,449,580
June	4,819,996	7,567,555	7,974,444	5,502,367	6,005,591	9,507,576
July	5,221,373	7,600,233	8,204,416	5,784,514	7,204,021	9,750,157
August	5,548,311	7,760,248	7,677,601	5,869,477	8,081,117	.....
September	5,251,069	7,287,230	7,258,413	5,438,049	7,863,146	.....
October	4,769,965	7,010,219	6,526,103	4,242,392	7,146,873	.....
November	2,523,253	4,072,674	3,270,958	1,068,682	4,445,129	.....
December		14,579	18,545	1,411	57,236	.....
Season Lake ..	32,130,411	47,435,777	49,070,478	32,021,987	46,318,804	29,365,724

U. S. STEEL CORPORATION'S OPERATIONS.

EARNINGS AND UNFILLED ORDERS.

Earnings by Quarters.

Net earnings by quarters since 1911:

Quarter.	1916.	1915.	1914.
1st	$60,713,624	$12,457,809	$17,994,382
2nd	81,126,048	27,950,055	20,457,596
3rd	.....	38,710,644	22,276,002
4th	.....	51,277,504	10,935,635
Year	.....	130,396,012	71,663,615

	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38,450,400	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year ...	137,181,345	108,174,,673	104,305,466

Unfilled Orders.

(At end of the Quarter).

	First.	Second.	Third.	Fourth.
1906..	7,018,712	6,809,584	7,936,884	4,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,833	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220
1916..	9,331,001	9,640,458		

BOOKINGS AND SHIPMENTS.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

1914—	Shipments. %	Bookings. %	Difference. %	Difference. Tons.
August	67	72	+ 5	+ 54,742
September ..	62	24	—38	—425,664
October ...	55	28	—27	—326,570
November .	45	32	—13	—136,505
December .	38	82	+44	+512,051
January 1915	44	81	+37	+411,928
February ..	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September .	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037
December .	102	152	+50	+615,731
January 1916	102	112	+10	+116,547
February ..	102	157	+55	+646,199
March	104	164	+60	+762,035
April	104	146	+42	+498,550
May	104	82	—22	—297,340
June	104	82	—22	—297,340
July	90	86	— 4	— 46,866

RAILROAD EARNINGS.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January ..	1,021	795	226	939	718	221	1,133	797	336
February .	914	746	168	900	680	220	1,140	800	340
March	1,091	801	290	1,015	722	293	1,260	844	416
April	1,038	782	256	1,013	724	289	1,223	827	396
May	1,047	800	247	1,044	735	309	1,307	857	450
June	1,097	789	308	1,090	730	360			

Comparison of Metal Prices.

Pig Iron.	Range for 1914. High.	Low.	Range for 1915. High.	Low.	Range for 1916. High.	Low.	Closing, Aug. 31, 1916.
Bessemer, valley	14.25	13.75	21.00	13.60	21.00	20.00	21.00
Basic, valley	13.25	12.50	18.00	12.50	18.50	17.75	18.00
No. 2 foundry, valley	13.25	12.75	18.50	12.50	18.50	18.25	18.50
No. 2X fdy. Philadelphia.	15.00	14.20	19.50	14.00	20 25	19.50	19.75
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	19.30	18.50	18.50
No. 2X foundry, Buffalo.	13.75	12.25	18.00	11.75	19.00	18.00	18.50
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	19.00	18.00	18.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.00	14.00
Scrap Iron and Steel.							
Melting Steel, Pittsburgh.	12.00	9.75	18.00	11.00	18.75	16.00	16.12
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	16.75	14.50	15.50
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	18.12
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.00	14.75	15.37
Heavy steel scrap, Phila.	11.25	9.00	16.25	9.50	17.75	14.75	14.87
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.47	1.25	1.47
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.50	1.90	2.60
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.60	1.85	2.60
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	3.00	1.85	3.00
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	2.60	1.85	2.60
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	2.35	1.75	2.35
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	2.90	2.60	2.90
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.15	4.15
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	6.00	3.75	5.50
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.60	2.10	2.60
Steel pipe, Pittsburgh	79½%	81%	79%	81%	70%	78%	70%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	2.80
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.25	3.35
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	37.50	38.87½
Lake copper	15.50	11.30	23.00	13.00	30.25	23.00	27.25
Electrolytic copper	14.87½	11.10	23.00	12.80	31.00	23.00	27.87½
Casting copper	14.65	11.00	22.00	12.70	28.25	22.00	25.12½
Sheet copper	20.25	16.50	27.25	18.75	37.50	28.00	37.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	6.50
Spelter	6.20	4.75	27.25	5.70	21.17½	8.37½	8.80
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	10.50	12.50
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	65.00	53.00	61.00
Silver	59¼	47⅝	56½	46¼	77¼	55⅞	67¼
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	6.50
Spelter	6.00	4.60	27.00	5.55	21.00	8.20	8.62½
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	15.00	15.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	205	163	170¾
Standard copper, prompts	66¾	49	86¾	57⅛	146	84½	109
Lead	24	17⅞	30¼	18¼	36⅜	27¾	31¼
Spelter	33	21¼	110	28⅛	111	44	52
Silver	27¼d	23¼d	27¼d	22 1/16d	37⅛d	26½d	32d

Comparison of Security Prices.

Railroads.	Range for 1914. High.	Low.	Range for 1915. High.	Low	Range for 1916. High	Low.	Closing. Aug. 31, 1916.
Atchison, Top. & Sante Fe...	100⅜	89½	111¼	92½	108½	100¼	103
Atch. Top. & Santa Fe,. pfd.	101¾	96½	102⅛	96	102	97⅞	98⅞
Baltimore & Ohio	95⅝	67	96	63¾	96	82⅞	85⅝
Canadian Pacific	220½	153	194	138	183¾	162½	178
Chesapeake & Ohio	68	40	64¾	35⅝	67¾	58	60½
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¾	102½	91	95
Erie R. R.	32½	20⅛	45⅝	19⅞	43⅝	32	37
Great Northern, pfd.	134¾	111⅝	128⅜	112¾	127½	116⅛	116⅞
Lehigh Valley	156¼	118	83⅜	64⅝	84¼	74½	78¾
Louisville & Nashville	141⅞	125	130¼	104½	135½	121⅛	129
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	7¼	3¼	3⅝
Missouri Pacific	30	7	18¼	1¾	7½	3¼	3⅝
New York Central	96⅝	77	110½	81½	111½	100¼	103
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	57	59½
Northern Pacific	118½	97	119	99⅛	118⅞	109	110½
Pennsylvania R. R.	115½	102½	61½	51¾	59¾	55⅛	55⅝
Reading	172¼	137	85⅝	69⅜	110¾	75⅛	105½
Southern Pacific	99½	81	104⅛	81¼	104⅛	94¼	97⅜
Union Pacific	164⅜	112	141½	115¾	143⅞	129¾	140¼
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¼	96⅛	61¾	88½
American Can	35⅛	19¼	68½	25	65⅜	50¼	61
American Can, pfd.	96	80	113½	89	113⅞	108⅛	113½
Am. Car & Foundry	53½	42¼	98	40	78	52	62½
Am. Cotton Oil	46½	32	64	39	57½	50½	52⅜
Am. Locomotive	37¼	29¼	74¾	19	83¾	58	76¼
Am. Smelting & Refining	71⅛	50¼	108⅞	56	113⅜	88½	98¾
Brooklyn Rapid Transit	94¼	79	93	83¼	88⅞	83½	85⅜
Chino Copper	44	31⅝	57⅜	32¾	60	46⅛	52
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	53	38⅛	48¼
Consolidated Gas	139½	112½	150½	113¾	144¾	130½	135½
General Electric	150⅝	137½	185½	138	178½	159	170
International Harvester	113½	82	114	90	119¾	108½	114
Lackawanna Steel	40	26½	94¾	28	86	64	77
National Lead	52	40	70¾	44	73⅞	60½	64⅞
Ray Consolidated Copper	22½	15	37½	15¼	26	20	25
Republic Iron & Steel	27	18	57¼	19	55¼	42	53
Republic Iron & Steel, pfd...	91¼	75	112⅝	72	114	106⅞	113¾
Sloss-Sheffield	35	19½	66⅞	22	63¼	37	47
Texas Co.	149⅞	112	237	120	235½	177¼	194
U. S. Rubber	63	44½	74¾	44	59⅜	47¾	56¾
U. S. Steel Corporation	67¼	48	89½	38	99⅜	79¾	97⅞
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	118⅝	115	...
Utah Copper	59⅜	45⅜	81¾	48½	86¾	74¾	83¼
Va.-Carolina Chem.	34⅞	17	52	15	51	36	41½
Western Union Telegraph ...	66⅞	53⅜	90	57	96⅞	87	95

IRON AND STEEL IMPORTS AND EXPORTS.

VALUE OF TONNAGE AND NON-TONNAGE.

	1911.	1912	1913.	1914.	1915	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,520,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	58,300,297
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	58,722,411
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	72,918,913.
June	20,310,053	24,795,802	25,228,346	18,927,958	31,730,132	76,257,884
July	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575	.....
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822	.....
September ...	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$371,998,698

EXPORTS OF TONNAGE LINES—Gross tons.

	1909.	1910.	1911	1912.	1913.	1914.	1915.	1916
January	70,109	118,681,	152,262	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	139,946	368,867
March	94,519	124,980	216,360	218,219	257,519	159,998	174,104	438,058
April	100,911	117,921	228,149	267,313	259,689	161,952	223,587	384,924
May	109,808	135,306	178,589	307,656	242,353	139,107	263,113	540,549
June	114,724	120,601	174,247	273,188	243,108	144,539	356,431	526,772
July	100,850	127,578	162,855	272,778	237,159	114,790	378,897	.....
August	105,690	131,391	177,902	282,645	209,856	86,599	405,853	.....
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	2,616,292

IRON ORE IMPORTS.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,844
Feb. ..	188,734	112,574	78,773	93,315
Mar. .	164,865	68,549	88,402	93,383
April.	174,162	111,812	91,561	75,712
May .	191,860	125,659	98,974	148,599
June .	241,069	188,647	118,575	134,154
July .	272,017	141,838	119,468	.....
Aug. .	213,139	134,913	126,806	.....
Sept. .	295,424	109,176	173,253	.....
Oct. ..	274,418	114,341	138,318	.....
Nov. .	179,727	90,222	113,544	.....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	635,007

IRON AND STEEL IMPORTS.

	1912.	1913.	1914.	1915.	1916.
Jan. .	20,008	21,740	17,776	10,568	15,824
Feb. .	11,622	25,505	14,757	7,506	20,280
Mar. .	15,466	27,467	27,829	8,025	15,162
April.	12,481	25,742	30,585	16,565	20,175
May .	15,949	28,728	28,173	28,916	32,113
June .	21,407	36,597	23,076	32,200	26,886
July .	17,882	36,694	25,282	20,858	.....
Aug. .	20,571	18,740	28,768	27,556	.....
Sept..	18,740	19,941	38,420	23,344	.....
Oct. .	25,559	20,840	22,754	34,319	.....
Nov. .	24,154	25,809	24,165	37,131	.....
Dec. .	21,231	26,454	9,493	35,455	.....
Total	225,072	317,260	289,778	282,443	130,440

Price Changes of Iron and Steel Products From March 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our **composite finished steel.** In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the rates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
Mar. 1	Bars	1.10	to 1.15
" 1	Plates	1.10	to 1.15
" 1	Shapes	1.10	to 1.15
" 1	Wire galvanizing	40c	to 50c
" 17	Wire galvanizing	50c	to 60c
April 1	Boiler tubes		75%
" 1	Bars	1.15	to 1.20
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 24	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galvanized sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30

1915—			
Sept. 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galvanized sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galvanized sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galvanized sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galvanized sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
Nov. 18	Shapes	1.60	to 1.70
" 18	Galvanized sheets	4.00	to 4.25
" 24	Galvanized sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galvanized sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60

Jan. 3	Tin plate	3.60	to 3.75
" 3	Blue ann. sheets	2.25	to 2.35
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%)	78%	to 77%
" 5	Blue ann. sheets	2.35	to 2.40
" 7	Boiler tubes	68%	to 66%
" 12	Blue ann. sheets	2.40	to 2.50
" 14	Boiler tubes	66%	to 64%
" 19	Blue ann. sheets	2.50	to 2.65
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00
" 14	Wire nails	2.20	to 2.30
" 15	Pipe	76%	to 75%
" 21	Bars	2.00	to 2.25
" 21	Plates	2.10	to 2.35
" 21	Shapes	2.00	to 2.25
" 21	Tin plate	3.75	to 4.00
" 29	Pipe	75%	to 74%
" 29	Boiler tubes	64%	to 63%
Mar. 1	Wire nails	2.30	to 2.40
" 8	Black sheets	2.60	to 2.75
" 8	Blue ann. sheets	2.65	to 2.90
" 13	Bars	2.25	to 2.35
" 13	Plates	2.35	to 2.60
" 13	Shapes	2.25	to 2.35
" 15	Steel pipe	74%	to 73%
" 15	Boiler tubes	63%	to 61%
" 23	Bars	2.35	to 2.50
" 23	Shapes	2.35	to 2.50
" 28	Plates	2.60	to 2.75
" 29	Sheets	2.75	to 2.85
" 29	Steel pipe	73%	to 72%
" 29	Boiler tubes	61%	to 60%
April 5	Sheets	2.85	to 2.90
" 15	Boiler tubes	60%	to 56%
" 19	Tin plate	4.50	to 5.00
" 24	Pipe	72%	to 70%
May 1	Wire nails	2.40	to 2.50
" 3	Tin plates	5.00	to 5.50
" 16	Plates	2.75	to 2.90
June 7	Galv. sheets	5.00	to 4.75
" 16	Tin plate	5.50	to 6.00
July 7	Blue ann. sheets	3.00	to 2.90
" 7	Galv. sheets	4.75	to 4.50
Aug. 1	Tin plate	6.00	to 5.50
" 7	Wire nails	2.50	to 2.60
" 15	Bars	2.50	to 2.60
" 18	Shapes	2.50	to 2.60
" 18	Plates	2.90	to 3.00
" 25	Galv. sheets	4.25	to 4.15

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
January, 1915.	20,684	31,556	— 10,872
February ...	18,704	14,188	+ 4,516
March	26,335	15,167	+ 11,168
April	31,765	17,670	+ 14,095
May	32,363	17,624	+ 14,739
June	28,499	21,532	+ 6,967
Year 1915 .	434,244	384,174	+ 50,070
July	27,097	16,015	+ 11,082
August	27,413	41,737	— 14,324
September ...	31,096	33,061	— 1,965
October	31,215	26,338	+ 4,877
November ..	29,297	26,005	+ 3,292
December ...	23,173	23,743	— 570
January, 1916.	17,293	4,015	+ 7,303
February ...	30,244	10,824	+ 19,420
March	33,685	9,894	+ 23,791
April	36,999	10,856	+ 26,143
May	37,925	13,217	+ 24,708
June	37,296	15,112	+ 22,184
Year 1916 ..	366,748	240,807	+125,941
July	25,035	12,723	+ 18,244

United States citizens arrived and departed, with change thereby effected in United States population:

	Arrived.	Departed.	Change.
July, 1915	9,027	5,115	+ 3,912
August	9,506	10,310	— 804
September ...	9,054	8,188	+ 866
October	8,991	8,329	+ 662
November ...	8,364	9,166	— 802
December	8,458	9,349	— 891
January, 1916.	8,257	9,469	— 1,212
February	11,082	12,908	— 1,826
March	15,065	10,867	+ 4,198
April	12,522	8,051	+ 4,471
May	10,989	8,968	+ 2,021
June	10,078	10,013	+ 65
Year 1916 ..	121,930	110,733	+ 11,197
July	12,624	8,990	+ 3,634

Net change in population caused by the movement of both aliens and citizens: 1913, +754,205; 1914, +687,065; 1915, +117,237; July, 1915, +14,994; August, 1915, —15,128; September, 1915, —1,099; October, 1915, +5,539; November, 1915, +2,490; December, 1915, —1,461; January, 1916, +6,091; February, +17,594; March, +27,989; April, +30,614; May, +26,249; June, +22,249; year 1916, +137,138; July, +21,878.

COMPOSITE STEEL.

Computation for September 1, 1916:

Pounds.	Group.	Price	Extension.
2½	Bars	2.60	6.500
1½	Plates	3.00	4.500
1½	Shapes	2.60	3.900
1½	Pipe (¾-3)	2.95	4.425
1½	Wire nails	2.60	3.900
1	Sheets (28 bl.)	2.90	2.900
½	Tin plates	5.50	2.750
10 pounds			28.875
One pound			2.8875

Averaged from daily quotations.

	1912.	1913.	1914.	1915.	1916
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7165
May	1.5590	1.7786	1.5078	1.5381	2.8043
June	1.5794	1.7719	1.4750	1.5312	2.8300
July	1.6188	1.7600	1.4805	1.5692	2.8425
Aug.	1.6784	1.7400	1.5241	1.6059	2.8588
Sept.	1.7086	1.7093	1.5632	1.6506	.....
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

SCRAP IRON & STEEL PRICES.

	Melting Steel. Pitts.	Bundled Sheet Pitts.	No. 1 R. R. Wrought Pitts.	No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1914—						
Oct.	10.75	8.50	10.25	11.25	10.00	9.00
Nov.	10.10	8.10	10.25	10.75	9.25	8.25
Dec.	10.50	8.50	10.50	11.00	9.65	8.40
Year	11.42	8.52	11.51	11.71	10.53	9.55
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.26	10.54	12.26	12.40	12.54	10.99
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75
May	17.00	13.65	19.65	16.10	17.00	15.90
June	16.25	13.00	19.00	15.40	15.45	14.80
July	16.70	12.50	18.80	15.30	15.00	14.30
Aug.	16.25	11.70	18.15	15.00	15.00	15.30

COMPOSITE PIG IRON.

Computation for September 1, 1916:

One ton Bessemer, valley	$21.00
Two tons basic, valley (18.00)	36.00
One ton No. 2 foundry, valley	18.50
One ton No. 2 foundry, Philadelphia	19.75
One ton No. 2 foundry, Buffalo	18.75
One ton No. 2 foundry, Cleveland	18.50
One ton No. 2 foundry, Chicago	18.50
Two tons No. 2 Southern foundry, Cincinnati (16.90)	33.80
Total, ten tons	184.80
One ton	18 480

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916
Jan.	13.240	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	18.965
June	14.005	14.968	13.606	13.047	18.552
July	14.288	14.578	13.520	13.125	18.585
Aug.	14.669	14.565	13.516	14.082	18.550
Sept.	15.386	14.692	13.503	14.895	.....
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

UNFINISHED STEEL AND IRON BARS.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, Phila.	delly. — Pitts.	Ch'go.
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	22.51	22.91	28.28	1.37	1.32	1.24
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35
May	43.00	43.00	59.00	2.66	2.60	2.35
June	42.00†	42.00†	58.00	2.66	2.60	2.35
July	42.50†	42.50†	58.00	2.66	2.60	2.35
Aug.	46.00	46.00	58.00	2.66	2.60	2.35

† Premium for open-hearth.

CAR BUYING.

Freight cars ordered:		
First half, 1914	11,380	
Second half, 1914	13,620	
Year, 1914		80,000
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,120	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	
May	6,204	
June	3,470	
Six months		64,287
July	1,723	
August	2,381	

PIG IRON PRODUCTION.

Rates per annum, including charcoal pig.

January, 1915	19,100,000
February	22,100,000
March	24,600,000
April	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,600,000
April	39,600,000
May	39,800,000
June	39,500,000
July	38,350,000
On August 1st	38,300,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

OUR FOREIGN TRADE.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1913—			
Oct.	132,949,302	271,861,464	138,912,162
Nov.	148,236,536	245,539,042	97,302,506
Dec.	184,025,571	233,195,628	49,170,057
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,745,913	134,169,807
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	193,935,117	402,991,118	209,056,001
Mar.	213,589,785	409,850,425	196,260,640
Apr.	217,705,397	399,861,157	182,155,760
May	229,188,957	*474,881,255	245,692,298
June	*245,795,438	464,784,318	218,988,880
July	183,000,000	446,000,000	*263,000,000

* High record.

† Balance unfavorable.

STEEL MAKING PIG IRON AVERAGES.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.35
April .	13.60	20.70	12.50	18.00
May ..	13.659	20.833	12.65	18.1607
June ..	13.75	21.00	12.724	18.00
July ..	13.991	21.00	12.959	18.00
Aug. ..	15.064	21.00	14.364	18.00
Sept. ..	15.906		15.00	
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f.o.b. valley furnace; delivered Pittsburgh is 95 cents higher.

WAGE SCALE AVERAGES.

Sworn averages of prices obtained by mills for shipments in months named, used in fixing wages under Amalgamated Association sliding scales. The figures represent the rates used, the actual ascertained averages lying between the figure given and the one five points higher. Base sizes of iron bars; average of 26, 27 and 28 gauges black sheets; tin plate per base box, 100-pound.

Bar Iron.

	1914.	1915.	1916.
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	*1.60
May-June	1.1257	*1.10	*1.85
July-August	1.0928	*1.15	....
September-October	1.0847	*1.15	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.144	....

* Settlement basis.

Sheets and Tin Plates.

1916.	Sheets.	Tin Plates.
January-February	2.25	3.50
March-April	2.50	3.70
May-June	2.60	3.90

TIN PLATE MOVEMENT.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1915	2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	7,582
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178
February	107	13,534
March	44	20,364
April	179	21,385
May	39	25,585
June	91	29,751

British tin plate exports have been as follows, in gross tons:

1914	435,497
1915	368,602
January 1916	26,271
February	27,289
March	39,482
April	23,337
May	41,868
June	30,351
July	38,174

BRITISH IRON AND STEEL EXPORTS.

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*	1916—				
Jan. ..	21,138	24,411	29,216	230,204	Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	21,934	14,877	15,101	198,294	Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	20,172	17,572	36,170	239,341	Mar. ..	87,283	3,366	39,482	307,488
April ..	35,209	21,602	40,135	265,244	April ..	82,976	10,510	23,337	293,897
May ..	29,342	21,776	33,727	267,524	May ..	97,967	4,103	41,868	395,750
June ..	39,127	23,728	33,986	272,195	June ...	77,487	3,243	30,351	310,595
July ..	78,370	33,224	39,528	351,984	July ...	69,999	3,485	38,174	298,929
Aug. ..	73,283	32,962	22,572	295,260	7 mos.	578,343	31,763	226,772	2,182,142
Sept. ..	53,068	15,800	20,002	249,501					
Oct. ..	78,973	13,640	31,968	312,141					
Nov. ..	86,109	12,760	25,556	308,219					
Dec. ..	74,892	9,937	30,641	259,782					
Year ..	611,617	242,289	368,602	3,250,299					

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Tin in August.

Net Rise of ½c to ¾c Per Pound for the Month—Market Weak at the Close—Month on the Whole Disappointing to Dealers and Operators—Foreign Figures Fair.

A firm undercurrent was evident in tin throughout August and a moderate advance in price was established on all positions, here and abroad, but the net result of the month's developments was disappointing to dealers and operators. Strong forces, apparently, opposed any sustained upward movement. Deliveries of 4,335 tons into American consumption during the month were quite satisfactory considering the relaxation in manufacturing industries generally because of the extremely hot weather, but they were less than foreign interests had hoped for and had expected. Of the deliveries, 3,800 tons were distributed from Atlantic ports and 535 tons came East from the Pacific Coast.

Foreign Figures Fair.

Stocks in store and landing on August 31st, were 4,756 tons, against 5,208 tons on July 31st—the decrease of 452 tons might be considered favorable were it not for the fact that 4,200 tons of the surplus were in store, the largest warehouse stocks at New York, in the history of the industry. At the end of July, 2,850 tons of the surplus were on dock or landing. The large domestic stocks at the end of August, however, were less depressing than they would be under normal conditions, as consumers agreements with the British authorities prevent this tin from coming into competition with offerings by producers and importers. Most of these supplies are understood to belong to the United States Steel Corporation and to other large consumers but a fair tonnage is also held by London interests to be applied either against contracts made at higher prices, or to be sold in the open market, only when a higher level has been

blished. **The fact that** London refers to these supplies as "American torpedo stocks", however, indicates how dangerous, to operators' interests, they are regarded abroad. The position of domestic consumers is certainly better fortified than before the war and the large stocks have been a steadying influence upon prices. Under these circumstances no spot tin is being pressed upon the market. On the other hand, there is not much demand for prompt shipment.

Arrivals by steamships at Atlantic ports in August are reported to have been 3,617 tons. Stocks at the end of July were 5,208 tons making the Atlantic Coast available supply 8,825 tons. Deliveries into American consumption from the East were 3,800 tons and 89 tons were exported, which would leave stocks 4,936 tons instead of 4,756 tons as reported by the Metal Exchange, a difference of 180 tons. The arrivals at and shipments from Pacific Coast ports are reported to have been 535 tons, hence the American total available supply in August was 9,360 tons. Of the exports, 13 tons went to Brazil and 76 tons are said to have been taken by the s.s. Deutschland to Bremen. As the latter shipment has been deducted from stocks, the inference is that the German shipment was not "recovered" tin, as it was previously reported to have been.

Shipments from the Straits were 4,526 tons, showing a decrease of 884 tons compared with July and 186 tons less than a year ago.

Dull Market in Opening Days of Month.

The domestic market was dull during the first eight days of the month and a weaker tone prevailed with prices down ¾c to ⅞c per pound, spot Straits being especially heavy because of pressure to sell Banca tin which was in large supply through big receipts late in July, and another boat arriving on August 4th, with 150 tons more from Batavia. On August 1st, sales of Banca were made at 36¾c and by the 7th, sales were made at 36½c per pound, while Straits, for prompt shipment was held at 1¼c per pound higher and difficult to sell. Chinese tin, too, during this time, was pressed for sale at concessions of 2c per pound from the asking price of Straits. Future positions of Straits also receded ¼c to ⅜c, L. & F. English tin was scarce here, importation being checked because of the abundance of No. 1 Chinese, at relatively low prices.

A firmer tone developed on August 9th, East Indian limits being up ¼c in sym-

VISIBLE SUPPLIES.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	19,614
June	12,920	11,101	16,027	15,927	19,363
July	13,346	12,063	14,167	16,084	18,404
Aug.	11,285	11,261	14,452	15,127	18,042
Sept.	13,245	12,943	14,613	15,191	.....
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

SHIPMENTS FROM THE STRAITS.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	3,965
June	4,290	4,280	5,870	6,665	6,210
July	4,580	4,770	4,975	5,606	5,410
Aug.	5,210	6,030	3,315	4,712	4,526
Sept.	5,430	5,160	4,973	5,296	....
Oct.	4,450	5,020	4,610	4,441	....
Nov.	5,600	5,560	5,155	6,713	....
Dec.	4,980	5,110	6,435	5,301	....
Total	59,018	62,550	63,093	66,517	....
Av'ge	4,918	5,213	5,258	5,543	....

CONSUMPTION IN THE U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	5,455
June	2,850	3,800	3,650	3,900	6,398
July	5,150	3,900	3,900	5,300	4,432
Aug.	4,300	3,600	2,900	4,500	4,335
Sept.	3,600	3,100	3,600	4,300	....
Oct.	3,850	3,700	3,700	4,900	....
Nov.	4,300	2,800	2,600	2,975	....
Dec.	4,050	3,100	1,900	5,200	....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4,125	3,658	3,475	4,062	....

MONTHLY TIN STATISTICS.

Compiled by New York Metal Exchange.

	July 1916.	June 1916.	July 1915.
Straits shipments			
To Gr. Britain..	2,370	1,860	1,922
" Continent ..	666	1,020	845
" U. S.	1,490	2,530	1,945
Total from Straits	4,526	5,410	4,712
Australian shipments			
To Gr. Britain .	63	119	139
" U. S.	nil	nil	nil
Total Australian	63	119	139
Consumption			
London deliveries	1,287	1,467	1,767
Holland deliveries	92	104	140
U. S.	4,335	4,432	4,500
Total	5,714	6,003	6,407
Stocks at close of month:			
In London—			
Straits, Australian	2,876	2,264	2,474
Other kinds ...	1,260	1,595	1,319
In Holland	.....	.....	26
In U. S.	4,756	5,028	2,527
Total	8,892	8,887	6,346
Afloat, close of month:			
Straits to London	3,530	4,140	2,585
" to U. S. .	4,390	3,917	6,170
Banca to Europe.	1,230	1,460	26
Total	9,150	9,517	8,781
	Aug. 31, 1916.	July 31, 1916.	Aug. 31, 1915.
Total visible supply	18,042	18,404	15,127

STRAITS TIN PRICES IN NEW YORK.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	49.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	49.15
June	47.77	44.93	30.65	40.37	42.18
July	44.75	40.39	31.75	37.50	38.46
Aug.	45.87	41.72	50.59½	34.39	38.54
Sept.	49.18	42.47	32.79	33.13	.....
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

pathy with London, although Singapore cable reported a decline to the lowest level —the same as on August 7th—since July 31st. The important feature, however, was the interest taken in cheap lots of late August and early September positions by importers dependent upon London stocks. Permits being difficult to obtain for shipment from London stocks, these operators were anxious to cover previous American contracts from other sources and they succeeded in obtaining some supplies, permits for the shipments of which had been granted at the Straits coming via London. More tin could have been sold for September and October arrivals but only on resales could such positions be obtained, the only future offerings from abroad being for November and December arrival at New York. Another interesting point at this time was the indisposition to sell spot and nearby tin although supplies were plentiful because sales at current prices would mean a loss to holders with no opportunity to replace stock to advantage.

Market Strong and Higher Here and Abroad.

During the next few days the foreign markets were strong and higher, with no limits from the Straits for any position on the 10th, which helped to cause a feverishly excited market here. Even Banca tin shared in the firmer feeling, with an advance of 1c per pound asked over previous sales. Spot Straits tin sold at an advance of ½c to ¾c per pound over the prices prevailing two days previously, but it is a remarkable fact that even with this recovery, the price for prompt shipment was 2c per pound lower than the level attained two months before. London was ripe for a strong upward movement but there was small encouragement from this side, lacking which, there could be no sustained rise.

American Smelting & Refining Company's Perth Amboy Plant Running 60% of Capacity.

It is of passing interest to note that the American Smelting & Refining Company's new plant at Perth Amboy, is now operating about 60% of capacity with an output of 300 tons per month. Development of this plant, to smelt and to refine Bolivian ore, has been slow because of the difficulty in obtaining workmen. It is understood that the output is being sold privately on a sliding scale basis to a few large consumers. Thus far these sales have not caused a ripple in the trade at large.

The upward movement that began August 8th, culminated at New York and at London on the 14th, when spot Straits tin here was up to 39¼c, an advance of 1½c to 1¾c from the low prices on August 8th. Banca was up to 38c, a recovery of 2c per pound in a week, with a fair amount of buying. Straits tin at London during the same period had advanced £6. On the following day the Singapore market was quoted at £177 15s, a rise of £7 15s in eight days but limits were lower and London was anxious to take profits. The orders taken by dealers and operators here, at the advances in prices, were not replaced at London and with lack of support the English market receded the next week. The Singapore market broke £4 on August 16th and continued to shadow London, dropping £3 more, up to August 21st.

Weakness Abroad Affects Sentiment Here —Demand Almost Nil.

There continued to be considerable inter-

TIN PRICES IN AUGUST.

Day.	New York. Cents.	London. £ s d Spot.	London. £ s d Futures.
1	38.25	167 5 0	168 0 0
2	38.12½	167 15 0	168 10 0
3	38.12½	168 0 0	168 15 0
4	37.80	167 10 0	168 10 0
7	37.75	167 10 0	168 5 0
8	37.75	167 5 0	168 0 0
9	38.00	168 0 0	168 0 0
10	38.30	169 10 0	170 10 0
11	38.62½	171 0 0	172 0 0
14	39.30	173 10 0	174 10 0
15	39.00	172 5 0	173 5 0
16	38.75	171 0 0	172 0 0
17	38.80	171 10 0	172 5 0
18	38.55	169 5 0	170 5 0
21	38.50	169 5 0	170 5 0
22	38.45	169 0 0	170 0 0
23	38.50	169 5 0	170 7 6
24	38.62½	170 0 0	171 0 0
25	38.75	170 15 0	171 15 0
28	39.25	172 15 0	173 12 6
29	39.37½	173 0 0	173 15 0
30	39.00	171 0 0	171 15 0
31	38.87½	170 15 0	171 10 0
High	39.37½	173 10 0	174 10 0
Low	37.75	167 5 0	168 0 0
Av'ge ...	38.54	169 17 5	170 15 5

est here, in September, October and November arrivals but there were no offerings of importance. The weakness apparent abroad, was a blow to the bullish sentiment that had been fostered for several weeks and there was renewed pressure to sell Banca tin with a sympathetic influence upon Straits. For the future positions offered from abroad—January, February and March arrivals—there was scarcely any demand here.

Slight Recovery Scored.

By August 23rd, spot Straits at New York had dropped to 38.35c and spot Banca was sold at 37⅛c. There was some recovery in the next few days, the confidence and renewed strength at London being impressive on August 28th and August 29th, when spot Straits was up to £173, an advance of £3 10s from August 22nd, while the Singapore market had recovered £3 5s from August 21st. The stronger tone at London was attributed to expectation of light shipments from the Straits in August, and September, and the sale to France of tin that was previously offered, to be shipped as soon as permits were obtainable. Foreign advices reported a good demand from all consumptive sources, the only unsettling feature being a lack of steel for Wales, that might force the closing of some tin plate mills there, which would cause a reduction in the consumption of tin, unless American mills could take on additional tin plate business. The latter, however, are already overburdened.

The domestic market was also stronger and higher with dealers more inclined to buy than to sell September and October positions. Spot Straits tin at New York was again advanced to 39¼c to 39⅜c, although there were few inquiries from consumers—and the cheapest future positions offered were January, February and March deliveries at 38½c New York.

Threatened Railroad Strike Causes Another Reaction.

A sudden and disconcerting reaction came on August 30th at London, attributed to fear of the effect of a strike of railroad employes in the United States. The drop in prices here was ⅜c per pound. The discovery that there is considerable unsold tin on nearby steamships afloat for New York, and more tin at London, awaiting shipment here because of the freer granting of permits, increased the desire to sell and resulted in further concessions. On the closing day of the month, prices were again down ⅛c to ¼c spot Straits at New York, being difficult to sell at 38.80c and future positions offered at 38c. The result of the fluctuations for the month was a net rise of ⅛c to ¾c per pound on the various positions.

Exports of Pig Lead from the United States by Six-Month Periods, 1914-1916, by Destination, in Short Tons.

(By U. S. Geological Survey.)

	1914			
	Jan.-June		July-Dec.	
To	Dom.	Foreign.	Dom.	Foreign.
Canada ..	....	28	4,082	.....
G. Britain	7,153	3,963	16,995	6,270
Netherlands	4,720	1,592	2,019	28
Belgium .	2,101	746	560	.....
France ...	....	.....	.....	560
Italy	....	71	589	.....
Germany ..	5,141	1,681	2,241	.....
Russia	448	.....	6,263	5,717
Japan	....	.....	2,247	.....
Other countries .	599	753	3,564	136
	20,162	8,834	38,560	12,711

	1915			
	Jan.-June		July-Dec.	
To	Dom.	Foreign.	Dom.	Foreign.
Canada ..	6,176	58	13,913	4,217
G. Britain	25,945	10,480	5,247	9,551
Netherlands	677	739	268	1,768
Belgium .	.....	.....	.....	.....
France ...	8,585	1,171	687	1,344
Italy	1,560	2,030	449	561
Germany ..	....	.....	.....	.....
Russia	7,623	1,741	5,901	2,128
Japan	2,081	.....	1,339	560
Other countries .	5,305	999	1,336	1,098
	57,952	17,218	29,140	21,227

	Jan.-June 1916.	
	Domestic.	Foreign.
Canada	12,634	607
Great Britain	5,356	1,905
Netherlands	1,527	305
Belgium	.....	.....
France	337	.....
Italy	336	.....
Germany	.....	.....
Russia	5,648	56
Japan	12,106	645
Other countries	8,673	1,226
	46,617	4,744

Lead in August.

Trust Price Advanced $20 Per Ton During August—Market Strong and Active With Large Demand Throughout Major Portion of Month—Large Premiums Paid By Independents.

Lead was heavy and weak at the beginning of August with independent producers still courting buyers. London was below the New York parity and home consumers required further concessions to entice them into the market. Late on August 2nd, the Trust gave belated recognition to the previous break in the market by reducing the "official" price ½c per pound to 6c New York, and 5.92½c, East St. Louis. The previous reduction by the American Smelting & Refining Co. to 6½c New York was made July 5th, following a similar reduction to 7c on June 2nd, from the maximum price 7½c that had been adhered to since March 30th.

In the West the Trust action was the signal for the placing of a number of small orders at the new level but the Eastern market continued dull and heavy. Independent producers accepted the new position by the American Smelting & Refining Co. as a challenge and at once offered further concession of $1.00 to $2.00 per ton to consumers without receiving immediate response to offerings of 5.85c for spot and August and 5¾c to 5.80c East St. Louis, for September shipment.

Two More Advances by Trust—Large Foreign Orders Placed.

At the beginning of the second week, however, consumers came forward with a fair demand but competition for orders was so keen among small producing interests that prices receded to 5¾c for spot and August and to 5.72½c for September shipment. A sudden change for the better came on August 10th, when large export sales were made for August and September. In the next few days domestic consumers bought more freely and prices recovered from $1.00 to $2.00 per ton. A more confident tone was developed and with a more active demand from domestic consumers, as well as from abroad, the outside market advanced above the Trust level, prompting the American Smelting & Refining Co. on August 17th to announce another rise of $5, the "official" price then being 6¼c New York. The most interesting development at the time was the closing of several large contracts for the Russian Government amounting to about 4,000 tons. The orders came to New York through London and the sales were made for shipment from East St. Louis to Russia in August and early September via the Pacific Coast. All of the business was taken by independent producers, the Trust being unable to accept orders for early shipment. The result of this activity was another advance of $5 per ton on August 18th, the Trust price being fixed at 6½c per pound, New York, for shipments from the West in 50 ton lots. In the meantime, the outside market had already advanced to 6⅜c, New York.

Market Excited by Large Foreign Demand.

The large foreign demand still further excited domestic consumers, dealers too.

LEAD PRICES IN AUGUST.

Day.	New York* Cents.	St. Louis. Cents.	London. £	s	d
1	6.22½	6.02½	28	7	6
2	6.20	6.00	28	15	0
3	6.00	5.85	28	10	0
4	6.00	5.85	28	10	0
7	6.00	5.85	28	15	0
8	5.95	5.80	28	15	0
9	5.97½	5.80	29	0	0
10	5.97½	5.75	29	2	6
11	6.00	5.80	29	5	0
14	6.02½	5.85	29	10	0
15	6.05	5.87½	30	0	0
16	6.12½	5.92½	30	0	0
17	6.25	6.12½	29	15	0
18	6.62½	6.50	30	0	0
21	6.75	6.62½	30	0	0
22	6.75	6.65	30	0	0
23	6.75	6.62½	30	5	0
24	6.75	6.62½	30	10	0
25	6.75	6.62½	30	12	6
28	6.75	6.62½	30	15	0
29	6.75	6.52½	31	0	0
30	6.67½	6.50	31	5	0
31	6.67½	6.50	31	5	0
High	6.75	6.75	31	5	0
Low	5.95	5.75	28	7	6
Av'ge	6.35	6.19	29	14	8

* Outside market.

were eager buyers. Considerable business was done in all positions up to and including November but most of the sales were for August and September shipment. Most of the foreign orders had been placed at 6c or less, East St. Louis. Before the end of the third week, producers' capacity for August and September had been well sold.

The position of the market on August 21st, was well defined, in responses made by four dealers to the United States Government inquiry for 300,000 pounds pig for delivery at the Frankfort Arsenal. The lowest bid was 6.72½c delivered. Sales were made in the open market on that day at 6¾c, New York, for August and September shipment, this being $5 per ton higher than the Trust price. The sentiment in the trade at this time is clearly reflected in the laying of a wager that sales of lead would be made at 7c, New York, before the end of September.

Trust Renews Efforts to Operate Mexican Plants.

One effect of the higher prices was the renewed effort made by the American Smelting & Refining Co. to resume operations at its Mexican plants, located at Chichuahua, Monterey, Asarco and Aguas Calientes. Activities await only an ample supply of coke.

Large sales were made on August 22nd, at 6¾c, New York for September shipment. Some business was also done in the October position between 6.65 and 6¾c, New York. Independent producers now have capacity better sold than at any time since last March and April. The London market, however, was disappointing, failing to keep pace with the rise here. A warning note from London came in the last week, that if America is advancing prices in anticipation of large orders from the Allies, she will probably be disappointed. Producers replied that the recent advance and the present strength of the domestic market is based upon the improved position of the producing plants and the large demand from domestic and Canadian consumers.

Market Turns Quieter.

It is evident, however, that buying has slackened and as the Trust has not followed the last advance in the open market it is more difficult to make sales at premiums. Indeed, some dealers are disposed to make sales at 6.60c to 6.65 East St. Louis, for September and at 6.55c to 6.65c for October shipment. Excitement disappeared with unfavorable political developments and relatively small sales were made during the last few days of the month, with freer offerings and an easier tone. On the closing day there were offerings of spot and September at 6½c, October at 6.47½c and November at 6.45c, East St. Louis in the open market.

The London market slowly but steadily advanced from day to day throughout the month with no important reactions and at the close, spot G.M.B. and English lead had advanced £2 15s while futures were up £3 2s 6d from the closing prices at the end of July.

Exports of Pig Lead from the United States, by Months, 1914-1916, in Short Tons.
(By the U. S. Geological Survey)

	1914			1915			1916		
	Domestic.	Foreign.	(a)	Domestic.	Foreign.	(a)	Domestic.	Foreign.	(a)
Jan.		1,363		6,460	3,072		7,192	1,236	
Feb.		166		3,820	1,778		10,246	1,229	
Mar. ...	5,838	246		7,023	2,301		8,585	734	
April ...	5,931	3,663		19,936	5,133		5,869	582	
May ...	2,045	2,420		15,312	3,021		7,358	641	
June ...	6,348	976	*3,798	5,401	1,913	*3,020	7,167	322	*4,745
July ...	10,894	1,119		1,452	3,224		.....	.....	.....
Aug. ...	5,486	.....		979	5,227		.....	.....	.....
Sept. ...	2,793	923		2,458	3,723		.....	.....	.....
Oct. ...	7,829	2,521		5,787	3,284		.....	.....	.....
Nov. ...	8,417	5,297		9,886	315		.....	.....	.....
Dec. ...	3,141	2,851	*5,708	8,578	5,454	*963	.....	.....	*.....
	58,722	21,545	9,506	87,092	38,445	3,983	46,617	4,744	4,745

(a) Foreign zinc used in articles exported with benefit of drawback. * Six months.

Copper in August.

Copper Quiet at the Beginning of Month but Second Week Opens Period of Considerable Activity During Which Prices Steadily Advanced as Heavy Buying Occurred for Domestic and Foreign Accounts—Market Closes With Net Advance for Month of 1¾c on Lake, 1⅜c on Electro and ¾c on Casting.

Assuming it to be true, that the August buying movement in copper rounded-up sales of 150,000,000 pounds, the indication is that unfilled orders at the end of August carried on producers' books, aggregated 432,000,000 pounds.

It will be recalled that at the end of June there was reason to believe that producers' unfilled orders were approximately 600,000,000 pounds. In the past two months deliveries into domestic and foreign consumptive channels have been about 368,000,000 pounds; leaving a balance of 232,000,000 pounds from old accounts. To this must be added the August sales of 150,000,000 pounds—a total of 382,000,000 pounds, to be delivered in the next four months. A few sales may have been made for delivery early in 1917 but they are unappreciable and safely may be ignored for statistical purposes.

From the middle of May to the middle of August no large sales were made by producing interests. Most of the orders taken were booked by second hands. Assuming, however, that the aggregate of small sales in July was 50,000,000 pounds, the total unfilled orders at the end of August would be 432,000,000 pounds.

The output of the refineries to-day, is understood to be at the rate of 190,000,000 pounds per month. At this rate, 760,000,000 pounds of refined copper will be available in the next four months for home and foreign consumption. After deducting the sales already made against the refining capacity, a balance of 328,000,000 pounds is disclosed. This amount of copper, therefore —equivalent to less than two months' output, may still be purchased for 1916 delivery. Very little September metal, however, remains to be sold.

Smelter Output Greatly Exceeds Refined Production.

One interesting phase of the situation is that the smelter output is now, and has been for several months, greatly in excess of the refined production. Since January 1st, this surplus is estimated to be 80,000,000 to 90,000,000 pounds, which must be added to the heavy stock of blister copper carried on January 1st. Some of the reasons assigned for this condition are that refining plant capacity, now building, has been delayed; that labor difficulties and exceedingly hot weather prevented utilization of full present refining capacity and last, but not least, the refiners are hedging against the "rainy day" of winter, when mine and smelter output invariably falls off. The July smelter output is understood to have been 210,000,000 pounds, and the August production was probably greater—estimated to be 215,000,000 pounds. The refined production each month fell 20,000,000 pounds below the output of the smelters.

Heavy Foreign Movement Continues Unabated.

Exports in August were again heavy. Returns are not complete, but the indication is that 70,000,000 pounds were shipped abroad. In the past three months exports have been in excess of 237,240,000 pounds, which is an average rate of over 79,000,000 pounds per month. This heavy foreign movement has been made possible by the sending of boats by the British Government to carry copper and other needed supplies for Russia and for France as well as for Great Britain. It is interesting at a time like the present, when merchant interests can secure only small freight room, that twenty boats are taking cargoes in New York harbor for Russia.

It will be recalled that at the end of July, the New York market for Electrolytic had recovered much of the decline suffered during the three preceding weeks. Early in August reports concerning sales were conflicting but a stronger undercurrent was evident although sheet manufacturers on August 2nd, recognized the previous weakness in the market, by reducing the base price of sheets 2 cents per pound. Late in the month, however, this decline was recovered.

Market Neglected by Domestic Consumers.

During the first week, domestic consum-

LAKE COPPER PRICES.

Monthly average prices of **Lake Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	29.28½
June	17.43	15.08	14.15	19.92	27.44
July	17.37	14.77	13.73	19.42	25.81
Aug.	17.61	15.79	12.68	17.47	26.58
Sept.	17.69	16.72	12.43½	17.76	....
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av. .	16.58	15.70	13.61	17.64	.....

ELECTROLYTIC COPPER PRICES.

Monthly average prices of **Electrolytic Copper** in New York.

	1912.	1913.	1914.	1915.	1916
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	29.81
June	17.29	14.85	13.81	19.71	27.49½
July	17.35	14.57	13.49	19.08	25.60
Aug.	17.60	15.68	12.41½	17.22	27.36½
Sept.	17.67	16.55	12.08½	17.70½	.....
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av. .	16.48	15.52	13.31½	17.47	.....

CASTING COPPER PRICES.

Monthly average prices of **Casting Copper** in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	27.37
June	17.08	14.72	13.65	18.74½	25.10
July	17.09	14.40½	13.34½	17.76½	23.61
Aug.	17.35	15.50	12.27	16.46	24.67
Sept.	17.51	16.37½	12.00	16.75	.....
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av. .	16.29	15.33	13.18	16.76	....

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper so far this year are given below together with the price of Lake copper on the same dates:

1916—	Sheet Copper.	Lake Copper.
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 20	36.50	29.75
May 5	37.50	29.75
August 2	35.50	25.50
August 18	37.50	27.00

WATERBURY COPPER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.50	17.00	14.75	14.12½	24.75
Feb.	14.50	15.50	15.12½	15.25	27.75
Mar.	15.00	15.12½	15.00	15.75	28.00
Apr.	16.00	15.75	14.87½	18.50	29.00
May	16.37½	15.87½	14.75	22.50	29.87½
June	17.50	15.37½	14.37½	22.50	28.25
July	17.75	14.75	14.12½	22.25	27.25
Aug.	17.75	15.62½	13.00	19.50	27.00
Sept.	17.87½	16.87½	12.87½	18.50	....
Oct.	17.75	16.87½	12.25	18.25	....
Nov.	17.75	16.25	12.25	19.37½	....
Dec.	17.75	15.00	13.50	20.75	....
Av.	16.71	15.83	13.91	18.94	....

EXPORTS OF COPPER FROM THE UNITED STATES.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26.193	23,663
February .	26,792	34,634	15.583	20,648
March ...	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	21,654
May	38,601	32,077	28,889	16,062
June	28,015	35,182	16,976	39,595
July	29,596	34,145	17,708	35,066
August ..	35,072	16,509	17,551	32,160
September	34,356	19,402	14,877	.....
October .	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December	30,653	22,166	42,426	.....
Totals ..	382,810	360,329	276,344	146,721

ers were more concerned about the scarcity of efficient labor and the shortage of crucibles, than about the buying of copper. The shortage of crucibles was due to the exhaustion of special clay previously imported from Germany and the inadequate supply of graphite imported from Ceylon. Some moderate business was done in August and nearby positions, for home consumption and Japan bought a few hundred tons for prompt shipment at 26½c per pound.

In the second week, there was considerable activity, mainly on domestic account, home melters being excited by tales of negotiations covering 300,000,000 to 500,000,000 pounds for Great Britain and actual orders of 5,000 ton lots for October, November and December shipments from Russia, and more substantial purchases by French consumers. Some foreign sales were reported for shipment over the first quarter of 1917. Round lots were taken by large home consumers at 25½c for shipment over the last quarter of the year while prompt and August shipments sold at 26¾c to 27c. September sold at 26½c but prices steadily advanced as buying increased in volume.

Buying Movement Fully Developed.

Before the middle of the month, the buying movement was in full swing; home manufacturers covering large munitions contracts and France and Italy taking more small lots running from 500 to 1,000 tons each. Large producers reported sales at 26½c for delivery over the last quarter of the year, an advance of 1½c per pound from the beginning of the month. Most of the small lots offering through second hands were absorbed and the market continued to harden.

Activity and strength continued during the third week, when the buying movement culminated, but the momentum gained continued to carry prices upward for several days longer in the domestic market. On the 25th, prices generally had advanced 2c per pound on all positions from the level established at the close of July. While the sales had covered all positions from August to December inclusive, the heaviest transactions were for delivery prior to November. As pointed out elsewhere, the indication is that over 300,000,000 pounds of copper are still available for this year's shipment. This estimate does not take into account metal in second hands and it is evident that the higher prices prevailing brought to light previously invisible supplies in substantial quantities.

Expected British Purchase Did Not Take Place.

Some disappointment was apparent late in the month because the much-heralded, large prospective British purchase failed of accomplishment, leaving the impression that domestic consumers had been exploited. It has been demonstrated that there is ample refining and smelting capacity in this country to meet all consumptive requirements, present and prospective, at home and abroad, although spot supplies of refined copper have been reduced to a low point. Up to the 21st of August, large producers reported a good demand for shipments over the last quarter of the year, but the open market was quiet and easier in tone with concessions from producers' asking prices, that were made to secure business.

Electrolytic Makes Net Advance of $5 for Month in London While Standard Shows £2 Decline on Both Positions.

The London market for American Electrolytic receded £1 from £125 to £124 on August 8th, since which time prices have

COPPER PRICES IN AUGUST.

	New York		London.		
	Lake.	Electro.	Casting.	Standard.	
Day.	Cents.	Cents.	Cents.	£ s	d
1	25.50	26.62½	24.37½	109 0	0
2	25.50	26.62½	24.25	107 0	0
3	25.75	26.62½	24.25	107 0	0
4	25.75	26.75	24.25	106 0	0
7	25.75	26.75	24.12½	106 10	0
8	25.75	26.75	24.12½	107 0	0
9	25.75	26.87½	24.12½	109 0	0
10	26.25	26.87½	24.12½	110 10	0
11	26.25	26.87½	24.37½	111 10	0
14	26.50	27.12½	24.50	116 0	0
15	26.50	27.12½	24.50	114 0	0
16	26.75	27.37½	24.75	115 0	0
17	27.00	27.75	25.00	114 0	0
18	27.00	27.75	25.00	113 0	0
21	27.25	27.87½	25.00	111 0	0
22	27.25	27.87½	25.00	110 10	0
23	27.25	27.87½	25.00	110 0	0
24	27.25	28.00	25.00	109 10	0
25	27.25	28.12½	25.12½	110 0	0
28	27.25	28.12½	25.12½	110 0	0
29	27.25	27.87½	25.12½	110 0	0
30	27.25	27.87½	25.12½	110 0	0
31	27.25	27.87½	25.12½	109 0	0
High ..	27.50	28.25	25.25	116 0	0
Low ..	25.25	26.50	24.00	106 0	0
Av'ge .	26.58	27.36½	24.67	110 5	8

gradually advanced £6 to £130, or a net advance of £5 for the month. Standard copper, however, continued to rise and fall in a very narrow market, the fluctuations having small bearing upon developments here. On July 31st, spot Standard was quoted at £111 and future at £108. By August 4th, prices had dropped £5. In the next ten days there was a rise of £10, followed by a decline of £6 10s on spot, and a recession of £5 10s on futures in the next eight days. From August 24th, to August 28th, there was a recovery of £1 10s on each position, succeeded by a decline of £2 in spot and £3 on futures by August 31st, the net result for the month being a decline of £2 on spot and future positions.

Spelter in August.

Trading Prostrated at Opening of Month and as a Result Prices Suffer Decline—Month Featured by Prolonged Vigorous Buying Movement Which Causes a Substantial Advance in Prices and Places the Market on a Firmer Basis.

The spelter trade was prostrated at the beginning of August. For nearly a week, there had been no buying of importance and on many days scarcely an inquiry. In ten days, prices had dropped 1 to 1½c per pound and the tendency was still downward. It was apparent, however, that consumers August-September needs were not fully covered. Producers' and consumers' interests were each in sorry plight. It was pointed out that the greatest activity in spelter was in the early months of the year, when large contracts were placed for delivery over the second half of 1916 at 11 to 16c per pound, for prime Western, and at much higher prices for special grades.

Buyers throughout the country therefore, as well as smelters, are suffering grievously from the decline in prices. The furor created by the excited buying of spelter when war munitions contracts were new to America, caused a phenomenal advance in prices. The seemingly vast profits being made in the smelting industry caused the rehabilitation of obsolete plants, a rush in the building of new works and the pushing of capacity of the active smelters.

Readjustment of Trade to Normal Conditions Now in Progress.

When, by reason of the great increase in production and the falling off of the abnormal demand, spelter became almost unsaleable, the financially weak producers were compelled to put their product upon the market at whatever price it would bring. Such was the state of the industry early in August. A painful readjustment was in progress and it is likely to continue for several months, or until the plants which cannot be operated profitably, are eliminated. The "survival-of-the-fitest" law, will prevail.

Lowness of Prices Causes Some Buying but This Does Not Check Decline.

Distress in the market was emphasized on August 3rd, when 75 tons of prompt spelter was sold under the hammer at the New York Metal Exchange at 8½c East St. Louis. Some rays of hope, however, penetrated the gloom. Encouraged by the low prices current, some buyers came into the market for round tonnages bidding 8¼c for prompt and August, and 8c East St. Louis for September to December shipment. On the following day, English buyers, also attracted by the low prices, came into the market in force. Domestic galvanizers made known their wants on August 4th, for August, September and October. At the beginning of the second week, when the market had dropped to 8¼c for prompt and August, 8c for Sept. and 7¾c for shipment over the last quarter of the year, other large inquiries came out for delivery over the balance of the year. On the 8th, fifty tons sold under the rule on the Metal Exchange, at 8.15c East St. Louis, for July bill of lading, and late in the day, many orders were placed by galvanizers for delivery from August to December; prompt selling at 8⅛c, August at 8c, September at 7¾c and October and November at 7¾c. Some sales for January-February-March, also were made to other consumers at 7½c to 7⅝c. Manufacturers of war munitions were actively negotiating.

Survey Report of Half-Year Spelter Production Very Satisfactory.

The report of the Geological Survey at this time, covering the first half of the year, seemed to give comfort to the trade, in that production for the six months was shown to be 316,205 tons, or at the rate of 632,410 tons for the year, against a capacity to produce 885,000 tons in 1916. It is also believed that production during the second half of the year will be smaller than in the first half, there being less incentive to push output; in fact, curtailment of production is already significant.

Prolonged Vigorous Buying Movement Boosts Prices 1½c Per Pound.

In the next ten days, from August 9th, to 18th, inclusive, the market was more active with prices advancing under heavy buying on domestic and foreign account, covering all positions for the next seven or eight months. On the 9th, sales of 6,000 tons were reported, followed by orders for 15,000 tons on the next day. The buying movement continued with increasing force up to the 16th, when the volume of business was especially impressive. Vigorous buying did not cease until the 21st, although after the 16th, transactions were somewhat less in volume from day-to-day. The result of the movement was an advance in price of 1½c per pound on all positions.

Galvanizers were among the first to cover requirements. Later, war munitions manufacturers placed liberal contracts, including brass special, intermediate, and high grades as well as Prime Western. Exporters were among the heaviest purchasers. Dealers and operators on speculative account were timid at first but later shared in the buying. The large producing interests were the heaviest sellers, although the smaller smelters sold more freely as prices advanced. All the cheap lots were absorbed early in the movement. The greatest activity was in the fourth quarter position. Foreign orders were renewed again and again.

Buying Places Market on Firmer Basis.

The buying movement brought about a more healthful condition than did the temporary activity in the preceding month, in that less metal was in second hands and producing capacity was better sold. Large producers reported 50% to 75% of output sold for the balance of the year. With a smaller floating supply, less offered for future delivery and a smaller output—more furnaces going out than coming in—the market was more stable.

Britain Enters Agreement for Disposal of Australian Concentrates.

The London market that had broken £16 on spot and £10 on future from the end of July to August 7th, recovered £9 on spot and £7 on future by August 17th, when further large purchases were made in the New York market. At this time it was announced that the British Government had entered into an agreement with the Australian Commonwealth to take annually, 100,000 tons of Australian zinc concentrates and 45,000 tons of spelter—equivalent to 100,000 tons more of concentrates—during the period of the war and for ten years afterward. The Imperial Government also will advance £250,000 toward the cost of plants. The whole scheme involves upward of £25,000,000. The remainder of the Australian output is expected to be taken by France and Belgium and other Allies. The German element is

SPELTER PRICES IN AUGUST.

	New York.	St. Louis.	London.		
Day.	Cents.	Cents.	£	s	d
1	9.30	9.12½	55	0	0
2	8.92½	8.75	50	0	0
3	8.67½	8.50	47	0	0
4	8.67½	8.50	47	0	0
7	8.55	8.37½	44	0	0
8	8.55	8.37½	44	0	0
9	8.48¾	8.31¼	47	0	0
10	8.42½	8.25	47	0	0
11	8.67½	8.50	49	0	0
14	8.92½	8.75	49	0	0
15	9.30	9.12½	49	0	0
16	9.42½	9.25	49	10	0
17	9.67½	9.50	53	0	0
18	9.67½	9.50	54	0	0
21	9.80	9.62½	55	0	0
22	9.80	9.62½	55	0	0
23	9.55	9.37½	55	0	0
24	9.42½	9.25	57	0	0
25	9.42½	9.25	58	0	0
28	9.05	8.87½	58	0	0
29	9.05	8.87½	58	0	0
30	9.05	8.87½	54	0	0
31	8.80	8.62½	52	0	0
High	9.92½	9.75	58	0	0
Low	8.37½	8.20	44	0	0
Av'ge	9.10	8.92	51	11	9

thus eliminated but foreign spelter will still be needed to meet the full British requirements.

Advance to 9⅝c for Spot Marks End of Upward Movement.

On August 21st, spot and August had advanced to 9⅝c, September to 9½c, October to 9⅜c and last quarter to 9¼c. This was the culmination of the advance. In the next ten days prices declined ¾c to 1c per pound on all positions. At times the market was disturbed by efforts to force sales on an unwilling market by dealers, or by small producers who had refused to sell while prices were advancing.

It is interesting to note that according to the Government report, not more than 180,417 retorts were active on August 15th, out of a total of 199,328 available retorts, indicating that the severe decline in prices in July and early August had caused a suspension of operations by some of the smaller smelters so that 10% of capacity was idle by that date. It is significant, however, that 24,000 more retorts were active August 15th than were available at the beginning of 1916.

The report renews the claim that the average capacity per retort is four tons per annum. That being the case the rate of production on August 15 was approximately 720,000 tons. The producers variously say that 3¼ to 3¾ tons is the capacity under present conditions, and taking an average 3½ the rate on August 15 would be 630,000 tons which is more likely what it is at present. Allowing for the smelters which are idle or which have cut down their operations and including the additions which are coming in, the production could readily be increased to a rate of over 700,000 tons if the demand required it.

WATERBURY SPELTER AVERAGES.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	21.20
June	7.25	5.50	5.37	25.60	17.40
July	7.46	5.61	5.26	24.90	15.20
Aug.	7.34	5.99	5.66	19.30	13.60
Sept.	7.72	6.13	5.91	17.85	
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

Market Lifeless as Month Closes.

The market was again lifeless during the last few days of the month although there were a few occasional foreign inquiries and some small inquiries from domestic dealers. Large producers were out of the market but others wanted orders although there was no marked pressure to sell. Prompt, September and October shipments were held at 8⅝c and November-December positions at 8½c, East St. Louis.

The London market advanced £5 on spot and £2 on future from Aug. 17th to 25th, but dropped £6 on spot and £2 on future by the end of the month. The net decline for the month was £8 on spot and £7 on future.

SPELTER (Monthly Averages.)

	New York		St. Louis	
	1915.	1916	1915.	1916.
Jan.	6.52	18.18	6.33	18.01
Feb.	8.86½	20.09	19.92	19.92
Mar.	10.12½	18.09½	9.80	17.91
Apr.	11.51	18.61½	11.22	18.44
May	15.82½	15.93	15.52½	15.75½
June	22.62½	12.80	22.14	12.62
July	20.80	9.70	20.54	9.52½
Aug.	14.45	9.10	14.19	8.92
Sept.	14.49		14.10½	
Oct.	14.07		13.89	
Nov.	17.04		16.87½	
Dec.	16.91		16.72	
Av'ge	14.44		14.16	

SHEET ZINC PRICE CHANGES.

The following table gives the changes in the price of sheet zinc November 22, 1915 together with the price of spelter ruling on the same day.

1915—	Sheet Zinc.	Spelter St. Louis.
January 26	24.00	19.00
February 17	25.00	20.87½
April 22	25.50	18.75
May 15	24.50	15.50
May 23	23.50	14.87½
May 26	22.50	14.12½
June 2	21.00	13.12½
June 13	20.00	13.37½
June 21	19.00	12.00
June 28	18.00	11.37½
July 6	17.00	9.37½
July 13	15.00	8.62½

Antimony In August

Month Opens Weak and Unsettled, Large Foreign Shrapnel Orders Turns Market Strong and Active—June Imports Highest on Record— Market Closes Dull and Weak.

The depression in antimony during the first week of August resulted from the continued liquidation of speculative holdings with small regard for the cost of importation. A large amount was closed out privately at serious loss and other lots were sold in the open market at what they would bring, resulting in a further unsettling of the market. Jobbing lots of American and of Chinese and Japanese metal were difficult to sell even at 12c to 12½c about the fourth of the month, a decline of 1½c, from the end of July.

Continued efforts to force sales for which no market existed resulted in the acceptance of bids under 11c per pound, duty paid, on August 7th, while some jobbing lots were sold at 12c per pound. Mining of antimony in Nevada has ceased. Not a single property is in operation and shipments are over. All ore has been disposed of and no further effort is to be made to work the mines at this time, as experience has shown that these properties cannot be profitably worked when the antimony price is under 25c per pound.

A sale of 100 tons at New York on August 8th, below 10c per pound, duty paid, indicated that liquidation was still painfully in progress. Jobbing lots were offered at 11½c. On the following day 25 ton lots were offered under 10c, for prompt shipment and October-November-December shipments were available at 9c per pound, duty paid. Jobbing lots were offered at 11c per pound. The distribution of ammunition orders by the Allied Governments gave rise on August 10th, to the hope that more shrapnel would be purchased, which would create a demand for antimony. Jobbing lots were offered at 10½c the next day, but apparently there was less pressure to sell speculative holdings although wholesale lots were available at 9¾c for prompt shipment and at 9c for future shipment.

Foreign Shrapnel Orders Precipitate Active Buying Movement.

More interest was evident on the part of consumers at the beginning of the second week in lots of 10 to 25 tons, but the market remained weak and prices declined to within 1½c to 1¾c per pound of the average price in the past five years. On August 15th, some foreign shrapnel orders were placed, the first in two months. This was the signal for which the large trading interests and a few large consumers had been watching. They speedily entered the market, quietly gathering up all the cheap lots for spot, August, September and October shipment at 9½c to 9c per pound. These purchasers would have taken November-December positions, also, but there were no sellers as the cost of importation was close to 13c, duty paid. The Oriental market, while depressed at no time, sank to the depths reached by the American speculator. At the close of the day, prices of all deliveries had recovered to 10½c to 11c per pound. Two months ago, antimony was selling at 40c to 45c per pound. On August 16th, it was difficult to buy substantial lots at an advance of 1c per pound. Some importers refused to sell except at 2c per pound higher, while others refused to sell at all. Nearly all of the outside lots which had been previously pressingly offered and which were held responsible for the recent demoralization of the market, disappeared.

Market Excited— Sales of 2,000 Tons.

On August 17th, the market was greatly excited by the withdrawal of importers, as sellers, following the report of the purchase of 1,000 tons by the Bethlehem Steel Corporation. Other manufacturers of war munitions were reported to have purchased, in the aggregate, about 500 tons and before the week ended, total sales to consuming interests aggregated about 2,000 tons. The result of the sudden awakening of the market was an advance of 4 to 5c per pound. The cheapest offering, late on August 17th, was 13c in bond, with sales, and the largest seller was asking 16c per pound. Dealers, however, bought at 14c per pound, duty paid, and at the close of the day, holders were asking 14 to 14½c for prompt shipment.

In war times, antimony is indispensable

in the manufacture of shrapnel, but at all times it is required with lead in making type and anti-friction metal. As noted elsewhere, the revival in the demand for lead for export, and for domestic consumption, caused an advance of $10 per ton in two days at this time.

Market Quieter.

The sudden and sensational rise in antimony that excited the market for a few days, was followed by a cooling process of waiting, although small consumers continued to place orders in fair volume and surplus stocks were further reduced. Some importers continued to ask extremely high prices but other offerings were freer and wide in price range. Consumers, in the next few days, bought moderately at 13½c to 14½c for prompt and September shipments.

Imports in June Highest on Record.

Imports of antimony in June, according to the report of the Department of Commerce, were the highest of record and the value of the arrivals exceeded the value of the total imports in the twelve months of 1915. The June imports of regulus and metal amounted to 4,960,751 pounds and the antimony contents of the ore imported amounted to 1,755,819 pounds more. The value of the metal and regulus was given at $1,359,593, equivalent to 29c per pound, in bond.

Dullness prevailed during the last five days of the month, and a weaker tone was developed. On the closing day the price had receded to 12½c per pound which was within ½c per pound of the price prevailing at the end of July.

LEAD PRICE CHANGES.

The changes in the Trust price of lead at New York since January 1, 1916 have been as follows:

1916—		
Opening price		5.50
January 4	Advanced	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	.05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60
March 14	"	.40c to 7.00
March 30	"	.50c to 7.50
June 2	Reduced	.50c to 7.00
July 5	"	.50c to 6.50
August 2	"	.50c to 6.00
August 17	Advanced	.25c to 6.25
August 18	"	.25c to 6.50

CHINESE and JAPANESE ANTIMONY.

Average monthly price of **Chinese** and **Japanese** (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	32.20½
June	7.07	7.62	5.62½	36.53½	20.40
July	7.37	7.55	5.44	35.98	14.55
Aug.	7.58	7.48	13.05	32.57	12.62
Sept.	8.00	7.31	9.79½	28.50	....
Oct.	9.11	6.46	11.64	30.96	....
Nov.	9.11	6.28	14.14	37.88	....
Dec.	9.05	6.05	13.15	39.36½	....
Av.	7.63	7.43	8.53½	29.52	....

ALUMINUM AND SILVER PRICES.

	New York — Aluminum.		— Silver —	
	1915.	1916.	1915.	1916.
Jan. ...	19.01	54.33	48.89½	56.77½
Feb. ...	19.20	57.50	48.48	56.75½
Mar. ...	18.94½	60.52	50.24	57.92½
April ..	18.83	60.00	50.25	64.37½
May ...	21.85	60.00	49.91½	74.27
June ...	29.66	62.09	49.03	65.02½
July ...	32.50	60.15	47.52	62.94
Aug. ...	34.00	59.48	47.18	66.08
Sept. ...	46.75	.....	48.68	.....
Oct. ...	54.17½	.....	49.38½	.....
Nov. ...	57.85	.....	51.71	.....
Dec. ...	56.80½	.....	54.97	.....
Av'ge..	34.13	.....	49.69	.....

QUICKSILVER PRICES.

Monthly average prices of **Quicksilver** in New York (flasks of 75 pounds).

	1913.	1914.	1915.	1916.
Jan.	40.00	38.05	50.90	214.76
Feb. ...	40.00	38.00	58.05½	288.50
Mar.	39.50	38.00	62.93½	223.91
April ...	39.14	38.00	65.71½	140.10¼
May	39.19	38.00	72.65	96.95
June	39.67	37.73	87.91	73.04¼
July	39.00	35.87	93.33	80.95
Aug.	39.00	74.19½	91.79½	75.04
Sept. ...	39.00	73.57	89.09½	....
Oct.	38.59	50.59½	92.40	....
Nov.	38.00	51.72	102.25	....
Dec.	38.50	51.61	126.52	....
Average.	**39.13**	**47.11**	**82.80**	....

Aluminum In August.

Market Dull and Uninteresting During First Three Weeks—Strong and Higher at Close—Aluminum Company of America to Supply Entire Domestic Needs.

Aluminum at the beginning of August was dull and easier with freer offerings at concessions of 1c per pound from the prices quoted at the end of July. No. 1 Virgin was offered at 58c to 60c, 98% to 99% remelted, at 56c to 58c and No. 12 alloy at 46c to 48c per pound. By the end of the first week, No. 12 alloy was weaker at 45c to 47c per pound. Otherwise there were few developments of interest throughout the first three weeks of the month, and no important change in prices. On August 22nd, sheets were offered at 80c to 85c per pound, for delivery in five to six weeks. Virgin aluminum was difficult either to buy or to sell, in a very narrow market. Small lots of Virgin sold at 58½c to 59c per pound at New York but buyers bid close to 60c for carload lots.

It is interesting to learn from Government reports that the Aluminum Company of America at the end of 1916, it is believed, through the completion of projects now under construction, will be in a position to supply the entire domestic consumptive demand for aluminum. The 1915 production in the United States, according to the Geological Survey report made during the month, was 99,806,000 pounds, against an output in 1914 of 79,129,000 pounds, showing an increase last year of 20,677,000 pounds.

This year, because of the abnormal conditions abroad the export demand for aluminum, has been a factor of some importance. Already, nearly all of the lots available in the outside market for shipment over the balance of the year have been sold for export and the market apparently is well controlled.

On August 24th, a firmer tone was developed because of the demand for ingots for rolling on the new mills recently completed; consequently, it was difficult to secure carload lots of Virgin, except at higher prices. All of the stray, small lots recently offered at 58c to 59c were absorbed and sellers were asking 61c to 62c at the close of the month, while carload lots sold at 60½c shipping point, and additional lots, were held at 61c per pound. Pure 98-99% remelted, also was stronger at 58 to 60c per pound.

ALUMINUM, SILVER and ANTIMONY PRICES IN AUGUST.

	Aluminum.	— Silver —		Antimony.
	N. Y.	N. Y.	London.	N. Y.
Day.	Cents.	Cents.	Pence.	Cents.
1	59.00	64	30½	13.00
2	59.00	64	30½	13.00
3	59.00	64¾	30⅞	12.75
4	59.00	64⅞	30⅛	12.25
5	.....	66⅛	31½	.....
7	59.00	65⅞	31 7/16	12.00
8	59.00	66¼	31⅝	11.50
9	59.00	66⅞	31⅛	11.00
10	59.00	66¼	31⅝	10.50
11	59.00	66¼	31⅝	10.50
12	.....	66¼	31⅛	.....
14	59.00	66⅝	31¾	10.50
15	59.00	66⅝	31¾	11.00
16	59.00	66½	31⅛	11.75
17	59.00	66¼	31⅞	14.25
18	59.00	65¾	31⅞	14.25
19	.....	65¾	31⅞	.....
21	59.00	66	31⅞	14.00
22	59.00	66¼	31⅞	14.00
23	59.00	66⅜	31⅝	14.00
24	60.00	66⅜	31⅝	14.00
25	61.00	66¼	31⅞	13.50
26	.....	66⅛	31½	.....
28	61.00	66½	31⅛	13.50
29	61.00	66⅞	31⅛	13.50
30	61.00	67¼	32	13.00
31	61.00	67¼	32	12.50
High ..	62.00	67¼	32	14.50
Low ..	58.00	64	30½	10.50
Av'ge .	59.48	66.08	31.50	12.62

SHEET COPPER PRICE CHANGES.

The changes in the base price of sheet copper since March 25, 1916, are given in the following table together with the price of Lake Copper on the same dates:

1916—	Sheet Copper.	Lake Copper.
March 25	34.50	27.37½
April 13	35.50	29.25
April 19	36.50	29.75
May 5	37.50	29.75
August 2	35.50	25.50
August 18	37.50	27.00

ACTIVE ZINC SMELTERS IN THE UNITED STATES, AND CAPACITY IN 1916, BY COMPANIES AND STATES.

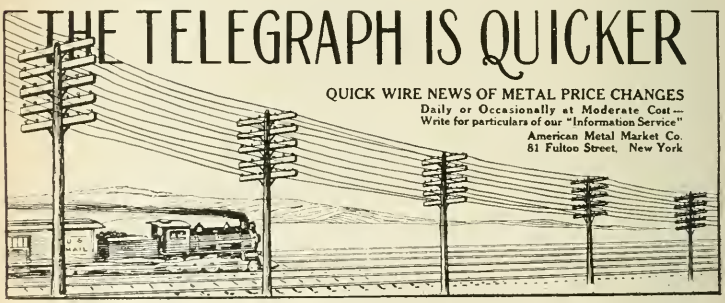
(According to the U. S. Geological Survey. Includes plants working on ore alone, on ore and drosses, and on drosses alone.)

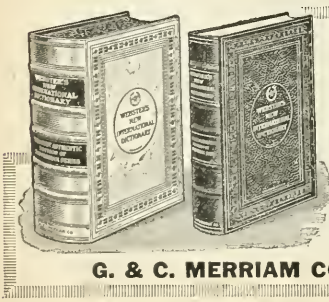
Operating Company.	Location.	Retorts, at close 1915.	Retorts, plated or June 30, 1916.	Additional retorts contemplated or under construction.
Arkansas.				
Fort Smith Spelter Co.	Fort Smith	.....	2,560	.....
Arkansas Zinc Co.	Van Buren	.....	2,400	.....
		.....	4,960	.....
Colorado.				
United States Zinc Co.	Pueblo	2,208	1,944	.....
Illinois.				
American Zinc Co. of Illinois	Hillsboro (A)	4,000	4,864	.....
Collinsville Zinc Smelter	Collinsville	1,792	2,304	.....
Granby Mining & Smelting Co.	East St. Louis (A)	3,220	3,220	2,400
Hegeler Zinc Co.	Danville (A)	3,600	5,400	.....
Illinois Zinc Co.	Peru (A)	4,640	4,640	800
Matthiesson & Hegeler Zinc Co.	La Salle (A)	6,168	6,168	.....
Missouri Zinc Co.	Beckemeyer	352	352	.....
Mineral Point Zinc Co.	Depue (A)	9,068	9,068	.....
National Zinc Co.	Springfield (A)	3,200	4,480	.....
Robert Lanyon Zinc & Acid Co.	Hillsboro (A)	1,840	3,200	.....
Sandoval Zinc Co.	Sandoval	672	672	.....
		38,552	44,368	3,200
Kansas.				
American Spelter Co.	Pittsburg	896	992	.....
American Zinc, Lead & Smelting Co.	Caney	6,080	6,080	.....
American Zinc, Lead & Smelting Co.	Dearing	4,480	4,480	.....
Chanute Spelter Co.	Chanute	1,280	1,280	.....
Cherokee Smelting Co.	Bruce	896	896	.....
Edgar Zinc Co.	Cherryvale	4,800	4,800	.....
Granby Mining & Smelting Co.	Neodesha	3,760	3,760	.....
Iola Zinc Co.	Concreto	660	1,320	.....
Joplin Ore & Spelter Corporation	Pittsburg	1,444	1,792	.....
Lanyon Smelting Co.	Pittsburg	448	448	.....
Owen Zinc Co.	Caney	1,280	1,280	640
Pittsburg Zinc Co.	Pittsburg	910	910	.....
Prime Western Spelter Co.	Gas (A)	4,868	4,868	.....
United States Smelting Co.	Altoona	3,960	4,600	.....
United States Smelting Co.	Iola	3,440	3,440	.....
United States Smelting Co.	La Harpe	1,924	1,924	.....
Weir Smelting Co.	Weir	.....	.....	448
		41,126	42,870	1,088
Missouri.				
Edgar Zinc Co.	St. Louis	2,000	2,000	.....
Missouri Zinc Smelting Co.	Rich Hill	.....	448	.....
Nevada Smelting Co.	Nevada	672	672	.....
		2,672	3,120	.....
Oklahoma.				
Bartlesville Zinc Co.	Bartlesville	5,184	6,336	.....
Bartlesville Zinc Co.	Blackwell	.....	1,600	4,800
Bartlesville Zinc Co.	Collinsville	10,752	13,440	.....
Bartlesville Zinc Co. (Lanyon-Starr plant)	Bartlesville	3,456	3,456	.....
Eagle-Picher Lead Co.	Henryetta	.....	.....	4,000
Henryetta Spelter Co.	Henryetta	.....	3,000	.....
J. B. Kirk Gas & Smelting Co.	Checotah	.....	2,560	2,560
Kusa Spelter Co.	Kusa	3,720	3,720	.....
La Harpe Spelter Co.	Kusa	.....	4,000	.....
National Zinc Co.	Bartlesville	4,970	4,970	.....
Oklahoma Spelter Co.	Kusa	.....	1,600	.....
Quinton Spelter Co.	Quinton	.....	.....	1,340
Tulsa Fuel & Manufacturing Co.	Collinsville	6,232	6,232	.....
United States Zinc Co.	Sand Springs	5,680	8,000	.....
		39,994	58,914	12,700

(Continued on next page.)

Operating Company.	Location.	Retorts, at close 1915.	Retorts, June 30, 1916.	Additional retorts contemplated or under construction.
Pennsylvania.				
American Steel & Wire Co.	Donora (A)	3,648	9,120	.....
American Zinc & Chemical Co.	Langeloth (A)	3,648	6,384	912
New Jersey Zinc Co. (of Pennsylvania)	Palmerton	6,720	6,960	.....
		14,016	22,464	912
West Virginia.				
Clarksburg Zinc Co.	Clarksburg	3,648	3,648	.....
Grasselli Chemical Co.	Clarksburg (A)	5,760	5,760	.....
Grasselli Chemical Co.	Meadowbrook (A)	8,592	8,592	.....
United Zinc Smelting Corporation	Moundsville (A)	.....	.....	6,912
		18,000	18,000	6,912
Total		**156,568**	**196,640**	**24,812**
Plants with special retorts:				
Michael Hayman & Co.	Buffalo, N. Y.	12	12	.....
Trenton Smelting & Refining Co.	Trenton, N. J.	96	60	.....
William Cramp & Sons Ship & Engine Building Co.	Philadelphia, Pa.	32	32	.....

(A) Acid plant.





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Trade Notes.

The Buffalo Metal Products Mfg. Company has completed a temporary manufacturing plant at Humboldt Parkway and East Delavan Avenue, Buffalo, and is manufacturing pressed steel parts. The company expects to increase its capacity shortly by putting up an additional concrete or brick structure. It was recently incorporated with a capital stock of $50,000. D. Reid is president.

The Rumford Electro Alloys Company, Portland, Me., has been incorporated with a capital stock of $200,000, to engage in the manufacture of iron, steel, manganese, copper, zinc, lead, tin, etc. The directors are: Pres. C. H. Drummond; Treas. W. B. Drummond, and clerk, J. H. Drummond.

The Chemical Pump & Valve Company, Jersey City, N. J., has been incorporated to manufacture pumps and valves. The company is capitalized at $30,000 by Frank O. Warter, Emil Warter, Perth Amboy, N. J., and Fred Batzel, South Amboy, N. J.

The Simonsville Mfg. Company, Waterbury, Conn., has been incorporated with capital stock of $25,000 to operate a foundry. The corporators are Charles V. Roller, George A. Carney and Roderick J. Perrault.

The Canadian Chicago Bridge & Iron Company, Ltd., Bridgeburg, Ont., has been incorporated with a capital stock of $100,000 by George T. Horton, Robert H. Murray, Horace B. Horton, and others, of Chicago, Ill. Christopher C. Gregory of Bridgeburg, Ont. and others, to manufacture tanks, iron, steel, etc.

The City Iron Foundry Company, Lowell, Mass., has been incorporated with capital stock of $10,000. The directors are A. J. Harris, president; James J. Norton, 290 Plain Street, Lowell, treasurer, and M. E. Harris.

The Lucas-Miller Pump Company, Springfield, O., has been incorporated with $25,000 to manufacture small electric pumps. Clyde C. Miner is one of the principal incorporators.

Homer F. Livermore, Inc., Boston, Mass. has been incorporated with capital stock of $50,000 to manufacture electrical appliances. The corporators are Homer F. Livermore, president and treasurer; F. E. Bobcock and A. E. Boorden.

The Boss Lock Nut Company of Canada, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Francis G. Bush, George R. Drennan, Herbert W. Jackson and others, to manufacture nuts, bolts, fastening devices, iron, steel, etc.

The Ontario Steel Products, Ltd., is making extensive additions to its plants at Brockville, Ont., and Chatham, Ont. The company recently signed up contracts with three Canadian automobile companies which will cover production for nearly three years. In addition it has been active on war orders.

The Stimple & Ward Company, Pittsburgh, with a capital stock of $30,000, has been incorporated by George L. Stimple, John C. Ward and Wm. S. Peters, to manufacture electrical machinery.

The Dixie Foundry Company, Cleveland, Tenn., has been incorporated with $10,000 capitalization by J. C. McKenzie, S. B. Rymer, F. J. Earle and others.

Articles of incorporation have been filed by the Sanitary Refrigerating Machinery Company, Milwaukee, Wis. The capital stock is $100,000 and the incorporators are: C. F. Schimmel, Louis Pierron and A. C. Lingelbach.

The Union Tool & Die Company, Indianapolis, Ind., has been incorporated to manufacture dies, castings and machinery. The company is capitalized at $10,000 by Dunward Rivers, C. J. McHugh and E. W. Holt.

The Empire Foundry Company, Port Chester, N. Y., has been incorporated with a capital stock of $50,000 to manufacture cast iron pipe, gratings, manhole covers, etc., W. A. Braun, J. Fuchs and B. Mills, Port Chester, are the incorporators.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, OCTOBER, 1916. NO. 10.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer.
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

Probable Business Developments Before War Ends.

The question that transcends all others, and on which the present remarkable conditions of trade in this country depends, is when is the war to end? As a well known writer on economic subjects said this week: "Tell me when the war will end, and I can answer almost any question that you may ask." This is perhaps too sweeping a statement, yet there is a good deal of truth in it, so plainly are developments to follow the war foreshadowed. The price of commodities, the condition of the labor market, the demand for raw material, the profits of industry, the supply of money, and almost every economic feature will be affected by the ending of the war.

Every Indication That Peace is Far Off.

While the fortunes of war favor the Allies at present, and while there is every prospect that future developments will continue to be in that direction, there are no grounds on which to build the hope for an early end of the war. On account of the present manner in which it is being waged, it is a case for the most part of slow siege operations. Pitched battles followed by a collapse of the defence, and a rout of the loosers have been relegated to the experiences of the past. Daily continuous operations exceeding in numbers engaged and loss of life some of the great battles of history, only result in a few hundred yards of advance, there to meet new lines of defence. To outflank the enemy and roll him up seems impossible. Even supposing the

advance of the Allies on the Western front continues (and we think that is where the war will be decided) at the rate of present progression, a year from now may only find Germany back to her own borders, which, it is well known, exceed in defensive strength those that she has created and is now defending on hostile territory. When it really becomes a defence of the Fatherland, there will be an increase in the fighting power of that country we believe, that will exceed anything we have yet seen and marvelled at.

No Prospect of Successful Intervention of Neutrals for Peace.

Notice has been served on neutrals by Lloyd George speaking for the English Government, and the response it has brought from the foreign press proves it represents the feeling of the Allies, that this war is to be a fight to a "knock out." To quote from his statement:

"Britain has only begun to fight; the British Empire has invested thousands of its best lives to purchase future immunity for civilization; this investment is too great to be thrown away."

* * * *

"Under the circumstances the British, now that the fortunes of the game have turned a bit, are not disposed to stop because of the squealing done by the Germans, or for the Germans, by probably well meaning but misguided sympathizers and humanitarians.

"The fight must be to a finish—to a knock out.

* * * *

"But how long do you figure this can and must go on?" Lloyd George was asked.

"There's neither clock nor calendar in the British army to-day," was his quick reply. "Time is the least vital factor. Only the result counts—not the time consumed in achieving it.

"It took England twenty years to defeat Napoleon, and the first fifteen of those years were black with British defeat. It will not take twenty years to win this war, but whatever time is required it will be done, and I say this recognizing that we have only begun to win. There is no disposition on our side to fix the hour of ultimate victory after the first success. We have no delusion that the war is nearing an end. We haven't the slightest doubt as to how it is to end."

Another of the British Cabinet is on record as saying that, "if to win this fight we have to go to the gates of Berlin, then to the gates of Berlin we will go."

It is impossible to reach, in view of the situation and attitude of the belligerents, any other opinion but that peace is far off—unless "something cracks" either economically or politically in Germany. Of this there seems no signs.

Under the circumstances what is to happen after peace comes may well be laid on one side for the present, and our thoughts devoted to what is to be expected during the year or perhaps more that is before us of warfare. "After war" conditions seem to be monopolizing all discussion. How about what is happening in the meanwhile?

American Prosperity to Increase.

Prosperity in the United States must continue to grow, since there can be no let up in the transfer of the hoard of accumulated European capital in exchange for the commodities and supplies necessary for their ordinary and Government war requirements, which they are unable to provide for themselves, partly by lack of labor to produce, and also from the absence of the raw material in their own lands. We hear a great deal of the steps being taken to turn out the finished product by the Allies, especially in England, but the raw material to a great extent must be drawn from America, also the skilled labor to produce all the finished commodities they need while the war lasts is not available. Every month must continue the movement of impoverishing the belligerents and enriching America. The demand for our goods and food products must continue. Foreign trade is the life of every nation; it has been the cause of our astounding prosperity, and foreign trade must continue not only at its

present record, but at an increased rate. As we become richer we have more to spend and speculation increases, and we are having at present an exhibition of the latter in what is going on in Wall Street. It is also seen in many commodities. This will continue irrespective of the ups and downs that may accompany it and irrespective of the serious situation which has been reached on labor and other economic questions. With signs of the end of the war chills may be expected, and with peace an accomplished fact there will come the struggle between our accrued wealth and the false position we have drifted into on so many economic matters. Meantime our manufacturers and merchants are swimming in increasing profits, and our banks bursting with surplus deposits. Everyone is busy making record profits and record wages and these conditions promise to continue.

Prosperity Always Manifests Itself In Increased Consumption.

At no time in our history were economic forces so easy to read and understand. It is an open book, the results are plain, the reason for our prosperity easily apprehended, and are visible on every side.

The full employment of labor at record high wages, the activity of our factories, taxed to their limit, the swelling bank deposits now drifting from our main financial centres to smallest country banks. The high turnover of industrial concerns being difused in dollars and cents and benefiting the wage earner as well as the shareholder. Everybody is busy, fortunes are being made by many, and the rank and file are spending more money than ever before and yet in most cases we think in spite of extravagance able to save little; $700,000,000 of gold has been injected into circulation—more to come. From a debtor we have become a creditor nation. Such conditions cannot disappear in a month, a year and we are inclined to think not even in a decade. They will grow while the war lasts, they will to a great part remain with us after the war ceases. It is not imaginary or paper wealth that has come to us, but real and solid wealth represented by cash (gold), the repurchase of our properties on which Europe had liens in the shape of securities, and the investment in loans we are now making to other countries.

What is to be Expected While War Lasts in the Metal Trade.

Iron, steel and metals have by recent experience been proved to be more necessary for warfare than the world had any idea. Fortunes would have been made had it been appreciated early in the war. The demand it has created for these commodities has been one of the astonishing features of the past eighteen months.

In spite of the increase in our production, this war demand, and the increase in our home demand caused by our prosperity has swept us bare of stocks and is taxing our mines and mills to keep up with the call made on them. We have reached the limit of production for at least another year. While the war lasts it is difficult to see anything but continued activity and high prices.

Iron and Steel.

Steel prices promise to continue advancing, both finished steel and unfinished, and that there will be greater famine than ever late this year is a safe prediction.

It seemed impossible that such high prices as the present could prevail for any length of time without operating to curtail consumption and thus bringing about easier conditions, but now it looks as if the production would all be absorbed for another year at least, despite the high prices. Conditions created in this country are so unusual that consumers can afford to pay unexpectedly high prices. The obligations on mill books appear very sound. The mills do not seem to have sold any large proportion of their prospective output on the usual contract form, of specifications to come later at the option of the buyer, but have been confining their sales to specific lots.

Metal Conditions Sound—Outlook Most Favorable.

To sum up, the metal trade is in a sound condition and prospects point, for months to come, to strong markets, large consumption, and periods of great activity while the war lasts.

(Further particulars are continued onpage 281.)

Business Trends.

Exports Cross $500,000,000 for First Time.

Export trade made an immense surge forward in August, and imports also regained some of the ground lost in July, but were below recent earlier months, the result being a record-breaking excess of merchandise exports over imports and further large additions to the immense excess shown in export trade since the European war began. August exports were nearly 15% larger than those of July, 7.8% greater than the high record total of May this year, almost double those of August a year ago. and over four and one-half times those of August, 1914, the month of the war's outbreak. Imports for August were 9.3% above July but 18% below the high record of June, and the excess of exports, $310,752,609, was never approached in this or any other country. The excess for August, indeed. would have been a good-sized yearly excess, measured by the size of the excesses recorded before the war began.

In the following table will be found the total of exports and imports for the month of August; for the eight months ended August 31st and for the period of the war:

August—	1915.	1916.
Exports	$261,975,771	$509,778,680
Imports	141,729,638	199,247,391
Exc. of exports	$120,246,133	$310,531,289
Eight months ended August 31st:		
Exports	$2,230,887,202	$3,435,872,580
Imports	1,150,858,760	1,667,066,965
Ex. of exports	$1,080,028,442	$1,768,805,615
Summary of trade during period of the war:		
Exports		$7,903,360,405
Imports		4,094,346,288
Excess of exports		$3,809,014,117

Daily Rate of Iron Production Increases 3,400 Tons.

Last month's iron production for 30 days was 3,202,366 tons or 106,745 tons a day, according to the "Iron Age." This compares with 3,203,713 tons for August or 103,346 tons a day. Th month opens up well with 328 furnac in blast with a daily capacity of 10 578 tons, against nine less furnaces 319 which started September 1, repr senting a daily production rate of 10 502 tons.

The daily average production of co and anthracite pig iron in the Unit States by months since January, 191 is given as follows by the "Iron Age

	1913.	1914.	1915.	191
January ..	90,172	60,808	51,659	102,7
February .	92,369	67,453	59,813	106,4
March ..	89,147	75,738	66,575	107,6
April	91,759	75,665	70,550	107,5
May	91,039	67,506	73,015	108,4
June	87,619	63,916	79,361	107,0
July	82,601	63,150	82,691	104,0
August ..	82,057	64,363	89,666	103,3
September	83,531	62,753	95,085	106,7
October .	82,123	57,361	100,822	....
November	74,453	50,611	101,244	....
December.	63,987	48,896	102,323	....

Commodity Prices Soaring.

A world-wide upward sweep occ red in commodity prices during Augu and of course, this country particip ed in the procession. Consequently find that "Bradstreets" latest ind number—$11.785 as of September 1 establishes a new high record, one th represents an advance of 3% over A gust 1st, while bringing to a sharp st the slight downward movements th had been in progress during the fo months prior to September 1st. T current level is a fraction of 1% hig er than the previous high mark, $11.7 touched on April 1st last, and sho increases of 20% over September 1915 and 1914.

"In England price levels are the hig est ever known," says "Bradstreet's "and in that respect the United Sta keeps the older country company." T journal continues:

"In England the propelling fac is the war, whereas with us a comb ation of circumstances influence the a vancing process. We are supplying large part of the world's needs, t

Business Trends.

United States being the one leading, ever open free market for the neutral as well the belligerent. Another important factor is the deterioration in wheat and other crop yields, while the high price of raw cotton is still another and about the first of the current month embargoes on railway freight because of fears of strikes by operating employees caused hurried calls for merchandise, thus raising some commodities to high marks. Of course, the increased wage rates paid tend to advance costs, but as both levels seem to be pursuing a somewhat similar direction, and as the country is enjoying prosperity, loud complaints are not heard."

Increase in New Enterprises.

While the amount represented in new enterprises formed last month was larger than that in August, it was much below that of the corresponding period a year ago. The September incorporations in the Eastern States, with a capital of $1,000,000 or over, involved $164,700,000. This is an increase of 22% over the preceding month, although 73% smaller than in September, 1915. Decidedly the most interesting feature of the returns is the fact that practically all lines of industry are represented, the same as for quite a while.

The grand total of all companies with a capital of $100,000 or over, covering all States, including those of the East, amounted to $216,455,000 against $174,933,000 in August and $323,950,000 in September a year ago.

Following are the comparative figures as specially compiled by The Journal of Commerce and Commercial Bulletin of companies incorporated in the eastern States during the last three years with an authorized capital of $1,000,000 or more:

	1916.	1915.	1914.
Jan.	$270,995,000	$51,150,000	$120,050,000
Feb.	365,995,300	53,950,000	51,575,000
Mar.	194,750,000	70,050,000	57,700,000
April	166,650,000	32,200,000	136,185,000
May	209,735,000	78,950,000	62,700,000
June	264,350,006	181,247,100	70,050,000
July	217,662,550	71,100,000	68,700,000
Aug.	113,472,000	67,100,000	50,600,000
Sept.	164,700,000	286,625,000	54,800,000
Total	$1,967,309,800	$892,372,100	$672,360,000
Oct.	.....	208,695,000	35,487,500
Nov.	.....	190,075,000	81,650,000
Dec.	.....	135,125,000	105,450,000

Stock Market Reflects Country's Prosperity.

Security markets in Wall Street in the month just ended experienced the most active and excited markets since 1906. As regards price fluctuations, the market of the past month did not come up to the "war boom" of October and November of 1915, but as regards activity it exceeds by far the markets of last month. The post month has a record of 20 consecutive million-share days. The nearest approach to this was in 1906, when there were 25 consecutive million-share days. In 1901 there were 44 such days.

The largest single day's trading last month was 2,340,000 shares on Monday, September 25th. This was the largest total since the "silent panic" of March 14, 1907. There was only one five-hour session last month in which sales fell below 1,000,000 shares.

Failures and Liabilites Still Lessening.

It is highly encouraging to note from "Dun's Review" that there were fewer commercial failures in September than in any month in three years, with the smallest indebtedness reported since August, 1911. According to the above journal, strictly commercial insolvencies numbered 1,154 last month and involved $11,569,078, against 1,394 for $20,128,709 in August and 2,009 reverses for $25,863,286 in January—the high point of the current year.

When comparison is made with September, 1915, there appears a numerical reduction of 260 and a contraction of $4,600,000 in amount, there being 1,414 suspensions last year, with liabilities of $16,208,070.

Our Trade Balance.

Foreigners Have Already Paid and Are Our Creditors Now.

It is well to bring out strongly the fact that our large favorable balances in our foreign trade are not piling up debits against foreign countries. They are not simply paying as they go, they are paying in advance very largely. The placing of a munitions contract has usually involved a cash payment, and nearly all goods are paid for before shipment. This is well known, and it is desirable to point out that certain statistics available illustrate the fact, showing that foreign countries have paid us already for more goods than they have received. The bearing of this matter is that the very strong financial position we occupy is not due entirely to the goods we have already exported. We cannot say that we are now so strong, and that each additional month of a large favorable merchandise balance will make us precisely so much stronger. Some of that future business has already been financed.

A discussion of this subject involves recourse to a great many figures and we shall endeavor to make as simple a presentation as possible, omitting reference to many minor points.

Past and Present Balances.

Large favorable merchandise balances began in 1898, and the averages up to the year the war began were:

1898-1905	$509,339,793
1906-1913	500,393,290

Thus the balances were not increasing, as one would expect when the total volume of business was increasing. There was no important gold movement either way.

A recent summary of the items in the unseen balance, which the merchandise balance is expected to cover, by Mr. A. D. Noyes, financial editor of the New York Evening Post, is that before the war there was about $160,000,000 annually paid in interest and dividends on our securities held abroad $150,000,000 to $200,000,000 spent by American tourists abroad, $50,000,000 sent by foreign born residents to relatives and friends abroad, and freights paid to foreign vessel owners for carrying our goods, some estimates for this item running as high as $300,000,000. We may consider it probable that the unseen balance was exceeding the merchandise balance by $100,000,000 a year or more, and that is how it came about that Europe owned such a large quantity of our securities when the war opened.

In 1914 our merchandise balance of trade was small, and there were large gold exports. The unseen balance was reduced, and in the absence of material permitting a close estimate may be taken at $500,000,000 a year since the war started. Our merchandise balances have been as follows:

1914	$324,348,049
1915	1,768,883,677
8 mos. 1916 ...	1,768,805,615
Total	$3,862,037,341

Deducting an unseen balance at the rate of $500,000,000 a year for two and two-thirds years we have left $2,529,000,000 of our merchandise balance to be settled otherwise.

On the other side of the account are three principal items, the movement in gold, the movement in old securities and the creation of new securities.

The gold movement has been as follows:

1914 Excess exports	$165,228,415
1915 Excess imports	420,528,672
8 mos. 1916 Excess imports	202,744,207
Net excess imports	$458,044,464

Next there is the movement in securities. The data available are Mr. Loree's reports as to railroad securities and the estimate that other of our securities held abroad are one-fourth as great. The Loree reports showed, at to par value of American railroad securities held abroad:

January 31, 1915..	$2,704,402,000
July 31, 1916	1,415,627,000
Decrease	$1,288,775,000

On July 31, 1916, the market value was 21% less than the face value. Applying that correction, which is only an approximate one, to the reduction one has about $1,000,000,000 as the price at which the securities were sold. Adding one-fourth, for other securities, there is a total of $1,250,000,000.

Loans made to foreign countries have totaled at least $1,300,000,000, and there have been private loans and investments besides, so that $1,500,000 seems to be a low estimate for the total.

Then we have, in liquidation of our merchandise trade balance, the following:

Gold	$450,000,000
American securities	1,250,000,000
Foreign securities ..	1,500,000,000
Total	$3,200,000,000

As the merchandise balance required to be liquidated was 2,529,000,000 there has been, apparently, about $700,000,000 of a credit established with us. The figure is far from exact, of course, but it is probably fairly representative of the conditions. The amount may, indeed, be substantially the amount by which advance payments for merchandise have been made. We must liquidate it, and we may have occasion to buy back the remainder of our railroad securities, $1,415,628,563 face value or $1,110,099,090 market value, together with a fraction as large an amount of other securities, industrial, etc. We may have occasion to lend more money or invest money in industrial enterprises abroad. All this will be against our trade balances for September and later, following the balance of $310,000,000 in August, and the average of $220,000,000 in the eight months ended August.

The Gold Question.

Its Relation to American Business.

By Ray Vance, Editor, Brookmire Service.

"If there are reasonable grounds for thinking that the war will last throughout next year and possibly longer, it seems safe to predict that specie payments cannot be maintained to the end."

It must have been something of a shock to American readers to find this expression of editorial opinion in the London Statist of September 16, 1916, under the title of "The Gold Question." "There is plenty more where that came from" has more nearly expressed the attitude of the American business man toward the steady flow of gold from Europe. Most newspapers likewise assume that the yellow metal comes from a boundless supply or from some mysterious "secret fund" which is ample for all demands. The Statist, which is supposed to stand very close to the British Treasury, does not go into particulars of the reasons for its assertion but simply says, "The quantity of gold in the world is not sufficient to pay for all the commodities of every kind that the various belligerent countries require." However, some figures which are generally overlooked in the United States thoroughly bear out its statement.

Sources of Gold.

When we think of a country's sources of gold, the most obvious item is its new production. In 1915 the world's production of new gold was about $477,000,000. Of this $380,000,000 was produced outside the United States, and might possibly have furnished a part of the import stream. This year, under extreme pressure, $400,000,000 may be produced outside this country.

If all of this were available for import to America, it would almost meet our present rate of incoming shipments. But we are not the only neutral nation piling up gold. In the last 12 months, Holland, Spain, Norway, Sweden, Denmark and Switzerland, have increased the gold holdings of

their national banks alone by $210,000,000. This omits their privately owned banks, and make no allowance for Japan, Argentine and Cuba, all of which are piling up large gold supplies. Even then it accounts for more than half of the new production outside the United States, while banks and countries not included, together with industrial uses, would probably account for enough to more than balance off the rest of the new production.

Manifestly, then, the great gold imports of the United States have created a drain which had to be met from other sources. During the first year of the war, this drain was met by the "mobilization of reserves," or, in other words, by the transfer of gold from individuals and from private banks to the national central institutions. This was possible because individual holdings of gold in Europe are much larger under ordinary conditions than they are in this country, but in spite of this fact, a comparative study of the effects which the two big gold import movements to this country have had on the gold holdings of the Central Banks of the belligerent countries, shows conclusively that the process of supplying gold through "mobilization" is exhausted.

Changes of Gold Reserves in Periods of American Imports.

	May-Sept. 1916.	Jan.-Dec. 1915.
	(000's omitted)	
Bank of Eng. ..	$—14,040	$—91,000
Bank of France	—139.000	+150,000
Bank of Italy ..	—13,000	—11,500
Bank of Russia .	—36,300	+26,500
Total Change	—202,340	+74.000
Total American Imports	305,000(a)	451,955
Balance	$102,660	$525,955

(a) September unofficial.

Not only from this time forward, but even going backward far enough to include the latest movement of gold imports to this country, the great bulk of the metal must therefore be supplied directly from the reserve of our customers with no compensating additions, so that every movement will leave them financially weakened.

It is true that the Bank of England the Bank of Russia, the Bank of France and the Bank of Italy, still have in their reserves an aggregate of $2,000,000,000 of gold, which is more than twice as much as they have sent us since the war opened. On the other hand, it is also true that they cannot send us much more of this gold and keep their financial systems intact. When the Central Banks took over the gold of privately owned institutions, they were also compelled to take over the corresponding loans, and the combined load has since grown enormously. For example, before the war, the Bank of England averaged carrying about 50% of reserve against liabilities and 40% was the legal minimum, a minimum which was abolished at the beginning of the war. On May 1, 1916, when the latest gold movement to the United States began, reserves were 30.90% of liabilities, but by the end of the movement (September 23, 1916) reserves had been reduced to 23.56% of liabilities. If it goes much lower, specie payments cannot be maintained in England and, since the other belligerents are in as bad a position, we cannot doubt that the Statist is justified in its seemingly pessimistic position.

Is There a Remedy?

It is hardly necessary to comment on the meaning to American business if payment in specie is discontinued by our best customers. The only question is—Can we prevent it? If the war is to be a three-year or five-year affair yet, we probably cannot, for in spite of our own imports of gold, our banking position has been greatly weakened during the past year. On the other hand if the Allies can close the war in 1917 or early in 1918—as their recent loadings indicate that they believe they can — it is easily possible that by granting larger credits to Europe and to neutrals instead of demanding so much gold, American bankers might avert the danger.

Effect on American Business.

Such a solution would have four effects on American business, which would take place in the order named.

1. Call money rates would rise checking the active stock market speculation almost immediately.

2. Commercial paper rates would rise, and the expansion of general business be less aggressive during the next six months.

3. We would provide ourselves with such a volume of current claims against Europe as to protect our business and security market against a panic from the loss of gold when the war exports stop.

4. We should establish the banking machinery and the investment habits necessary for that direct financing of export sales, the lack of which is our traditional handicap in foreign trade.

I believe that the lasting benefits of the third and fourth features far outweigh any temporary sacrifices entailed by the first two, and that this is the logical and reasonable part for America to carry in the solution of the "Gold Question," which is largely the result of our tremendous imports of the metal. If, on the other hand, our bankers elect to continue demanding gold until our customers can pay no more, we shall not only suffer the customary temporary penalty of the panic which follows every reckless inflation of commodity and security prices, but shall also have missed the permanent advantage of becoming financially and commercially a real world power.

Railroad Earnings in Seven Years.

It may be interesting at this time to have a concise statement of railway earnings in recent years. We have compiled a table of operating revenues for the past seven years, giving first the total operating revenue, then the operating expenses and then the net operating revenue, all per mile of road reporting. The figures are all the corrected figures, except that for the past fiscal year the figures will be revised slightly a year hence. For 1910 the figures include returns from all roads 50 miles and more in length. For subsequent years the inclusion is of roads having annual income of more than $1,000,000.

The trends shown in the table are unmistakeable. Barring the fiscal year 1915, which was distinctly an off year industrially, embracing the second half of the calendar year 1914 and the first half of 1915, there is an almost continuous increase in the total operating revenues per mile of road. There is for a time a continuous increase in the operating expense, with the curious divergence that 1915, the off year, showed a decrease greater than the decrease in total revenue, and the further divergence that 1916, with the largest operations of all, showed smaller operating expenses than 1914.

The result of these changes was that the net operating revenue was substantially the same for four years, 1910 to 1913 inclusive, dropping sharply for 1914 and 1915 and then jumping in a remarkable manner to 1916. The net operating revenue in 1915 was 29% greater than the average of the four fairly good years 1910 to 1913.

Revenue from Operation, per Mile of Road, Fiscal Years.

	Total.	Expenses.	Net.
1910	$12,067	$8,007	$4,060
1911	12,580	8,625	3,955
1912	12,730	8,803	3,927
1913	13,737	9,519	4,218
1914	13,483	9,801	3,682
1915	12,678	8,916	3,763
1916.	14,818	8,684	5,134

Will There Be A Steel War?

In some quarters there seems to be a positive conviction that after the war there will be an international commercial war in steel products. The opinion is not universal but it is expressed in some quarters that must be respected. There is certainly confusion of thought on the subject for there are those whose fears appear to be chiefly whether we shall be able to maintain a large export trade in steel, and others whose expressed fears are that we may not have a high enough tariff to protect our own market.

We are perfectly ready to grant that there will be a large iron and steel productive capacity after the war. There is the direct evidence, in millions of tons of steel a year going out of this country, and hundreds of millions of dollars coming in, that steel is very essential to the prosecution of the war, and it goes without saying that the warring nations are preserving their iron and steel industries, not only the plants but the organizations. At the end of the war the works will be there, many of them, particularly in England, substantially enlarged in fact, and with the men now engaged and those who will return unimpaired they can be operated in full. As to the works in territory captured by the Germans little is definitely known. The usual assumption is that they are practically intact, but one does not know how much more fighting there will be in the territory involved. However, the total capacity possibly in jeopardy would hardly be more than 10 or 15% of the world's total, and thus it is readily granted that with the plant extensions made here and abroad the world's iron and steel making capacity will be greater after the war than just before the war.

The world's demand for steel, we maintain, will be very large. There are three cases, the neutral and non-producing countries, the belligerents, and ourselves.

(1) The neutrals. Steel is used largely for construction purposes. Demand deferred is not lost; the wants accumulate. The neutrals have been starved in steel, having little money with which to buy and being confronted by very high prices, high prices at works and extremely high freights. After the war there will be more credit and steel of course will be much cheaper.

(2) The belligerents. All the countries will seek trade very actively, but to do business, to make and deliver goods, requires steel. Russia is already engaged in a very extensive railway building operation. The effort to expand trade will involve the employment of steel rather than of selling steel. In rehabilitation after war's damage a great deal of steel will undoubtedly be needed.

(3) Ourselves. It needs but a casual scrutiny of the character and distribution of steel demand in the United States at present, by one who is familiar with the usual allotment of the steel production among the different classes of finished and commercial steel products, to observe that the present steel demand is quite abnormally proportioned. In the lines of consumption representing new construction the demand is relatively light, much less than it would ordinarily be with the country considerably less prosperous than it is. With export freight rates very high, labor extremely scarce and all materials including steel, extremely dear, the investor is indisposed to take hold. After the war the country will be still richer and after the first shock is over the disposition on all hands will be to take hold. It is inconceivable that the country should be otherwise than very prosperous. The idea, sometimes set forth that Europe will immediately proceed to take all our money away from us, is absurd. If the money were equally distributed per capita it is conceivable though absurd, that everyone would take a vacation to spend the money accumulated. The money, however, is not thus distributed. It will be invested not frittered away in buying silk hats from London, toys from Germany and wines from France. After the shock at any rate the United States is going to be prosperous and is going to require

a great deal of steel for current uses and for industrial expansion. The farmers who have been accumulating money will buy Ford tractors and everything they can conveniently use and can secure at a reasonable price.

With a large demand for steel a trade war is not to be expected. Costs abroad will not be extremely low. Men will be scarce and able bodied men, not cripples, the only men that can work in steel mills, will be scarcer still. Whatever the general wage level abroad the steel mill wages will be relatively higher than formerly. Our own costs are high, undoubtedly, but we can reduce them considerably, both by introducing more labor saving machinery and by men giving a full day's work for a day's pay. We may find ourselves in a decidedly favorable, rather than an unfavorable, position for prosecuting export business, but in any event we shall have a magnificent market for steel within our borders. There may be some sort of a trade war but it certainly cannot be as serious as is suggested in some quarters. Let us prepare for the worst and hope for the best.

The Sheet and Tin Plate Mills.

Full Lists of Regularly Operative Mills.

NOTE.—In view of the fact that there are "tin mills" in sheet plants and also in plants regularly engaged in making tin and terne plate, we designate the former as "tin mills" and the latter as "tin plate mills."

AMERICAN SHEET & TIN PLATE COMPANY,
Frick Building, Pittsburgh.

Sheet Mills.	Jobbing mills.	Sheet mills.	Galvanizing kettles.
Aetna-Standard, Bridgeport, O.	1		
Dover, Dover, O.		11	3
Gary, Gary, Ind.	4	16	10
Guernsey, Cambridge, O.		11	8
Hyde Park, Hyde Park, Pa.		6	
Leechburg, Leechburg, Pa.		11	
Mercer, Farrell, Pa.		8	
New Philadelphia, O.	2	10	
Old Meadow, Scottdale, Pa.		9	
Scottdale, Scottdale, Pa.		8	7
Vandergrift, Vandergrift, Pa.		35	20
Wellsville, Wellsville, O.		10	
Wood, McKeesport, Pa.		12	
Total	7	147	48

Also light plate mills: Aetna-Standard, 1; Gary, 2; Wood, 1; total, 4.

Tin Plate Mills.	Hot mills.	Tinning sets.
American, Elwood, Ind.	22	56
Cambridge, O. (no tin house)	7	..
Chester, Chester, W. Va.	7	17*
Crescent, Cleveland, O.	6	13
Farrell, Farrell, Pa.	20	32
La Belle, Wheeling, W. Va.	10	13
Laughlin, Martins Ferry, O.	23	46
National, Monessen, Pa.	25	47
New Castle, New Castle, Pa.	20	36
Pennsylvania, New Kensington, Pa.	8	13
Pittsburgh, New Kensington, Pa.	8	14
Sabraton, Morgantown, W. Va.	10	24*
Shenango, New Castle, Pa.	30	45
Total	196	356*

* Including terne sets: Chester, 5; Sabraton, 14; total 19.

Independent Sheet Mills.

	Jobbing mills.	Tin mills.	Sheet mills.	Total mills.	Galvanizing kettles.
Allegheny Steel Co., Brackenridge, Pa.			14	14	2
American Rolling Mill Co., Middletown, O.:					
East Side Works	3		9	12	7
Central Works			4	4	
Zanesville Works*		2	5	7	
Apollo Steel Co., Apollo, Pa.			6	6	3
Ashland Iron & Mining Co., Ashland, Ky.		2	4	6	3
Brier Hill Steel Co., Youngstown, O.:					
Empire Works, Niles		2	6	8	4
Thomas Works, Niles		1	11	12	6
Canonsburg Steel & Iron Works, Canonsburg, Pa.		3	3	6	
Canton Sheet Steel Co., Canton, O.	2		12	14	8
Carnahan Tin Plate & Sheet Co., Canton, O.*			1	1	
Deforest Sheet & Tinplate Co., Niles, O.*	1	2	7	10	6
Follansbee Bros. Co., Pittsburgh;					
Works, Follansbee, W. Va.*			7	7	3
Inland Steel Co., Chicago;					
Works, Indiana Harbor, Ind.	4	4	9	17	8
La Belle Iron Works, Steubenville, O.	2		8	10	4
McCullough Iron Co., Wilmington, Del.			4	4	2
Mansfield Sheet & Tin Plate Co., Mansfield, O.		3	4	7	
Massillon Rolling Mill Co., Massillon, O.		7	5	12	
National Enameling & Stamping Co., (*) New York; works:					
St. Louis, Mo.			6	6	8
Granite City, Ill.	2		4	6	
Newport Rolling Mill Co., Newport, Ky.		1	9	10	8
Otis Steel Co., Cleveland, O.	3			3	
Parkersburg Iron & Steel Co., Parkersburg, W. Va.		2	4	6	2
Reeves Manufacturing Co., Dover, O.		2	5	7	4
Seneca Iron & Steel Co., Buffalo, N. Y.			12	12	3
Stark Rolling Mill Co., Canton, O.	1		17	18	10
Trumbull Steel Co., Warren, O.*	2		14	16	10
Western Reserve Steel Co., Warren, O.	1		5	6	2
West Penn Steel Co., Brackenridge, Pa		2	8	10	
Whitaker-Glessner Co., Wheeling, W. Va.:					
Martins Ferry Works, Martins Ferry, O.			6	6	
Portsmouth Works, Portsmouth, O.	2		10	12	8
Whitaker Works, Wheeling, W. Va.*			9	9	
Wheeling Corrugating Co. (*) (controlled by Whitaker-Glessner Co.)					9
Alan Wood Iron & Steel Co., Philadelphia:					
Works, Conshohocken, Pa.			3	3	
J. Wood & Bros. Co., Conshohocken, Pa.			1	1	
Youngstown Iron & Steel Co., Youngstown, O.	1		8	9	3
Youngstown Sheet & Tube Co., Youngstown, O.		1	14	15	6
Total	24	34	254	312	129

* See also tin plate list.

Notes.—Western Reserve Steel Co., is adding two sheet mills, to be completed in the spring of 1917. Mahoning Valley Steel Co. is building a six-mill plant at Niles, O., to be completed in October or November, 1916.

¶ Also light plate mills: Allegheny Steel Co., 1; Inland Steel Co., 1; La Belle, Iron Works, 2; Alan Wood Iron & Steel Co., 6; J. Wood & Bros. Co., 12; Youngstown Iron & Steel Co., 1; total, 13.

Independent Tin Plate Mills.

	Tin Plate mills.	Tinning sets.
American Rolling Mill Co., Middletown, O., Zanesville Branch*		6†
Carnahan Tin Plate & Sheet Co., Canton, O.*	6	14†
Follansbee Bros. Co., Pittsburgh; works, Follansbee, W. Va.*	6	12
Griffiths Charcoal Iron Mills, Washington, Pa.	2	7†
Jones & Laughlin Steel Co., Pittsburgh; works, Woodlawn, Pa.	32	50
Lalanee & Grosjean Manufacturing Co., Harrisburg, Pa.	5	5
McKeesport Tin Plate Co., McKeesport, Pa.	43	80
National Enameling & Stamping Co., (*) New York; works, Granite City, Ill.	20	23
Phillips Sheet & Tin Plate Co., Weirton W. Va.;		
Clarksburg Plant 12 mills 28 sets		
Steubenville Plant 12 " 20 " "		
Weirton Plant 24 " 52 " " (totals)	48	100†
Pittsburgh Sheet & Tin Plate Co., Pittsburgh; works, Marietta, O.	4	9†
Standard Tin Plate Co., Canonsburg, Pa.	22	42†
Trumbull Steel Co., Warren, O.*	16	40†
N. & G. Taylor Co., Philadelphia; works, Cumberland, Md.	8	14†
Washington Tin Plate Co., Washington, Pa.	6	10
Wheeling Steel & Iron Co., Wheeling, W. Va.; works, Yorkville, O.	18	30
Whitaker-Glessner Co., Wheeling, W. Va.; Whitaker Works, Wheeling*	5	
Wheeling Corrugating Co. (controlled by Whitaker-Glessner Co.)*		13
Total	241	455†

* See also sheet mill list.

†The total of 455 sets includes 53 sets for terne plate: American Rolling Mill, 1; Carnahan, 10; Griffiths, 7; Phillips, (at Weirton) 6; Pittsburgh, (at Marietta) 6; Standard, 6; Taylor, 7; Trumbull, 4; Wheeling Corrugating, 6.

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The Rule of Doubling In Pig Iron.

When the slump in iron and steel demand occurred at the time of the panic of October, 1907, the majority of observers felt that a very serious backset had been received in the iron and steel industry. In the bleak December and January that followed the heavy tonnages then recently attained seemed altogether exceptional, and it was thought that it would be a long time before the 28,000,000 ton pig iron production rate, seen in October, would be reached again. For some time afterwards demand backed and filled and there were many who suggested that the old rule of pig iron production doubling every ten years had broken down. Anyone could recognize, of course, that such a geometrical progression could not continue indefinitely. The rule would have to break down some time and it looked as if it had then done so.

It is well to point out that the outlook to-day is altogether different. It can now be shown that, from the broad viewpoint, the rule really has not broken down thus far, while the prospects are certainly encouraging for the next ten years.

It is impossible to make illuminating comparisons of pig iron production year by year, as the annual fluctuations are so large, while comparisons of production in ten-year periods are conclusive, as they account for all the iron, and tend to average. The record for the series of ten year periods ending December 31, 1915, is a remarkable one, and a close correspondence with the rule is shown by taking a broad view. It chances that the production in the past ten years makes a number that is conveniently subject to repeated bisections, and we make the comparison in the following interesting form.

Pig Iron Production, Gross Tons.

	Actual Production.	Bisections
1906-1915 ..	257,714,701	256,000,000
1896-1905 ..	148,658,012	128,000,000
1886-1895 ..	76,061,628	64,000,000
1876-1885 ..	32,319,295	32,000,000
1866-1875 ..	18,589,866	16,000,000
1856-1865 ..	7,951,047	8,000,000
1846-1855 ..	6,400,000	4,000,000
1836-1845 ..	3,000,000	2,000,000
1826-1835 ..	1,600,000	1,000,000

Study of the foregoing table will show a remarkable agreement between the actual production and the production that would be indicated by the rule of doubling. Noting the ten-year periods ending respectively 1865, 1885 and 1915 the harmony is astonishingly exact. In various other periods the agreement is not far out. Where there is a divergence the actual production is greater than the computed, which shows, of course, that the production in the past ten years was not altogether up to the amount that would be indicated by multiplying the production in some previous period by a multiple of two. Making the comparison in this particular way puts it on a conservative basis, for it indicates that it would be particularly easy for production in the next ten years to be double that in the past ten.

For production to be doubled in the next ten years would require an average of 51,500,000 tons a year. Thus far this year we have been averaging more than 39,000,000 tons a year, and the furnaces now being built or expected to be built shortly represent more than a 10% increase. Thus we are making an excellent start on the next ten-year period.

The British Censorship and Blacklist.

An important conference took place in New York Sept. 27, when Sir Richard Crawford, trade adviser to the British Embassy, met at luncheon some of the leading bankers and business men, in an informal way, with a view of explaining and adjusting some of the misunderstandings and difficulties that seem to exist at the present time as regards the British censorship and blacklist. Sir Richard Crawford issued the following statement:

"It may be observed that in Great Britain the principle of domicile had been accepted prior to this war, whereby trading with an enemy applied only to trading with an enemy domiciled in enemy territory; whereas, in the other allied countries, as also in Germany, an enemy is an enemy by birth and status wherever he may be domiciled, and trading with him is an offense under the laws of those countries. In the prosecution of the war it was found imperative, in order to ensure uniformity of procedure on the part of the Allies, for Great Britain to adopt the principle recognized by her Allies, and accordingly the Trading With the Enemy Extension act was introduced, which makes it a penal offense for any British subject to trade with a firm of enemy nationality, or with enemy interests, wherever situated.

How British Firms Trading With America Were Affected.

"The result was at once to confront a large number of British houses engaged in trade with thousands of firms with German names in the United States, with the serious problem of determining for themselves whether such firms were in fact enemy houses by nationality or whether, notwithstanding their status as American corporations, they were by their constitution or by the unneutrality of their transactions in all respects to be regarded as enemy concerns within the meaning of the law.

Gives Striking Example.

"A striking example of the incidence and rigorous application of the Trading With the Enemy Act was soon forthcoming in the case of a British house which was prosecuted for obtaining indirectly goods of enemy origin for the purpose of its business. In that case the principal of the firm concerned was sentenced to a term of imprisonment, followed by other disabilities, including the stigma of want of patriotism, while an American house of enemy antecedents, indirectly implicated, had received a permit from the British authorities to bring out goods of the same description from an enemy country. The act immediately became a very living and real thing to every British firm trading with the United States. The penalties, material and moral, were so disastrous to their existence and honor that there was widespread apprehension and uncertainty, which threatened to disorganize the business of a large body of American citizens whose names might have aroused unfounded suspicions as to the neutrality of their transactions and interests.

Really Protects Strictly Neutral American Firms.

In these circumstances the British Government was impelled to afford such information to British subjects as would enable them without the fear of bringing themselves within the purview of the act. After careful examination of all the evidence before them the British authorities found that out of the thousands of firms in the United States bearing names which might have caused hesitation on the part of British subjects to engage in trade with them, only a very small proportion were, in the opinion of the British Government, properly to be classed at unneutral. The publication of these few names has served to remove this hesitation, and while it has enabled British subjects to avoid incurring penalties under the laws of their country. It has at the same time relieved a large body of American citizens from the effects of

unfounded suspicion which might have had disastrous results on their trading interests.

"In other words, the publication of the statutory list has indeed operated as a white list, and to call it a black list is in fact a misnomer."

Favorable Impression Made.

After the meeting officers of some of the large banks who attended it, said that they were impressed by the talk of the British official and that they had gone away with an entirely different view of the situation. They confessed that their conversation wih Si Richard had convinced them that the had entertained an erroneous view c the purposes and effects of the publica tion of the British blacklist. One c the bankers who attended the luncheo said he felt that the British Goverr ment was sincerely desirous of avoidin any offense to American firms and tha every possible means would be taken t reduce to a minimum the hardships ir flicted upon innocents through the op eration of rules designed to prever British subjects from unintentionall trading with enemy firms.

Topical Talks On Iron.

XLII.—Transporting Ores Down the Lakes.

The American iron and steel industry is one of vast tonnages, and one of the interesting instances of enormous tonnages is that of iron ore transportation down the Great Lakes from the great Lake Superior ore region. As nearly all the furnaces tributary to the Lake Superior region are in Illinois, Indiana, Ohio, West Virginia, Pennsylvania and New York, the great bulk of the ore is moved down the lakes. An average of a trifle less than a million tons a year has been moved out of the region by all-rail routes, and this tonnage is augmented in 1916 by the operation of the Steel Corporation's two new furnaces at Duluth, so that an all-rail movement of one and a half to two million tons is indicated for the future.

In our last Topical Talk it was noted that the first canal at the Saulte was opened in 1855, inaugurating the regular lake movement of ore, with 1,449 tons the first year. In 1913 the movement amounted to about 49,000,000 tons. Lake shipping has been revolutionized over and over again One of the interesting revolutions was the "whalebacks" of the early nineties, a string of them being towed by one steamer, but the whalebacks lasted only a few years.

The average iron ore cargo at present is about 7,500 tons. There are about 395 vessels in the lake fleet, engaged more or less regularly in transporting ore, the total capacity being figured at 2,950,000 tons for one trip. A normal season's experience for a lake vessel is 20 round trips, carrying ore down each trip, and taking coal on four c five of the up trips, the remainder b ing made light. In addition to thi one or two down trips may be mad with grain. Under heavy pressur such as exists this year, and with fa vorable conditions all around, two c three extra trips may be made. Ind cations are that this year the fleet wi bring down the lakes a total of full 62,000,000 tons of ore, against the normal rating, as indicated above, c 59,000,000 tons 20 trips at 2,950,00 tons per trip.

This heavy despatch is accomplishe by the greatest refinement at all point There have been constant improv ments at both the loading and the u loading docks, and the construction c vessels, as to facilities for loading an unloading, and speed, has been brough to a very exact science. The large boats have a capacity slightly in exce of what they can accomplish with th drafts permitted. For a long time th pinch was at the locks at the Sault but at present the shallowest point in Lake St. Clair. So exact is the op eration that the largest boats are loa ed with an extra draft astern, on th computation that by the time Lake S Clair is reached the consumption c coal will have brought the draft to th permissable point.

The record ore cargo was carried b the W. P. Snyder, Jr., 13,800 gross ton This vessel has a length of 617 fe over all, 64 feet beam and 33 fe depth, with a maximum draft of 20 fe 10 inches.

Steel Making Capacity.

The Increases During the War and Those to Follow.

The **Iron Age** has compiled a statement of the additions that have been made to steel making capacity thus far this year, with a statement of additions likely to be completed by the end of this year, and an estimate of the later additions, chiefly in the form of large projects which are not at all likely to be completed until the war is over. Supplying information as to the capacity available before this year a very interesting presentation can be made. The **Iron Age** figures are as follows, in gross tons of annual ingot capacity:

Thus far this year..	2,700,000
Later in year	500,000
Still later	4,000,000

We adopt these figures, except that we deduct 100,000 tons from the first item as the increased capacity assigned to the duplexing addition at Donora seems excessive, and we are indisposed to conclude that of the 4,000,000 tons to be completed after this year two-thirds to three fourths is likely to get into commission next year.

The Annual Increases.

The production of steel ingots in 1912 was 30,284,682 gross tons. We find that we can make reasonable assumptions to account for the new construction reported since then and to bring out the capacity at the beginning of this year at the estimated rate of production. We take the 1912 production as equal to 90% of the capacity existing at the close of that year, the production dividend by .9 being precisely 33,650,000 tons. Thus we have the following:

Steel Ingot Capacity Per Annum.

January 1, 1913	33,650,000
New furnaces in 1913	2,920,000
New furnaces in 1914	1,215,000
New furnaces in 1915	1,405,000
Minor improvements a. old furnaces in three years ..	810,000
January 1, 1916	40,000,000
New furnaces in 1916	3,100,000
January 1, 1917	43,100,000

Thus in four years, January 1, 1913, to January 1, 1917, there is an increase in capacity amounting to 28%. That is equivalent to an average rate of increase, on one date as compared with that of a year previous, of 6.4%, while such an annual rate if continued for ten years (on the compound interest principle) would amount to 85.7% increase in ten years, or less than the rate of doubling which it has been hitherto supposed the steel industry could readily bear.

It is entirely possible for domestic demand, either latent or expressed in actual orders, to grow at this rate. Demand for iron and steel grows while it sleeps, and after every period of depression demand is expressed in actual orders at a rate far in excess of the best previous rate.

It is a question of whether demand will be expressed, whether high prices or other circumstances will cause the expression of demand to be deferred. Frequently the existence of stocks curtails actual buying. It is generally claimed that at this time the country is bare of stocks. Certainly the delivery premiums being paid for many commodities the existence of large stocks could not be reconciled. As to curtailment of demand from high prices, the latest news is of increased buying of freight cars, at record high prices, and of the agricultural implement makers finding a much larger demand for farm machinery than they had anticipated. The general conclusion is that the people can afford to pay much higher prices for steel and steel products than was assumed only a few months ago.

With the 4,000,000 tons of steel making capacity that is to follow the new construction soon to be completed one need not be greatly concerned, in connection with a forecast of what is to be expected in American business while the war continues. This 4,000,000 tons

of prospective capacity is chiefly in the form of large units, involving on the whole vastly more construction work than has been required in most of the additions lately made, those consisting largely of adding furnaces here and there to existing plants. Labor is so scarce that construction work on these large projects cannot be pushed. The labor is needed to make steel in the existing plants. The Steel Corporation's Gary Bessemer plant and pipe mill is still in the offices of the engineers. If the 43,000,000 tons capacity indicated for January 1, 1917 is to be augmented by 4,000,000 tons in two years following, the average annual increase for the two years will be only 4.5%. The tonnages look large but it is a large industry now.

August exports furnished a new record, yet all the finished steel involved directly and indirectly in exports is only about 30% of our current finished steel production. The domestic demand is extremely large and as the country grows more and more prosperous through the heavy trade balance the domestic consumption should readily continue. The export trade may reasonably be counted upon to continue through the war. The allies show no signs of exhaustion. As pointed out elsewhere in this issue in an analysis of our merchandise trade balance, the foreigners have established a credit with us to date, having settled, in sending us gold, in selling us our securities and in floating loans with us, for a larger quantity of merchandise than we have yet exported.

Manganese Supplies.

More recent statistics as to ferromanganese exports are to be available in future. Hitherto the Monthly Summary has included ferromanganese with "pig iron" in stating the imports, the separate ferromanganese statistics being given only in the quarterly report, which is not published until many months after the quarter is ended. Beginning with the Monthly Summary of July the ferromanganese imports are reported separately.

This year's ferromanganese imports have been as follows:

Six months	34,821
July	5,341
August	8,525
Eight months	48,687

In the five years ending 1912 the domestic ferromanganese production equalled 35.4% of the weight of manganese ore imported. In 1913 and 1914 the average was 36.0%, but it is possible nevertheless that the ores were leaner on the average and that the larger production was due to reduction in stocks of ore. We are not likely to be far out, however, in assuming that our domestic production this year is running at the rate of 35% of the weight of ore imported, the imports having been thus far at the rate of 460,000 tons a year, so that our production should be at the rate of 160,000 tons while the imports have been at the rate of 73,000 tons, making supplies apparently at the rate of 233,000 tons a year.

In the **Steel and Metal Digest** for March, 1915, it was computed that the average normal consumption (1901-13 inclusive) of ferromanganese is .764% of the weight of steel ingots and castings the manufacture of which involves its use, the production of Bessemer rail steel, which has always involved the employment of spiegeleisen, and the production of special steels, being excluded. Since ferromanganese became scarce the consumption has been reduced very considerably, both by the practice of ordinary economy and by the use of substitutes, spiegeleisen, ferrosilicon, etc. Dividing the imports and production in 1915 by the steel production that would normally consume ferromanganese one obtains a factor of .58% instead of .764%, but that establishes nothing since one does not know the extent to which stocks of ferromanganese were drawn upon.

It is interesting, however, to compare the rate of supply this year, figured above as 233,000 tons, with what would be normal consumption. We estimate that production of steel ingots and castings that would normally involve ferromanganese consumption has been at the rate of about 42,000,000 tons a year, and applying the factor .764% to this one obtains 320,000 tons. It is possible that the steel works, on the whole, have been able to get along with three-fourths as much ferromanganese as they usually employ in making steel, that being the proportion between 320,000 tons and 233,000 tons.

The following table shows the statistics available to date.

	Manganese ore imports.	Ferromanganese imports	Ferromanganese production.	Production plus imports.
1901	165,722	20,750	59,639	80,389
1902	235,576	50,388	44,526	94,914
1903	146,056	41,518	35,961	77,479
1904	108,519	21,814	57,076	78,890
1905	257,033	52,841	62,186	115,027
1906	221,260	84,359	55,520	139,879
1907	209,021	87,400	55,918	143,318
1908	178,203	44,624	40,642	85,266
1909	212,765	88,934	82,209	171,143
1910	242,348	114,278	71,376	185,654
1911	176,852	80,263	74,482	154,745
1912	300,661	99,137	125,378	224,515
1913	345,090	128,070	119,495	247,565
1914	283,294	82,997	106,083	189,080
1915	320,782	55,263	129,072	184,335
1916	230,226*	48,687†	.....	.....

* Six months. † Eight months.

Tin Plate Price Changes.

Changes in prices per box 14 x 20, prime Bessemer coke tin plate, 100-lb., f.o.b. mill, Pittsburgh district, with prices of pig tin, New York, and sheet bars, Pittsburgh, same date.

	Tin Plates.	Tin.	Sheet Bars.
Jan. 6, 1899	3.00	20.75	17.50
Jan. 26, 1899	3.25	24.50	18.50
Feb. 17, 1899	3.50	23.75	22.00
Mar. 8, 1899	3.87½	23.70	25.00
July 14, 1899	4.37½	29.12½	33.50
Aug. 6, 1899	4.65	31.25	36.00
Sept. 24, 1900 ...	4.00	28.62½	22.00
Nov. 3, 1902	3.60*	26.75	31.75
Mar. 3, 1903	3.80*	30.80	31.50
Nov. 16, 1903	3.60*	25.40	24.00
Jan. 25, 1904	3.45*	28.20	24.00
July 25, 1904 .. (a)	3.30*	27.10	24.00
Nov. 15, 1904	3.45*	29.15	22.50
Dec. 22, 1904	3.55*	29.25	23.00
Oct. 3, 1905	3.35*	32.60	26.00
Oct. 20, 1905	3.45*	32.60	26.00
Nov. 20, 1905	3.40*	33.55	26.00
Jan. 8, 1906	3.50*	36.25	26.00
April 10, 1906	3.60*	38.75	28.00
May 19, 1906	3.75*	44.75	28.00
Oct. 25, 1906	3.90*	43.25	30.00
Jan. 6, 1908	3.70*	27.35	29.00
Mar. 10, 1909	3.40	28.70	25.00
Sept. 28, 1909 ...	3.50	30.85	27.50
Nov. 12, 1909 ...	3.60	30.50	28.50
Feb. 3, 1911	3.70	41.40	24.00
Aug. 12, 1911	3.60	43.00	22.00
Oct. 16, 1911	3.40	41.70	20.00
July 9, 1912	3.50	44.40	22.00(b)
Sept. 4, 1912	3.60	47.20	23.75(b)
Oct. 2, 1913	3.50	41.20	25.00
Nov. 3, 1913	3.40	39.90	21.50
Dec. 3, 1914	3.20	33.50	19.50
Nov. 11, 1915	3.60	39.00	26.50(b)
Oct. 7, 1916	6.00	39.87½	45.00

* Subject to 5-cent rebate.

(a) Cash discount changed from 1 to 2%.

(b) Premium for open-hearth.

Steel Plants.

XI. The La Belle Iron Works.

From a near viewpoint one might conclude that as the steel industry grows its members simply grow with it, some faster and some more slowly. From the longer range the aspect is quite different. Many of the most successful concerns have at one time or another abandoned works which in their day were highly successful, and all have had to spend vast sums of money to maintain their position in the race. One observes the successes for they remain, while the wrecks are cleared away and forgotten.

The La Belle Iron Works of to-day is a prosperous steel interest located at Steubenville, O., with a couple blast furnaces, some open-hearth furnaces, finishing mills and a by-product coking plant almost completed. Incidentally, the newcomer would say, it has a little plant at Wheeling, W. Va., where it rolls skelp and nail plate in two mills and makes a thousand kegs or so of cut nails a day.

As a matter of fact the original La Belle Iron Works was a concern operating this Wheeling plant, built in 1852. For a long time the plant contained puddling furnaces, the iron being rolled into skelp and nail plate and cut nails being made. When the general change from wrought iron to steel occurred, in the early nineties, some of the iron interests financed the change and established steel mills. Others were lost entirely. The La Belle Iron Works simply abandoned its puddling furnaces, maintaining its rolling equipment, and built a tin plate plant, which made money. Towards the close of 1898 the tin plate plant was sold to Judge Moore and became the La Belle plant of the American Tin Plate Company. There was a little plant at Steubenville, O., known as the Jefferson Iron Works, containing a train of 21-inch plate rolls and 128 cut nail machines. It had gone into receivers' hands and the La Belle Iron Works bought the plant for a small sum and then proceeded to build a steel mill, acquiring also an old blast furnace at Steubenville. Thus it changed from a Wheeling concern with a mill at Steubenville bought to dismantle to a Steubenville concern with a relatively small plant at Wheeling.

The Steubenville plant comprises among other items the following:

94 by-product ovens, almost completed, across the river from Steubenville, O. There is a five-year coal contract with the Pittsburgh Coal Company.

Two blast furnaces, 90x20 feet, of 300,000 tons total annual capacity.

Eleven 50-ton basic open-hearth furnaces with a 300-ton metal mixer, rated at over 400,000 tons of steel ingots a year.

One universal plate mill, two sheared plate mills, two skelp mills with continuous heating furnaces, three jobbing plate mills and eight sheet mills, with galvanizing and roofing departments, etc.

Pipe mill with two lap weld and two butt weld furnaces, socket shop, galvanizing department, etc.

To make its position especially secure as to raw materials the company acquired altogether about 6,000 acres of coal in Ohio and West Virginia, and two iron ore mines on the Mesabi Range, producing 700,000 tons of ore a year. It also operates a lake vessel, the La Belle, and has a number of gas wells.

———o-O-o———

The Iron and Steel Situation.

A New Steel Movement.

The outstanding fact is that a new movement has started in the steel market. Demand upon the mills has increased and prices show an advancing tendency all along the line. Such a thing is unprecedented. In all the history of the steel market price advancing movements have been clear cut. They started, they continued and they ended. Then, after a longer or shorter pause, a decline would commence and the decline continued until the market was thoroughly shaken out and market prices approximated the cost of production. Never has a fresh advance started without an intermediate decline, but that is what is occurring this time. The advance in steel products practically ended last March. There were occasional advances thereafter, but they were altogether sporadic. Now the general trend is upwards again.

High Prices Can Be Paid.

The new fact that makes this development possible, that causes it, indeed, is that buyers can afford to pay very high prices for steel. All along it has been supposed that many could not. Last June the common view was that high prosperity in steel, and pressure upon mills for deliveries, would last but little longer than the period during which the orders then on books would carry the mills. It was even thought that some of the contract business then on books would not be carried out. A fair measure of buying in June, July and August suggested that the period would be somewhat lengthened, but it was hardly thought that the new business coming in could equal the old business being filled, so that the business would run down, but not altogether as rapidly as had been expected.

By this time we have all learned that we knew nothing about it. There may be many limits, in normal times, to the buying power and paying ability of the people. The limits at present one knows nothing about. For instance, orders for freight cars amounted to 21,337 cars in January, decreasing month by month to 1,883 cars in July, less than one-tenth as many. The buying decreased practically in inverse ratio as the price of plates and other steel material advanced. The railroads were done, according to the common appraisement, and would not buy cars again, except in odd lots, until prices were materially lower. The cars placed in July probably involved plates at 2.75c, when the open market was 2.90c, but now the open market is 3.00c, for very late delivery, with higher prices for earlier deliveries and—about 20,000 cars were sold in September, while there is inquiry pending for more than 10,000!

Another illustration. Last July the statement was made, apparently upon good authority among the producing ranks, that 80,000 tons of steel bars had been sold to agricultural implement makers at 2.35c, the regular market being 2.50c. Promptly the implement makers announced that they had not bought at 2.35c and would not. They could not afford to pay the price, for their products would not sell at the prices they would have to ask. The mills rejoined, early in August, by advancing the open market from 2.50c to 2.60c and giving the implement makers the remainder of the month in which to close at 2.50c. The latest news is that the implement makers find there will be a heavy demand for implements and that they are asking the mills to accept additional tonnages on the contracts closed in August.

In our review of a month ago reference was made to a gradual change of sentiment among buyers as to taking hold for next year at the high prices. That change has proceeded farther and the buyers are ready to take hold but they find mills unwilling to sell except in the case of specific orders. There is less placing of open contracts than ever.

Exports.

Thus the situation has altogether changed. It is not to be asserted that every consumer is found able to pay high prices, for as large tonnages as formerly but that is evidently the general position. Decreases in consumption, on account of high prices, cannot be very great, from the present outlook, and whatever they are it now appears that export demand will step in and take up the slack. August made a new record in iron and steel exports, with 598,000 tons. It was in June, 1915, that the month export record before the war was broken. From June, 1915, to August, 1916, inclusive is 15 months, and six of those months have made new records. If exports do not increase in the next few months it will be because the orders cannot be accepted. The export demand exists.

It may be noted that the export demand for pig iron has greatly increased. The English government is credited with having bought 100,000 tons of basic from Sloss-Sheffield, for shipment October to March inclusive, absorbing the output of two of Sloss's four furnaces, and there is demand for valley basic as well.

Tin Plate Market Opened.

On October 8th several of the independent tin plate mills opened their books for first half business at $6.00 per base box, the price for the season closing having been $3.60. That price had proved altogether absurd, on account of developments during the year and the mills have declared positively they are done selling tin plate a year ahead, and also done with making open contracts, subject to price guarantees etc., for the contracts they made have been specified in full and result in their having to carry over into 1917 about two months of production, chiefly at about $3.60. The new price of $6.00 seems very high, but considering the greatly increased labor cost and the ad

Pig Iron Prices.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered.

	Bessemer,	Basic, Valley	No. 2 fdy.	Basic, Phila.	No 2X fdy. Phila.	No. 2 fdy. Buffalo.	Cleveland.	Chicago.	Birmingham.	Ferro-manganese.*	Furnace coke x
1915											
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.55
Mar. ..	13.60	12.50	12.75	13.50	14.05	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.55
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.35
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.85
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.45
May ..	21.00	18.21	18.44	20.50	20.25	19.15	19.08	19.50	15.00	175.00	2.34
June ..	21.00	18.25	18.39	19.90	20.04	18.75	19.30	19.50	14.63	175.00	2.54
July ..	21.00	18.00	18.25	19.15	19.75	18.75	18.80	19.50	14.00	175.00	2.65
Aug. ..	21.00	18.00	18.27	19.00	19.58	18.75	18.57	19.17	14.00	175.00	2.75
Sept. .	21.32	18.27	18.58	19.50	19.50	19.04	18.67	18.75	14.38	165.00	2.94

* Contract price, f.o.b. Baltimore; x Prompt, f.o.b. Connellsville ovens.

vances in all supplies it is not especially high. It reflects in some measure, however, the tin plate position, which is that the whole matter is one of securing deliveries. All the indications are that there will not be enough production to go around, and that despite the fact that there are some new mills and the further fact that the tin plate mills are practically giving up their business in black plate specialties, the tonnage of which last year was about one-fifth of the total they rolled.

Unfinished Steel.

About the beginning of August offerings of billets and sheet bars practically disappeared. The mills would not quote for either early or late delivery. The situation was almost weird and there were few who believed it could continue. Surely a situation would eventually arise in which unfinished steel would be offered, at a price. Up to date the situation has, if possible, grown more tight. The trade continues to call "the market" $45 to $50, but the figures are practically nominal. The Carnegie settlement basis for fourth quarter sheet bars on long term contracts is reported to be $42, against $37 for the third quarter, and $45 or $47 is already predicted for the first quarter. Foreign buyers would readily buy large tonnages of both billets and sheet bars, but as they cannot be secured there have been large purchases of shell steel discards and rejections, simply because the material is better than nothing.

Pig Iron.

Pig iron presents a very curious study. Last year the market was practically stationary for six or seven months, while steel prices were advancing moderately, and then pig iron advanced, for remainder of the year, about $5 a ton. To date this year has been a replica of last. The market was stationary, at the advanced level, until early August. Then a few selling interests started a drive and cut prices. A movement was inaugurated which in

Finished Steel Prices.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved	Sheets				Comp.
1915	Shapes	Plates,	Bars,	Pipe,	Wire,	Wire Nails.	Steel Skelp.	Black.	Galv.	Blue Annld.	Tin plate.	Fin. steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3.60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.75	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5692
August	1.30	1.26	1.30	79	1.38	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.25	2.40	2.35	2.89	5.00	2.95	4.70	2.7166
May	2.50	2.83	2.50	70	2.45	2.50	2.35	290	5.00	3.00	5.46	2.8043
June	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.80	3.00	5.75	2.8300
July	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.40	2.90	6.00	2.8425
Aug.	2.54	2.94	2.56	70	2.53	2.58	2.35	2.90	4.20	2.90	5.54	2.8588
Sept.	2.60	3.00	2.60	69¼	2.55	260	2.35	2.91	4.20	2.90	5.75	2.9013

September has advanced prices rather sharply.

We cannot judge the market's future by what has occurred. That buyers of pig iron have freely paid advances of 50 cents to $1.50 a ton means little in itself for everything is so uncertain that the buyer cannot hesitate over such trifles. It is conceivable that it may be found the advances were not altogether necessary, but it is just as easily imagined that buyers will not stop at paying $5, or $10, advance, particularly for steel making iron.

As to demand and supply. In many quarters the theory has been entertained all year that the constant additions to steel making capacity, when pig iron production would not be increased materially, would result in a scarcity of pig iron as there has been a scarcity of steel. The hot weather of July and August, curtailing steel production more than it did pig iron production, may have operated to delay the development, and a marked scarcity of pig iron may now occur. Certainly this is the reasonable assumption. At this writing prospects are that ore for next season will be about $1 a ton higher and coke 50 cents to $1. If so, the furnaces have made a mistake in selling first half iron at old prices or at slight advances. They may even have a smaller margin of profit next May and June than they have had in the past two months.

The War and Steel Demand.

Some observers outside the steel in dustry were disposed two or thre months ago to dispute the steel trade' appraisal that the war would last fro one to two years longer, but all wi now admit that the steel trade wa probably right. The latest development indicate that throughout duration c the war, provided of course the dura tion of the war does not extend to complete prostration of the belligerent there will be a heavy demand for ste at approximately present or higher pr ces. Absolutely enormous profits a still to be made. Given the opportu ity, the steel industry might so expan as to find itself after the war with large surplus of productive capacit but the opportunity is not afforde Men and materials cannot be foun The steel mills are physically unable spend their surplus earnings. Constru tion work that involves an early co pletion of productive units can be pus ed, but the large projects must be he rather in abeyance. At the end of t war the steel industry will find its with a large capacity but not an e tremely large capacity considering t growth of the country, and the co mon appraisal is that there will be su a loosening of investment funds f permanent investment as to furnish t steel trade with a good demand, course at moderate prices, whatev they may prove to be, for a period years.

Lake Superior Iron Ore.

Shipments of iron ore down the lakes have been as follows, in gross tons:

	1911.	1912.	1913.	1914.	1915.	1916.
April	331,645	204,042	866,386	269,686	503,832	1,658,41
May	3,684,819	5,919,074	7,284,212	3,852,063	5,012,359	8,449,58
June	4,819,996	7,567,555	7,974,444	5,502,367	6,005,591	9,507,57
July	5,221,373	7,600,233	8,204,416	5,784,514	7,204,021	9,750,15
August	5,548,311	7,760,248	7,677,601	5,869,477	8,081,117	9,850,14
September	5,231,069	7,287,230	7,258,413	5,438,049	7,863,146	9,600,78
October	4,769,965	7,010,219	6,526,103	4,242,392	7,146,873	.....
November	2,523,253	4,072,674	3,270,958	1,068,682	4,445,129	.....
December		14,579	18,545	1,411	57,236	.....
Season Lake ..	32,130,411	47,435,777	49,070,478	32,021,987	46,318,804	48,816,65

U. S. Steel Corporation's Operations.

Earnings and Unfilled Orders.

Earnings by Quarters.

Net earnings by quarters since 1911:

Quarter.	1916.	1915.	1914.
1st	$60,713,624	$12,457,809	$17,994,382
2nd	81,126,048	27,950,055	20,457,596
3rd		38,710,644	22,276,002
4th		51,277,504	10,935,635
Year		130,396,012	71,663,615
	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38,450,100	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year	137,181,345	108,174,673	104,305,466

Unfilled Orders.

(At end of the Quarter.)

	First.	Second.	Third.	Fourth.
1904	4,136,961	3,192,277	3,027,436	4,696,203
1905	5,579,560	4,829,655	5,865,377	7,605,086
1906	7,018,712	6,809,584	7,936,884	4,489,718
1907	8,043,858	7,603,878	6,425,008	4,642,553
1908	3,765,343	3,313,876	3,421,977	3,603,527
1909	3,542,590	4,057,939	4,796,833	5,927,031
1910	5,402,514	4,237,794	3,158,106	2,674,757
1911	3,447,301	3,361,058	3,611,317	5,084,761
1912	5,304,841	5,807,346	6,551,507	7,932,164
1913	7,468,956	5,807,317	5,003,785	4,282,108
1914	4,653,825	4,032,857	3,787,667	3,836,643
1915	4,255,749	4,678,196	5,317,608	7,805,220
1916	9,331,001	9,640,458		

Bookings and Shipments.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

1914	Shipments. %	Bookings. %	Difference. %	Difference. Tons.
December	38	82	+44	+512,051
1915				
January	44	81	+37	+411,928
February	57	66	+ 9	+ 96,800
March	67	60	- 7	- 89,622
April	71	63	- 8	- 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	- 2	- 20,085
September	98	133	+35	+409,163
October	103	172	+69	+847,834
November	102	186	+84	+1,024,037
December	102	152	+50	+615,731
1916				
January	102	112	+10	+116,547
February	102	157	+55	+646,199
March	104	164	+60	+762,035
April	104	146	+42	+498,550
May	104	82	-22	-297,340
June	104	82	-22	-297,340
July	90	86	- 4	- 46,866
August	92	97	+ 5	+ 66,765

Railroad Earnings.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000. this being about 229,000 miles or about 90% of the total steam railway mileage: compiled by the Bureau of Railway Economics from duplicates of reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August	1,244	856	388	1,171	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January	1,021	795	226	939	718	221	1,133	797	336
February	914	746	168	900	680	220	1,140	800	340
March	1,091	801	290	1,015	722	293	1,260	844	416
April	1,038	782	256	1,013	724	289	1,223	827	396
May	1,047	800	247	1,044	735	309	1,307	857	450
June	1,097	789	308	1,094	732	362	1,302	851	451

Iron and Steel Imports and Exports.

Value of Tonnage and Non-Tonnage.

	1911.	1912.	1913.	1914.	1915.	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,560,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	58,300,297
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	58,722,411
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	72,918,913
June	20,310,053	24,795,802	25,228,346	18,927,958	31,730,132	76,257,884
July	17,454,772	24,917,952	24,170,704	16,737,552	35,891,575	70,345,162
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,822	86,296,703
September ...	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$528,640,563

Exports of Tonnage Lines,---Gross Tons.

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.
January	70,109	118,681.	152,262	151,575	249,493	118,770	140,550	357,12
February	84,837	110,224	150,919	204,969	241,888	121,206	139,946	368,86
March	94,519	124,980	216,360	218,219	257,519	159,998	174,104	438,05
April	100,911	117,921	228,149	267,313	259,689	161,952	223,587	384,92
May	109,808	135,306	178,589	307,656	242,353	139,107	263,113	540,54
June	114,724	120,601	174,247	273,188	243,108	144,539	356,431	526,77
July	100,850	127,578	162,855	272,778	237,159	114,790	378,897	497,00
August	105,690	131,391	177,902	282,645	209,856	86,599	405,853	598,00
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	3,711,29

Iron Ore Imports.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,844
Feb. ..	188,734	112,574	78,773	93,315
Mar. .	164,865	68,549	88,402	93,383
April.	174,162	111,812	91,561	75,712
May .	191,860	125,659	98,974	148,599
June .	241,069	188,647	118,575	134 154
July .	272,017	141,838	119,468	.....
Aug. .	213,139	134,913	126,806	.....
Sept. .	295,424	109,176	173,253	.....
Oct. ..	274,418	114,341	138,318	.....
Nov. .	179,727	90,222	113,544	.....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	635,007

Iron and Steel Imports.

	1912.	1913.	1914.	1915.	191
Jan. .	20,008	21,740	17,776	10,568	15,8
Feb. .	11,622	25,505	14,757	7,506	20,2
Mar. .	15,466	27,467	27,829	8,025	15,1
April.	12,481	25,742	30,585	16,565	20,1
May .	15,949	28,728	28,173	28,916	32,1
June .	21,407	36,597	23,076	32,200	26,8
July .	17,882	36,694	25,282	20,858	14,7
Aug. .	20,371	18,740	28,768	27,556	32,2
Sept..	18,740	19,941	38,420	23,344	..
Oct. .	25,559	20,840	22,754	34,319	..
Nov. .	24,154	25,809	24,165	37,131	..
Dec. .	21,231	26,454	9,493	35,455	..
Total	225,072	317,260	289,778	282,443	177,4

Price Changes of Iron and Steel Products From April 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our composite finished steel. In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the rates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
April 1	Plates	1.15	to 1.20
" 1	Shapes	1.15	to 1.20
" 14	Wire nails	1.60	to 1.55
May 1	Steel pipe	80%	to 79%
" 1	Boiler tubes	75%	to 74%
" 1	Tin plate	3.20	to 3.10
" 12	Plates	1.20	to 1.15
" 17	Galvanized sheets	3.40	to 3.60
" 24	Galvanized sheets	3.60	to 3.75
June 1	Galvanized pipe	62½	to 63½
" 24	Galvanized sheets	3.75	to 4.25
" 1	Wire galvanizing	60c	to 80c
" 8	Sheets	1.80	to 1.75
" 9	Galvanized sheets	4.25	to 5.00
" 15	Boiler tubes	74%	to 73%
July 1	Bars	1.20	to 1.25
" 1	Plates	1.15	to 1.20
" 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
Sept. 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00

1915—			
Oct. 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galvanized sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
Oct. 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galvanized sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galvanized sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galvanized sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
Nov. 18	Shapes	1.60	to 1.70
" 18	Galvanized sheets	4.00	to 4.25
" 24	Galvanized sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galvanized sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
Jan. 3	Tin plate	3.60	to 3.75
" 3	Blue ann. sheets	2.25	to 2.35
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%	78%	to 77%

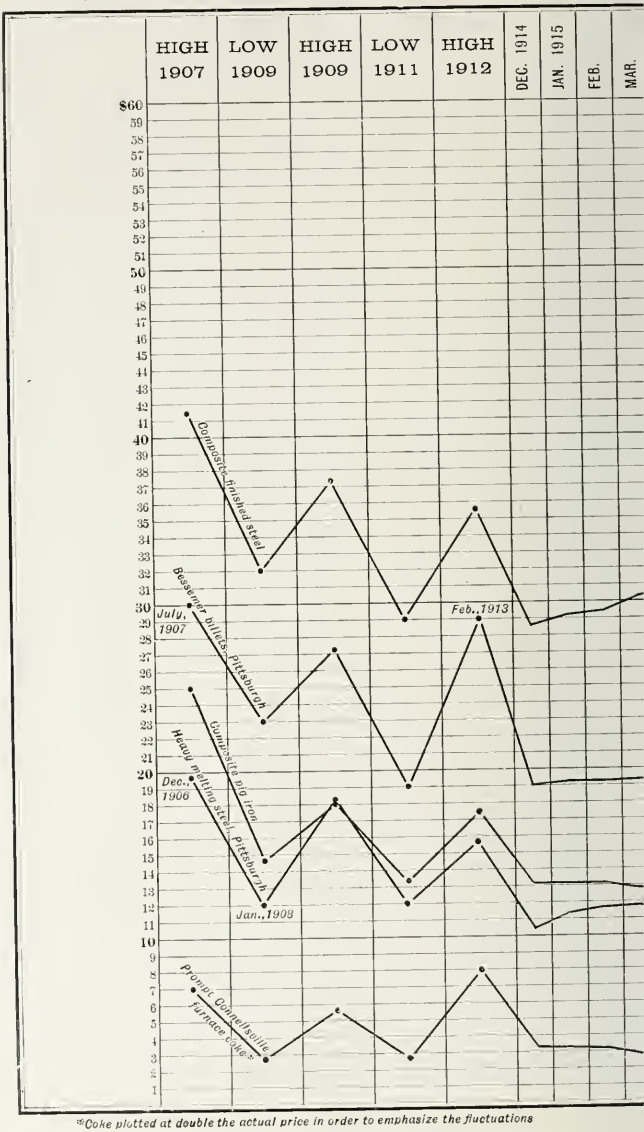
Comparison of Metal Prices.

	Range for 1914		Range for 1915		Range for 1916		Closin
	High.	Low.	High.	Low.	High.	Low.	Sept. 3 1916.
Pig Iron.							
Bessemer, valley	14.25	13.75	21.00	13.60	22.50	20.00	22.50
Basic, valley	13.25	12.50	18.00	12.50	19.50	17.75	19.50
No. 2 foundry, valley	13.25	12.75	18.50	12.50	19.00	18.25	19.00
No. 2X fdy. Philadelphia	15.00	14.20	19.50	14.00	20.25	19.50	19.50
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	19.30	18.50	18.80
No. 2X foundry, Buffalo	13.75	12.25	18.00	11.75	19.00	18.00	19.00
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	19.00	18.00	18.50
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	15.00	14.00	14.50
Scrap Iron and Steel.							
Melting Steel, Pittsburgh	12.00	9.75	18.00	11.00	18.75	16.00	17.25
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	16.75	14.50	16.00
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	18.60
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.00	14.75	15.25
Heavy steel scrap, Phila.	11.25	9.00	16.25	9.50	17.75	14.75	15.00
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.47	1.25	1.47
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.70	1.90	2.70
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.60	1.85	2.60
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	3.00	1.85	3.00
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	2.60	1.85	2.60
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	2.35	1.75	2.35
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	3.00	2.60	3.00
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.15	4.30
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	6.00	3.75	5.75
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.60	2.10	2.60
Steel pipe, Pittsburgh	79½%	81%	79%	81%	69%	78%	69%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	5.00	2.50	3.50
Prompt foundry	2.50	2.00	3.75	2.00	4.25	3.25	3.75
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	37.50	39.37
Lake copper	15.50	11.30	23.00	13.00	30.25	23.00	28.25
Electrolytic copper	14.87½	11.10	23.00	12.80	31.00	23.00	28.50
Casting copper	14.65	11.00	22.00	12.70	28.25	22.00	26.50
Sheet copper	20.25	16.50	27.25	18.75	37.50	28.00	37.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	7.00
Spelter	6.20	4.75	27.25	5.70	21.17½	8.37½	9.36
Chinese & Jap. antimony	18.00	5.30	40.00	13.00	45.00	10.50	10.93
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	65.00	53.00	62.50
Silver	59¼	17⅝	56½	46¼	77¼	55⅞	69⅛
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	6.87
Spelter	6.00	4.60	27.00	5.55	21.00	8.20	9.18
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	15.00	15.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	205	163	175
Standard copper, prompts	66¾	49	86⅜	57⅛	146	84½	118
Lead	24	17⅞	30¼	18¼	36⅜	27¾	32
Spelter	33	21¼	110	28⅛	111	44	52
Silver	27¼d	23¼d	27¼d	22⅛d	37⅛d	26⅛d	32⅞d

Iron and Steel Price Movement C

(Supplement to The

The plotting is from monthly averages of daily quotations. Where the and low points the fact is indicated. Prices are per net ton of composite finis

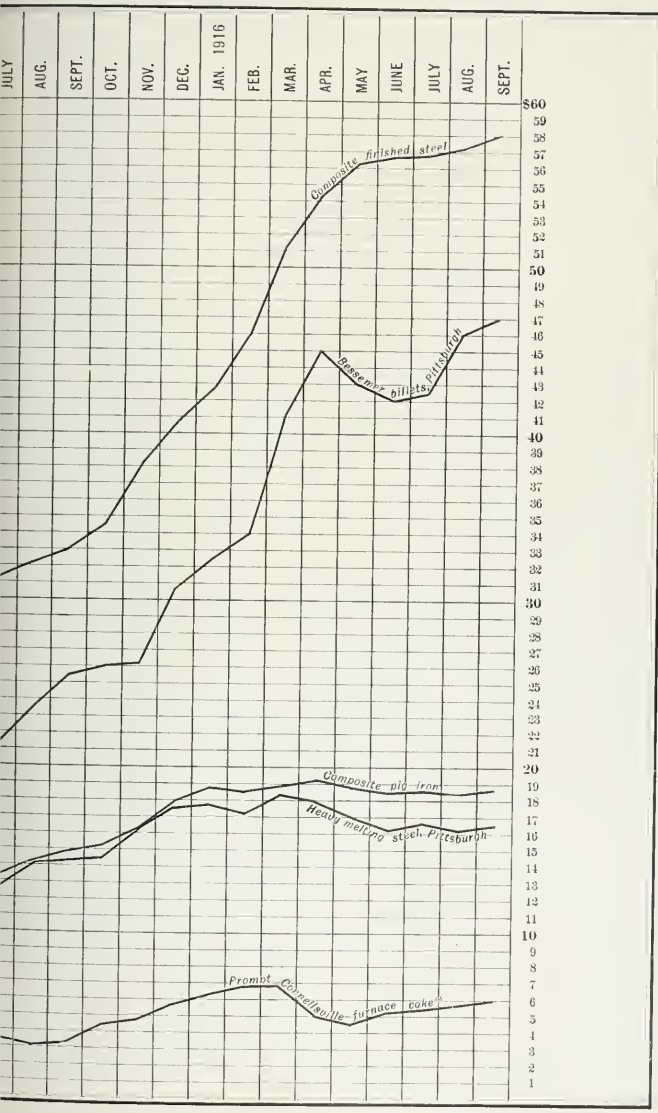


*Coke plotted at double the actual price in order to emphasize the fluctuations

ed with Old High and Low Points

tal Digest, October 1916.)

points of billets and scrap fell at times widely different from the general high coke, and per gross ton of other materials.



Comparison of Security Prices.

	Range for 1914		Range for 1915		Range for 1916		Closing,
	High.	Low.	High.	Low	High	Low.	Aug. 31, 1916.
Railroads.							
Atchison, Top. & Santa Fe...	100 3/8	89 1/2	111 1/4	92 1/2	108 1/2	100 1/4	106 3/4
Atch. Top. & Santa Fe. pfd.	101 3/4	96 1/2	102 5/8	96	102	97 7/8	101
Baltimore & Ohio	95 5/8	67	96	63 3/4	96	82 7/8	88 1/4
Canadian Pacific	220 1/2	153	194	138	183 3/4	162 1/2	179
Chesapeake & Ohio	68	40	64 3/4	35 5/8	68 1/2	58	67 1/8
Chicago, Mil. & St. Paul	107 1/8	84 3/4	101 1/8	77 3/4	102 1/2	91	96 1/4
Erie R. R.	32 1/2	20 1/8	45 5/8	19 7/8	43 5/8	32	40 1/4
Great Northern pfd.	134 3/4	111 5/8	128 3/8	112 3/4	127 1/2	116 1/8	119 3/8
Lehigh Valley	136 1/4	118	83 3/8	64 5/8	84 1/4	74 1/2	83
Louisville & Nashville	141 7/8	125	130 1/4	104 1/2	135 1/2	121 1/8	134
Missouri, Kansas & Texas	24	8 3/8	15 1/4	4	7 1/4	3 1/8	4 1/2
Missouri Pacific	30	7	18 1/4	1 3/4	7 1/2	3 1/4	4 3/4
New York Central	96 5/8	77	110 1/2	81 1/2	111 1/2	100 1/4	109 3/4
N. Y., N. H. & Hartford	78	49 5/8	89	43	77 7/8	57	60 1/2
Northern Pacific	118 1/2	97	119	99 1/8	118 7/8	108 1/4	113 1/2
Pennsylvania R. R.	115 1/2	102 1/2	61 1/2	51 3/4	59 3/4	55 1/8	57 7/8
Reading	172 1/4	137	85 5/8	69 3/8	115 1/2	75 1/8	113 1/2
Southern Pacific	99 1/2	81	104 1/8	81 1/4	104 1/8	94 1/4	102
Union Pacific	164 3/8	112	141 1/2	115 3/4	152 1/2	129 3/4	151 1/2
Industrials.							
Am. Beet Sugar	33 1/2	19	72 7/8	33 1/4	99	61 3/4	97
American Can	35 1/8	19 1/4	68 1/2	25	68 1/2	50 3/4	66 3/4
American Can, pfd.	96	80	113 1/2	89	115	108 1/8	115
Am. Car & Foundry	53 1/2	42 1/4	98	40	78	52	71 3/4
Am. Cotton Oil	46 1/2	32	64	39	57 1/2	50 1/2	55
Am. Locomotive	37 1/4	29 1/4	74 3/4	19	83 3/4	58	81
Am. Smelting & Refining	71 1/8	50 1/4	108 7/8	56	117	88 1/2	115 1/2
Brooklyn Rapid Transit	94 1/4	79	93	83 1/4	88 7/8	83 1/2	85
Chino Copper	44	31 5/8	57 3/8	32 3/4	60	46 1/8	57
Colo. Fuel & Iron Co.	34 1/2	29 1/2	66 1/2	21 3/4	59 1/4	38 1/8	62 1/2
Consolidated Gas	139 1/2	112 1/2	150 1/2	113 3/4	144 3/4	130 1/2	139
General Electric	150 5/8	137 1/2	185 1/2	138	186 1/4	159	182 1/8
International Harvester	113 1/2	82	114	90	119 3/4	108 1/2	116 3/4
Lackawanna Steel	40	26 1/2	94 3/4	28	90	64	87 1/4
National Lead	52	40	70 3/4	44	74 5/8	60 1/2	70 1/2
Ray Consolidated Copper	22 1/2	15	27 1/2	15 1/4	27	20	26 1/8
Republic Iron & Steel	37	18	57 1/4	19	83 3/4	42	82 1/4
Republic Iron & Steel, pfd.	91 1/4	75	112 5/8	72	116 1/2	106 7/8	112
Sloss-Sheffield	35	19 1/2	66 7/8	22	64 3/4	37	64
Texas Co.	149 7/8	112	237	120	235 1/2	177 3/4	211
U. S. Rubber	63	44 1/2	74 3/4	14	63 3/4	47 3/4	62
U. S. Steel Corporation	67 1/4	48	89 1/2	38	120 5/8	79 3/4	120
U. S. Steel Corporation, pfd.	112 3/4	103 1/4	117	102	122	115	121 5/8
Utah Copper	59 3/8	45 3/8	81 3/4	48 1/2	99 3/4	74 3/4	96 5/8
Va.-Carolina Chem.	34 7/8	17	52	15	51	36	42 7/8
Western Union Telegraph	66 7/8	53 3/8	90	57	102 7/8	87	100 1/2

Jan. 5	Blue ann. sheets	2.35	to 2.40
" 7	Boiler tubes	68%	to 66%
" 12	Blue ann. sheets	2.40	to 2.50
" 14	Boiler tubes	66%	to 64%
" 19	Blue ann. sheets	2.50	to 2.65
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00
" 14	Wire nails	2.20	to 2.30
" 15	Pipe	76%	to 75%
" 21	Bars	2.00	to 2.25
" 21	Plates	2.10	to 2.35
" 21	Shapes	2.00	to 2.25
" 21	Tin plate	3.75	to 4.00
" 29	Pipe	75%	to 74%
" 29	Boiler tubes	64%	to 63%
Mar. 1	Wire nails	2.30	to 2.40
" 8	Black sheets	2.60	to 2.75
" 8	Blue ann. sheets	2.65	to 2.90
" 13	Bars	2.25	to 2.35
" 13	Plates	2.35	to 2.60
" 13	Shapes	2.25	to 2.35
" 15	Steel pipe	74%	to 73%
" 15	Boiler tubes	63%	to 61%
" 23	Bars	2.35	to 2.50
" 23	Shapes	2.35	to 2.50
" 28	Plates	2.60	to 2.75
" 29	Sheets	2.75	to 2.85
" 29	Steel pipe	73%	to 72%
" 29	Boiler tubes	61%	to 60%
April 5	Sheets	2.85	to 2.90
" 15	Boiler tubes	60%	to 56%
" 19	Tin plate	4.50	to 5.00
" 24	Pipe	72%	to 70%
May 1	Wire nails	2.40	to 2.50
" 3	Tin plates	5.00	to 5.50
" 16	Plates	2.75	to 2.90
June 7	Galv. sheets	5.00	to 4.75
" 16	Tin plate	5.50	to 6.00
July 7	Blue ann. sheets	3.00	to 2.90
" 7	Galv. sheets	4.75	to 4.50
Aug. 1	Tin plate	6.00	to 5.50
" 7	Wire nails	2.50	to 2.60
" 15	Bars	2.50	to 2.60
" 18	Shapes	2.50	to 2.60
" 18	Plates	2.90	to 3.00
" 25	Galv. sheets	4.25	to 4.15
Sept. 7	Pipe	70%	to 69%
" 7	Boiler tubes	56%	to 54%
" 20	Galv. sheets	4.15	to 4.25
" 28	Sheets	2.90	to 3.00
Oct. 3	Blue ann. sheets	2.90	to 4.25
" 6	Sheets	3.00	to 3.10
" 7	Tin plate	5.50	to 6.00

IMMIGRATION STATISTICS.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted, both immigrant and non-immigrant, and aliens departed, both emigrant and non-emigrant, with change thereby effected in United States population:

	Admitted.	Departed.	Change.
January, 1915.	20,684	31,556	— 10,87
February ...	18,704	14,188	+ 4,51
March	26,335	15,167	+ 11,16
April	31,765	17,670	+ 14,09
May	32,363	17,624	+ 14,73
June	28,499	21,532	+ 6,96
Year 1915 .	434,244	384,174	+ 50,07
July	27,097	16,015	+ 11,08
August	27,413	41,737	— 14,32
September ...	31,096	33,061	— 1,96
October	31,215	26,338	+ 4,87
November ..	29,297	26,005	+ 3,29
December ...	23,173	23,743	— 57
January, 1916.	17,293	4,015	+ 7,30
February ...	30,244	10,824	+ 19,42
March	33,685	9,894	+ 23,79
April	36,999	10,856	+ 26,14
May	37,925	13,217	+ 24,70
June	37,296	15,112	+ 22,18
Year 1916 ..	366,748	240,807	+125,9
July	25,035	12,723	+ 18,2

United States citizens arrived and depar ed, with change thereby effected in Unit States population:

	Arrived.	Departed.	Chang
July, 1915	9,027	5,115	+ 3,9
August	9,506	10,310	— 8
September ...	9,054	8,188	+ 8
October	8,991	8,329	+ 6
November ...	8,364	9,166	— 8
December	8,458	9,349	— 8
January, 1916.	8,257	9,469	— 1,2
February	11,082	12,908	— 1,8
March	15,065	10,867	+ 4,1
April	12,522	8,051	+ 4,4
May	10,989	8,968	+ 2,0
June	10,078	10,013	+
Year 1916 ..	121,930	110,733	+ 11,1
July	12,624	8,990	+ 3,6

Net change in population caused by t movement of both aliens and citize 1913, +754,205; 1914, +687,065; 1915, +11 237; July, 1915, +14,994; August, 1915, —1 128; September, 1915, —1,099; October, 19 +5,539; November, 1915, +2,490; Dece ber, 1915, —1,461; January, 1916, +6,0 February, +17,594; March, +27,989; Ap +30,614; May, +26,249; June, +22,2 year 1916, +137,138; July, +21,878.

Composite Steel.

Computation for October 1, 1916:

Pounds.	Group.	Price	Extension.
2½	Bars	2.60	6.500
1½	Plates	3.00	4.500
1½	Shapes	2.60	3.900
1½	Pipe (¾-3)	3.05	4.575
1½	Wire nails	2.60	3.900
1	Sheets (28 bl.)	3.00	3.000
½	Tin plates	5.50	2.750
10 pounds			29.125
	One pound		**2.9125**

Averaged from daily quotations.

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7165
May	1.5590	1.7786	1.5078	1.5381	2.8043
June	1.5794	1.7719	1.4750	1.5312	2.8300
July	1.6188	1.7600	1.4805	1.5692	2.8425
Aug.	1.6784	1.7400	1.5241	1.6059	2.8588
Sept.	1.7086	1.7093	1.5632	1.6506	2.9013
Oct.	1.7588	1.6779	1.5236	1.7264	.....
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

Scrap Iron and Steel Prices.

	Melting Steel. Phila.	Bundled Sheet Phila.	No. 1 R. Wrought Phila.	R. No. 1 Cast. Phila.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.25	10.54	12.26	12.40	12.54	10.90
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75
May	17.00	13.65	19.65	16.10	17.00	15.90
June	16.25	13.00	19.00	15.40	15.45	14.80
July	16.70	12.50	18.80	15.30	15.00	14.30
Aug.	16.25	11.70	18.15	15.00	15.00	15.30
Sep.	16.61	11.65	18.35	15.00	15.00	16.00

Composite Pig Iron.

Computation for October 1, 1916:

One ton Bessemer, valley	$22.50
Two tons basic, valley (19.00)	38.00
One ton No. 2 foundry, valley	19.00
One ton No. 2 foundry, Philadelphia	19.50
One ton No. 2 foundry, Buffalo	18.75
One ton No. 2 foundry, Cleveland	18.80
One ton No. 2 foundry, Chicago	19.00
Two tons No. 2 Southern foundry, Cincinnati (17.40)	34.80
Total, ten tons	191.85
One ton	**19.185**

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.240	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	18.965
June	14.005	14.968	13.606	13.047	18.552
July	14.288	14.578	13.520	13.125	18.585
Aug.	14.669	14.565	13.516	14.082	18.514
Sept.	15.386	14.692	13.503	14.895	18.697
Oct.	16.706	14.737	13.267	15.213	.....
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

Unfinished Steel and Iron Bars.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, deliv. — Phila.	Pitts.	Ch'go.
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	13.26	10.54	12.26	12.40	12.54	10.90
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35
May	43.00	43.00	59.00	2.66	2.60	2.35
June	42.00†	42.00†	58.00	2.66	2.60	2.35
July	42.50†	42.50†	58.00	2.66	2.60	2.35
Aug.	46.00	46.00	58.00	2.66	2.60	2.35
Sep.	47.00	45.00	58.00	2.66	2.70	2.35

† Premium for open-hearth.

Car Buying.

Freight cars ordered:		
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,120	
June	29,864	
Six months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	
May	6,204	
June	3,470	
Six months		64,287
July	4,883	
August	3,384	
September	19,683	

Pig Iron Production.

Rates per annum, including charcoal pig.

April, 1915	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,600,000
April	39,600,000
May	39,800,000
June	39,500,000
July	38,350,000
August	39,200,000
On October 1st	39,800,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

Our Foreign Trade.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1904	1,035,909,190	1,451,318,740	415,409,550
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,745,913	134,169,807
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	193,935,117	402,991,118	209,056,001
Mar.	213,589,785	409,850,425	196,260,640
Apr.	217,705,397	399,861,157	182,155,760
May	229,188,957	474,881,255	245,692,298
June	*245,795,438	164,784,318	218,988,880
July	182,722,938	145,472,000	262,749,062
Aug.	199,247,391	*509,778,680	*310,531,289

* High record.

† Balance unfavorable.

Steel Making Pig Iron Averages.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April .	13.60	20.70	12.50	18.00
May ..	13.659	20.833	12.65	18.1607
June ..	13.75	21.00	12.724	18.00
July ..	13.991	21.00	12.959	18.00
Aug. ..	15.064	21.00	14.364	18.00
Sept. ..	15.906	21.9346	15.00	18.63
Oct. ..	16.00		15.0147	
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f. o. b. valley furnace; delivered Pittsburgh is 95 cents higher.

Tin Plate Movement.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1915	2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	7,582
July	71	13,845
August	50	21,939
September	31	22,262
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178
February	107	13,534
March	44	20,364
April	179	21,385
May	39	25,585
June	91	29,751
July	150	18,742
August	105	18,758

British tin plate exports have been as follows, in gross tons:

January 1916	26,271
February	27,289
March	39,482
April	23,337
May	41,868
June	30,351
July	38,174

British Iron And Steel Exports.

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*
Mar. ..	20,172	17,572	36,170	239,341
April ..	35,209	21,602	40,135	265,244
May ..	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	33,224	39,528	351,984
Aug. ..	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ..	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	87,283	3,366	39,482	307,488
April ..	82,976	10,510	23,337	293,897
May ..	97,967	4,103	41,868	395,750
June ...	77,487	3,243	30,351	310,595
July ...	69,999	3,485	38,174	298,929
Aug. ..	95,655	1,983	34,124	319,928
8 mos.	673,998	33,746	260,896	2,502,070

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Wage Scale Averages.

Sworn averages of prices obtained by mills for shipments in months named, used in fixing wages under Amalgamated Association sliding scales. The figures represent the rates used, the actual ascertained averages lying between the figure given and the one five points higher. Base sizes of iron bars; average of 26, 27 and 28 gauges black sheets; tin plate per base box, 100-pound.

Bar Iron.

	1914.	1915.	1916.
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	*1.60
May-June	1.1257	*1.10	*1.85
July-August	1.0928	*1.15	*1.95
September-October	1.0847	*1.15	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.144	....

* Settlement basis.

Sheets and Tin Plates.

1916.	Sheets.	Tin Plates.
January-February	2.25	3.50
March-April	2.50	3.70
May-June	2.60	3.90
July-August	2.70	4.05

Tin in September.

Net Advance for Month 5/8 to 3/4c Per Pound for Last Quarter Deliveries, 1 1/4c for First Quarter 1917—Deliveries into Consumption Less Than Last Month—Net Advance £4 15s on Spot and £4 10s on Futures

The result of the fluctuations in tin prices during September was a net advance of 5/8c to 3/4c per lb. on all positions to the end of the year and a rise of 1 1/4c per lb. on domestic arrivals during the first quarter of next year. The sentiment in the foreign markets was conservatively strong without any tendency toward speculation and was reflected in a net advance of £4 15s on spot Straits and on spot Standard, and £4 10s on future Standard at London, while the Singapore price was £4 10s higher at the close than at the beginning of the month.

Deliveries into American consumption in September were 4,025 tons, as against 4,335 tons in August and 4,300 tons in September last year. The September deliveries this year included 3,350 tons from Atlantic ports and 675 tons from the Pacific Coast to eastern plants.

Stocks in warehouse and landing at the end of the month was 4,769 tons, against 4,756 tons at the end of August and 4,546 tons at the end of September last year.

Shipments from the Straits were 3,270 tons, being 2,026 tons less than in September 1915. For the nine months this year the decrease in shipments has been 4,480 tons. The total visible supply on September 30th was 16,192 tons, being a decrease of 1,850 tons during the month but 1,000 tons more than a year ago.

Submarine Activities—Insurance Rates Advanced 1%.

The only stirring event came in the last week of the month, when submarine activity in the Mediterranean uncomfortably reminded importers, dealers and consumers that the exigencies of war may still cause sudden losses to tin-laden ships. American underwriters are reported to have suffered heavily from losses to shipping in the Levant as a result of the renewal of the undersea war, but thus far, none of the craft carrying tin has been molested. The cost of carrying metal from the East Indies, via the Suez canal, and from London to this country, however, has been increased. Insurance companies advanced rates 1% to cover the greater war risk and consumers of course must ultimately pay the increased cost of transportation.

Market Dull but Steady.

Prior to these incidents the tin market was devoid of any excitement, the trade being monotonously placid from day-to-day and from week-to-week. The British Government is certainly exercising strong control over the marketing of this commodity in all consuming countries as well as over its production in the East Indies and in Wales. There is a practical embargo on exports from Singapore, Penang and London and shipments are made only by special permits of the English Government, so that consumers supplies are subject to close espionage. Thus far, however available supplies have been fully ample to meet all requirements. American consumers, in fact, have benefited largely from the bridling of speculation abroad, which in normal times, exploits the consumer and puts the market in a ferment with sudden, wide and violent fluctuations. The advance in prices in September, apparently, were legitimate; but some American consumers were silently expressing their protest at the close of the month by remaining out of the market. It is notable however, that some of the largest home consumers have covered requirements for the first quarter of 1917 in the past two weeks.

Fear of Railroad Strike Causes Slight Reaction.

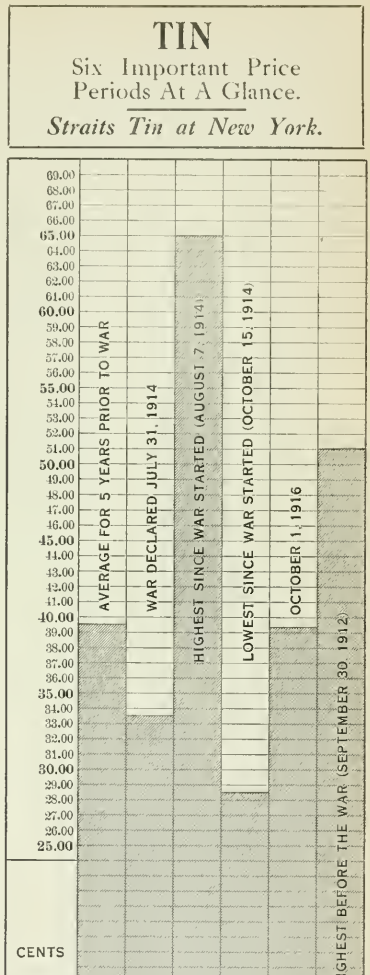
It will be recalled, that late in August and early in September, there was a hesitating spirit at London, as well as at home, because of a dread of the consequences of the United States rail

road employees strike. This was expressed in a drifting market and in slightly lower prices at home and abroad during the first two weeks of the month. Spot Straits, however, was steadier for a few days, while Banca tin, comprising about half the stocks, was pressed for sale with more or less persistence at 1½c per lb. under Straits. Chinese tin, also sold at approximately the same price as did Banca. Toward the end of the second week some special lots of Straits tin sold down to 38.10c for delivery from steamships at dock and first quarter of 1917 sold between 37⅝c and 37¾c.

The reaction in spot Straits up to this time, had been ¾c and this year's arrivals had receded ½c to ⅝c. Future deliveries, however, that is, for arrivals in next January, February and March, had receded very slightly. On several occasions during this time, London interests were buyers here, for the earlier deliveries, attributed to the need of covering sales against higher prices and to some temporary difficulty in getting shipments from London. At 38c, however, for September and October, tin seemed cheap when viewed in the light of the year's fluctuations. It was pointed out that when the year opened sales of spot tin were made at 44½c; the highest point touched was 56c and the minimum was 37½c while the average price to September was 44⅜c.

Market Affected Favorably on News of Successes by Allies.

Confidence and strength that developed about the middle of the month, was attributed to the expectation that large American buyers would enter the market soon, but here, the favorable turn of the war for the Allies was assigned as the reason for the stronger feeling at London. This sentiment seems to have been well founded, for late on September 19th, a large business was transacted here, in December, January and February arrivals. These orders sent abroad helped the London market on the following day and an upward tendency was communicated to prices by reports that a German raiding submarine was operating in the Atlantic with similar activities going on



in the Mediterranean. A fair business with higher prices was done on the 21st, but most of the advance at London, that had occurred during the third week, was lost on the 22nd. The awakening interest of domestic consumers in spot was checked by the reaction but considerable trading was done in futures—February, March and April delivery—at close to 37⅞c. In the last few days of the month a stronger tone prevailed here and abroad, with more active buying of nearby and future positions by domestic consumers, including some large tin plate manufacturers who placed several important orders for spring delivery.

Use of Tin in Manufacture of War Munitions Larger Than Ever.

Tin is being utilized in the manufacture of war munitions to a greater extent than ever before and the consumption of Great Britain, France and Russia for this purpose is now large. It is also of interest to note that the production of "English" tin, from Cornish, Bolivian and Nigerian ore, is reported to be at the rate of 2,000 tons per month; all of which output is going rapidly into consumption.

Export Permits and Submarine Activities Two Disturbing Prospects.

Another recent notable feature is the tendency of prices for nearby and for future positions to come together. On the closing day of the month large dealers would rather have bought than to have sold tin for delivery in the earlier months, while at the same time they were close sellers of January, February and March positions. London interests, too, who previously had been sellers were reported to be buyers of the earlier months. The possibility of renewed difficulty in securing permits for shipment from London and the Straits, and the prospective incursions of the dreaded submarine, were factors of importance with which the trade had to reckon at the close of the month.

Tin Prices in September.

	New York.	London					
		Spot.			Futures.		
Day.	Cents.	£	s	d	£	s	d
1	38.87½	170	5	0	171	0	0
4	.....	170	5	0	171	5	0
5	39.00	170	15	0	171	10	0
6	39.00	171	0	0	172	0	0
7	38.90	170	15	0	171	15	0
8	38.62½	170	0	0	170	15	0
11	38.37½	169	10	0	170	10	0
12	38.30	169	10	0	170	10	0
13	38.30	169	15	0	170	12	6
14	38.50	170	10	0	171	10	0
15	38.37½	170	5	0	171	5	0
18	38.37½	170	15	0	171	10	0
19	38.50	171	10	0	172	0	0
20	38.75	172	5	0	173	0	0
21	38.87½	173	0	0	173	10	0
22	38.60	171	5	0	171	10	0
25	38.75	172	0	0	172	10	0
26	38.62½	172	0	0	172	10	0
27	38.87½	173	0	0	173	5	0
28	39.12½	174	10	0	174	15	0
29	39.37½	175	10	0	175	10	0
High	39.37½	175	10	0	175	10	0
Low	38.30	169	10	0	170	10	0
Average.	38.70½	171	6	11	172	0	7

TIN SMELTING CAPACITY OF THE WORLD.

(From the London Mining Journal.)

While the world's capacity for producing the leading metals—copper, spelter, lead, iron, and the like—has long been the study of careful and full statistics, corresponding data with reference to tin smelting have never, so far as we know, been compiled and published. The reason, no doubt, lies largely in the fact that most of the concerns interested are private or semi-private undertakings, which are under the influence of English smelting traditions that it is bad trade policy to give anything away. At the present time, however, when such marked changes and displacements have been caused by the great war, and we see the United States for the first time appearing as a competitor in the tin smelting trade, we think it timely to examine as closely as may be the various undertakings and their respective importance.

Pride of place is taken by the undertakings grouped around the Straits Settlements. As our readers know, the production of tin from these sources under the British flag amounts now to about 66,000 tons per year. The leading producer and the oldest, apart from

Visible Supplies.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	19,614
June	12,920	11,101	16,027	15,927	19,363
July	13,346	12,063	14,167	16,084	18,404
Aug.	11,285	11,261	14,452	15,127	18,042
Sept.	13,245	12,943	14,613	15,191	16,192
Oct.	10,735	11,857	10,894	13,154	.....
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

Shipments From the Straits.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	3,965
June	4,290	4,280	5,870	6,665	6,210
July	4,580	4,770	4,975	5,606	5,410
Aug.	5,210	6,030	3,315	4,712	4,526
Sept.	5,430	5,160	4,973	5,296	3,270
Oct.	4,450	5,020	4,610	4,441	....
Nov.	5,600	5,560	5,155	6,713	....
Dec.	4,980	5,110	6,435	5,301	....
Total	59,018	62,550	63,093	66,517	....
Av'ge	4,918	5,213	5,258	5,543	....

Consumption In the U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	5,455
June	2,850	3,800	3,650	3,900	6,398
July	5,150	3,900	3,900	5,300	4,432
Aug.	4,300	3,600	2,900	4,500	4,335
Sept.	3,600	3,100	3,600	4,300	4,025
Oct.	3,850	3,700	3,700	4,900	....
Nov.	4,300	2,800	2,600	2,975	....
Dec.	4,050	3,100	1,900	5,200	....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4,125	3,658	3,475	4,062	....

Monthly Tin Statistics.

Compiled by New York Metal Exchange.

Straits shipments	Sept. 1916.	Aug. 1916.	Sept. 1915.
To G. Britain..	1,910	2,370	749
" Continent ..	760	666	1,292
" U. S.	600	1,490	3,345
Total from Straits	3,270	4,526	5,296
Total from Australia	90	63	253
Consumption			
London deliveries	1,397	1,287	1,996
Holland deliveries	127	92	664
U. S.	4,025	4,335	4,300
Total	5,549	5,714	6,960
Stocks at close of month:			
In London—			
Straits, Australian	3,012	2,876	2,528
Other kinds	1,018	1,260	1,144
In Holland	.....	.....	5
In U. S.	4,769	4,756	4,546
Total	8,799	8,892	8,223
Afloat close of month:			
Straits to London	3,290	3,530	1,448
" to U. S...	2,840	4,390	5,520
Banca to Europe.	1,263	1,230	.....
Total	7,393	9,150	6,968
Total visible supply	Sept. 30, 1916. 16,192	Aug. 31, 1916. 18,042	Sept. 30, 1915. 15,191

Straits Tin Prices In New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	49.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	49.15
June	47.77	44.93	30.65	40.37	42.18
July	44.75	40.39	31.75	37.50	38.46
Aug.	45.87	41.72	50.59½	43.39	38.54
Sept.	49.18	42.47	32.79	33.13	38.70½
Oct.	50.11	40.50	30.39½	33.08	.....
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

purely Chinese business, is the Straits Trading Company. This concern has, as has recently been noted in the Journal, been steadily enlarging its works, and has capacity to-day of approximately 36,000 tons. Second, comes its young and vigorous rival, the Eastern Smelting Company, with a capacity of about 17,000 tons. The balance of the output is usually attributed to Chinese operators. There is, however, some difficulty in checking these figures with any accuracy. The amount of tin exported from the Federated Malay States as metal in 1913 was a little over 5,000 tons, and though, no doubt, Chinese buyers and smelters carry on their business in the tin producing districts of Siam and Siamese Malaya, it is not sufficient to explain the large balance of 8,000 tons required to make up the deficiency. Possibly some of the impure Yunnan tin may be included in this figure, but as the total output from the Mongtze smelters does not exceed 8,000 tons, and has hitherto been almost entirely refined in Hong Kong, the explanation is not a satisfactory explanation of the discrepancy. In the neighboring Dutch Islands we have the Banka smelters, worked by the Dutch Government, with a capacity of about 15,000 tons. The output of Billiton and Singkep is, we believe, now sold to the Straits smelters, but even if some of it is reduced in the islands it hardly affects the question of the world's smelting capacity.

Next to the East, Europe is the chief centre. In 1913 the United Kingdom from home and imported ores had about 23,500 tons of metal to realize, and we may take it that the smelting capacity at that time was up to that mark. Since the war Williams, Harvey & Company and the Cornish Tin Smelting Company have had extensions of their plant in hand, the London Tin Smelting Company has been established, and the Penpoll and Redruth Smelting Companies have probably also some extension in contemplation. Taking these increases into account, it seems probable that the smelting capacity of the United Kingdom after the war will not be far short of 30,000 tons. Individual companies, however, do not care to give us their figures for publication. In Germany the output from the Goldschmidt and other works in 1913 was about 11,200 tons. In Hungary the Loszinsky works were developing previous to the war, but to what capacity we are unacquainted. Of late smelting has been started in the United States by the American Smelting & Refining Company. Their present output is stated to be about 3,500 tons a year, but their capacity is reported to be designed for some 6,000 tons, and there is a possibility of some other enterprises also. The only other centre where, so far as we know, smelting is established is Australia, where tin smelters are in operation at Mount Bischoff in Tasmania, at Woolwich in Sydney, and at Irvinebank in Queensland. It is very difficult to say what is the capacity of these works. Theoretically their capacity is probably largely in excess of production, the latter being limited by the amount of ore produced in the particular State and by the difficulty of competing with foreign buyers. The output from the Woolwich works is about 900 tons per annum, that from Mount Bischoff, so far as we can judge at present, about 1,500; while from Irvinebank we have no data as to present activity, save only that the Queensland output last year was 2,125 tons of black tin, for which the Straits is also a competitor. Probably, therefore, the output of metal would not be in excess of 1,000 tons. The Irvinebank smelter has an actual capacity of 50 tons per day which illustrates the difference between furnace capacity and actual output based on the supply of ore. Summing up the above figures we get something like the following as a rough aggregate:

Asia		Tons
Straits Trading Company		36,000
Eastern Smelting Company		17,000
Chinese Smelters		13,000
Banka		15,000
Yunnan		8,000
England		28,000
Germany		11,200
U. S. A.		6,000
Australia		
Mount Bischoff	(say)	1,500
Woolwich		900
Irvinebank	(say)	1,000
Total		137,600

The gross total is probably excessive, partly on account of the want of harmony between the Chinese figures already noticed and partly because the German works are reckoned in at their full capacity, despite the fact that it is to take their place that new works have been undertaken by this country and the United States. However, if we take off the German capacity, we get a total which is not very greatly in exeess of the world's normal output, and, consequently, we may take it that the figures are not very seriously out. At the same time it must be remembered that no capital is required for the primitive Chinese smelter, and that in some cases the capacity of individual smelters might be further reduced by the competition of large centralized works such as those existing in the Straits Settlements, which draw their supplies from many quarters. On the whole, however, on the present scale of output it cannot be said that the industry, when once again on a normal basis, will lack smelting accommodation.

Lead in September.

An Active Month in Lead—Price Advanced $20 Per Ton by the Trust—Large Business Done—London Opens Weak, Closes Strong.

In September, lead steadily gathered strength as the month progressed, with a large volume of business transaeted in the aggregate. Buying by domestic consumers was re-enforced by large export orders mainly for shipment to Canada and to Japan. The result of the increased demand and heavier buying was an advance of ½c per pound or $10 per ton by the largest produeing interest and a further rise of $2 to $3 per ton in the open market by the close of the month. Most of the foreign buying, at least so far as the Dominion purchases are concerned, was by manufaeturers of shrapnel. The metal purchased on Japanese account is understood to be destined for consumption by manufacturers of war munitions.

Month Opens Quiet but Firm.

At the opening of the month there was very little demand but the offerings were also small and the tone of the market was firm. Independent produeers were well supplied with orders for September delivery and for this position were asking an advance over the Trust price but were meeting competition for October and later shipments.

The St. Louis market was stationary and the undercurrent was sentimentally weaker beeause of some apprehension concerning the effect of the railroad employe's strike; but with light offerings—large independent companies applying output upon previous orders—prices were well sustained.

Open Market Advances $2 to $3 Per Ton.

Before the close of the first week, foreign buyers were sounding the market and inquiries developed rapidly into business. Most of the buying was on Japanese account, the order being placed with independent producers in the Central West—the first Oriental business in several months that has gone directly to the interior. These orders are understood to have been placed at 6½c East St. Louis, for September, and about 6¾c for October shipments. The result of this buying was to further strengthen the market with an advance in the Trust price predicted. Small domestic consumers were prompted to eome into the market for quiek shipment and dealers bought round lots of October and December deliveries. All positions from September to Deeember, inelusive, were held at 6½c on the 11th inst., and on the following day prices in the open market advanced $2 to $3 per ton; spot and September, bringing 6.65c and October and November 6.60c with all offerings readily taken by domestic consumers. By Sept. 13th, 50 to 100 ton lots could not be obtained in New York markets, with 6¾c bid while carload

lots sold at 6.77c in store. On the following day, orders for 1,500 tons or more were placed here for shipment to manufacturers of shrapnel in Canada.

Two Advances by the Trust.

On Sept. 15th, the American Smelting & Refining Co. announced an advance of ¼c per pound or $5.00 per ton to 6¾c per pound, New York, and 6.67½c East St. Louis. The higher prices seemed to stimulate the demand at home and brought out more foreign inquiries. In the next few days, independent producers sold September and early October shipments at 6.80c East St. Louis with a strong upward tendency. The American Smelting & Refining Co. recognized the strength of the market on September 19th, by another advance of ¼c per pound or $5.00 per ton, the official price being now 7c New York and 6.92½c at East St. Louis.

Some Consumers Caught Short.

The quick rise in the market caught many consumers napping and they were forced to cover requirements at the

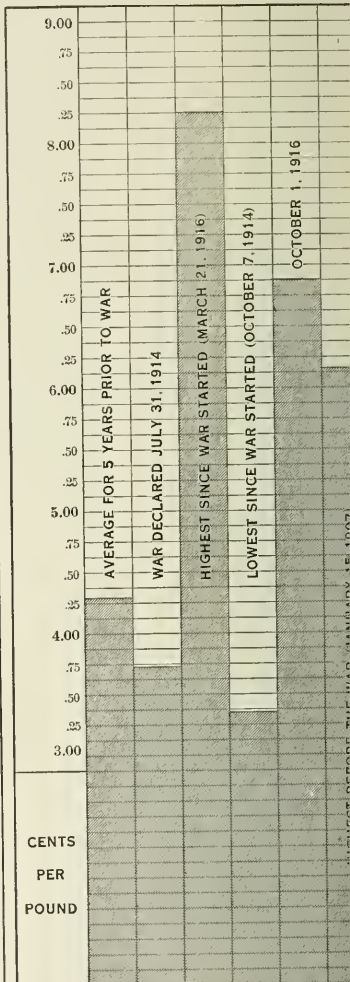
Lead Prices in September.

Day.	New York.* Cents.	St. Louis. Cents.	London. £	s	d
1	6.67½	6.50	31	5	0
4	....	....	31	0	0
5	6.65	6.50	31	5	0
6	6.62½	6.50	30	5	0
7	6.60	6.50	30	5	0
8	6.60	6.50	30	5	0
11	6.60	6.50	30	0	0
12	6.70	6.60	30	0	0
13	6.77½	6.65	30	0	0
14	6.77½	6.65	30	5	0
15	6.80	6.67½	30	10	0
18	6.90	6.75	30	10	0
19	7.00	6.90	30	15	0
20	7.00	6.90	30	15	0
21	7.00	6.87½	30	15	0
22	6.97½	6.85	30	15	0
25	6.97½	6.85	31	5	0
26	7.06¼	6.90	31	10	0
27	7.06¼	6.90	31	10	0
28	7.06¼	6.87½	31	10	0
29	7.06¼	6.87½	32	0	0
High ...	7.12½	6.95	32	0	0
Low	6.60	6.50	30	0	0
Average .	6.84½	6.71½	30	15	3

LEAD

Six Important Price Periods At A Glance.

Lead at St. Louis.



higher level. Several inquiries for 500 ton lots came from domestic manufacturers of war munitions in the next day or two but there was a less active, general demand. On September 21st, a large business was done for export to Canada; buying covered September, October and November shipment; several thousand tons were sold. There was considerable competition for these foreign orders, the business being done at 6.85c and 6.90c, East St. Louis.

Second hands, who had been out of the market for some time sold more or less vigorously about September 22nd, slightly under the Trust price, for all deliveries up to January. There were some special offerings of October-November-December shipments at 6.80c, East St. Louis, but the general market was five points higher. There was greater competition on future than on nearby deliveries; indeed, the largest independent producers had all September and October capacity sold, and even some of the smaller producers had the same positions well sold. On September 26th, Canadian buyers again took large tonnages for prompt and October shipment and other large inquiries were in the market, one, for several thousand tons, and three or four others amounted to 350 to 750 tons each.

Month Closes Strong but Less Active.

Independent producers occupying very strong positions toward the close of the month, were asking 7⅛c to 7¼c New York, for such metal as they had to offer for nearby but most of the demand in the open market was satisfied by second hands at 7c New York and at 6.90c to 6.92½c, East St. Louis—the Trust price. November, and later deliveries were offered by independent producers at 7c New York. At the close of the month the market was strong but less active with early October and later deliveries in the West, offered at 6⅞c East St. Louis.

The London market was weaker during the first fortnight of the month, prices dropping £1 5s on spot and £1 7s 6d on futures, from the end of August to September 11th, after which time, a stronger tone prevailed and the market slowly but steadily recovered. The advance in prices from September 11th to the end of the month was £2 on spot and £1 15s on futures, making a net September advance of 15s on spot and 7s 6d on futures.

Lead (Monthly Averages.)

	——New York*——			——St. Louis——		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19	7.50	3.70	4.11	7.67
May	3.90	4.23½	7.50	3.81	4.16	7.28
June	3.90	5.86	7.04	3.80	5.76	6.77
July	3.90	5.74	6.52	3.75	5.52	6.20
Aug.	9.30	4.75	6.27	3.73½	4.59	6.27
Sep.	3.86	4.62	6.75	3.67	4.53	6.71
Oct.	3.54	4.59½		3.39	4.51	
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

Lead Price Changes.

The changes in the Trust price of lead at New York since January 1, 1916 have been as follows:

1916—		
Opening price		5.50
January 4	Advanced	.25c to 5.75
January 7	"	.15c to 5.90
January 21	"	.20c to 6.10
February 9	"	.15c to 6.25
February 16	"	.05c to 6.30
March 3	"	.10c to 6.40
March 7	"	.20c to 6.60
March 14	"	.40c to 7.00
March 30	"	.50c to 7.50
June 2	Reduced	.50c to 7.00
July 5	"	.50c to 6.50
August 2	"	.50c to 6.00
August 17	Advanced	.25c to 6.25
August 18	"	.25c to 6.50
September 15	"	.25c to 6.75
September 19	"	.25c to 7.00

Spelter in September.

Market Active With Large Business Done in Futures—Net Advance for Month ¾c per Pound—Futures Abroad Advance £3, Spots Stationary—Scarcity of Demand for Brass Special a Feature.

After a day or two of dulness and slight declines in prices the market for prime western spelter was speedily awakened by an active demand for this year's deliveries. The buying movement thus suddenly inaugurated, while remittent in character, gained in force and volume as the month progressed. Interest was extended into the first quarter of 1917 deliveries and the vigorous buying carried prices upward ¾c to 1c per pound. Domestic consumers were first to enter the market followed by exporters and dealers until a great broad market was developed. The rise culminated about September 18th, when there were signs that domestic and foreign consumers were satisfied; at least temporarily. Dullness in the next week was accompanied by recessions of ⅜c to ½c per pound in prices of all positions, followed by improved buying and a recovery of ¼c per pound in the remaining days of the month. The net result of the month's business transactions was an average advance of ¾c per pound. At the close there was no great animation, the observance of the Jewish holidays, militating against full activity, but there was evidence that greater interest was focusing in the market.

The course of the English market was similar to the trend of events here. From the end of August to September 6th, prices receded £3 10s on spot and £1 10s on futures, followed by an advance of £7 10s on all positions up to September 19th, and a subsequent decline of £4 and £3 respectively. The net result of September fluctuations was an advance of £3 on futures while the spot price at the close of the month was the same as on the last day of August.

Month Opens Quiet But Quickly Turns Active

Buying was at low ebb on September 1st, with small interest shown by home consumers but there were a few inquiries from England for high grade metal for October, November, December shipments. Large producers were out of the market but small smelters and second hands were willing to make concessions of ⅛c to effect moderate sales of nearby positions. There was no desire to sell future months. Large producers, however, were not offering for early shipment. The complexion of the trade changed completely on the following day, large sales being made to home consumers for shipment over the balance of the year, with a few sales made for shipment in the first quarter of 1917. On the next day, the demand continuing active, prices were advanced ⅛c.

The enactment of the eight-hour law for railroad employees, it was assumed would prevent a contemplated reduction in wages at the smaller smelters which in turn would support prices for spelter. In the Joplin district, it was pointed out, that some smelters had 25 to 50% of furnaces out of commission the high pressure operations for a year and a half necessitating extensive repairs. With large expenditures for rebuilding and the high cost of ores and with small prospect for reducing wages of laborers, operators of these plants sees light chance of profit at current prices for the metal. Hence some of the furnaces closed down, may remain in the idle list indefinitely.

Active Buying—Interest Centered in Futures.

After a day of hesitation, more domestic consumers came into the market on September 7th, brass founders being the largest buyers to cover large contracts for brass rods. Sheet galvanizers also purchased liberally for October-November shipment. Interest was more in future positions with sales covering shipments for the next six months. Dealers bought, too, but their

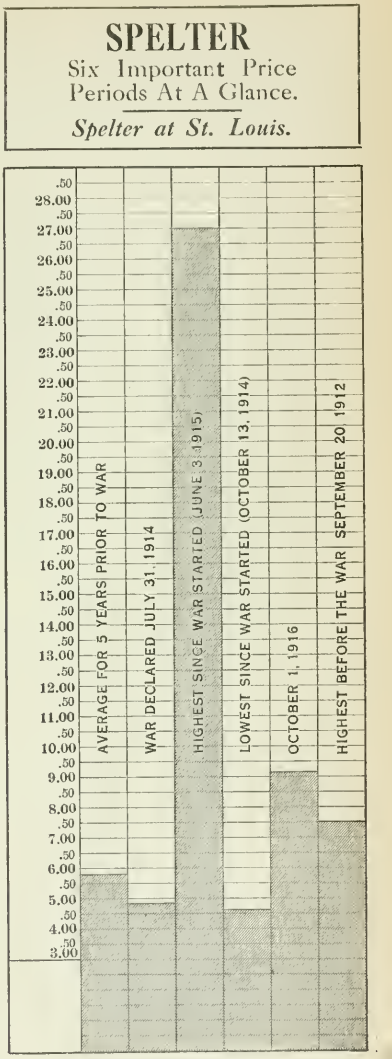
sales exceeded their purchases. The rise at London at this time was attributed to the higher ocean freight rates and the difficulty of securing vessel room on boats sailing from New York or Philadelphia in September and October. This did not prevent more English inquiries, however, for September exports from New York.

Continued active buying at home absorbed most of the cheap outside lots offered for September shipment and further strengthened the market. An absence of domestic orders on September 11th, was compensated for by inquiries from Canada for high grades as well as for prime western metal from munitions manufacturers to cover new shrapnel contracts distributed in the Dominion. Large producers were more reserved in offerings for this year's shipment and second hands had less to offer.

Market Advances Sharply.

Vigorous buying by dealers and exporters in the next few days, caused a sharp upward turn; Canadian orders were especially heavy but domestic consumers temporarily retired from the market. On September 14th and 15th, export buying for Europe as well as for Canada, was the most prominent feature. Transactions covered fourth quarter 1916 and first quarter 1917 as well as September and October shipments. Dealers competed strongly and prices rose to the highest point of the month. On the following day, Monday, producers asked another advance of ⅛c for 1916 shipments but the rapid advance checked the consumptive demand and only moderate orders were placed by dealers.

A period of dullness ensued during which prices receded. Brass manufacturers had covered requirements to the end of the year but galvanizers, having purchased conservatively, were still in need. After a decline of ⅜c to ½c per pound, the interest of buyers was renewed and purchases, at first restricted to prompt and early October deliveries, expended into the future months causing an advance of ⅛c to ¼c per pound on all positions. A fair volume of business was transacted on



The average price for spelter for the thirty years —1886 to 1915—was 5.36c New York. The highest price on record was 27c on June 3, 1915.

September 27th and 28th with more substantial orders in sight on the closing day of the month, although actual sales were only moderate. Greater vitality was evident although large consumers temporarily hesitated to buy on the rising tide.

Practically no Demand for Brass Spelter.

One notable feature, discouraging to manufacturers of high grade spelter, is the small recent demand for "brass special." It will be recalled that in the early stages of the war, brass special commanded a premium of 2½c to 3c per pound or more, over prime western. In recent months, however, brass manufacturers have been using the ordinary or guaranteed prime western grades on all leaded brass work. Today it is difficult to obtain ½c per pound premium. Some grades of brass special have sold recently at a premium of only ¼c per pound. For high grade special, prices vary widely but the best grades of virgin spelter are quotable at 18c to 20c per pound

Spelter Prices in September.

Day.	New York. Cents.	St. Louis. Cents.	London. £	s	d
1	8.67½	8.50	49	0	0
4	....	....	49	0	0
5	8.80	8.62½	49	0	0
6	8.80	8.62½	48	10	0
7	8.86¼	8.68¾	48	10	0
8	8.92½	8.75	50	0	0
11	9.17½	9.00	50	0	0
12	9.23¾	9.06¼	52	0	0
13	9.36¼	9.18¾	54	0	0
14	9.42½	9.25	54	0	0
15	9.55	9.37½	54	0	0
18	9.67½	9.50	55	0	0
19	9.67½	9.50	56	0	0
20	9.55	9.37½	56	0	0
21	9.42½	9.25	55	0	0
22	9.23¾	9.06¼	54	0	0
25	9.11¼	8.93¾	52	0	0
26	9.17½	9.00	52	0	0
27	9.30	9.12½	52	0	0
28	9.36¼	9.18¾	52	0	0
29	9.36¼	9.18¾	52	0	0
High	9.80	9.62½	56	0	0
Low	8.67½	8.50	48	10	0
Average	9.24	9.06	52	1	11

Spelter (Monthly Averages.)

	New York 1915.	New York 1916.	St. Louis 1915.	St. Louis 1916.
Jan.	6.52	18.18	6.33	18.01
Feb.	8.86½	20.09	19.92	19.92
Mar.	10.12½	18.09½	9.80	17.91
Apr.	11.51	18.61½	11.22	18.44
May	15.82½	15.93	15.52½	15.75
June	22.62½	12.80	22.14	12.62
July	20.80	9.70	20.54	9.52
Aug.	14.45	9.10	14.19	8.92
Sept.	14.49	9.23½	14.10½	9.06
Oct.	14.07		13.89	
Nov.	17.04		16.87½	
Dec.	16.91		16.72	
Av'ge	14.44		14.16	

Sheet Zinc Price Changes.

The following table gives the changes in the price of sheet zinc since January 2, 1916, together with the price of spelter ruling on the same day.

1916—	Sheet Zinc.	Spelter St. Lou
January 26	24.00	19.00
February 17	25.00	20.87½
April 22	25.50	18.75
May 15	24.50	15.50
May 23	23.50	14.87½
May 26	22.50	14.12½
June 2	21.00	13.12½
June 13	20.00	13.37½
June 21	19.00	12.00
June 28	18.00	11.37½
July 6	17.00	9.37½
July 13	15.00	8.62½

Waterbury Spelter Averages.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.76	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	21.20
June	7.25	5.50	5.37	25.60	17.40
July	7.46	5.61	5.26	24.90	15.20
Aug.	7.34	5.99	5.66	19.30	13.60
Sept.	7.72	6.13	5.91	17.85	13.70
Oct.	7.83	5.74	5.23	16.85	
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

Copper in September.

Largest Sale on Record Made to the Allies—Market Strong With Prices Up ½c to 1c Per Pound—Electrolytic in London Up £10, Standard £9 Spot and Futures—Month's Total Business Largest in History.

September sales of refined copper are estimated to have been 650,000,000 lbs.; being the heaviest monthly transactions in the history of the trade industry. The net revenues of the producing companies on this turnover, are placed at $113,750,000. The heavy volume of business carried prices upward ½c to 1c per lb. on all positions at home and American Electrolytic at London advanced £10 while Standard warrants in the English market were up £9 net. Unfilled orders on the books of the selling companies at the end of the month were approximately 850,000,000 lbs. Exports were 70,000,000 lbs.; deliveries into domestic channels 110,000,000 lbs.; the combined outgo about offsetting the output of the refineries. These statistical estimates are based upon reliable trade data.

Huge Sale to Allies Negotiated.

The announcement made with much complacency by the producers on September 23, and 200,000 tons—448,000,000 lbs.—refined copper had been sold to the Entente Allied Governments for shipment over the first half of 1917, had an electrical effect upon the trade and was thrilling to Wall Street, but by delaying the publicity of the news long enough to permit it to leak through several private channels, the dramatic effect was somewhat diminished. This maximum individual sale was negotiated at 26c per lb., it is understood, and the transaction will bring $120,000,000 to the sellers. The profit accruing is believed to be $78,000,000. Exports are to be made at the rate of 75,000,000 lbs. per month beginning in January 1917. The indication is that the Entente Allies will take about 90% of American shipments during the first half of 1917. Russia and Italy will share the remaining 10% of exports, having placed some individual contracts earlier in the month, Russia alone, having purchased 15,000,000 lbs. through London.

Order Takes Up 40% of American Output for First Half 1917.

These export obligations will absorb about 40% of the probable American output up to July next year. Domestic consumers, too, have covered finished export contracts requiring about 100,000,000 lbs. for shipment over the first quarter of 1917 and the total sales to home melters during the month were in excess of 150,000,000 lbs. so that about 55% of refining capacity for six months of 1917 has been pre-empted

It is an interesting fact that France in the past eight months has taken over 105,000 tons of our copper exports while to Russia has been shipped only

Copper in September.

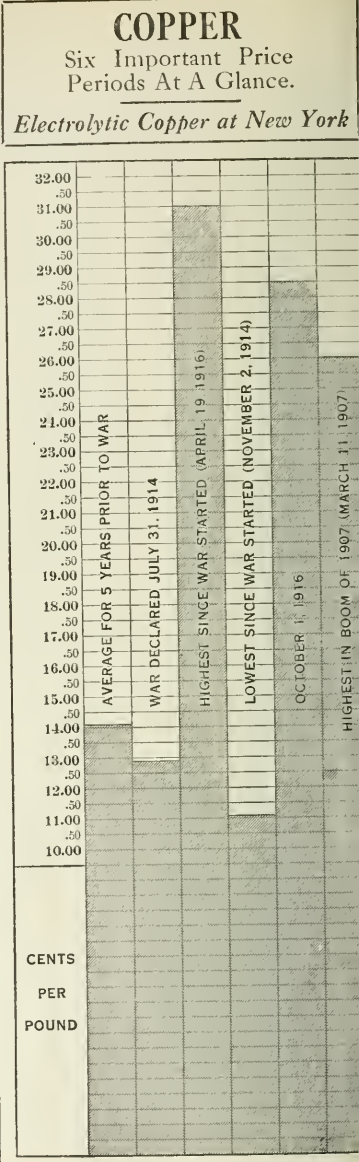
	New York			London.
	Lake.	Electro.	Casting.	Standard.
Day.	Cents.	Cents.	Cents.	£ s d
1	27.25	27.75	25.12½	110 0 0
4	.....	.....	.....	109 10 0
5	27.25	27.75	25.12½	109 0 0
6	27.25	27.75	25.12½	109 0 0
7	27.25	27.87½	25.25	109 10 0
8	27.50	28.00	25.37½	110 0 0
11	27.75	28.00	25.50	111 0 0
12	27.81¼	28.25	25.62½	111 0 0
13	27.87½	28.25	25.75	114 10 0
14	28.00	28.37½	25.87½	117 0 0
15	28.00	28.50	26.00	116 0 0
18	28.00	28.50	26.12½	116 0 0
19	28.00	28.50	26.12½	116 0 0
20	28.00	28.50	26.12½	116 10 0
21	28.00	28.37½	26.12½	116 10 0
22	28.00	28.37½	26.25	116 0 0
25	28.25	28.50	26.50	116 0 0
26	28.25	28.50	26.68¾	116 0 0
27	28.25	28.50	26.75	116 10 0
28	28.25	28.50	26.68¾	117 10 0
29	28.25	28.50	26.50	118 10 0
High..	28.50	28.62½	26.87½	118 10 0
Low .	27.00	27.50	25.00	109 0 0
Av'ge	27.86	28.26½	25.93½	113 18 1

12,283 tons; but not a few Russian orders placed in London, were all allocated to Australia and to Japan. The total exports to all Allies in the same period were 200,537 tons. In 1913, the year of our greatest exports, the Entente Allies took about 245,000 tons, out of a total of 276,344 tons. It is evident that these governments have prepared plans to manufacture war munitions in 1917 on a vastly greater scale than during 1916.

The refineries in September, made some headway against the labor troubles that plagued the works in August, the September output being about 180,000,000 to 185,000,000 lbs, including refining by the Bessemer process. The smelters production is estimated to be about 210,000,000 lbs., so there was a further accumulation of pig copper. The available annual capacity of the electrolytic refineries on September 1st, was about 2,175,000,000 lbs. Construction now in process will increase the total capacity by January 1st, to 2,400,000,000 lbs. annually. In the next three months, however, the smelters will accumulate more pig metal and a further congestion of ore will occur at many mines that are unable to have output treated by the smelters and refineries that are already choked with raw material.

Consumers Enter the Market.

Early in the month, there was a hesitating spirit in the open market for refined copper, with second hands desirous of selling, but before the end of the first week, there was a scarcity of nearby metal; exporters finding it difficult to buy more than 50 to 100 ton lots for September shipment. In the second week, some large domestic consumers having taken foreign orders for about 30,000 tons of brass rods and discs, and 20,000 tons of copper wire, purchased ingot copper in sufficient amounts to cover manufacturing requirements for shipments late in 1916 and in the first quarter of next year. Smaller home consumers also purchased moderate amounts mainly for delivery in the last quarter of this year, prior to the consummation of the heavy export contract that had been under negotiation for over a month. Although



Lake Copper Prices.

Monthly average prices of Lake Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	29.28½
June	17.43	15.08	14.15	19.92	27.44
July	17.37	14.77	13.73	19.42	25.81
Aug.	17.61	15.79	12.68	17.47	26.58
Sept.	17.69	16.72	12.43½	17.76	27.86
Oct.	17.69	16.81	11.66	17.92½	.....
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av. .	16.58	15.70	13.61	17.64	.....

Electrolytic Copper Prices.

Monthly average prices of Electrolytic Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	29.81
June	17.29	14.85	13.81	19.71	27.49½
July	17.35	14.57	13.49	19.08	25.60
Aug.	17.60	15.68	12.41½	17.22	27.36½
Sept.	17.67	16.55	12.08½	17.70½	28.26
Oct.	17.60	16.54	11.40	17.86	.....
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av. .	16.48	15.52	13.31½	17.47	.....

Casting Copper Prices.

Monthly average prices of Casting Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	27.37
June	17.08	14.72	13.65	18.74½	25.10
July	17.09	14.40½	13.34½	17.76½	23.61
Aug.	17.35	15.50	12.27	16.46	24.67
Sept.	17.51	16.37½	12.00	16.75	25.93
Oct.	17.44	16.33	11.29	17.32	.....
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av..	16.29	15.33	13.18	16.76	....

Sheet Copper Price Changes.

The changes in the base price of sheet copper so far this year are given below together with the price of Lake copper on the same dates:

1916—	Sheet Copper.	Lake Copper.
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 20	36.50	29.75
May 5	37.50	29.75
August 2	35.50	25.50
August 18	37.50	27.00

Waterbury Copper Averages.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.50	17.00	14.75	14.12½	24.75
Feb.	14.50	15.50	15.12½	15.25	27.75
Mar.	15.00	15.12½	15.00	15.75	28.00
Apr.	16.00	15.75	14.87½	18.50	29.00
May	16.37½	15.87½	14.75	22.50	29.87½
June	17.50	15.37½	14.37½	22.50	28.25
July	17.75	14.75	14.12½	22.25	27.25
Aug.	17.75	15.62½	13.00	19.50	27.00
Sept.	17.87½	16.87½	12.87½	18.50	28.00
Oct.	17.75	16.87½	12.25	18.25	....
Nov.	17.75	16.25	12.25	19.37½	....
Dec.	17.75	15.00	13.50	20.75	....
Av.	16.71	15.83	13.91	18.94	....

Exports of Copper From the United States.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	23,663
February .	26,792	34,634	15,583	20,648
March ...	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	21,654
May	38,601	32,077	28,889	16,062
June	28,015	35,182	16,976	39,595
July	29,596	34,145	17,708	35,066
August ..	35,072	16,509	17,551	32,160
September	34,356	19,402	14,877	29,803
October .	29,239	23,514	24,087	.....
November	29,758	24,999	23,168	.....
December	30,653	22,166	42,426	.....
Totals ..	382,810	360,229	276,344	244,972

sales were made in the open market at ¼c or more, under producers' asking prices, there was a general upward tendency throughout the month. Some producers report this year's output fully sold but it is estimated that 175,000,000 lbs. are still available to consumers for shipment over the next three months.

In the wake of the maximum sales there were many small export inquiries from private merchants and manufacturers with some sales, but reports that European Governments are still negotiating for 200,000,000 lbs. of American copper for shipment in the next six months are not fully credited. In the last week, home consumers bought moderately for November and December shipment, and placed a few additional orders for first quarter of 1917 shipment. Electrolytic copper which sold early in the month at 27½c for October, 27 to 27½c for November, at 26½ to 27c for December and at 26½c for the first quarter of 1917; at the close of the month, was selling at 28½c for November, at 28c for December, at 27c for the first quarter and at 26½c to 26¾c for the first half of 1917. Some producing interests were asking ¼c per lb. more, for nearby delivery.

At London, American Electrolytic advanced steadily from £130 on September 1st, to £140 on the closing business day of the month. English Standard warrants advanced £8 on spot and £9 on future from August 31st to September 14th, followed by a reaction of £1 to £2, with a later recovery, the net result being an advance of £9 on spot and futures.

Joplin Zinc and Lead Ore Market.

The month of September was a very satisfactory one from the standpoint of shipments and decreased surplus stocks and taking into consideration the classes of ore shipped the price level was satisfactory for zinc ores and showed a decided improvement for lead ores. For five weeks of the month the total shipments of blende ores reached 31,074 tons or an average of 6,215 tons per week while calamine ores sent out amounted to 2,907 tons or an average of 581 tons per week. This closely approximated 6,800 tons of all classes of zinc ores which was decidedly above the weekly production for the same period.

The month opened with a stock of ores variously estimated at from 23,000 to 32,000 tons according to the different sources of estimation. From the best information available it appears that the latter figure is more nearly correct and even then was perhaps a little too conservative rather than too high. But by the end of the month the shipments had so exceeded the production that the stocks had dwindled to 18,820 tons. There will have to be still greater shipments during the coming month to make the same inroads upon the stocks because there is a steadily increasing output at the present time.

Prices so far as averages are concerned were lower during the month of September than for the previous month but so far as the base range levels are concerned there was little change noted. The averages were lower, due to the larger tonnages of low and medium grades sold as compared with the larger tonnages of high grade ores the previous month. The monthly average for August for blende ore was $59.11, while in September the average was but $56.59. On the other hand calamine ores not only sold more freely but the ores sold were higher grade and the price paid higher and as a consequence the average for September exceeds that of August, being respectively $42.12 and $40.23.

A variety of causes contributed to

the lower output for the month which was one of the factors entering into the decreased surplus stocks. The coal strike in Kansas and its long drawn out settlement depleted the available coal for the power plants dependent upon this class of fuel for power. At the same time one of the big turbines at the electric power station supplying the district with electric power had to be taken out and replaced which cut off a number of plants using that class of power. Other plants were simply forced out of commission on account of too high production costs where ore bodies were not rich enough to make up the difference. But these causes were all removed by the end of the month save the latter one and even here there is some improvement and it is believed that before the present month ends there will be a resumption of a number of mills that have been closed down. Offsetting these to a certain extent will be additions to the idle list by mines that have tried to keep running when they should have closed down when the price went below their cost of production.

Most producers believe that the buying movement inaugurated last month will continue up to the winter season as the smelters are known to have small stocks of Joplin ore although fairly well stocked with western ores and with Mexican and Australian ores. Increasing difficulty of shipment during the winter months will make it less easy to obtain ores and hence the desire to stock up now. Also the rigors of winter always cut off considerable production also and often just when it is wanted by the smelters. For these reasons it is generally believed that the price level will be such as to encourage the sale of all surplus stocks and to help increase the outputting of the mines.

The better position of the lead ore market has been decidedly stimulating to the district as a whole. Both the lead ore producers and the zinc ore producers have profited by it, the former by the increased price for all their product and the latter by the improvement for their by-product and hence their whole position has been helped. From a $65 level for August it jumped up as high as $75 for 80% grades. Naturally there has been a marked improvement in sales and shipments for the month. The total shipment for the month was 4,655 tons of lead ore or an average of 931 tons per week as compared with 710 tons weekly for August. The average price for all grades in August was $65.51 as compared with $68 for September. Stocks of lead ores dwindled from 2,550 tons at the month's opening to 1,130 at its close.

The month therefore shows a decided advantage for the district from all points of view. There has been a heavy decrease in both lead and zinc stocks. there has been a decidedly better demand for both ores and consequent better prices which in turn has resulted in increasing production once more and bringing a more healthy tone to the labor situation which was being directly affected by the heavy curtailment of mining activities over the district.

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Antimony In September.

**Market Dull and Declining Throughout the Month—
Prices Off 1c to 1½c Per Pound.**

Antimony continued heavy and depressed throughout the month of September prices suffering a further decline of 1 to 1½c per pound on round lots in bond and of 1½c to 1¾c per pound on jobbing lots, duty paid. It was believed that large orders for shrapnel would be the salvation of the market. Shrapnel orders were placed in Canada late in the month and resulted in the buying of antimony here but the tonnages purchased were too small or the competition too keen to cause any radical improvement in the local trade; indeed, prices receded to lower levels. The increased vitality, however, arising from the war purchases established more healthful conditions; yet at the close of the month dolorous dealers were soliciting small orders at concessions. Importers, on the other hand, were holding prices for round lots above the trading level because the Oriental market, from which new supplies must come, was less depressed than was the Occident.

Dealers at the beginning of September were holding jobbing lots at 12 to 12½c but by the middle of the month they were seeking orders at 11¼c to 11¾c, duty paid, with small success. In the meantime 25 ton lots had been sold at 10½c in bond—equivalent to 12c duty paid, and on several subsequent occasions an effort was made to buy 25 ton lots at 11c duty paid without finding ready sellers. Holders were asking a fraction more. Some lots of domestic held on the Pacific Coast were offered for future delivery here but there being no consuming outlet, dealers failed to respond satisfactorily.

On the 18th, an improved jobbing demand was experienced which was met with alacrity by dealers making concessions. There was also some interest in wholesale lots, would be buyers offerings 10½c to 10¾c duty paid for shipments in October to February. Sellers' views were slightly above 11c duty paid. Importers were more responsive to overtures but not ready t make substantial concessions. On th following day dealers offered to se October, November and December shi ments at 11c duty paid but with sma success. The appearance of Canadia buyers on September 21st, followin the distribution of shrapnel orders the Dominion, found dealers eager f orders with November, December shi ments offered at 10½c duty paid ar even greater concessions were made f carload lots. In the next few days, o ders for several large lots were plac at 9½c in bond for September, Octob shipment to Canada, followed by bu

Aluminum, Silver, and Antimony Prices in September.

	Aluminum.	— Silver —		Antimon
	N. Y.	N. Y.	London.	N. Y
Day.	Cents.	Cents.	Pence.	Cent
1	61.00	68⅛	32 7/16	12.25
2	.....	67¾	32¼	.....
4	.....	....	32⅛	.....
5	61.00	68	32⅜	12.25
6	61.00	68¼	32½	12.00
7	61.00	67⅞	32 7/16	12.00
8	61.00	68¼	32½	12.00
9	.....	68⅜	32 7/16	.....
11	61.00	68	32⅜	12.00
12	62.00	67⅞	32 7/16	12.00
13	62.00	68	32⅜	12.00
14	62.00	68¼	32½	11.75
15	62.00	68	32⅜	11.50
16	.....	68¼	32½	.....
18	62.00	68¾	32 11/16	11.37
19	62.00	68⅝	32⅝	11.25
20	62.50	68⅝	32⅝	11.25
21	62.50	68⅞	32¾	11.25
22	62.50	68⅞	32¾	11.12
23	.....	68⅞	32¾	....
25	62.50	69¼	32 13/16	11.12
26	62.50	69¼	32 13/16	11.12
27	62.50	69¼	32 13/16	11.12
28	62.50	69⅛	32⅞	11.12
29	62.50	69¼	32 13/16	10.9
30	.....	69⅛	32⅞	....
High ..	63.00	69¼	32 13/16	12.5
Av'ge, ..	61.90	68.51½	32.58½	11.5
Av'ge.	16.90	68.51½	32.58½	11.5

ing in 25 ton lots at 9½c in bond for November shipments with more inquiries for October shipment on Canadian account which subsequently resulted in business. On the last two days of the month the market again lapsed into dullness with dealers disappointed because the buying by ammunition manufacturers had failed to advance prices. With foreign orders satisfied there was an absence of demand for metal in bond and holders were again seeking duty-paid orders at concessions. Jobbing lots were offered at 11c and 10 ton lots at 10¾c duty paid.

Chinese and Japanese Antimony.

Average monthly price of Chinese and Japanese (ordinary brands) in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	32.20½
June	7.07	7.62	5.62½	36.53½	20.40
July	7.37	7.55	5.44	35.98	14.55
Aug.	7.58	7.48	13.05	32.57	12.62
Sept.	8.00	7.31	9.79½	28.50	11.57
Oct.	9.11	6.46	11.64	30.96	.....
Nov.	9.11	6.28	14.14	37.88	.....
Dec.	9.05	6.05	13.15	39.36½	.....
Av.	7.63	7.43	8.53½	29.52	.....

Quicksilver Prices.

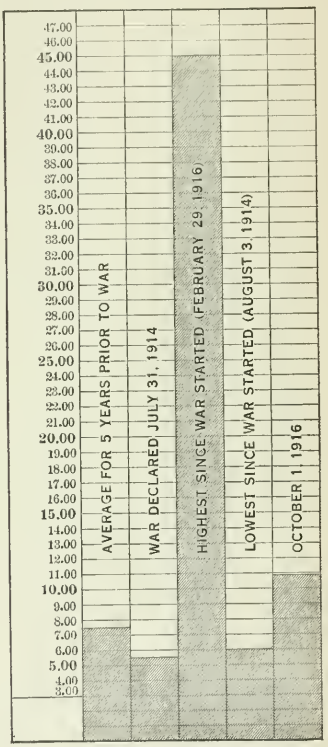
Monthly average prices of Quicksilver in New York (flasks of 75 pounds).

	1913.	1914.	1915.	1916.
Jan.	40.00	38.05	50.90	214.76
Feb. ...	40.00	38.00	58.05½	288.50
Mar.	39.50	38.00	62.93½	223.91
April ...	39.14	38.00	65.71½	140.10½
May	39.19	38.00	72.65	96.95
June	39.67	37.73	87.91	73.04½
July	39.00	35.87	93.33	80.95
Aug.	39.00	74.19½	91.79½	75.04
Sept. ...	39.00	73.57	89.09½	75.85
Oct.	38.59	50.59½	92.40	....
Nov.	38.00	51.72	102.25	....
Dec.	38.50	51.61	126.52	....
Average.	39.13	47.11	82.80	.....

ANTIMONY

Five Important Price Periods at A Glance.

Chinese and Japanese Grade at New York



Prior to the present war the highest price for antimony was reached in May 1906, eight months after peace was declared in the Russo-Japanese War. Thus in May, 1906 ordinary grades of antimony sold as high as 26¾c. From May 1906 until April 1907 the price fluctuated between 25c and 20c, then the market broke badly and the average price for the month of July 1907 was as low as 9.53c.

Aluminum In September.

Firm in September—Prices Up One to Two Cents per Pound.

Aluminum, like most other metals, has felt the effect of the European war and America has been called upon to share her supply of this metal with the Entente Allies who have needed large amounts in the manufacture of aeroplanes and other munitions of war. The prices prevailing in the open market to-day are almost double those current one year ago, the result of an inadequate supply to meet the increased demand the world over. In September there was an advance of 1c to 2c per pound. The outside domestic market has been narrow, largely because of the light supply available. Sales of small lots of Virgin No. 1 ingots were made to consumers late in the month at 62 to 63c against sales at 60 to 62c at the end of August. Dealers were seeking round lots at 1c to 2c under these prices; No. 12 alloy remelted, too, was in good demand at 48c or higher, an advance of about 2c per pound during the month.

There has been considerable interest recently in the report that the British Government has purchased a second lot of aluminum from the largest American producer for shipment over the balance of this year and for several months in 1917. The sale is said to cover 8,000,000 to 10,000,000 pounds. It will be recalled that in the Fall of 1915, the British Government was reported to have made a similar purchase in the United States when the open market price of Virgin aluminum was close to 48c per pound. In the first eight months of this year the value of our exports was $4,867,743 which would indicate total exports of about 10,000,000 pounds or at the rate of 1,250,000 pounds per month. Most of this metal has gone to Great Britain and Russia, and some to Italy. The French output in normal times is in excess of her home needs and liberal exports are made to other countries including the United States. Early in the war the French Government commandeered the aluminum factories, among other industrial plants in that Republic. What the French output has been since that time is an unknown quantity but probably there has been no decrease as the needs of war are heavy and in one month of this year France was able to export 1,000 tons.

In normal times United States imports about 30% of the total amount of aluminum consumed here but no foreign metal has been avilable for United States consumption since October, 1915. In the 10 past months preceding October we imported only 3,765 tons against an average annual importation of 10,000 tons, equivalent to 20,000,000 pounds. It is therefore evident that our aluminum supply has been cut down about 27,000,000 lbs. in last 8 months.

On the other hand, domestic production has been increased some during the past year and a still further increase will be available when the plant now building in North Carolina is finished. These works will have a capacity of 40,000,000 pounds per year. It was expected that the plant would be in operation late this year but heavy floods have delayed construction so it will probably be March, 1917, before the work is completed.

Producers' contract prices for ingot aluminum to be shipped in 1917 is 35 to 37c per pound; second hands prices to dealers range from 55 to 60c and dealers' prices to consumers range from 60 to 65c per pound.

Aluminum and Silver Prices.

	New York			
	Aluminum.		— Silver —	
	1915.	1916.	1915.	1916.
Jan. ...	19.01	54.33	48.89½	56.77½
Feb. ...	19.20	57.50	48.48	56.75½
Mar. ...	18.94½	60.52	50.24	57.92½
April ..	18.83	60.00	50.25	64.37½
May ...	21.85	60.00	49.91½	74.27
June ...	29.66	62.09	49.03	65.02½
July ...	32.50	60.15	47.52	62.94
Aug. ...	34.00	59.48	47.18	66.08
Sept. ..	46.75	61.90	48.68	68.51½
Oct. ...	54.17½	.....	49.38½	.....
Nov. ...	57.85	.....	51.71	.....
Dec. ...	56.80½	.....	54.97	.....
Av'ge..	34.13	.....	49.69	.....

Aluminum Prices in New York.

Extreme price fluctuations of pure aluminum (No. 1 Virgin 98-99%) in New York; by months.

	— 1913—		— 1914 —	
	High.	Low.	High.	Low.
Jan.	26.50	26.00	19.00	18.50
Feb.	26.50	26.00	19.00	18.50
Mar.	27.12½	26.25	18.75	18.00
April ...	27.12½	26.62½	18.25	17.75
May	26.62½	25.00	18.12½	17.75
June	25.75	23.00	18.00	17.50
July	24.00	23.00	17.25	17.37½
Aug. ...	23.50	21.50	21.50	18.00
Sept. ...	22.50	21.50	20.50	18.25
Oct.	22.00	19.75	18.50	18.00
Nov.	19.75	19.00	19.50	18.00
Dec.	19.00	18.50	19.25	18.75
Average.	27.12½	18.50	21.50	17.37½

	— 1915 —		— 1916—	
	High.	Low.	High.	Low
Jan.	19.25	18.75	56.00	53.00
Feb.	19.50	18.75	63.00	53.00
Mar.	19.25	18.75	63.00	58.00
April ...	19.50	18.75	61.00	59.00
May	26.50	19.25	61.00	59.00
June	33.00	26.00	65.00	59.00
July	33.00	32.00	62.00	59.00
Aug.	37.00	32.00	62.00	58.00
Sept. ...	50.00	36.00	63.00	60.00
Oct.	57.00	49.00	.....	.....
Nov.	60.00	55.00	.....	.....
Dec.	60.00	53.00	.....	.....
Average.	60.00	18.75	.....	.....

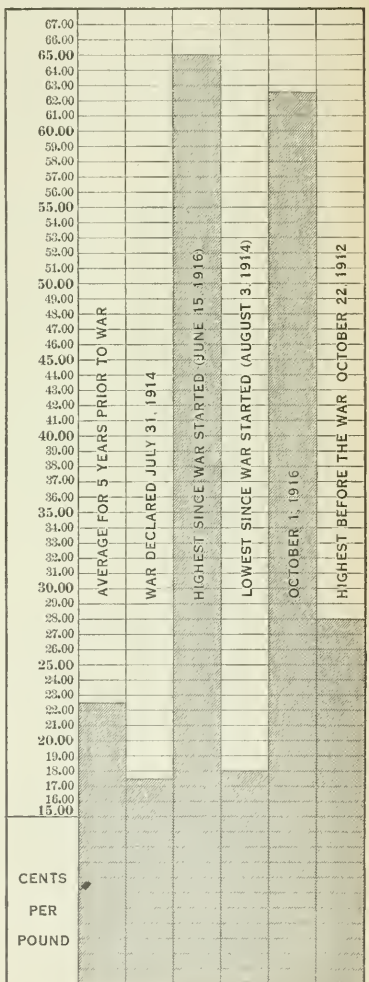
Consumption of Aluminum in the United States.

	Pounds.
1904	8,600,000
1905	11,347,000
1906	14,910,000
1907	17,211,000
1908	11,152,000
1909	34,210,000
1910	47,734,000
1911	46,125,000
1912	65,607,000
1913	72,379,000
1914	79,139,000
1915	99,806,000
1916 (estimated)	120,000,000
Total	628,220,000

ALUMINUM

Six Important Price Periods At A Glance.

No. 1 Virgin Alum. at New York.



Probable Business Developments Before War Ends.

Iron and Steel.

(Continued from page 431.)

Where open contracts are made, they are for relatively short periods. Thus the sheet and tin plate mills have not opened their books for next year, but when they do, probably by now, but when they do, probthey expect to place under contract all the tin plate and nearly all their sheets, with buyers who are certain to specify in full.

The railroads have entered the market again, and are inquiring for 15,000 or 20,000 cars, a large number in the circumstances, and they have been buying in the past two or three weeks in a moderate way, at a distinctly better rate than formerly, showing conditions to be such that they had better pay the high prices than do without.

Hitherto the great advance has been in steel, but in the past fortnight pig iron has been advancing, and as steel capacity is not materially increasing, capacity is not materially increasing there is a prospect that the scarcity in steel may develop into scarcity of pig iron, the latter advancing and reducing the present absurdly wide margin between pig iron prices and steel prices.

Copper.

In spite of an increase in production there is a positive scarcity of the metal for delivery this side of January, and although prices are double normal the market is stronger to-day than at any time, and consumers following the lead of the British Government are buyers up to next August at what would seem high prices, but which may look very cheap when time of delivery comes round. What the Allies think of the continuation of the war, and the price of copper over the next nine months has been shown in their purchases of 200,000 tons for the first half of next year at a price believed to be not under 26c. The most astounding purchase on record both as to quantity, extended deliveries and price. This purchase alone is equal to one-third the anticipated output of this country. The cop per situation never was sounder o stronger or the future so assured.

Lead.

Home and war demand has taxed pro duction, which on account of Mexica troubles and conditions attending hom operations has not been increased a much as the high prices ruling migh have indicated.

Every pound of the metal being pro duced is wanted, our home require ments have heavily increased. Whil prices are very high, there must be great change in the demand before an decline can be possible.

Spelter.

The excitement and extraordinary prices caused some months ago whe we realized the unsatiable demands o war for spelter have disappeared. heavy reaction has brought the pric down to bare cost of production unde the present labor and other costs t many producers. The output is enor mous but so is the demand. In the pas few days an advance of 1 to 1½c pe pound has taken place and the outloo is for prices to fluctuate around th present level.

No such sensational prices as in th past are to be expected, the facilities o output are too large, and if any advan ces above 10½c to 11c take place the promise to be only temporary, likewis will be any declines below 9c while th war lasts.

Tin.

Tin being a peace metal, has not bee affected by war demand, but has bee at times extraordinarily affected by wa conditions, namely, dangers of ocea transportation and fears of embargoe or British regulations affecting our sup ply, as for instance, in the first fe days of the war when prices doubled The falling off in European consump tion by the war has been been mor than offset by increase in America deliveries to our consumers. Our con sumption promises to continue to in crease with our prosperity, the outpu shows no increasing tendency, prices a present compared with those ruling i recent years before the war are low The prospect is for a gradually improv

ional decline. After selling as high s 45c last February is now down to 1½c.

No antimony can be imported from Europe on account of embargoes, the Allies protecting their supplies in that way for their war requirements. We re dependent on China and Japan for ur supplies, and while these countries ave developed an output equal to our eeds this attitude is to hold their etal for higher prices. Meanwhile urplus stocks that were accumulated ere are being used up, and soon the truggle will come between sources of ing market during the winter and next spring, with, at any time, excitement and rapidly advancing price should any dangers of transportation be threatened.

Antimony.

This metal has sustained a sensa- production and our requirements. The outlook is for better prices, and if speculation takes hold or if any of the big and sudden war demands strike the producing countries or our market as was the case repeatedly in the past, sudden advances are to be expected.

Increased Production of Natural Gas.

There have been so many "failures" f the natural gas supply as applicable o industries in various sections that the npression may have been obtained that he production of natural gas in general has been decreasing. This is not he case. There are decreases in some elds, and there is also the influence hat with increasing consumption in omes the quantity available for manuacturing purposes decreases in many ases. Statistics of production in 1915 ave just been issued by the Geological urvey, the figures comparing as fol- ows:

	Thousands of cubic feet.	Value at point of consumption.
912	562,203,452	$ 84,563,957
913	581,898,239	87,846,677
914	591,866,733	94,115,524
915	628,578,842	101,312,381

From 1912 to 1915 the largest increase was in the California production, while Ohio and Oklahoma had fairly arge increases and West Virginia, 'ennsylvania and Texas showed slight ncreases. There were slight decreases n Kansas, New York and Kentucky, nd relatively large decreases in Indiana and Illinois.

It is only in recent years that the production of natural gas by quantity has een ascertained. In the old days the producers paid practically no attention to the matter of quantity. Even domestic consumers were given "unlimited service" the charge being regulated by the number of outlets. The total values as ascertained by the Geological Survey are given below at quanquennial intervals:

1885	$ 4,857,200
1890	18,792,725
1895	13,006,650
1900	23,698,674
1905	41,562,855
1910	70,756,158
1915	101,312,381

Of the 1915 production it is estimated that 35% was distributed to 2,195,081 domestic consumers, at an average price of 28.32 cents per thousand feet, and 65% to 18,358 industrial consumers at an average price of 9.7 cents per thousand. On the whole, there has been only a very slight increase in the past few years in the proportion of natural gas going to domestic consumers, and very little change in the prices paid by either domestic or industrial consumers. In certain districts there have been great changes. Pittsburgh industrial concerns, for instance, have had their supplies greatly decreased, but these decreases have been largely paid up by increased industrial use in the relatively new fields.

Brands of Copper in the United States

LAKE.

	Refined at:	Branded.
Adventure	Hancock, Michigan.	Adv. C. Co.
Atlantic	Houghton, Michigan.	A.
Calumet & Hecla	Hubbell, Michigan.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	B. L.
Centennial	Hancock, Michigan.	C. C. M. Co.
Copper Range	Houghton, Michigan.	C. R.
Franklin	Hancock, Michigan.	F. M. Co.
Isle Royale	Dollar Bay, Michigan.	I. R. C. Co.
Mass.	Hancock, Michigan.	Mass.
Michigan	Houghton, Michigan.	M. C.
Mohawk	Houghton, Michigan.	M. M.
Osceola	Dollar Bay, Michigan.	T. O.
Quincy	Hancock, Michigan.	Q. M. Co.
Tamarack	Dollar Bay, Michigan.	T. O.
Victoria	Hubbell, Michigan.	V. C.
Winona	Hubbell, Michigan.	W. A.
Wolverine	Houghton, Michigan.	W.

ELECTROLYTIC.

	Refined at:	Branded.
American S. & R. Co.	Perth Amboy, N. J.	P. A.
Balback S. & R. Co.	Newark, N. J.	Bb.
Baltimore Copper Works	Baltimore, Md.	B. E. R.
Boston & Montana Co.	Great Falls, Mont.	B. & M.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Copper Queen	Laurel Hill, L. I.	C. * Q.
Miami	Laurel Hill, L. I.	A. L. S.
Nichols Copper Co.	Laurel Hill, L. I.	L. N. S.
Orford Copper Co.	Chrome, N. J.	O. E. C.
Raritan Copper Works	Perth Amboy, N. J.	N. E. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. R. W.
United Metals Selling Co.	Laurel Hill, L. I.	R. M. C.

CASTING.

	Refined at:	Branded.
Balbach S. & R. Co.	Newark, N. J.	N. B. C.
Boston & Montana Co.	Great Falls, Mont.	M. A.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Duquesne Reduction Co.	Pittsburgh, Pa.	D. E. C.
Nichols Copper Co.	Laurel Hill, L. I.	C. N. C.
Phelps, Dodge & Co.	Laurel Hill, L. I.	P. D. Co.
Tottenville Copper Co.	Tottenville, N. Y.	C. T. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. S.
White & Bro., Inc.	Philadelphia, Pa.	W. B.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, NOVEMBER, 1916. NO. 11.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer,
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

How Peace May Effect the Prices of Metals.

(By Charles S. Trench, Editor of the American Metal Market.)

What will be the effect on metals after the war? If they will decline what is a fair supposition of how great will be that decline? To this I have to ask the question, what will be the prices of the various metals when peace negotiations begin which will absolutely result in end of the war? This no one can answer and therefore it can be seen, how at the present time, it is difficult to predict with any exactness. Is there to start in shortly a movement to discount the end of the war, which at present does not exist, by allowing stocks to run down and result in an empty future order book? Will this be so overdone that when peace comes it will be proved that after-war effects have been so overdiscounted that instead of a further decline with peace there follows an improvement for the reason stated? If normal prices are to rule in metals after the war, what are normal prices? How much above normal prices are we to-day? Here we have to turn to past performances, in other words, to statistics. I do not intend to bother you with figures. My organization is responsible for a compilation of, I think, about all the important statistics appertaining to iron, steel and metals, known to many of you as METAL STATISTICS, and there will never be a time when it will be more important to refresh our memory of production, consumption, prices, etc., that have ruled in the past, as in the period into which

we are entering. The fact that the average price of the past 30 years up to the beginning of this year was

14.06c for Copper
5.36c for Spelter,
27.63c for Tin,
4.25c for Lead,

has very little bearing on the normal value of these metals on account of the change in the relation of output to consumption in what we might call present times. But I do think that a comparison of the average prices of the two years before the war is of the greatest value. This comparison shows the following:

	1912-1913.	To-day.	% inc.
Tin	45.37½	41.00	*10
Copper (Elec.)	16.00	28.75	80
Lead (St. L.).	4.32	6.87½	59
Spelter (St. L.)	6.27	9.50	52
Antimony	7.53	13.00	73
Aluminum	23.00	65.00	181

* Decrease.

Unless before peace a radical adjustment takes place there must be some serious declines at that time in every metal except tin. It might be interesting to examine each metal separately.

Tin.

Pig tin is a peace metal and consequently has suffered in consumption in Europe and in price the world over. There has been an increase in deliveries to our consumers of nearly 20% in the current year as compared with the year prior to the war. A part of this has been caused by the fears of interruption in obtaining supplies from abroad, which has led our consumers to adopt the policy of carrying large stocks, safety stocks, but the greater part of the increase has been by reason of increased consumption, the result of prosperous trade conditions in this country and especially in the tin plate trade through increased demand for our canned meats and other commodities. Consumers are not likely to take any chances while the war lasts and will continue to carry good stocks. The sensational advances in prices at times, caused by threatened ocean transportation by reason of submarines, and English Government regulations are not forgotten, but these advances were quickly lost when the fears wer found unwarranted. The actual con sumption with continued prosperit promises to remain large, in fact to in crease. No stocks of manufacture goods have accumulated. The price o tin plates for the next six months ha just been announced at 60% above tha of a year ago and there is a rush t place season contracts and best author ties in the trade estimate the output o tin plates for 1917 will be quite a amount in excess of this year. Th statistical position of tin is a stron one. Production is not increasing, an it is the common opinion that highe prices than those now ruling will rul over the next six months. When th war ends there will be a recovery i European consumption and the repler ishing of stocks which are down t nothing in the continental countrie but against this there will be a disap pearance of the fears in America abou getting supplies, and the safety stock which our consumers have been carry ing will no longer be held, and if ther were no other factors to be considere one might counterbalance the othe But tin has for years been the specula tive counter of the London metal mar ket, and by reason of British Goverr ment regulations, speculation has bee non-existant during the war. In othe metals it has been not only forbidde but absolutely made impossible by th British Government. With peace, specu lation will revive in tin abroad. A Lon don correspondent a few weeks ag wrote me: "Of course, we are unabl by Government orders, to trade in ti except on consumer's requirements, bu I lick my chops at the thought of th revival of my business when peac comes." The opinion is universa abroad that peace will increase the con sumption of tin and make for grea speculation and higher prices in th metal, and probably this will be foun to be true. A contingency that is forgo ten and which may advance prices that an export duty may be levied o tin by England to help the addition revenue she will need to pay for th war. The wonder is it has not bee done before. Supposing an export dut of 5c, 10c, 15c or 20c was placed by En land on the metal, we would have

ay it. Nickel and tin are the only etals we seem unable to find among ir mineral resources. There is no sub-itute for tin. Unlike other metals, the rice has virtually no effect on con-umption. If tin was at 15c we would erhaps put more on our tin plates and ake better solder and babbitt metal, ut of this I am not sure. If it was $1 er pound we would still have to use it or nearly every use to which it is put. in is one of the weakest points in merica's economic self-sufficiency as nation, and it has been truly said hat the control of this metal is Eng-nds' strongest economic weapon in ase of disagreement with America. he effect of being cut off from tin ould create sanitary troubles that ould be terrible. I give it as my pinion that tin at present prices is n a safe basis and that after peace uch higher prices are to be expected. t is well to remember that tin is the nly metal selling to-day at less than he average price of two years before he war for as previously noted the rice of tin is 10% lower while the price f other metals are 52% to 180% igher.

Copper.

There are those who predict that the eace demand for copper will offset he falling off in war demand—that ustria, Germany and some of the ad-oining neutral countries will be com-letely bare of the metal and that there vill be a rush to get supplies, and that t will apply not only to the raw ma-erial but to the manufactured com-nodities many of which have been nelted for war material and all f which have gone the length of he war without replenishment. There s some truth in this, and already arge purchases are reported to ave been made for German account o be delivered when the war ends. But gainst this must be placed the fact that when that time comes several of the countries will be on the verge of bank-ruptcy, and all of them staggering un-der an enormous indebtedness both pri-vate and governmental, which will require the practice of the strict-est economy. It is inconceivable to imagine that Europeans would set in to replace their copper supplies at prices which are more than double nor-mal and triple the cost of production. Even at a normal price copper is not a cheap metal, and for many purposes has a more economical substitute, and the thought that the Germans will im-mediately replace the copper roofs and gutters and cooking utensils and the hundred and one other articles that were thrown into the melting pot to furnish war munitions, is to my way of thinking ridiculous. Cheaper ma-terials will be used not by choice but for economy. Then again Germany's large purchases for the years before the war were partly in preparation for the war, and will not be repeated, and partly to supply Germany's foreign trade which she has completely lost and may not readily regain. Another point to remember is that copper is a metal that is not destroyed in the using, and while this enormous consumption has been going on for war purposes, the copper so used has not all been lost, in fact a very large portion of the used shells and cartridges are being system-atically collected, and the metal will be put to another use. The idea of these being saved and collected has been ridiculed by a prominent copper authority, but it is nevertheless a fact, and the style of trench warfare that has been conducted has made this pos-sible. Men and guns have occupied the same positions for months at a time and it has not been a matter of explor-ing "no man's land" for an occasion-al cartridge shell, as my critic has sug-gested, but simply a case of recovering the piles of exploded shells and cart-ridges that accumulated in every trench and gun station. It may seem a small matter in the detail but we have little appreciation of what it amounts to in the whole. Shut off from the rest of the world and with a home production of less than one-tenth of the copper that the Allies have been receiving from us, Germany has undoubtedly recovered every pound that was recoverable.

At the end of the war there will be an immense stock of this scrap in Europe, and more than that the Allies will have on hand, and under contract, enormous supplies of copper both in a raw and semi-finished condition, be-

cause there will be no diminution in the Allied purchases or no decrease in their reserve stocks until peace is actually established, and I venture the opinion the supply then will be greater than it is to-day or at any other time in the past.

The increase in the production of refined copper was slower to come about than in any of the other metals, and while it to-day shows a gain of only about 25% over 1913 we will by next year have increased it another 25% and in a few months will have the facility of turning out more than 200,000,000 pounds of copper a month, or 2,400,000,000 pounds a year. Before the war our home consumption in only one year exceeded 800,000,000 pounds and with the loss in the war order business in this country, we would indeed have to enjoy extraordinarily prosperous conditions to use 1,000,000,000 pounds a year. The normal exports before the war were less than 750,000,000 pounds yearly, so even if our foreign trade came back to us on the former basis, we would face an immense oversupply, or rather an immense over-supply of productive capacity. A point to be remembered is that this increase in production was accomplished without any pronounced increase in costs, and the costs of the principal producers today range from 7c to 10c with the general average slightly below 10c. You can see how much room there is for a decline before production costs are reached, or before the price reaches the level that producers were wont to consider a fair level for copper, viz. 15c. I do not expect to see the decline for months to come, neither does the British Government, or they would not have contracted for 450,000,000 pounds for 1917 deliveries at 26c. But we cannot avoid a readjustment of prices later on, and with the first real indications that the war is coming to an end we will experience a contraction in the demand which will bring on an unsettled market until the industry is established in accordance with the altered conditions. As the production and sale of copper is controlled by comparatively few interests the market is not so quickly sensitive to trade developments, and it would be in line with past performances if the readjustment of the pr of this metal is done more slowly conservatively than in the case of ot metals.

Spelter.

One of the greatest changes that taken place in the metal industry reason of the war has been in spel Before the war Europe produced m than double the quantity of spelter t was produced in this country, figures for 1913 being 742,854 tons Europe as against 346,676 tons in United States, and three-quarters of European production came from G many and Belgium, the greater par which was derived from the refining Australian concentrates. Germany collared these Australian concentra by long time contracts, and thro their syndicates they absolutely c trolled the output and also the pr of the metal in Europe. The expo of spelter from our country had ne amounted to more than a few thous tons a year, in fact during the years preceding the war our total ports exceeded by a few hundred t our total exports, and therefore we virtually no say in the world's mar for spelter which was completely der German control. When the broke out England found herself i helpless condition, for although poss ing these Australian concentrates had smelting facilities for less than third of her ordinary consumption say nothing of the amounts requi by France, Russia and Italy. Our co try was immediately called upon supply the Allies with their spelter quirements, and this huge demand only for the raw material, but also brass and brass products, and the cessively high prices which were p caused a phenomenal increase in production here. The total number American retorts at the end of year will be in the neighborhood 220,000 as against 120,000 at the end 1914, representing a theoretical crease in the output of 350,000 ton year. Some authorities place it hi er than that, and it has been stated the U. S. Geological Survey that will end this year with facilities produce 900,000 tons of spelter a ye

ncluding the output of electrolytic inc. This is two and one-half to three imes the amount of our domestic consumption before the war. It is impossible to believe that we will produce it this rate any time during this year or next, but taking the present output of about 650,000 tons a year, and estimating the ordinary domestic consumption, outside of war supplies, at 350,000 tons t can be seen to what extent the industry is dependent on the war demand. Among this increase in production is he zinc smelting plant erected by the U. S. Steel Corporation, the largest individual consumer of spelter in the country, which removes this company from its dependence on the outside market for its supplies, and furthermore one or two other consuming interests are following their example on a smaller scale.

There is no need to discuss the price fluctuations which have taken place during the last two years, exeept to say that the advance in the first year of the war from 4¾c to 26½c represented the extent of the insufficiency of supplies which has since been corrected, for today's price of 9½c does not mean so much a scarcity of metal, but rather the increased cost of produetion, which figures, on account of high labor and other reasons, ore, etc., about 8c at the present time.

We face a most serious situation in the American spelter industry with the ending of the war for while Germany will not resume the position she held before, as the Australian conecntrates will never be allowed to go to her again, still an agreement has been entered into between the Governments of Great Britain and Australia by which the former agrees to take 45,000 tons of spelter and 100,000 tons of concentrates annually during the war and for ten years thereafter, and has put aside $2,500,000 towards erection of works, and it is only a question of time when provision will be made for the entire Australian production. Peace will not instantly deprive us of our export trade in spelter, but it will cause a serious falling off, and more important still will cause a heavy shrinkage in the demand from the brass trade in this country through the stoppage of war orders. A complete revision of the industry will take place when that comes, and there will have to be a reduction in operations in every direction, and smelters will be closed down that perhaps will never run again. As many smelting plants have paid for themselves several times over through the extraordinary profits of the last two years, this will not prove such a great hardship, but the real trouble will come through the readjustment of the work to the altered conditions. Costs will have to be reduced, both smelting and mining costs, which will be to some extent automatic through the lesser demand for labor and the lesser demand for ore, and the price of the metal will decline as the costs decline, until we will probably reach a point that represents the extreme limit of the best equipped and most economical plants in the country. What that will be I do not dare to prophesy, but you can cut the present price in half and yet be only a little under what was considered a fair price for spelter several years ago.

Lead.

During the first year of the war, lead averaged only 1c higher than the low price prevailing at the start, and as the market showed an inability to absorb more metal than was available, the production was increased less than 2% over what it was in 1914. This year, however, it has been an entirely different story, and with the average price 50% over normal, and to-day double what it was in October, 1914, there has been a steady increase in operations in order to take care of the larger consumption, both ordinary and for account of war material, and furthermore to supply the export demand in Europe and the Far East. Lead has not been affected so sensationally as copper and spelter and some of the other metals, but as the war demand is the basis for present prosperity just so will there have to be the same sort of a readjustment when the war ceases. There is little likelihood of any attempt to maintain the price of lead at a high level when it is shown that the demand is falling short of the supplies, and we have had illustrations of this both this year and last year when the price de-

clined in one case from 7c to 6c and in the other from 7c to 4½c. The fact there is a protective tariff on lead of 25% ad valorem does not alter the case, first, because it would not be good policy to forego our export trade which was commenced several months before the war started, and averages in the neighborhood of 75,000 to 100,000 tons a year, and secondly, because the lead market here is no longer controlled by one interest, but is established by the competition between half a dozen important producers. The laws of supply and demand control the price of lead in this country to a greater extent than ever before, and the discontinuance of the European Syndicate, which was under German domination, means that the same conditions will prevail in Europe. There is no possibility of the world's market being apportioned and divided along the lines of the old syndicate, and while the tariff will prevent our market from being made a dumping ground for foreign lead, it is not to be supposed that our prices will always be as high as the tariff permits. There again the question of our export trade comes in, for to continue our export business our market will have to stand on an even footing with other producing countries. Preferential tariffs on the part of England and the British Colonies may place us at a disadvantage with Australia, and we may get back to the point where we are only able to export lead produced in Mexico, and smelted here in bond, but whatever it is, we can rest assured prices will be readjusted to meet the conditions which present themselves. Having had a smaller and more orderly advance than the other metals under discussion, it stands to reason that the reaction will also be more moderate and conservative. Lead can be produced and sold at a small profit for 4c and the question whether it falls below that level when the war ends, will depend very largely on whether the prosperous conditions in this country are continued.

Antimony.

Antimony being a comparatively unimportant metal, in the sense that it is used in such small doses for all peaceful purposes, requires no detailed discussion. Its use for war munitions, particularly shrapnel, that has brought into the limelight during the past tw years, and the inability of the world increase the output at the same rate the impressed demand was the cause the unexampled rise in prices. With t opening of the war an embargo w placed on antimony by England and have had to depend on China and Jap for our supplies. In the early part this year antimony was selling at 80 higher than when the war started, b it has since declined to 13c as against average price of about 7½c for the ha a dozen years ending 1913. The produ tion of antimony in the Far East h been more than doubled, and as the will be a large excess of supplies aft the war, the price will inevitably d cline to a level of around 5c a poun Like tin, but unlike most of the oth metals, the price of antimony has no e fect on the consumption, and the fa that the metal is cheap will not increa its use, and the market will be deter ined almost entirely by the cost of pr duction which is not over 5c in China

Aluminum.

Aluminum in recent years has tak greater strides forward than any oth metal, in fact we are only just begi ning to realize its possibilities of dev opment, and the regret is that the pr duction is not more generally distribu ed instead of being centered in a fe hands. Anything that would tend increase the competition and there cheapen the cost would be welcomed the trade, but the abandonment of important prospective independent o eration in this country does not gi much promise of this. Before the w the market here was influenced by t European market, and notwithstandi a duty of 2c per pound considerab quantities were imported. Latterly ho ever, the movement has been reverse and we have been supplying aluminu to the Allies at record prices, rece sales having been made as high as 6 as against an average price of 18½c the year 1914. That peace will cause return to former prices is the most na ural conclusion, because of the loss the war demand and because the i creased output will probably only saleable at a price reasonable enou to encourage the use for those purpos

for which a substitute can be used and is used when prices are high. The aluminum works in Europe may not be in a position to spare any supplies to America or to compete in our market for some years, and a decline in price here might be entirely independent of foreign competition. The price of copper will also influence the price and use of aluminum for lately notwithstanding the dearness of copper large amounts of aluminum wire and cable have been scrapped and sold and replaced with copper. Also the prosperity of the country as reflected in the state of the automobile industry, minus the greater part of the automobile export trade, will to a large measure determine how low the price of aluminum will go and how soon a normal level is reached again. Aluminum like all the other metals is having its fling but the old basis of values has not been altered but only lost sight of for the time being.

I am afraid I have exceeded my time, but just one word more. It is often said the world is in the melting pot now while the war is being waged. My idea is the world in social, economic and business relations will be in the melting pot when peace comes, and the product that will be produced, in social, economic, trade developments will be wonderful and inspiring. I am enough of an optimist to believe that out of this great disaster there will come in Europe a new world of ideals and conduct. The awful suffering and bloodshed will not be in vain. The cancer of slavery had to be cut out in our Civil War with all the suffering it entailed, so likewise the cancer of militarism in Europe. The war has not only made Europe find their souls and develop the spiritual part of their nature, but there has been a tremendous quickening of intellect and ability and efficiency, and in that is the promise of her recovery. Let us see to it that we in America who have been wallowing in prosperity in the face of this awful suffering have not lost thereby those sterling virtues that come from adversity; that prosperity and ease has not atropized our abilities and efficiency and enterprise. Great opportunities are before us, but they won't be thrown in our laps. We must go after them, seize and make them our own. In the race we start with tremendous advantages. Let it never be said that in the new world of endeavor now opening before us we were weighed in the balance and found wanting. And one last word, realizing all that Europe's suffering has brought to us in wealth let us determine to consecrate a part of it in "pouring oil and wine into the wounds and binding up the broken hearts", so that instead of feelings of resentment at our prosperity in face of their loss, our fellow world citizens may in the years to come thank God that one country at least was saved to lead in the work of restoration and equipped with the means to do so.

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Business Trends.

Record Bank Clearings

Remarkably heavy payments through the banks, as reflected in clearing house transactions indicate that business is being maintained in unprecedented volume in practically all sections, total bank exchanges in October, according to returns received by "Dun's" Review from 131 leading cities in the United States, amounting to no less than $25,501,563,806, an increase of 27.1% as compared with the same month last year and 63.4% as contrasted with the corresponding month in 1913. Indeed, for the first time in the history of the country, bank exchanges exceeded the twenty-five million-dollar mark, the above total being far and away the largest ever recorded.

The sum above set forth excels by about 12% the previous high-water mark touched in September, while disclosing a gain of about 27% over the extraordinary total for October 1915, and indicating increases of about 120% and about 65% respectively, over the corresponding month in 1914 and 1913.

Many New Incorporations.

Exceptional activity is noted among promoters in the formation of new enterprises. This is indicated in the October incorporations in the Eastern States with a capital of $1,000,000 or over, which represented a total of $303,768,700. With the exception of February last, when the charters filed involved $365,995,300, the past month's output is the largest in years. It compares with a total of $164,700,000 in September. In October a year ago the incorporations amounted to $208,695,000. A striking feature of the returns is the fact that all lines of industry are represented, in keeping with the monthly showing for more than a year past.

The grand total of all companies with a capital of $100,000 or over, covering all States, including those of the East, reached the large total of $365,050,700, against $174,933,000 in August and $420,680,500 in February. The October figures a year ago were $266,701,000.

Following are the comparativ figures as specially compiled by Th Journal of Commerce and Commercia Bulletin of companies incorporated i the eastern States during the last thre years with an authorized capital o $1,000,000 or more:

	1916.	1915.	1914.
Jan.	$270,995,000	$51,150,000	$120,050,00
Feb.	365,995,300	53,950,000	51,575,00
Mar.	194,750,000	70,050,000	57,700,00
April	166,650,000	32,200,000	136,185,00
May	209,735,000	78,950,000	62,700,00
June	264,350,006	181,247,100	70,050,00
July	217,662,550	71,100,000	68,700,00
Aug.	113,472,000	67,100,000	50,600,00
Sept.	164,700,000	286,625,000	54,800,00
Oct.	303,768,700	208,695,000	35,487,50
Total	$2,271,069,500	1,101,067,100	707,847,50
Nov.	.....	190,075,000	81,650,00
Dec.	.....	135,125,000	105,450,00
Total	.....	$1,426,267,100	$894,947,50

October Failure Record Good.

In view of the active trade reporte for the month of October and the ne high records established in bank clea ings, foreign trade and other measur of movement, it is not at all surprisi to note that October failure retur make a good showing when compare with most of the preceding months this year or with October of the tw preceding years. It is true there we more failures last month than in Se tember or July, the increase over tho months according to "Bradstreet's being 7% and 8% respectively, b there were fewer than in any oth month this year and the decreases fro October, 1915 and 1914, according the same authority were 7% and 13 respectively.

Liabilities make an even better sho ing than do failures. Compared wi those of September there is a decrea shown of 26% and June and July we the only months of this year showi smaller totals.

Business Trends.

Commodity Prices Still Rising.

An extraordinary price situation prevails in America at peace and in Europe at war. Commodity prices in England, on the continent of Europe, in Canada and here are at record levels for what are termed modern times and the indications are that they will go higher. That is the gist of all three reports issued by "Bradstreet's", "Dun's" and "The Economist."

The competition to get goods seems to overshadow the question of whether prices are not already too high. Though there is much talk about the necessity for checking the upward flight of commodities, as well as about conservatism in buying being desirable, the fact is that supplies relative to demands are all too light, and while America remains the one leading open market of the world, with money to lend as credit to finance purchases by over-sea buyers, little relief from high prices can be expected, particularly as prospects of peace seem as distant as at any time in the past.

"Bradstreet's" index number as of October 1st stands at $12.039, the highest figure ever touched within the life of its data. This level indicates a rise of 2.2% over September 1st, while showing an advance of 22% over August 15, 1914, almost directly after the outbreak of the war.

"Dun's" index number for October 1st works out at $152.355 against $152.018 a month earlier and discloses an extreme rise of $31.615, or over 25% as compared with the number of August 1, 1914, when the war commenced.

Now we will turn our attention to England. The end of October index number published by "The Economist" registers a sensational advance over the figure for August and September. The October number is 4596 an advance of 173 points over the September record which in turn was 51 points higher than that for August. The average of the commodities on which this index number is based is 2200 and the advance now recorded is thus more than 108% above the average.

An Unparalleled Record of Foreign Trade.

Export trade in September surpassed by about half of 1% that of August, was 70% in excess of September a year ago, and was over three and one-quarter times the value of that of the month of September two years ago. Furthermore, the total exports in September were equal to those of the entire fiscal year 1875, and owing to a rather sharp decline in imports, the excess of exports over imports in that month was not only the largest ever recorded in any month, but was larger than any shown in any full fiscal year previous to 1898, while little below the like excesses for the fiscal years 1909 and 1910. Swelled by the very large totals for August and September, exports for the nine months of the present calendar year are $400,000,000 in excess of those for the entire calendar year 1915, 56% heavier than a year ago, and $1,200,000,000 greater than the exports for the entire fiscal year 1915, while more than double those of any fiscal year previous to 1911. September imports showed a decrease of 17% from August, and of 34% from the high-record month of June, being the smallest since November, 1915. For eight months of the calendar year 1916 they were $300,000,000 less than half the exports, but were $58,000,000 more than those for the entire calendar year 1915, and only $62,000,000 below those for the high-record fiscal year 1914, while, of course, exceeding those of any previous fiscal year in the country's history. For the 26 months of the war (August, 1914, to September, 1916, inclusive) exports were only $100,000,000 less than double the imports. Gold imports since the beginning of the war have been $858,095,662 and exports have been $230,828,448, an excess of imports of $627,267,214, and the total exports of all kinds since the war began exceed all imports by $3,580,475,485, which sum overtops the total imports and exports of merchandise in any fiscal year previous to 1912.

Profits in Iron and Steel.

While the whole iron and steel industry is making money the profits are by no means equally divided. In a general way it may be said that the profits are by far the largest in the making of steel, the conversion of pig iron and scrap into unfinished steel. In general the producers are obtaining prices that are high, compared with the average of a series of years, but decidedly low compared with prices realized on steel. While the steel finishing departments are not making large profits, on the whole, some of them have very heavy profits. Then there are wide divergences in the profits of different concerns engaged in practically the same line of business, depending upon individual circumstances.

Average prices being realized on pig iron may be estimated by taking it that the iron now being shipped was sold when our composite averaged about $18.60, but our composite contains freights totalling 76 cents, so that the furnace price averages a shade under $18. The furnaces were selling at cost when the composite stood at $13, but Lake Superior ore is higher to the extent of $1.30 per ton of pig iron and Connellsville coke to the extent of 75 cents, and other costs, including labor are much higher, whereby if a furnace is receiving $5 above its former cost its profit is probably not half that amount. As the investment sometimes runs as low as $5 per ton of annual output the profits are large even though the blast furnace is making much less than the steel works.

The Steel Corporation's earnings per ton of ouput in the past quarter were between $25 and $30 per gross ton. The majority of independents have been making more per ton, as they did not sell so far ahead and thus are shipping higher priced material, on an average, than the Steel Corporation. Independents making a large proportion o shell steel in their output are makiv profits on that material probably no far from $50, a vastly greater earnin; than that of the Steel Corporation i the case of the many smaller interest which have little or no investmen prior to the steel mill, and not so muc in finishing departments.

The smaller plate mills are makin exceptionally heavy profits. The larg mills, which sold ahead, are still deliv ering some plates at 1.60c, and the ton nage they are shipping above 2.00 is probably relatively small, wherea there are some independents whos shipments are averaging in the neigh borhood of 3.25c, say $30 a ton mor than the large mills are currently realiz ing.

The total advance in the basing dis count on steel pipe is about $21 pe net ton. At minimum prices there wa a profit, but on account of increase costs of labor and supplies there i some ground for doubting whether th profit is now much over $20 a net to even to the concerns who make thei coke and mine their ore. There woul be much more money in selling billet at the currently quoted market of $5(

On account of the rapid movement in the various markets, changing th realized prices as well as the costs o raw materials, there are great differ ences in profits of concerns in precisel the same line of business. For illus tration, there was pig iron sold on th basis of $18 and a shade less, for th first half of 1917, while $22 or highe can now be realized. There was cok sold at less than $3.00, say at $2.75 fo that period, while now it would be diff cult to buy at $4.00. If $18 pig iron i matched against $4.00 coke and $21 pi iron against $2.75 coke there is a di vergence in profit of about $4.50 pe ton of pig iron.

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Judge Gary Discusses Conditions in the Orient.

Address by the President, Elbert H. Gary, at Semi-Annual Meeting of American Iron and Steel Institute, St. Louis, October 27, 1916.

At the last directors' meeting of The Institute, before the summer vacation, a member suggested that, at the October meeting, I give some account of my proposed visit to the Orient and therefore he properly may be charged with the responsibility of the President's remarks on this occasion.

I left New York on July 3rd for Toronto and from thence proceeded via the Canadian Pacific Railroad to Vancouver; sailed on the "Empress of Asia" July 13th; arrived at Yokohama July 24th (dropping one day at the 180th meridian and picking it up again on the return trip, and from there went on same steamer to Manila, arriving July 31st. I left Manila on another ship (Japanese) August 7th for Hong Kong, overtaking the "Empress of Asia," which had preceded the Japanese ship, and sailed for Shanghai. From there I went through portions of China (visiting Peking, Soochow, Nanking and various other places in the eastern and northern part) to Mukden, in Manchuria; Seoul, in Korea, and then across Japan Sea or Strait of Korea to Shimonoseki, in Japan, arriving Aug. 29. I remained in Japan until Sept. 14, when I embarked on the "Empress of Russia" for Victoria, B. C., arriving September 23rd. I visited the principal cities in Japan and motored considerably through the country, as I also did in China and the Philippines, wherever practicable. The journey, taken as a whole, was long, rather warm and somewhat tiresome, as I expected it would be, but it was all interesting and enjoyable and a trip to be recommended, even in the summer months. The accommodations for the traveler are generally good and in many respects are excellent.

This brief outline has been given because I am hoping many of my hearers will be inclined to inquire into the details and then to personally inspect this fascinating portion of the Earth situated on the opposite side of the Globe from your habitation. I will later suggest reasons for my wish.

There are many phases of Oriental life and customs, of natural and artificial beauty, of contrasts between the old and new civilizations, all of which attract and interest the student and charm the traveler; but it is not my purpose to attempt at this time to do more than glance at some of the general features of the different countries mentioned, in which it seems to me you, as business men, are especially concerned. I was diligent and impartial in the endeavor to ascertain facts that appeared to have a bearing upon your interests and mine in the affairs and conditions of these nations respectively. I saw as much of the countries and as many of the people as the limit of time permitted. Posing only as a member of the business fraternity, I received from foreigners everywhere the most hospitable and generous treatment and the frankest expression of sentiment toward the people of the United States. Also our diplomatic representatives, without exception, were courteous, helpful and hospitable; they are rendering faithful and efficient service.

The Philippines.

The Philippine Islands, with proper development and modern practice, are capable of supporting comfortably ten times, or more, the number of people now living within their territory. There can be produced everything indigenous to semi-tropical latitudes and many things to better advantage than on any other lands within the same proximity to the equator. Hemp, tobacco, sugar, rice, cocoanut oils, coffee, fruits, vegetables, grains, choicest timber and multitudes of other valuable products can be raised in as large or larger abundance than in any other

country, with comparatively slight exception. The natural requisites, including moisture, water-power and particularly richness of soil, are all sufficient. The climate is equable and excellent. In the summer, it is warm during the middle of the day, but the nights are agreeable, and, on the whole, the temperature seemed to me very much better than the average. No doubt the records will show favorably by comparison. The Filipinos, as a race, are a fine people, intelligent, of good disposition and possessed of capacity for success. I met large numbers of them, confined perhaps to the better educated classes, but nevertheless representative. With opportunity, example and precept they will take a desirable place in the ranks of progressive and worthy citizens.

When the United States paid nearly $20,000,000 to Spain, the owner, for the title to the Philippine Islands, she acquired a territory possessed of all the essentials for building up a rich, healthful and desirable extension of its dominions as a valuable and necessary supplement to the immense productive capacity which she already possessed; and it was inhabited by a people who, by nature, would readily become loyal and faithful citizens of our country. When the United States, by mere chance, or as the result of an overruling Providence, became responsible for the future welfare of the inhabitants of the Islands and for the conditions which might directly and seriously affect other countries, especially those in proximity, there was much in the condition of the people to be deplored. The masses were ignorant; perhaps purposely deprived of education; and they were subjected to tyranny and cruelty. They were poor, unhealthy, diseased, overtaxed and wretched. They were more or less at war with each other and with their Government. Every influence, every tendency, was bad. They had no hope for the future. Intelligent happiness was neither a reminiscence nor even an aspiration. Because of the diseases prevalent, both the people and their beasts of burden were a menace to the outside world. The Filipinos were not blamable for this situation; they deserved a better fate.

The United States was a good Samaritan. The splendid men who were dul appointed by our country, includin both military and civil representative with fortitude and judgment and hu man instincts took up and carried o the work of renovating and rejuvena ing this conglomerate of physical an moral corruption, which had develope without the fault or the understandin of the people themselves. The result of their efforts will stand for all tim to come as a monument to the generou humane and intelligent policy of an en lightened and unselfish nation, unles something shall be done in the future t counteract or neutralize the results o the course which has been pursued. A those who have represented the Unite States in bringing about the wonderfu changes in the Phillipine Islands are en titled to the highest commendatio Their work has not been fully appre ciated by the average citizen of thi country.

There has been established a soun and exemplary government. The law are wisely and justly administered b able and impartial judges; modern an commodious hospitals have been buil and are in charge of competent, prac tical and humane doctors and nurses plagues and dreadful contagious an infectious diseases have been largel stamped out; model schools, special an common, have been established, an they are filled with eager and indus trious Filipinos taught in the Englis language. Good roads have been built agriculture, horticulture and forestr have been improved; means and meth ods for civilization and for moder practical results have been taugh though, of course, much remains to b done.

There has been a general cleanin up, and the best results of experienc in other up-to-date countries are bein applied so far as possible. Filipinos un derstand and appreciate what has bee done, and they are a grateful peopl Of course, the large majority are re ferred to. There are always exception All this has cost and is costing larg sums of money, but emphasis should b given to the fact that, with the excep tion of the money paid for maintainin the army and navy, which is no mor

than it would be if stationed elsewhere, the total expense of making the improvements and changes adverted to and maintaining the same, as well as the expenses of administration, including the civil government, courts of law, salaries of appointees of the United States Government, schools, hospitals and everything else of the kind, are and, from the start, have been paid from the treasury of the Philippine Government.

Without the protection and assistance of the United States; without the experienced talent of representatives sent from here; without the added energy, skill and invested capital of Americans; if the Filipinos were again left to themselves, they would be unable to make the progress in the development of the resources of the country which is possible and desirable; and the future of the Islands would be uncertain. They would not long be permitted to drift towards old conditions so as to be a menace to the health of neighboring nations particularly interested, for the latter would interfere and probably take possession and control.

The United States assumed a moral obligation to the Filipinos and to other nations when she took charge of these islands. She could not shirk it if she wished to do so.

Moreover, if the Filipinos desire it, as I believe they do, and if the United States, as I think a majority of the citizens wish, shall decide to have the Philippine Islands remain permanently a part of the territory of the United States, it would result in great financial benefit to the Islands and their inhabitants and also to the United States; and all other nations would approve. Considering the interests of the Filipinos and the Americans both, it would be a grave mistake to sever the relations now existing between them.

There cannot be properly developed the immense natural resources of the country and the resulting business with adequate facilities for conducting the same, without large amounts of capital, and it is impossible to secure these unless and until there shall be permanently established a government which is satisfactory and will not be assailed. If the United States should abandon the Islands, capital already invested would be withdrawn, in part at least, and additional investments would be discontinued. The Americans in the Philippines who have done and are doing much to advance the pecuniary interests of the Archipelago, as well as the natives themselves, understand and openly recognize the fatal results to the Islands if they should lose our support.

China.

During the last few decades, at least, China has not kept pace with others in the progressive march of nations. Possessed by nature with extraordinary opportunities, she has nevertheless been retroactive in disposition and, to some extent, has been exploited for the benefit of others. With a population of 400,000,000 and a territory almost as large as Russia, containing the richest and most productive soil, a variety of climate which permits the growth and maturity of the principal grains and fruits, and with an abundance of the richest minerals, she has, notwithstanding, become poor in cash resources; and the normal and necessary development of the country for the proper utilization of the national assets has been neglected, if not ignored. Consequently, in the consideration of questions relating to economic expansion, and in other respects, China has, for a long time, been well nigh helpless. It would not be useful, nor does time permit, to discuss the reasons for these conditions. Many of them are well known. It is sufficient to say that China, with her natural facilities, has the opportunity of becoming one of the greatest and most prosperous of nations.

Apparently, the leading Chinese statesmen, the most intelligent and most influential citizens and the best thinkers are keenly alive to the situation and are earnestly solicitous for the immediate future of China. The present Governmental Administration and the Parliament as well are devoting their talent and energy to ascertain and apply a solution for the problems which interfere with the growth and strength of their country. They realize that there is needed a new constitution which will establish a concentrated,

unified, though democratc, government; a new and modern financial system which will be satisfactory to the financiers throughout the world; an adequate, thoroughly trained and fully equipped military force for defensive purposes; and the adoption of a systematic plan for the development of the whole country for the benefit and for the promotion of the welfare of the whole population. The leaders are frank and outspoken in declaring the desirability of a government such as I have indicated; and they appreciate also the necessity of having friendship and assistance of all other nations. They know that, under these conditions and with this attitude on their part, and not otherwise, they may expect to establish a credit which will secure the loans necessary to reorganize the affairs of government, and will put to practical use the instrumentalities for providing the money which is now lacking.

The present Government is an honest, unselfish, capable, industrious and harmonious organization. There are statesmen in China of high intelligence and qualifications. It should be only a question of time when the internal strifes, that are prevalent and have done so much to obstruct and retard legitimate growth and prosperity, will have ceased; when the peoples of the different provinces will be pacified and possessed of a spirit of genuine loyalty and patriotism. This is what is especially needed in China, and this is what will be experienced when there is a clear and general understanding of the motives of those now in governmental control.

China is now in a transition stage of activity. For a single and simple instance, the visitor to Shanghai may see from his hotel window, within a space of two hundred by seventy-five feet, the jinrikisha, the sedan chair, the wheelbarrow (carrying a large load of freight or passengers), a cart drawn by a caribou or water buffalo, a donkey or pony cart used as a passenger vehicle, a bicycle an automobile, an electric train; and nationalities and costumes of a great variety of patterns and styles.

One of the principal things needed in China is first-class railroads. We know by experience what they are and do for a new country. There are provinces with immense acreages of the most fertile soil and a population of scores of millions, that have no pretension of reasonable facilities for getting to purchasing or consuming markets. If there can be established the basis of credit as already suggested, and as now seems probable, it is to be hoped American capitalists will participate in further loans which will permit the rapid extension of railroad lines, for this will tend to correspondingly increase the volume of general business between the two countries. The people of China who are well posted are desirous of maintaining the most cordial and intimate relations with the business concerns of the United States. Formerly China desired to be left alone. She wanted to be exclusive and seclusive. She claimed to be self-contained, and really thought it was wise to live unto herself alone. That belief and attitude are becoming changed as a nation. She now wishes the open door policy to prevail. The national latch string is out for all other nations. Indeed, in some instances, those in authority have been too willing to grant concessions. Permanent concessions of territory at Shanghai, Peking, Hankow, Hongkong and other places have been granted to various foreign countries who still own and occupy the same. The United States was formerly included in the list but I think we have released and abandoned all that were ever given to us.

The people are becoming familiar with the habits and methods of other peoples. They are entering educational institutions in other countries and they are learning the English language. True it is that large numbers in outlying provinces are ignorant concerning the language or ways or even existence of foreigners, but all those in control of national or provincial affairs are well advised and they welcome every opportunity to learn and to assimilate. Especially does China need and desire the sympathy and neighborly support of the people of the United States. Here is a great field for operation on the part of American business men which can be cultivated without injury or objection on the part of any other nation

and with decided benefit to China herself. I could wish that in some respects the conditions in the United States which now exist, resulting, I think, from political agitation, might be modified.

The Chinaman is naturally strong, diligent, industrious, economical, honest and intelligent. He is a good farmer and a shrewd merchant. He would like to be a good and loyal citizen, and it is only because he has been imposed upon or has misunderstood the facts that he appears to have been at times unreasonable or disloyal. He is a force in the world that must be considered, and it is wise to influence him honestly and practically in the right direction whenever the opportunty is afforded. Where Chinese blood is mixed with the Hawaiian or Filipino it has raised the standard of intelligent manhood, so far as I have observed.

There are men listening to me who will live to see China a great and prosperous nation; rich, powerful and progressive; better than she ever was in her palmiest days; one of the best creditors of and debtors to other countries; and at peace with all the world. I hope and trust she is just now making a successful start in this direction. I have for her the same kindly feeling which so many of her best people undoubtedly entertain toward the United States. She will sometime have the power to do harm, but instead she may be a force for international peace, progress and prosperity.

Throughout the country and in the cities and villages there is much to surprise and charm the visitor. There may be seen uncleanliness in many places and crowded habitations to the extent of danger to health, but in other places it is decidedly different in appearance. For illustration, there is a striking contrast between Canton or Soochow, on the one hand, and Peking, on the other. The latter has an abundance of open space.

Scattered over the farms, throughout the country, are innumerable mounds of earth resembling, from a distance, cocks of hay. These are graves of the dead. They are of different sizes, depending upon the prominence or lack of prominence of the departed, and perhaps some other considerations. As ancestry is worshipped and the spirits of the deceased believed to visit, if not abide near, the graves, one can understand why, for years, the Chinese objected to the disturbance of the lands resulting from the building of railroads.

The use of opium is diminishing and will disappear in the comparatively near future.

Many books have been and more will be written on China; but to understand and appreciate one should personally observe.

I have endeavored to excite your interest only in some of the practical things that ordinarily engage the attention of the business men. We should know the country and its people better from the standpoint of our own interests.

Japan.

Japan is a vigorous, progressive, prosperous nation. Representatives have temporarily resided in foreign countries, including England, Germany and the United States, for the purpose of studying the languages, customs, methods, improvements and facilities for advancement and for defense; and on their reports, from time to time, the Japanese people have adopted and assimilated what they consider to be the best features of enlightened civilization shown in the different countries. They are highly intelligent, determined, adaptable, very industrious and, above everything else, superbly loyal to their emperor and to their nation. The ordinary citizen lives for his country and is just as willing to die for it. There are no internal strifes; on the contrary there is a harmonious whole. They present to the outside world a united front. This is as it ought to be in every nation. It gives a solidarity of power that is invincible.

It may therefore be seen why Japan has taken a leading position amongst the nations of the world, contrasting in a striking manner with her place 60 years ago. Rice is the principal, though not the only, crop grown in Japan. As the Islands are mountainous and not fertile, it is probable at least 50% is not cultivated. The fish industry is large and profitable. In farming, min-

ing, manufacturing, merchandising, and with respect to her schools, hospitals, courts, prisons, temples, means of transportation, military training and strength and, generally, in the possession of modern equipment and administration of public and private affairs, Japan excels, and already may be considered a model government in many particulars.

Japan has grown and is growing with her strength. She has, with Korea, Formosa and other island territory recently acquired, 259,671 square miles and a population of 72,000,000, as compared with 37,000,000 in 1872. Besides all this, she is now increasing in wealth and in the near future will, I believe, be considered rich, unless her present policy shall be abandoned. Her financiers, her business men and her statesmen deservedly rank high. They are farseeing and they are conservative. The wonderful natural beauties and artistic development and display, I cannot take time to describe.

I am disposed just now to discuss briefly before you questions which as a business man, I was free to speak about in my intercourse with Japanese acquaintances. Because I was open and sincere and especially as I was an American, independent of any political obligation to consider questions of diplomacy, I met willing and attentive listeners and cordial greetings.

For some time there have been suggestions, in public and in private, in the United States and in Japan as well, that, for numerous reasons not necessary to recall, there was possibility, if not likelihood, of active hostility between these two countries. Whenever either Government has decided to provide an additional warship some one in the other country has been prompt in charging that this meant preparation for war between these two nations.

I said repeatedly, on my own responsibility, making no claim except that I believed I could accurately represent public sentiment, that a large majority of the people of the United States did not desire, but would deplore and stubbornly oppose, war with Japan, except in self-defense, and that they were of the opinion there is not now nor will be any cause for seriou trouble or disagreement; that ther need be no conflict of opinion whic could not be finally and satisfactoril settled by mutual negotiation and con sideration. I also expressed the belie that our governmental administratio is and would be inclined toward thi most desirable exercise of authority To all this I am sure this large com pany of representative business me will heartily subscribe. I would repea and emphasize the sentiments thus ex pressed.

And now, gentlemen, I am here to sa to you in words just as emphatic an in a belief no less absolute that th leading and controlling men of Japa are equally anxious to have a contin uance, permanently, of the peaceabl and friendly relations now existing be tween these two countries. That ther may be exceptions may go without say ing; it would be usual and need excit no surprise nor fear if such is the fac Still I have no positive information o which to base this conjecture. I ha good opportunity to ascertain the rea situation, though my visit to Japan wa comparatively short. The most prom inent and influential men in Japan ar outspoken in their profession of friend ship for the United States and her ci izens. They refer with sentiments o gratitude to Commodore Perry's vis in 1853, to them, apparently hostile a that time. They now consider this a tion as friendly and as the beginnin of the growth of a great an prosperous nation. They speak o the benefit Japan has received an is receiving from the United State educationally and otherwise. The claim to have received the largest bene fit in economic lines by visits to an intercourse with Americans. They re fer with satisfaction to the large an increasing trade relations. And, with out stopping to enumerate, they spea of our people as their friends and ad visers, now and always, as fair an generous and pacificatory in policy an practice; as a model government, whos friendly interest they court.

If you suggest these men may hav dealt simply in diplomacy, so-called, o in diplomatic language, I answer, the gave me no reason to think so; I s

cured their confidence as I gave them mine. They do not hesitate to advance the reasons for peace and the objections to trouble. They realize that the geographical locations of these two countries should make them practically allies although acting independently and in their individual capacities and interests. And, from the business standpoint, the Japanese manufacturers, merchants and financiers are desirous of co-operating with those in the United States, to the fullest extent, in protecting and promoting the welfare of both and at the same time benefiting those in other countries with whom both of us may be conducting business. They understand and appreciate the spirit of co-operation which has actuated the the men engaged in our lines of business and they would be pleased to consider with us all legitimate plans for the application of this principle. While it is a difficult problem, requiring patience, skill and tact, still I believe we may be able to work out methods which will benefit all concerned. It is well worth trying. International conditions are peculiar. They are complicated and will be worse. Every one interested in international commerce should make careful survey of existing facts for purposes of future explorations and developments. There are many practical problems to consider and their solution will require time and thought; but we will find the Japanese business men ready to take them up in a fair, reasonable and intelligent manner.

What Japan Wishes in China.

The subject of Japan's intentions toward China and her possessions is a mooted question in many foreign quarters. From considerable inquiry and study, I conclude Japan sincerely desires that China shall proceed and succeed in the directions I have indicated; that she shall become firmly established as a sound, peaceful, progressive, prosperous and rich government with free and open seaports, transacting an increasing business of every kind, within the limits of her capabilities, with any country or all countries outside her domains, on a fair, just and profitable basis. I am confident Japan would like China for a continuous, permanent, friendly, profitable and satisfied customer, with no political, social or financial difficulties, internal or international. I think we may expect to see, before long, efforts on the part of the Japanese people to cultivate cordial business relations with those in China. I know there are important and influential men in Japan who will actively advocate this course. I am also of the opinion, founded on conversations, that the Japanese will be glad to consult with Americans concerning financial, commercial and even political questions relating to China. Japan and China both wish for close and intimate relations with the United States and are willing to discuss and determine all matters affecting the rights and interests of any, with the purpose of doing justice to themselves and all other nations. The more our statesmen study these questions the more clearly it will appear there need be no irreconcilable differences of opinion.

Korea.

Korea, as you know, has again become a part of Japan. The name has been changed to Chosen, which is the same word in the Japanese language. It is a fine country, with people of good appearance, disposition and physical and mental ability, fully equal to the average. Under Japanese methods, conditions and appearances are rapidly improving. The Koreans seem to be satisfied with the governmental change. They have more respect for the present administration than they entertained towards former ones, and they believe their prosperity is increasing and will continue to increase. It seems probable there will be a gradual and complete amalgamation of the two races, and, if so, it will be beneficial to both.

Our Business Men Should Visit The Orient.

Now, I would urge all of you, who find it practicable to visit the Far East. Go during the autumn or early spring months, if convenient, but do not hesitate to make the journey during the summer time. You owe it to yourselves, to the business interests you represent and to your country to come into close relations with the people of these

far distant lands. While they are far away, if measured by miles, yet in point of time they are growing nearer, by reason of improvements in transportation; and the trip is enjoyable. You may be assured there are innumerable features in each of the countries intensely attractive and in many respects different from what you have ever seen. While I was somewhat fatigued at times, I continued in good health and I have every reason to congratulate myself on having had the opportunity to see these countries and to meet so many agreeable people. If you decide to do so, you likewise will be glad to have made the journey.

More and more of our business men should come into close contact with the people of Japan, China and the Philippines. It will be of benefit to all. There is much to see and to learn. Many misunderstandings have arisen and some still exist. They can and should be removed. It is as true as it is old that human nature is about the same the world over. We in the United States are not possessed of all the virtues. We are just as likely to be wrong in judgment and conclusion as others. Indeed, we have often been wrong. If some of our leaders in Congress had been better posted, it is possible that many ill-advised speeches would not have been delivered. At any rate, I strongly urge that as many of our citizens as find it possible take the time to personally and impartially inquire into the facts which bear upon the relations of the United States with other countries. There is always danger of unsettled disagreements if parties conduct their communications at arm's length. If they converse "eye to eye and face to face" even nations are much more likely to avoid conflict and to settle disputes without doing an injustice to any. If we are looking for trouble we can usually find it; and if we are looking for harmony it is, as a rule, equally easy to procure.

If any one connected with our government will spend a few months, or less time, in Japan, with an honest intention and effort to ascertain the sentiment of the large majority of the controlling elements, I verily believe such a one will be convinced Japan is not desirous of trouble with the United States, but, on the contrary, earnestly desires our friendship and co-operation in every worthy ambition.

Business Conditions.

Following my usual custom I will conclude with a few words regarding business conditions.

It is well known that the steel business in this country is better than ever before. Our concern is only for the future. Many believe there will be a continuance of large business for many months or years after the war closes; others think there will be a material recession. No one can certainly foretell. I have heretofore expressed opinions on the subject which have been published. Obviously the wise man will husband his resources, keep within safe limits and avoid over-extension. It is better to be prudent and make less profits than to become reckless or extravagant at the risk of calamity. With large bank balances we are independent and secure; with large indebtedness to the banks which we could not readily pay we would be in danger of bankruptcy depending upon future business conditions. All this we know by the experience of the past. As we cannot read the future we should exercise caution and be prepared for unfavorable changes.

Whenever the war shall close, the business of this country will be confronted with new conditions. The purchasing power of the whole world will have been very greatly reduced. Foreign countries who are now buying our products, because compelled, will withdraw their patronage in a large measure. Other non-producing countries will find their financial resources and credits lessened. More than this foreign producers, in great need, will strive more diligently than ever to supply the countries that are financially able to pay and at prices based upon cheap labor and low cost, as they have a perfect right to do.

Our producers, including our wage earners, will find themselves in commercial antagonism with the most persistent and difficult competition ever experienced, unless this shall be prevented by laws that are reasonable and sufficient. Most of the foreign produc

ing countries, and quite likely all of them, will be thoroughly protected by tariff provisions and we should be on a parity with them in this respect.

I firmly believe, if the present unprotective tariff laws remain unchanged, we shall probably meet with competition from foreign sources after the war closes which will adversely, and perhaps disastrously, affect American industry and American labor. Conditions will be even worse than they were between October 1st, 1913, and the beginning of the war. If the laws shall be amended and adequate protection to American producers and their workmen is afforded, we may expect satisfactory business conditions for some time to come.

Tin Plate Forecast.

We forecast this year's production of tin and terne plate at 1,350,000 gross tons, involving about 1,275,000 tons of tin plate and about 75,000 tons of terne plate. These estimates compare with production as officially reported for previous years as follows:

	Terne Plate.	Tin Plate.	Total.
1906 ..	86,324	491,238	577,562
1907 ..	69,842	444,933	514,775
1908 ..	68,830	468,257	537,087
1909 ..	85,237	526,722	611,959
1910 ..	75,082	647,688	722,770
1911 ..	70,733	713,227	783,960
1912 ..	85,445	877,526	962,971
1913 ..	61,136	762,583	823,719
1914 ..	65,266	865,975	931,241
1915 ..	72,978	982,958	1,055,936
1916* .	75,000	1,275,000	1,350,000

* Forecast.

The fact that mills are oversold for this year and will carry tonnage into the new year enables us to make our usual tin plate production forecast at an earlier date than at some previous times, because we are justified in assuming that the mills will run full during the balance of the year. If they do not we shall be entitled to revise our estimate at the close of the year. There are, of course, bare possibilities of production being curtailed through shortages of steel or coal arising from railroad blockades or other causes.

Our estimate for 1915 was published in our issue for February, 1916, and was incorporated in our annual Metal Statistics, the figure being 1,060,000 gross tons, while the official statistics, made public by the Institute six months later, showed 1,055,936 tons, representing a divergence in our estimate of three-eighths of one per cent.

The gain in production this year over last is about 28%, by far the largest percentage increase in recent years, the next largest being the 23% from 1911 to 1912.

A peculiarity of this year's tin plate operations is that the rate of output at the present time, and the prospective rate to the end of the year, is larger than at any previous time in the year. This arises from the fact that new mills have been put into commission recently. We estimate that the production in the fourth quarter is at a rate 20% greater than the average rate in the three quarters preceding.

Next year's output will be much larger than this year's, if the expectations of makers are borne out, that there will be demand for more than can be produced. Production can gain next year over this by reason of the year starting with more mills than the average of this year, as the independents will have more and the leading interest will have the 24 mills at Gary, and by the tin mills making less than their usual tonnage of black plate specialties. There will be, according to our count, 461 mills, 241 for the independents and 220 for the leading interest. These mills could make in the neighborhood of 1,500,000 gross tons of tin and terne plate and possibly a trifle more.

Notes On The Iron Situation.

The Lake Superior iron ore shipping season is now nearly ended and the result as to total tonnage is almost established. Prospects are for a total movement, lake and all-rail, of close to 64,000,000 tons. Speculation now turns to the character of ores brought down this year and the prospective prices and tonnage for next year.

A question has been raised as to the supplies of Bessemer ore as compared with non-Bessemer. It is understood that the independents are completing a program of bringing down 7,000,000 tons of Bessemer ores. In 1914 and 1915 the Steel Corporation's production of Bessemer steel was 67% of the total, leaving 33% for the independents, and on this proportion 7,000,000 tons of independent ore would go with 14,000,000 tons of Steel Corporation ore, making 21,000,000 tons altogether. The annual compilation showing the movement of Bessemer and non-Bessemer ores is not published for 1915, but in the four years preceding there was 1.59 tons of Bessemer ores for every ton of Bessemer pig iron made in the United States. The low ratio is explained by the fact that all the furnaces use non-Bessemer ores to the extent permitted by their Bessemer ores running lower in phosphorus than required to produce the standard analysis of pig iron. The production of Bessemer pig iron in the first half of this year represented a rate of 13,130,000 tons a year, which multiplied by 1.59 gives 20,900,000 tons of ore required for a year's run. This checks admirably with the 21,000,000 tons already estimated as the prospective supply. Evidently, however, there would be no room for the Bessemer steel works to operate any more fully than they did in the first half of this year, nor would there be room for any large exports of Bessemer pig iron.

The next interesting question is whether, in the rush to ship iron ore as the problem has been one of lake shipping more than of mining, the average iron content of the season's shipments has been greatly reduced. In the past the average iron content has always dropped when the shipments became particularly heavy, besides which there has been a continual though gradual decrease. In the 11 years, 1902 to 1913, those years being comparable as both showed heavy production, there was an average decrease of .42 of a unit per year in the average iron content. If there were a drop of one unit for 1916 it would be equivalent, on 64,000,000 tons, to no less than 1,250,000 tons of ore. Such a drop would not tend to produce an iron ore shortage of course, but it would tend to decrease the average production of pig iron at furnaces, the yield being so much less. The coke consumption would be somewhat increased.

Several weeks ago it was thought that ore prices for 1917 would be made very shortly, but this event seems, to be quite in the future. That there will be a large advance is certain. The lake freight rate will be higher, though hardly by the 50 cents recently predicted. The cost of mining is increased in various ways, all supplies being higher priced while labor costs more, and many of the mines are operated on a sliding scale of royalties whereby the royalty per ton will be increased. The ore advance will doubtless run close to a dollar a ton.

It seems to be assured already that it will be possible to move considerably more ore next year. Vessels to be completed for the new season will add at least 4,000,000 tons to the carrying capacity in a season, so that if 64,000,000 tons is shipped this year from the region next season's shipments could be 68,000,000 tons.

Lighter Immigration Again.

From December, 1915 to April of this year there was an increase in immigration, whereby measurable progress was made towards a restoration of the rate that obtained before the war. Since then there have been progressive decreases, whereby distinct hopes of decisive improvement are dispelled, and here is the cumulative effect of continued light immigation, making labor career month by month.

In the two fiscal years before the war there was an average increase in population due to the passenger movement, of about 60,000 per month, this average figure being obtained by taking the excess of arrivals over departures, both aliens and citizens. The movement since July 1, 1914, has been as follows:

Fiscal year 1915	117,237
" " 1916	137,138
July, 1916	21,878
August	21,717
Total	297,870

If the former rate of increase in population had obtained, 60,000 a month for 26 months there would have been an increase of 1,560,000, and deducting 297,970, as shown above as the actual increase there is left what amounts to an accumulated deficit 1,260,000 in our population.

The immigration in the fiscal years 1913 and 1914, taken for comparison, cannot be regarded as exceptionally heavy, as while the fiscal year 1913 was a good one industrially the fiscal year 1914 was bad in the main and certainly conditions were not such as to encourage an unusual volume of immigration. On the contrary one would rather have expected a large volume of emigration January to June, the second half of the fiscal year. The present industrial activity is such as would attract immigration. It cannot be said that labor is scarce simply because there is so little immigration. It is reasonable to assume that if there had been the usual volume of immigration there would still be very full employment. The deficit in immigration explains in part why the scarcity is so acute.

As already noted, there was an improvement for a while. In December, 1915, there was a net decrease in population due to passenger movement of 1,461, the next four months showing progressive increases until in April the excess of persons entering the country over those leaving was 30,614, representing fully half the average population increase that occurred in the two fiscal years preceding the war. The April movement was the largest for any month since the war started.

The movement of citizens has been rather interesting. Of course in the long run there is an excess of citizens leaving the country, but not a single citizen is made abroad, except in the case of births abroad to American parentage, and that cannot count much, while there are some native born citizens who die abroad, and there are many foreign born who come to this country, become naturalized, and then return to their native country.

Accordingly there is nothing remarkable in the fact that in the two fiscal years 1913 and 1914, before the war, there was a large excess of citizens leaving the country over those entering, but it is somewhat remarkable that since the war started there has been a large excess movement the other way. Many citizens returned home while a smaller number left the country. The excess of citizen movement has been as follows:

Fiscal year	
1913 excess out	61,098
1914 excess out	82,211
1915 excess in	67,167
1916 excess in	11,197
July, 1916 excess in	3,634
August excess in	304

Topical Talks On Iron.

XLIII. The Basic Steel Process.

The four great steel making processes, as explained in Talk No. 6, September, 1913, are the acid Bessemer, basic Bessemer, acid open-hearth and basic open-hearth. The acid Bessemer and acid open-hearth processes were separate inventions. The basic Bessemer and basic open-hearth were not. The two acid processes involve as their chief function the reduction of carbon and silicon in pig iron in order to produce steel. The basic processes involve the reduction of phosphorus also and hence quite naturally the basic process was developed later than the acid. Prior to its development it was necessary, in order to make steel, to use a pig iron containing no more phosphorus than could be permitted in the steel produced, as none was eliminated. The basic process was the development of Sidney Gilchrist and Percy C. Thomas, both of England.

The idea of blowing cold air through a bath of molten pig iron whereby the carbon and silicon were burned out and the metal was raised greatly in temperature was a brilliant conception, a stroke of genius arising, relatively speaking, from nothing. The development of the basic process, on the other hand, represented the painful working out of means to fill long felt want. During the decade of the eighteen-seventies, when the acid Bessemer steel process was making great commercial strides, there was continual discussion of the possibilities of finding a process whereby pig iron containing considerable quantities of phosphorus could be used in the manufacture of steel. At most of the meetings of the Iron and Steel Institute the matter came up in one form or another. It is therefore one of the curious facts in this history of this interesting process that the Institute itself smothered a paper detailing the solution of the problem. Messrs. Thomas and Gilchrist submitted a paper, detailing quite fully the results of their experiments and giving analyses, to be read at the Paris meeting of the Institute in September, 1878. The paper was or inally near the top of the list, but t youths were practically unknown a the paper was placed at the bottom, ing eventually left unread for lack time. Mr. Windsor Richards, manag of Bolckow, Vaughan & Company works at Middlesbrough, however, w personally interested by Mr. Thom this interest resulting in the erecti of a pair of 30 cwt. converters by t firm, and on April 4, 1879, they we able to show an absolutely successf operation. A record of one of the ea blows shows that at the end of minutes of the blow the carbon w very slightly reduced, the silicon most entirely eliminated and the ph phorus slightly increased. In the ne six minutes nearly all the carbon disa peared with the remaining silicon a the phosphorus was slightly reduc In the next four and a half minutes t phosphorus (originally 1.57%) dro ped from 1.22% to .14%, and in fi seconds more, at the end of the blow stood at .08%, the final analysis bein Carbon, trace; silicon, nil; mangane trace; sulphur, .05% (originally .06% while as noted the phosphorus w .08%.

Mr. George W. Maynard, an Ame can, but for several years consulti engineer for the Standard Iron & St Company at Manchester, England, to an interest in the new process with t idea of introducing it in the Unit States. Arrangements were complet and Mr. Maynard returned to t United States in March 1879, fi spending considerable time, as himself put it, "at the patent office Washington in an effort to educate metallurgical department." Eventua the patents were granted in good for The first license was granted to Shoe berger & Company, Pittsburgh, for u in open-hearth furnaces, but it does n appear that they ever exercised t license.

The first actual practice of the ba process in the United States was Steelton, Pa., by the Pennsylvan

teel Company. Upon the completion f a new Bessemer department the old ne, with two 5-ton converters, was vailable for experiments, and on May , 1883, the first basic Bessemer steel as made. The iron came chiefly from regular blast furnace, which had been roducing iron running a trifle over % in phosphorus, while a small quanity came from a stack using puddle inder and therefore making high phosphorus, over 3½%. The operation of he regular furnace was modified by sing some converter scrap and slag, to ncrease the phosphorus. The steel roduced was of excellent quality and ery soft but the cost was so high that he operation was abandoned. The ext basic Bessemer operation was at ottstown, Pa., by the Pottstown Iron ompany, Joseph Hartshorne, manager. he first blow was July 1, 1886, while he operation was finally abandoned ugust 15, 1893, after somewhat less han half a million tons had been made.

The first basic open-hearth steel manufacture was at the works of the Otis Steel Company, Cleveland O., S. T. Wellman being manager, in 1886, when a run of several weeks was made with a 15-ton furnace, using the Bessemer iron of the day, .10% to .15% in phosphorus, with a large proportion of miscellaneous scrap.

Partly through the instrumentality of Andrew Carnegie the various patents relating to the basic process were sold, early in 1881, to the Bessemer Company, Limited, which had control of the Bessemer patents. While there were several patents, the important feature of the process, whether practiced in the converter or open-hearth furnace, is to use a basic instead of an acid lining, and to introduce limestone. The basic Bessemer process requires an iron quite high in phosphorous to obtain the necessary heat of combustion, and such iron is not produced in the United States, hence only the open-hearth basic process is employed in the United States. Abroad the production by the basic Bessemer process is large.

Railroad Earnings.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 229,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,191	765	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January ..	1,021	795	226	939	718	221	1,133	797	336
February .	914	746	168	900	680	220	1,140	800	340
March	1,091	801	290	1,015	722	293	1,260	844	416
April	1,038	782	256	1,013	724	289	1,223	827	396
May	1,047	800	247	1,044	735	309	1,307	857	450
June	1,097	789	308	1,094	732	362	1,302	851	451

Steel Plants.

XII.— The Duquesne Steel Works.

The Duquesne Steel Works of the Carnegie Steel Company has had quite an interesting history. The Duquesne Steel Company was organized with $350,000 capital stock on June 4, 1886, by a number of Pittsburghers who wished to compete in rail manufacture with Carnegie Brothers & Company, operating the Edgar Thomson and Homestead steel works. Dissensions soon arose and the company was reorganized as the Allegheny Bessemer Steel Company with $700,000 capital. The plant was erected under the supervision of Charles Amsler, consulting engineer of Maekintosh, Hemphill & Company, and comprised two seven-ton Bessemer converters with the necessary roll trains, arranged to roll rails without reheating the blooms, while the mills hitherto had reheated the blooms. On the completion of the works the Carnegie firm addressed a letter to purchasing agents of the railroads warning them against rails thus made. The rail pool was alleged to have discriminated against the new works in the allotment of orders, and with some dissensions among the management, and more or less labor trouble, the operation was not a great success. The first bloom was rolled February 9, 1889. October 30, 1890, the stockholders accepted a bid from Mr. Frick, of the Carnegie firm, of $1,000,000 in bonds for the plant, the material on hand to be paid for in cash. The price paid was less than the invest ment. It is claimed that in the firs twelvemonth the works earned he mil lion dollars, by the mill being switche from rails to billets, for which ther was a heavy demand at good prices.

The converters ran until Septembe 1907, 18 years, when they were aban doned to provide room for additiona open-hearth furnaces, the first open hearth steel having been made at Du quesne in October, 1900, while the pres ent capacity is 1,346,000 tons of ingot all basic open-hearth.

The Duquesne blast furnaces, th first of which was blown in June 8, 189 inaugurated a new era in blast furnac construetion, as they were very larg and were provided with much mor blowing capacity, in proportion to cul ical contents of the stack, than had eve before been furnished. It was year however, before any of them ever a tained the standard rate of 600 ton of pig iron a day for which they ha been built. There are now six stack rated at 1,035,000 tons of basic pig iro The output, apart from billets and shee bars, runs chiefly to merchant bars. Th first continuous bar mill built at th Duquesne works was not expected t find employment more than an averag of half time but was expected to ear a profit nevertheless. There are no three such continuous merchant ba mills at the works.

Lake Superior Iron Ore.

Shipments of iron ore down the lakes have been as follows, in gross tons:

	1911.	1912.	1913.	1914.	1915.	1916.
April	331,645	204,042	866,386	269,686	503,832	1,658,411
May	3,684,819	5,919,074	7,284,212	3,852,063	5,012,359	8,449,580
June	4,819,996	7,567,555	7,974,444	5,502,367	6,005,591	9,507,576
July	5,221,373	7,600,233	8,204,416	5,784,514	7,204,021	9,750,157
August	5,548,311	7,760,248	7,677,601	5,869,477	8,081,117	9,850,140
September	5,231,069	7,287,230	7,258,413	5,438,049	7,863,146	9,600,786
October	4,769,965	7,010,219	6,526,103	4,242,392	7,146,873	*8,500,000
November	2,523,253	4,072,674	3,270,958	1,068,682	4,445,129	.....
December	.....	14,579	18,545	1,411	57,236	.....
Season Lake ..	32,130,411	47,435,777	49,070,478	32,021,987	46,318,804	57,316,650

* Estimated.

The Iron and Steel Situation.

Market Running Wild.

A month ago we began our review under the caption "A new steel movement." The word "movement" is no longer precisely applicable, for the term when applied to the iron and steel industry suggests broad and regular buying and selling, with an orderly advance in prices. There is no regular buying and selling now. Some classes of buyers are practically out of the market, while many mills refuse altogether to quote on a considerable proportion of the inquiries that come to them. There is not only no orderly advance in prices, there are on some commodities no definite prices at all.

This change is the contribution October has made to the already interesting history of the iron and steel market. The market is running wild. There are two causes of the disorder. Prices have reachel a level which some buyers cannot pay, or feel they cannot pay with the existing condition of their business. In some products at least producers find they cannot fully supply their regular customers, and hence on many inquiries they do not quote, so that purchases when made are at different prices when the character of the material and the delivery is the same, but the relation between the buyer and seller is different.

The pig iron market, hitherto quite a laggard behind steel, became wild in October, with sharp and quite disorderly advances, the markets in different districts advancing unevenly, whereby pig iron frequently penetrated into new territory.

Steel Price Advances.

As indicated, it is no longer possible to quote finished steel prices closely, even for the familiar "delivery at mill convenience," partly because the mills make distinctions between buyers, as to whether they are regular customers or not, and as to their ability to pay high prices, and partly because "delivery at mill convenience" while itself a very elastic term, sometimes runs so far ahead that the delivery is uninteresting. We have always defined the regular market price of a commodity as the price at which the bulk of the material was being sold at the time, but at the present time there is in the case of some commodities no one price at which most of the tonnage is being sold.

In a general way, however, it may be said that during October minimum prices have advanced $2 a ton on bars, $4 on shapes, $5 on plates, $8 on black sheets, $15 on galvanized sheets and $2 on wire products.

The Mill Attitude.

There is a similarity between the attitude the mills appear to maintain now and that of early this year. By the first of this year steel prices, for forward delivery, had reached a level equal to that attained in 1907, generally regarded as the highest "safe" level. The sharp advances that occurred in January, February and March could reasonably be interpreted as a recognition on the part of the large mills that they could not hope to hold the market indefinitely, while since prompt deliveries were commanding much higher prices they might as well advance their prices for forward delivery. If that resulted in partly clearing their order books they would be able to make earlier deliveries and those deliveries might command the high prices. In other words it looked as if the mills considered that there was a time limit rather than a price limit on the market.

When the mills made those sharp advances in the first three months of the year, representing more than half a cent a pound on the average of all finished steel products, the buying was not curtailed. There was more business on books July 1st than on April 1st or January 1st. The market has continued strong and the time limit has been set forward. Instead of its being the end of this year it is the end, or nearly the end, of next year. The mills feel that nothing they do is likely to hasten or retard the final break. In all probability that will come when

peace in Europe is assured. While there are widely divergent forecasts the more common one sets the time at about a twelvemonth hence. It seems quite well assurd that the market cannot do anything which will cause a break in less time, or at least a break that would affect mill operations. The business on books almost fully assures operation at capacity until that time. The actual business is, of course, not nearly sufficient, but in many cases there is tonnage reserved for certain classes of buyers, tonnage that it is practically certain will be taken. In many cases the buyer would already have contracted for the tonnage, but the mill has preferred to wait, expecting delay to make the order involve a higher price.

Production and Shipments.

In July and August steel production was 10%, possibly 15% less than in June. September saw the June rate regained or at least closely approached. In October a new rate has probab been made. Certainly many of t mills have made new tonnage record The sharp increase in shipments h not served to make steel more plentif or cause buyers to relax their effor to secure better deliveries from the mills. It is doubtful whether Nove ber and December shipments will be large as those of October. October traditionally the month for breaki records, because weather conditio are favorable, but many mill manage have acquired the habit of making a assist nature, and in various ways th arrange that the heaviest tonnag shall fall in October. Sometimes th mortgage November operations, by a ranging rolling schedules to the a vantage of October and by postponi needed repairs. Then there is ba weather to be counted upon, and mo serious of all is the matter of tran portation. Weeks ago the railroads fe down in the matter of coal car supplie

Pig Iron Prices.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland an Chicago, prices are delivered.

1915	Bessemer,	Basic, Valley	No. 2 fdy.	Basic, Phila.	No 2 X fdy. Phila.	Buffalo.	Cleveland.	No. 2 fdy. Chicago.	Birmingham.	Ferro-manganese.*	Furnace coke
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.5
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.5
Mar. ..	13.60	12.50	12.75	13.50	14.05	12.74	13.25	13.39	9.42	78.00	1.5
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.5
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.5
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.5
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.6
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.5
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.6
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.1
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.3
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.8
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.7
1916											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.1
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.4
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.4
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.4
May ..	21.00	18.21	18.44	20.50	20.25	19.15	19.08	19.50	15.00	175.00	2.3
June ..	21.00	18.25	18.39	19.90	20.04	18.75	19.30	19.50	14.63	175.00	2.5
July ..	21.00	18.00	18.25	19.15	19.75	18.75	18.80	19.50	14.00	175.00	2.6
Aug. ..	21.00	18.00	18.27	19.00	19.58	18.75	18.57	19.17	14.00	175.00	2.75
Sept. .	21.32	18.27	18.58	19.50	19.50	19.04	18.67	18.75	14.38	165.00	2.9
Oct. ..	23.81	20.17	20.56	20.52	20.58	20.48	19.87	19.79	15.35	165.00	5.6

* Contract price, f.o.b. Baltimore; x Prompt, f.o.b. Connellsville ovens.

ıd they have not furnished the coke orks an altogether sufficient supply. t the end of October some steel mills ere beginning to feel a serious short- ge of cars for the shipment of their roduct. For the future there is the vorable influence that lake shipments ore and coal will soon end while the aviest pressure for grain movement ill be over, while there are the unfa- orable influences of bad weather and nstantly decreasing motive power as comotives are not repaired as they ıould be. The first cold snap, which ways disarranges transportation, may the present delicate alignment cause blockade from which the railroads ill not quickly extricate themselves. he blockade that started in October, 002, was not broken for six months, ntil the combination of spring weath- and decreased industrial activity ıddenly restored normal conditions as transportation.

Thus the prospect is that steel will ecome more scarce rather than more plentiful in the next two or three months, for any serious transportation difficulties will slow down iron and steel production all along the line. There are no stocks of coke or pig iron and for most finished steel products there are no storage facilities adequate to handling the mill output for any length of time. Any link in the chain may prove to be a weak one.

Coke.

Connellsville furnace coke for spot shipment stood at 1.50 in May, 1915. At the beginning of last August it was $2.50. At the beginning of October it was $3.50. On October 25th it sold at $8.00, and it has since declined only a fraction of a dollar. Contracts being filled are at $2.25 to $2.75, but in many cases the shipments are inadequate. The daily turnover in spot coke is quite small. Some observers suggest that there is danger of a condition arising whereby consumers will be buying their coke over again, and suggest that buyers do not help themselves by bidding

Finished Steel Prices.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved		Sheets				Comp.
1915	Shapes	Plates.	Bars.	Pipe.	Wire.	Wire Nails.	Steel Skelp.	Black.	Galv.	Blue Annld.	Tin plate.	Fin. steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3.60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.75	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5692
August	1.30	1.26	1.30	79	1.38	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.25	2.40	2.35	2.89	5.00	2.95	4.70	2.7166
May	2.50	2.83	2.50	70	2.45	2.50	2.35	290	5.00	3.00	5.46	2.8043
June	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.80	3.00	5.75	2.8300
July	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.40	2.90	6.00	2.8425
Aug.	2.54	2.94	2.56	70	2.53	2.58	2.35	2.90	4.20	2.90	5.54	2.8588
Sept.	2.60	3.00	2.60	69¼	2.55	260	2.35	2.91	4.20	2.90	5.75	2.9013
Oct.	2.63	3.07	2.62	69	2.59	2.64	2.40	3.23	4.50	3.15	5.77	2.9747

Comparison of Metal Prices.

	Range for 1914		Range for 1915		Range for 1916		Closing,
	High.	Low.	High.	Low.	High.	Low.	Oct. 31,
Pig Iron.							**1916.**
Bessemer, valley	14.25	13.75	21.00	13.60	26.00	20.00	26.00
Basic, valley	13.25	12.50	18.00	12.50	22.00	17.75	22.00
No. 2 foundry, valley	13.25	12.75	18.50	12.50	23.00	18.25	23.00
No. 2X fdy. Philadelphia.	15.00	14.20	19.50	14.00	22.75	19.50	22.75
No. 2 foundry, Cleveland .	14.25	13.25	18.80	13.00	21.30	18.50	21.30
No. 2X foundry, Buffalo.	13.75	12.25	18.00	11.75	25.00	18.00	25.00
No. 2 foundry, Chicago ..	14.75	13.00	18.50	13.00	22.00	18.00	22.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	16.50	14.00	16.50
Scrap Iron and Steel.							
Melting Steel, Pittsburgh.	12.00	9.75	18.00	11.00	18.75	16.00	18.75
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	18.00	14.50	18.00
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	19.50	17.50	19.37
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	16.25	14.75	16.12
Heavy steel scrap, Phila. ..	11.25	9.00	16.25	9.50	17.75	14.75	16.25
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	1.25	1.25	1.47	1.25	1.47
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.75	1.90	2.75
Iron bars, Philadelphia ...	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.70	1.85	2.70
Tank plates, Pittsburgh ..	1.20	1.05	1.60	1.10	3.25	1.85	3.25
Structural shapes, Pitts. ..	1.25	1.05	1.80	1.10	2.80	1.85	2.80
Grooved steel skelp, Pitts..	1.20	1.12½	1.75	1.12½	2.50	1.75	2.50
Black sheets, Pittsburgh..	1.95	1.80	2.60	1.70	3.40	2.60	3.40
Galv. sheets. Pittsburgh ..	3.00	2.75	5.00	2.65	5.00	4.15	5.00
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	6.00	3.75	6.00
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	2.70	2.10	2.70
Steel pipe, Pittsburgh	79½%	81%	79%	81%	69%	78%	69%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	8.00	2.50	7.15
Prompt foundry	2.50	2.00	3.75	2.00	8.25	3.25	7.90
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	37.50	41.87½
Lake copper	15.50	11.30	23.00	13.00	30.25	23.00	28.37½
Electrolytic copper	14.87½	11.10	23.00	12.80	31.00	23.00	28.62½
Casting copper	14.65	11.00	22.00	12.70	28.25	22.00	27.25
Sheet copper	20.25	16.50	27.25	18.75	37.50	28.00	37.50
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	7.00
Spelter	6.20	4.75	27.25	5.70	21.17½	8.37½	10.42½
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	10.50	13.12½
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	65.00	53.00	64.50
Silver	59¼	47⅝	56½	46¼	77¼	55⅞	68.12½
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	6.87½
Spelter	6.00	4.60	27.00	5.55	21.00	8.20	10.25
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	15.00	16.00
London.	£	£	£	£	£	£	£
Standard tin, prompts ...	188	132	190	148¼	205	163	180¾
Standard copper, prompts	66¾	49	86⅜	57⅛	146	84½	182
Lead	24	17⅞	30¼	18¼	36⅜	27¾	30½
Spelter	33	21¼	110	28⅛	111	44	52¾
Silver	27¼d	23¼d	27¼d	22 1/16d	37⅛d	26 11/16d	32½d

Comparison of Security Prices.

	Range for 1914		Range for 1915		Range for 1916		Closing,
	High.	Low.	High.	Low.	High.	Low.	Oct. 31, 1916.
Railroads.							
Atchison, Top. & Santa Fe...	100⅜	89½	111¼	92½	108⅞	100¾	107¼
Atch. Top. & Santa Fe. pfd.	101¾	96½	102⅛	96	102	97⅞	100¾
Baltimore & Ohio	95⅝	67	96	63¾	96	82⅞	87¾
Canadian Pacific	220½	153	194	138	183¾	162½	172¾
Chesapeake & Ohio	68	40	64¾	35⅝	71	58	68¾
Chicago, Mil. & St. Paul	107⅛	84¾	101⅛	77¾	102½	91	94⅞
Erie R. R.	32½	20⅛	45⅝	19⅞	43⅝	32	39
Great Northern pfd.	134¾	111⅜	128⅜	112¾	127½	116⅛	118⅛
Lehigh Valley	156¼	118	83⅜	64⅝	87⅛	74½	83¾
Louisville & Nashville	141⅞	125	130¼	104½	139½	121⅛	136½
Missouri, Kansas & Texas ..	24	8⅜	15¼	4	8¾	3⅛	7⅜
Missouri Pacific	30	7	18¼	1¾	19⅜	3¼	9¾
New York Central	96⅝	77	110½	81½	114¼	100¼	107⅞
N. Y., N. H. & Hartford	78	49⅝	89	43	77⅞	57	60½
Northern Pacific	118½	97	119	99⅛	118⅞	108¼	112
Pennsylvania R. R.	115½	102½	61½	51¾	60	55⅛	58⅝
Reading	172¼	137	85⅝	69⅜	115½	75⅛	109⅛
Southern Pacific	99½	81	104⅛	81¼	104⅜	94¼	100½
Union Pacific	164⅜	112	141½	115¾	153⅜	129¾	150½
Industrials.							
Am. Beet Sugar	33½	19	72⅞	33¼	104½	61¾	102⅞
American Can	35⅛	19¼	68½	25	68½	50¼	61¾
American Can, pfd.	96	80	113½	89	115⅜	108⅝	113¼
Am. Car & Foundry	53½	42¼	98	40	78	52	67¼
Am. Cotton Oil	46½	32	64	39	58⅛	50½	56¾
Am. Locomotive	37¼	29¼	74¾	19	92½	58	82⅛
Am. Smelting & Refining	71⅛	50¼	108⅞	56	117	88½	112
Brooklyn Rapid Transit	94¼	79	93	83¼	88⅞	83½	85
Chino Copper	44	31⅝	57⅜	32¾	64⅛	46⅛	61
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	63¼	38⅛	52⅞
Consolidated Gas	139½	112½	150½	113¾	144¾	130½	138¾
General Electric	150⅝	137½	185½	138	187¼	159	182⅛
International Harvester	113½	82	114	90	119¾	108½	117½
Lackawanna Steel	40	26½	94¾	28	90¼	64	88½
National Lead	52	40	70¾	44	74⅝	60½	68½
Ray Consolidated Copper	22½	15	27½	15¼	29¾	20	26⅜
Republic Iron & Steel	27	18	57¼	19	83¾	42	77⅞
Republic Iron & Steel, pfd...	91¼	75	112⅝	72	116½	106⅞	114
Sloss-Sheffield	35	19½	66⅞	22	70¾	37	62
Texas Co.	149⅞	112	237	120	235½	177¼	225½
U. S. Rubber	63	44½	74¾	44	63¾	47¾	59⅝
U. S. Steel Corporation	67¼	48	89½	38	122¼	79¾	118⅞
U. S. Steel Corporation, pfd..	112¾	103¼	117	102	123	115	121¾
Utah Copper	59⅜	45⅜	81¾	48½	113½	74¾	106¼
Va.-Carolina Chem.	34⅞	17	52	15	51	36	46¾
Western Union Telegraph ...	66⅞	53⅜	90	57	105½	87	102½

high prices for spot coke. The observation is not entirely applicable, for the consumers are in two classes, the steel works, which can pay almost any price for coke rather than have their output of steel diminished, because they are making $25 to $50 a ton profit on it, and the merchant furnaces, which have their iron sold at relatively low prices and would lose money if they paid more than about $5.00 for coke. We do not understand that there is any moral delinquency on the part of coke sellers, but such a delinquency is feared, and it is well to point out that if a steel works bids $8.00 for spot coke that coke may come out of a merchant furnace contract and thus the steel works would be ahead.

The latest business in contract furnace coke involves a contract for first half at $4.00 and the extension of a $3.75 first half contract over the second half at the same figure.

Spot foundry coke lagged behind furnace coke because it required a day or two for news of the successively higher prices obtained for furnace to reach the trade. Eventually foundry coke passed furnace, sales being made regularly in the closing days of October at $8.00, while as high as $9.50 appears to have been paid in exceptional cases for single carloads.

Pig Iron.

The advances in pig iron have been wild, the different districts not holding together at all. Virginia was the slowest to avance, and Virginia iron penetrated to Pittsburgh, while it re-

U. S. Steel Corporation's Operations.

Earnings and Unfilled Orders.

Earnings by Quarters.

Net earnings by quarters since 1911:

Quarter.	1916.	1915.	1914.
1st	$60,713,624	$12,457,809	$17,994,382
2nd	81,126,048	27,950,055	20,457,596
3rd	85,817,067	38,710,644	22,276,002
4th		51,277,504	10,935,635
Year		130,396,012	71,663,615
	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38,450,400	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year ...	137,181,345	108,174,673	104,305,466

Unfilled Orders.

(At end of the Quarter.)

	First.	Second.	Third.	Fourth.
1904..	4,136,961	3,192,277	3,027,436	4,696,203
1905..	5,579,560	4,829,655	5,865,377	7,605,086
1906..	7,018,712	6,809,584	7,936,884	4,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,833	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220
1916..	9,331,001	9,640,458		

Bookings and Shipments.

In this table, first two columns, percentages of bookings and shipments to total capacity, our own estimates, while last column is derived from official reports of "unfilled tonnage" while third percentage column is directly computed from this tonnage column.

	Shipments.	Bookings.	Difference.	Difference.
1915—	%	%	%	Tons.
January ..	44	81	+37	+411,928
February ..	57	66	+ 9	+ 96,800
March	67	60	— 7	— 89,622
April	71	63	— 8	— 93,505
May	76	85	+ 9	+102,354
June	79	113	+34	+413,598
July	83	104	+21	+250,344
August	91	89	— 2	— 20,085
September .	98	133	+35	+409,163
October ...	103	172	+69	+847,834
November .	102	186	+84	+1,024,037
December .	102	152	+50	+615,731
1916—				
January ...	102	112	+10	+116,547
February ..	102	157	+55	+646,199
March	104	164	+60	+762,035
April	104	146	+42	+498,550
May	104	82	—22	—297,340
June	104	82	—22	—297,340
July	90	86	— 4	— 46,866
September .	96	87	— 9	—137,773

tarded the advance in the East to such an extent that delivered Philadelphia was $22.75 while f.o.b. furnace Buffalo was $25, the normal divergence being about $1.50 in the other direction. Southern iron was rather sluggish in advancing, but eventually advanced so sharply as to become almost unquotable at all. The average advance in the whole pig iron market in October, as shown by our **composite,** was almost $2.50 per ton. From the low point of December, 1914, to October 1, 1916, the advance had been only a shade more than $6.

Unfinished Steel.

From the middle of August until the middle of October billets and sheet bars were regarded throughout the trade as fairly quotable at $45 to $50. Transactions were light, but practically all that were made testified to the range mentioned being fairly representative of the market. Suddenly the lower prices disappeared entirely, and at the end of October fair quotations were $50 for billets and $52 for sheet bars. Bessemer steel was quotable as high as open-hearth, partly because none was obtainable. Rods advanced $5 a ton to $60 to $65 and forging billets an equal amount, becoming quotable at $70 to $75.

Tin Plate.

On October 8th, as noted in last issue, several of the independent tin plate mills announced a price of $6.00, for the first three months of 1917 in the case of jobbers and the first six months in the case of manufacturing consumers. Much to the surprise of the majority the leading interest on October 12th announced a price of $5.75. All producers had insisted that there would not be enough tin plate to meet requirements and each producer insisted he would sell only to his regular customers. Thus there was not much regular competition. Some of the independents came down to $5.75 in the case of the majority of their customers while others held out for $6.00. By the end of the month regular customers of the leading interest were bidding independents $6.25 and customers of independents were doing likewise. A sale of 50,000 boxes for export was made at $6.50 on the next to the last day of the month.

Railroads Buying Heavily.

A noteworthy feature of the situation is the heavy buying by railroads. Orders for spikes and other track repair material are being placed freely for delivery in the first half of next year. There has been fairly heavy inquiry for rails for delivery late in 1917, but as a rule deliveries cannot be arranged and some contracts have been placed for early 1918 delivery.

Buying of freight cars has reached really spectacular proportions in the past two months seeing that last spring the railroads practically withdrew from the market on account of the very high prices but they have since re-entered with prices still higher. Our regular summary, printed on another page shows that about 19,683 freight cars were ordered in September and about 32,402 in October, making 52,985 for the two months against only 23,000 ordered in the five months preceding. Thus the rate of buying has been multiplied almost six times.

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Steel Making Pig Iron Averages.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April .	13.60	20.70	12.50	18.00
May ..	13.659	20.833	12.65	18.1607
June ..	13.75	21.00	12.724	18.00
July ..	13.991	21.00	12.959	18.00
Aug. ..	15.064	21.00	14.364	18.00
Sept. ..	15.906	21.9346	15.00	18.63
Oct. ..	16.00	23.6576	15.0147	20.3086
Nov. ..	16.615		15.518	
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f. o. b. valley furnace; delivered Pittsburgh is 95 cents higher.

British Iron And Steel Exports.

1915—	Pig Iron.	Rails.	Tin Plate.	Total.*
Mar. ..	20,172	17,572	36,170	239,341
April ..	35,209	21,602	40,135	265,244
May ..	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	33,224	39,528	351,984
Aug. ..	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ..	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	87,283	3,366	39,482	307,488
April ..	82,976	10,510	23,337	293,897
May ..	97,967	4,103	41,868	395,750
June ...	77,487	3,243	30,351	310,595
July ...	69,999	3,485	38,174	298,929
Aug. ..	95,655	1,983	34,124	319,928
Sept. ..	72,683	2,712	19,226	231,335
9 mos..	746,687	36,458	280,122	2,733,405

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Tin Plate Movement.

United States imports and exports of t plate in gross tons have been as follov the imports of course including those f drawback purposes:

	Imports.	Expor
1915	2,350	154,54
January, 1915	1,608	7,01
February	265	5,83
March	53	10,50
April	44	9,08
May	24	7,21
June	75	7,58
July	71	13,89
August	50	21,93
September	31	22,26
October	15	16,92
November	54	15,53
December	62	16,79
January, 1916	62	12,17
February	107	13,53
March	44	20,36
April	179	21,38
May	39	25,58
June	91	29,75
July	150	18,76
August	105	18,75

Wage Scale Averages.

Sworn averages of prices obtained l mills for shipments in months named, us in fixing wages under Amalgamated Ass ciation sliding scales. The figures represe the rates used, the actual ascertained ave ages lying between the figure given and tl one five points higher. Base sizes of iro bars; average of 26, 27 and 28 gauges blac sheets; tin plate per base box, 100-pound.

Bar Iron.

	1914.	1915.	1916
January-February.	1.1590	1.024	*1.40
March-April	1.176	1.087	*1.60
May-June	1.1257	*1.10	*1.85
July-August	1.0928	*1.15	*1.95
September-October	1.0847	*1.15	....
November-Dec'ber	1.037	*1.30	....
Year's average	1.1125	1.144	....

* Settlement basis.

Sheets and Tin Plates.

1916.	Sheets.	Tin Plate
January-February	2.25	3.50
March-April	2.50	3.70
May-June	2.60	3.90
July-August	2.70	4.05

Car Buying.

reight cars ordered:		
January, 1915	3,300	
February	4,255	
March	1,287	
April	3,000	
May	20,120	
June	29,864	
ix months		61,916
July	5,675	
August	4,625	
September	5,060	
October	26,939	
November	19,863	
December	7,055	
Six months		69,217
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	
May	6,204	
June	3,470	
Six months		64,287
July	4,883	
August	3,384	
September	19,683	
October	32,403	

Pig Iron Production.

Rates per annum, including charcoal pig.

April, 1915	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,600,000
April	39,600,000
May	39,800,000
June	39,500,000
July	38,350,000
August	39,200,000
On October 1st	39,800,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

Our Foreign Trade.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,745,913	134,169,807
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	193,935,117	402,991,118	209,056,001
Mar.	213,589,785	409,850,425	196,260,640
Apr.	217,705,397	399,861,157	182,155,760
May	229,188,957	474,881,255	245,692,298
June	*245,795,438	464,784,318	218,988,880
July	182,722,938	445,472,000	262,749,062
Aug.	199,247,391	509,778,680	310,531,289
Sept.	164,128,604	*512,847,957	348,719,353

* High record.

† Balance unfavorable.

Price Changes of Iron and Steel Products From July 1, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pipe, sheets and tin plates are given below, with dates. These are the commodities used in compiling our composite finished steel. In some cases the dates named are those upon which prominent producers announced price changes, but more frequently the rates are merely those upon which our quotations were changed. A few other price changes are included.

1915—			
July 1	Shapes	1.20	to 1.25
" 2	Sheets	1.75	to 1.70
" 6	Wire nails	1.55	to 1.60
" 6	Painted barb wire	1.55	to 1.70
" 7	Sheets	1.70	to 1.75
" 14	Galvanized sheets	5.00	to 4.50
" 16	Boiler tubes	73%	to 72%
" 20	Plates	1.20	to 1.25
" 20	Wire nails	1.60	to 1.55
" 28	Galvanized sheets	4.50	to 4.25
" 29	Wire nails	1.55	to 1.60
Aug. 3	Shapes	1.25	to 1.30
" 4	Sheets	1.75	to 1.80
" 6	Black sheets	1.80	to 1.85
" 16	Wire galvanizing	80c	to 60c
" 19	Blue ann. sheets	1.35	to 1.40
" 23	Wire galvanizing	60c	to 70c
" 24	Wire	1.40	to 1.50
" 24	Wire nails	1.60	to 1.65
" 25	Black sheets	1.85	to 1.90
" 27	Plates	1.25	to 1.30
Sept. 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galvanized sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
" 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galvanized sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galvanized sheets	3.60	to 3.70

1915—			
Nov. 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galvanized sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
Nov. 18	Shapes	1.60	to 1.70
" 18	Galvanized sheets	4.00	to 4.25
" 24	Galvanized sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galvanized sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10
" 22	Sheets	2.50	to 2.60
Jan. 3	Tin plate	3.60	to 3.75
" 3	Blue ann. sheets	2.25	to 2.35
" 4	Bars	1.80	to 1.85
" 4	Plates	1.80	to 1.85
" 4	Shapes	1.80	to 1.85
" 4	Pipe (with extra 2½%)	78%	to 77%
" 5	Blue ann. sheets	2.35	to 2.40
" 7	Boiler tubes	68%	to 66%
" 12	Blue ann. sheets	2.40	to 2.50
" 14	Boiler tubes	66%	to 64%
" 19	Blue ann. sheets	2.50	to 2.65
" 21	Bars	1.85	to 1.90
" 21	Plates	1.85	to 2.00
" 21	Shapes	1.85	to 1.90
" 21	Pipe	77%	to 76%
" 24	Wire nails	2.10	to 2.20
Feb. 7	Bars	1.90	to 2.00
" 7	Plates	2.00	to 2.10
" 7	Shapes	1.90	to 2.00
" 14	Wire nails	2.20	to 2.30
" 15	Pipe	76%	to 75%
" 21	Bars	2.00	to 2.25
" 21	Plates	2.10	to 2.35

Feb. 21	Shapes	2.00	to 2.25
" 21	Tin plate	3.75	to 4.00
" 29	Pipe	75%	to 74%
" 29	Boiler tubes	64%	to 63%
Mar. 1	Wire nails	2.30	to 2.40
" 8	Black sheets	2.60	to 2.75
" 8	Blue ann. sheets	2.65	to 2.90
" 13	Bars	2.25	to 2.35
" 13	Plates	2.35	to 2.60
" 13	Shapes	2.25	to 2.35
" 15	Steel pipe	74%	to 73%
" 15	Boiler tubes	63%	to 61%
" 23	Bars	2.35	to 2.50
" 23	Shapes	2.35	to 2.50
" 28	Plates	2.60	to 2.75
" 29	Sheets	2.75	to 2.85
" 29	Steel pipe	73%	to 72%
" 29	Boiler tubes	61%	to 60%
April 5	Sheets	2.85	to 2.90
" 15	Boiler tubes	60%	to 56%
" 19	Tin plate	4.50	to 5.00
" 24	Pipe	72%	to 70%
May 1	Wire nails	2.40	to 2.50
" 3	Tin plates	5.00	to 5.50
" 16	Plates	2.75	to 2.90
June 7	Galv. sheets	5.00	to 4.75
" 16	Tin plate	5.50	to 6.00
July 7	Blue ann. sheets	3.00	to 2.90
" 7	Galv. sheets	4.75	to 4.50
Aug. 1	Tin plate	6.00	to 5.50
" 7	Wire nails	2.50	to 2.60
" 15	Bars	2.50	to 2.60
" 18	Shapes	2.50	to 2.60
" 18	Plates	2.90	to 3.00
" 25	Galv. sheets	4.25	to 4.15
Sept. 7	Pipe	70%	to 69%
" 7	Boiler tubes	56%	to 54%
" 20	Galv. sheets	4.15	to 4.25
" 28	Sheets	2.90	to 3.00
Oct. 3	Blue ann. sheets	2.90	to 3.00
" 3	Galv. sheets	4.25	to 4.30
" 6	Sheets	3.00	to 3.10
" 7	Tin plate	5.50	to 6.00
" 13	Sheets	3.10	to 3.25
" 13	Galv. sheets	4.30	to 4.40
" 13	Tin plate	6.00	to 5.75
" 16	Galv. sheets	4.40	to 4.50
" 19	Wire nails	2.60	to 2.70
" 20	Sheets	3.25	to 3.35
" 20	Blue ann. sheets	3.00	to 3.15
" 24	Plates	3.00	to 3.25
" 25	Bars	2.60	to 2.70
" 25	Shapes	2.60	to 2.70
" 25	Grooved skelp	2.35	to 2.50
" 26	Sheets	3.35	to 3.40
" 26	Galv. sheets	4.50	to 4.75
" 27	Blue ann. sheets	3.15	to 3.30
" 30	Tin plate	5.75	to 6.00
" 31	Shapes	2.70	to 2.80

Immigration Statistics.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted include immigrant and non-immigrant, aliens departing to and emigrant and non-emigrant.

Excess Arrivals Over Departures.

	Aliens.	Citizens.	Total.
1913	815,303	*61,098	754,205
1914	769,276	*82,211	687,065
1915	50,070	67,167	117,237
1916	125,941	11,197	137,138
July, 1915 ...	11,082	3,912	14,994
August	*14,324	*804	*15,128
September ..	*1,965	866	*1,099
October	4,877	662	5,539
November ..	3,292	*802	2,490
December ...	*570	*891	*1,461
January, 1916	7,303	*1,212	6,091
February	19,420	*1,826	17,594
March	23,791	4,198	27,989
April	26,143	4,471	30,614
May	24,708	2,021	26,729
June	22,184	65	22,249
July	18,244	3,634	21,878
August	21,413	304	21,717

August, 1916.

Immigrant aliens in	29,975
Non-immigrants in	6,372
Total aliens in	36,347
Emigrant aliens out	7,686
Non-emigrant aliens out	7,248
Total aliens out	14,934
Excess aliens in	21,413
Citizens in	9,809
Citizens out	9,505
Excess citizens in	304
Total increase population	21,717

September, 1916

Aliens in	43,298	
out	13,988	
Excess in	29,310	
Citizens in	10,669	
out	9,226	
Excess in	1,443	
Increase in population aliens		+29,310
citizens		+ 1,443
Total		+30,753

* Excess of departures.

Iron and Steel Imports and Exports.

Value of Tonnage and Non-Tonnage.

	1911.	1912.	1913.	1914.	1915.	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,520,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	58,300,297
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	58,722,411
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	72,918,913
June	20,310,053	24,795,802	25,228,346	18,927,958	31,730,132	76,257,884
July	17,454,772	24,917,952	24,170,704	16,737,552	35,892,106	70,745,162
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,657	86,296,703
September ...	19,875,308	23,286,040	22,831,082	12,531,102	38,415,180	.....
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$529,040,563

Exports of Tonnage Lines,---Gross Tons.

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.
January	70,109	118,681,	152,262	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	139,946	368,867
March	94,519	124,980	216,360	218,219	257,519	159,998	174,104	438,058
April	100,911	117,921	228,149	267,313	259,689	161,952	223,587	384,924
May	109,808	135,306	178,589	307,656	242,353	139,107	263,113	540,549
June	114,724	120,601	174,247	273,188	243,108	144,539	356,431	526,772
July	100,850	127,578	162,855	272,778	237,159	114,790	380,336	503,685
August	105,690	131,391	177,902	282,645	209,856	86,599	405,952	597,750
September	97,641	119,155	181,150	248,613	213,057	96,476	381,917	.....
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	3,717,727

Iron Ore Imports.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,844
Feb. ..	188,734	112,574	78,773	93,315
Mar. .	164,865	68,549	88,402	93,383
April.	174,162	111,812	91,561	75,712
May .	191,860	125,659	98,974	148,599
June .	241,069	188,647	118,575	134,154
July .	272,017	141,838	119,468	156,755
Aug. .	213,139	134,913	126,806	127,094
Sept. .	295,424	109,176	173,253	.....
Oct. ..	274,418	114,341	138,318	.....
Nov. .	179,727	90,222	113,544	.....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	918,856

Iron and Steel Imports.

	1912.	1913.	1914.	1915.	1916
Jan. .	20,008	21,740	17,776	10,568	15,8
Feb. .	11,622	25,505	14,757	7,506	20,2
Mar. .	15,466	27,467	27,829	8,025	15,1
April.	12,481	25,742	30,585	16,565	20,1
May .	15,949	28,728	28,173	28,916	32,1
June .	21,407	36,597	23,076	32,200	26,8
July .	17,882	36,694	25,282	20,858	14,7
Aug. .	20,571	18,740	28,768	27,557	32,2
Sept..	18,740	19,941	38,420	23,344	...
Oct. .	25,559	20,840	22,754	34,319	...
Nov. .	24,154	25,809	24,165	37,131	...
Dec. .	21,231	26,454	9,493	35,455	...
Total	225,072	317,260	289,778	282,443	177,47

Composite Steel.

Computation for November 1, 1916:

Pounds.	Group.	Price	Extension.
2½	Bars	2.70	6.750
1½	Plates	3.25	4.875
1½	Shapes	2.80	4.200
1½	Pipe (¾-3)	3.05	4.575
1½	Wire nails	2.70	4.050
1	Sheets (28 bl.)	3.40	3.400
½	Tin plates	6.00	3.000
10 pounds			30.850
	One pound		3.0850

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7165
May	1.5590	1.7786	1.5078	1.5381	2.8043
June	1.5794	1.7719	1.4750	1.5312	2.8300
July	1.6188	1.7600	1.4805	1.5692	2.8425
Aug.	1.6784	1.7400	1.5241	1.6059	2.8588
Sept.	1.7086	1.7093	1.5632	1.6506	2.9013
Oct.	1.7588	1.6779	1.5236	1.7264	2.9747
Nov.	1.7750	1.6203	1.4769	1.9089	.....
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

Scrap Iron and Steel Prices.

	Melting Steel. Pitts.	Bundled Sheet Pitts.	No. 1 R. R. Wrought Pitts.	No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.25	10.54	12.26	12.40	12.54	10.90
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75
May	17.00	13.65	19.65	16.10	17.00	15.90
June	16.25	13.00	19.00	15.40	15.45	14.80
July	16.70	12.50	18.80	15.30	15.00	14.30
Aug.	16.25	11.70	18.15	15.00	15.00	15.30
Sep.	16.61	11.65	18.35	15.00	15.00	16.00
Oct.	18.25	11.65	19.30	15.80	15.65	17.35

† Premium for open-hearth.

Composite Pig Iron.

Computation for November 1, 1916:

One ton Bessemer, valley	$26.00
Two tons basic, valley (22.00)	44.00
One ton No. 2 foundry, valley	23.00
One ton No. 2 foundry, Philadelphia	22.75
One ton No 2 foundry, Buffalo	25.25
One ton No 2 foundry, Cleveland	21.30
One ton No. 2 foundry, Chicago	22.00
Two tons No. 2 Southern, Foundry Cincinnati (19.40)	38.80
Total, ten tons	223.10
One ton	22.310

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.240	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	18.965
June	14.005	14.968	13.606	13.047	18.552
July	14.288	14.578	13.520	13.125	18.585
Aug.	14.669	14.565	13.516	14.082	18.514
Sept.	15.386	14.692	13.503	14.895	18.697
Oct.	16.706	14.737	13.267	15.213	20.192
Nov.	17.226	14.282	13.047	16.398	.....
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

Unfinished Steel and Iron Bars.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, deliv. — Phila.	Pitts.	Ch'go.
1915—						
Jan.	19.25	19.75	24.80	1.12	1.20	.97
Feb.	19.25	19.75	25.00	1.12	1.20	1.03
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	13.26	10.54	12.26	12.40	12.54	10.90
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35
May	43.00	43.00	59.00	2.66	2.60	2.35
June	42.00†	42.00†	58.00	2.66	2.60	2.35
July	42.50†	42.50†	58.00	2.66	2.60	2.35
Aug.	46.00	46.00	58.00	2.66	2.60	2.35
Sep.	47.00	45.00	58.00	2.66	2.70	2.35
Oct.	48.00	48.00	59.00	2.66	2.75	2.35

Copper in October.

Enormous Production and Consumption in October—Market Very Firm With Prices up ½c to 1c per Pound —Foreign Market £5 10s Higher on Spot, £4 10s on Futures—Record Sales Since Last December.

The production of copper was at an enormously heavy rate in October. The smelter output was close to 230,000,000 pounds. Refined output was somewhat uncertain; there were so many contingencies that more time must be allowed before attempting to make a close estimate. Tentatively, however, it appears that about 190,000,000 pounds were refined including the metal treated by the Bessemer process.

Deliveries into home melting channels in October, are estimated to have been 120,000,000 pounds. Exports were 73,274,880 pounds. Consumption, therefore, practically offset output.

In the past ten months, the output of pig copper was only a little under 2,000,000,000 pounds while the refined production was about 1,800,000,000 pounds, or at an average rate of 180,000,000 pounds per month. Shipments to domestic consumers in the same period were at an average rate of 115,000,000 pounds per month—having been as low as 100,000,000 pounds and as high as 130,000,000 pounds—making a total for the ten months of 1,150,000,000 pounds. Exports from January 1st to November 1st, were 622,081,600 pounds. The total deliveries thus far this year, therefore, have been 1,772,081,600 pounds, leaving only a margin of 27,918,400 pounds between current refined output and consumption.

Sales Since Last December Approximately 2,700,000,000 Pounds.

Impressive and huge as these productive and consumptive totals are, and reflecting the extraordinary growth of the refineries, as they do, yet, they are eclipsed by the achievements of the smelters and the climax of interest is reached in the phenomenal sales aggregating approximately 2,700,000,000 pounds since last December. The commitments made in the last 60 days are equivalent to 60% of the probable output in the first half and 80% of the maximum production anticipated in the first quarter o 1917.

October orders placed on domesti and foreign account are believed t have aggregated 200,000,000 pounds leaving only a very small unsold capac ty for November and December. I the past four weeks, the demand ha been mainly for deliveries over the ba ance of this year, and there are sti many unsatisfied inquiries for these de liveries. Liberal sales, also, have bee made for shipment in the first quarte and moderate transactions have cov ered deliveries to be made in the firs half of 1917.

Market ½c to 1c per Pound Higher.

The natural result of these cond tions, has been to carry prices upwar ½c to 1c per pound and the indica tion is that prices will continue to ad vance in the next month or so. Som selling interests believe that the mar ket in the next 60 days, will agai reach the price altitude attained las April, and possibly establish a ne high record. On the closing days o the month, sales of Electrolytic wer made by large producers at 29c t 29¼c for November-December shi ment, at 28c for January, at 27¾c fo February, 27½c for March, and a 27¼c for second quarter delivery, i the open market.

Total London Advance £5 10s on Spo £4 10s on Futures.

The London market for Electrolyti steadily advanced from £140 at th end of September, to £144 on Octobe 24th, subsequently receding to £14 10s on the closing day of October, net advance of £2 10s. Standard cop per advanced from £118 10s for spo and £115 for futures on Septembe 29th, to £124 for spot and £120 fo futures on October 19th. Futur Standard receded to £119 on Octobe 25th, but recovered to £120 on Oc tober 30th. In the meantime, spo Standard advanced to £125 on Oc

Lake Copper Prices.

Monthly average prices of Lake Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.73	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	29.28½
June	17.43	15.08	14.15	19.92	27.44
July	17.37	14.77	13.73	19.42	25.81
Aug.	17.61	15.79	12.68	17.47	26.58
Sept.	17.69	16.72	12.43½	17.76	27.86
Oct.	17.69	16.81	11.66	17.92½	28.37½
Nov.	17.66	15.90	11.93	18.86	.....
Dec.	17.62½	14.82	13.16	20.37½	.....
Av. .	16.58	15.70	13.61	17.64	.....

Electrolytic Copper Prices.

Monthly average prices of Electrolytic Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	29.81
June	17.29	14.85	13.81	19.71	27.49½
July	17.35	14.57	13.49	19.08	25.60
Aug.	17.60	15.68	12.41½	17.22	27.36½
Sept.	17.67	16.55	12.08½	17.70½	28.26
Oct.	17.60	16.54	11.40	17.86	28.64
Nov.	17.49	15.47	11.74	18.83	.....
Dec.	17.50½	14.47	12.93	20.35	.....
Av. .	16.48	15.52	13.31½	17.47	.....

Casting Copper Prices.

Monthly average prices of Casting Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	27.37
June	17.08	14.72	13.65	18.74½	25.10
July	17.09	14.40½	13.34½	17.76½	23.61
Aug.	17.35	15.50	12.27	16.46	24.67
Sept.	17.51	16.37½	12.00	16.75	25.93
Oct.	17.44	16.33	11.29	17.32	27.17
Nov.	17.34	15.19	11.63	18.41	.....
Dec.	17.34	14.22	12.83½	19.73	.....
Av..	16.29	15.33	13.18	16.76	....

Sheet Copper Price Changes.

The changes in the base price of sheet copper so far this year are given below together with the price of Lake copper on the same dates:

1916—	Sheet Copper.	Lake Copper.
January 1	28.00	22.75
January 3	29.00	23.25
January 5	30.00	23.50
January 19	30.50	24.12½
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 20	36.50	29.75
May 5	37.50	29.75
August 2	35.50	25.50
August 18	37.50	27.00

Waterbury Copper Averages.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.50	17.00	14.75	14.12½	24.75
Feb.	14.50	15.50	15.12½	15.25	27.75
Mar.	15.00	15.12½	15.00	15.75	28.00
Apr.	16.00	15.75	14.87½	18.50	29.00
May	16.37½	15.87½	14.75	22.50	29.87½
June	17.50	15.37½	14.37½	22.50	28.25
July	17.75	14.75	14.12½	22.25	27.25
Aug.	17.75	15.62½	13.00	19.50	27.00
Sept.	17.87½	16.87½	12.87½	18.50	28.00
Oct.	17.75	16.87½	12.25	18.25	28.87½
Nov.	17.75	16.25	12.25	19.37½	....
Dec.	17.75	15.00	13.50	20.75	....
Av.	16.71	15.83	13.91	18.94	....

Exports of Copper From the United States.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	23,663
February .	26,792	34,634	15.583	20,648
March ...	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	21,654
May	38,601	32,077	28,889	16,062
June	28,015	35,182	16,976	39,595
July	29,596	34,145	17,708	35,066
August ..	35,072	16,509	17,551	32,160
September	34,356	19,402	14,877	29,803
October ..	29,239	23,514	24,087	32,712
November	29,758	24,999	23,168	.....
December	30,653	22,166	42,426	.....
Totals ..	382,810	360,229	276,344	277,684

tober 30th. On the last day of the month, spot receded to £124 and futures to £119 10s. The result of the fluctuations was a net rise of £5 10s on spot and £4 10s on futures.

At the beginning of the month, a strong and even buoyant tone prevailed, resulting from the exceptionally heavy transactions in September and while producers accepted some orders, second hands were not disposed to sell; offerings in the open market being reduced to very small lots. Domestic consumers displayed renewed interest in shipments to be made in the first quarter of next year during the first week, placing some contracts at fractionally higher prices.

S. S. Strathdene Sunk With 5,000,000 Pounds of Copper and Brass.

In the second week, the trade was stimulated by reports of further large munitions contracts that did not develop, but this fact was lost sight of in the excitement attending the extension of the German submarine activity on the American coast. In the sinking of the Strathdene, among other boats, on the 8th, by the U-53, about 5,000,000 pounds of copper and brass were lost; this led to additional buying in the open market. Insurance rates advanced immediately, as a result of the undersea danger to shipping, but the apprehension was ephemeral and rates subsequently were reduced. Belief that Germany would not, or could not, interfere seriously with our shipping was followed by a temporarily easier feeling with freer offerings of Electrolytic at 28¾c for October; at 28 to 28½c for November-December; at 27½c for January-February and at 27c for the first half of 1917.

Month Closes With Active Demand—Freight Room Scarce.

Early in the third week, there was a lull in buying but sales of small lots of Electrolytic for prompt shipment were made at 28⅝c to 28¾c. Casting copper was very scarce and advanced fractionally. On the 19th, there was renewed activity at home and more liberal sales were made to foreign consumers for this year's shipment. All demands were not satisfied, there be ing a lack of freight room on outgo ing steamships for weeks ahead. A the month advanced the scarcity o nearby copper became more pronounc ed, the demand for November-Decem ber shipments being most pressing During the last few days, inquiry fo 100,000,000 to 125,000,000 pounds wer in the market for November-Decem ber and January shipment from hom consumers resulting in sales of 40,000, 000 to 50,000,000 pounds for shipmen after January 1st. Demand from ex porters too, was active, but few of th large producers could accept contract for shipment before February. As th month closed, large domestic bras manufacturers, who had purchased 40, 000,000 to 50,000,000 pounds, earlier i the month, were again in the marke with small prospect of being able t secure shipments before January i then. There were also new export in quiries, mainly from France.

Copper In October.

	New York			London.
	Lake.	Electro.	Casting.	Standard.
Day.	Cents.	Cents.	Cents.	£ s d
2	28.37½	28.75	26.62½	119 0 0
3	28.37½	28.62½	26.75	119 10 0
4	28.37½	28.75	26.87½	120 0 0
5	28.37½	26.62½	27.37½	120 0 0
6	28.37½	28.62½	27.25	120 10 0
9	28.37½	28.62½	27.25	121 0 0
10	28.37½	28.62½	27.25	123 0 0
11	28.37½	28.62½	27.12½	123 10 0
12	.....	.....	.....	123 0 0
13	28.37½	28.62½	27.12½	123 0 0
16	28.37½	28.62½	27.12½	123 0 0
17	28.37½	28.62½	27.12½	123 10 0
18	28.37½	28.62½	27.25	123 10 0
19	28.37½	28.62½	27.25	124 0 0
20	28.37½	28.62½	27.25	124 0 0
23	28.37½	28.62½	27.25	124 0 0
24	28.37½	28.62½	27.25	124 0 0
25	28.37½	28.62½	27.25	124 0 0
26	28.37½	28.62½	27.25	124 10 0
27	28.37½	28.62½	27.25	124 10 0
30	28.37½	28.62½	27.25	125 0 0
31	28.37½	28.62½	27.37½	124 0 0
High .	28.50	29.00	27.50	125 0 0
Low ..	28.25	28.50	27.00	119 0 0
Av'ge	28.37½	28.64	27.17	122 15 0

Tin in October.

Market Strong Throughout the Month—Net Advance 2½c Per Pound on Spot, 2¼c to 2¾c on Futures—Large Business Done—London Up £5 5s on Spot Standard, £6 15s on Futures and £5 15s on Spot Straits—Statistics Unfavorable.

Tin came forward from primary markets in full measure in October, the Straits shipments being 5,868 tons, thus compensating for the smaller shipments in September. The average monthly shipments from the East Indies this year have been 5,145 tons and the average in the past two months has been 4,569 tons. Since January 1st the Straits have shipped 51,449 tons, which are only 3,054 tons less than during the corresponding period last year.

Arrivals at Atlantic ports were only 2,655 tons in October and six tons were exported, but in the past ten months 50,466 tons have been received here. Deliveries into American consumption in October were 4,556 tons of which 556 tons were sent from Pacific ports to eastern works.

American stocks October 31st were 3,419 tons, of which 2,819 tons were in store and 600 tons landing. It is interesting to note that while stocks landing were 1,000 tons less than a month ago, the supply in store was decreased only 300 tons. Evidently, much of the store tin is held against emergencies by consumers and cannot be resold under the agreement with British authorities. Other stocks, mostly Banca, are not for sale now and are being carried for foreign account.

The visible supply on October 31st was 17,415 tons, which is 1,223 tons larger than on September 30th, and 4,261 tons greater than a year ago. Of the 10,251 tons now afloat from the Straits, 2,194 tons are Banca and Billiton for Europe and 4,427 tons are coming direct to the United States.

The net result of fluctuations in prices in the home market during the month was an advance of 2½c per pound on spot, and 2¼ to 2¾c per pound on other positions. Spot tin, however, during the excitement caused by the German U-boat campaign, advanced 4c per pound, nearly half of which was subsequently lost.

The foreign markets were generally strong and the net changes resulted in establishing an advance of £5 5s on spot Standard, a rise of £6 15s on future Standard and an advance of £5 15s on spot Straits at London, while the net rise at Singapore was £8 5s. The intermediate fluctuations were within a range of £6, the highest prices being current at London on October 26th, when spot Straits and Standard sold at £182 2s 6d. The Singapore market reached its highest level—£186 10s—on October 27th.

Month Opens With Sound Situation.

At the beginning of October tin was commercially and statistically sound although large stocks were in store. The September monthly report indicated no falling off in production; delay in the sailing of vessels being the cause of what had appeared to be a shortage. With a supply of 961 tons more on hand; with an advance in price of 7c per pound, and with a fine outlook for good business, the comparison with tin a year ago, when the market was depressed, was most favorable.

Active Demand—Prices Up ¼c to ⅜c.

As a result of these conditions an active American demand, with the best buying seen for some time, developed immediately and on the fourth day, with prices ¼c to ⅜c higher, 400 to 500 tons were sold at 39.25 to 39.40c for spot and October; 39.25c for November, December and 39c to 39⅛c for January arrivals, with many in the trade believing that futures would soon command a premium.

On the following day, 40c per pound was asked for spot with no future positions offering; sellers withdrawing to await higher prices, although many buyers were anxious to place orders for January, February, March deliveries. For two days after this, the market re-

Visible Supplies.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	19,614
June	12,920	11,101	16,027	15,927	19,363
July	13,346	12,063	14,167	16,084	18,404
Aug.	11,285	11,261	14,452	15,127	18,042
Sept.	13,245	12,943	14,613	15,191	16,192
Oct.	10,735	11,857	10,894	13,154	17,415
Nov.	12,348	14,470	11,483	16,451	.....
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

Shipments From the Straits.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	3,965
June	4,290	4,280	5,870	6,665	6,210
July	4,580	4,770	4,975	5,606	5,410
Aug.	5,210	6,030	3,315	4,712	4,526
Sept.	5,430	5,160	4,973	5,296	3,270
Oct.	4,450	5,020	4,610	4,441	5,868
Nov.	5,600	5,560	5,155	6,713	....
Dec.	4,980	5,110	6,435	5,301	....
Total	59,018	62,550	63,093	66,517	....
Av'ge	4,918	5,213	5,258	5,543	....

Consumption In the U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	5,455
June	2,850	3,800	3,650	3,900	6,398
July	5,150	3,900	3,900	5,300	4,432
Aug.	4,300	3,600	2,900	4,500	4,335
Sept.	3,600	3,100	3,600	4,300	4,025
Oct.	3,850	3,700	3,700	4,900	4,550
Nov.	4,300	2,800	2,600	2,975	....
Dec.	4,050	3,100	1,900	5,200	....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4,125	3,658	3,475	4,062	....

Monthly Tin Statistics.

Compiled by New York Metal Exchang

(Tons of 2,240 lbs.)

	Oct. 1916.	Sept. 1916.	Oct. 1915
Straits shipments			
To G. Britain..	2,455	1,910	1,16
" Continent ..	730	760	1,23
" U. S.	2,683	600	2,05
Total from Straits	5,868	3,270	4,44
Total from Australia	100	90	26
Consumption			
London deliveries	1,208	1,397	1,69
Holland deliveries	109	127	45
U. S.	4,556	4,025	4,90
Total	5,873	5,549	7,04
Stocks at close of month:			
In London—			
Straits, Australian	2,858	3,012	1,79
Other kinds	887	1,018	1,44
In Holland	.....	.....	.....
In U. S.	3,419	4,769	2,14
Total	7,164	8,799	5,37
Afloat close of month:			
Straits to London	3,630	3,290	1,91
" to U. S. ..	4,427	2,840	5,54
Banca to Europe.	2,194	1,263	31
Total	10,251	7,393	7,77
	Oct. 31, 1916.	Sep 30, 1916.	Oct. 31 1915.
Total visible supply	17,415	16,192	13,15

Straits Tin Prices In New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	49.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	49.15
June	47.77	44.93	30.65	40.37	42.18
July	44.75	40.39	31.75	37.50	38.46
Aug.	45.87	41.72	50.59½	43.39	38.54
Sept.	49.18	42.47	32.79	33.13	38.70½
Oct.	50.11	40.50	30.39½	33.08	41.16
Nov.	49.90	39.81	33.50	39.37½	.....
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

mained quiet and firm with possibilities for large business being transacted but with insufficient amounts offered to accomplish much. All foreign limits were sold and expectations for a sharp advance were entertained. The movements of the first week resulted in an advance of ½c per pound on prompt and ¾c on early Spring deliveries.

Spot Tin Up 4c On U-Boat Scare.

The German submarine activity at the beginning of the second week disturbed the market, causing a sharp advance of 4c on spot; Straits being offered at 43 to 43¾c. It was impossible to get quotations for future positions, even with numerous inquiries for December, January, February deliveries. On the following day a large business was done with domestic consumers, sales being made at 41 to 41½c for November, 40½c for January-February and 40c for April-May; all limits being sold, many orders were not filled. With two tin-laden vessels afloat in the danger zone, and insurance rates sharply advanced, sellers became very cautious; even Banca tin was scarce and difficult to purchase at only ½c per pound less than Straits.

With the safe arrival of the City of Naples and the Lancashire at their respective ports just after the holiday on the 12th, the tension was relieved, but foreign limits on futures were few and high, sellers being reluctant to name prices although there was a very fair inquiry for early deliveries.

Market Reacts, Then Turns Firm.

Following this, the spot price declined both at home and abroad but there was no pressure to sell, there being only about 2,000 tons expected in total arrivals for the entire month and this was an insufficient tonnage to cover the average monthly requirements. Stocks afloat were reported to be 2,350 tons—600 of which were from the East Indies—but sellers offered only a few nearby positions at 41c per pound.

The next day, a reaction of ¼c per pound occurred here, with a decline at London and the East Indies of £1 5s on spot, because of the unsettled conditions, London also reporting difficulty in securing sufficient freight room for shipments. Banca tin, also was scarce; spot being held at 40⅞c and futures at 40½c per pound.

The market gathered strength in the days succeeding both at home and abroad and London advanced £1 on all positions with East Indies up 15s. By the 19th, a notable feature, was the fact that future deliveries for January and beyond, were the same price as the cheapest lots obtainable from steamers afloat for New York, while spot market was nominal at 41c with the submarine fear allayed by the reported sinking of the U-boat 53. An unverified report that the British government had requested that all buyers names must be given before shipments could be made, caused some anxiety about this time. A few days after this the non-arrival of the s.s. Michigan, overdue for two days, with 275 tons, again made sellers cautious but Banca remained steady within ½c per pound of the Straits price; the scarcity now being explained by the poor quality of the

Tin Prices in October.

	New York.	London — Spot.	London — Futures.
2	39.37½	175 5 0	175 5 0
3	39.45	175 10 0	175 10 0
4	39.75	176 15 0	177 0 0
5	39.87½	177 10 0	178 0 0
6	39.87½	177 5 0	177 10 0
9	42.75	178 0 0	178 10 0
10	42.75	181 0 0	181 10 0
11	42.25	180 0 0	180 10 0
12	.....	180 17 6	181 7 6
13	41.50	180 15 0	181 5 0
16	41.25	179 10 0	180 0 0
17	40.85	178 5 0	178 10 0
18	40.87½	178 10 0	179 5 0
19	41.00	179 10 0	180 5 0
20	41.00	179 10 0	180 10 0
23	41.12½	180 0 0	181 10 0
24	41.25	179 15 0	181 0 0
25	41.70	181 5 0	182 15 0
26	42.00	182 2 6	183 12 6
27	41.87½	181 5 0	182 15 0
30	42.00	181 10 0	183 0 0
31	41.87½	180 15 0	182 0 0
High	42.75	182 2 6	183 12 6
Low	39.37½	175 5 0	175 5 0
Average.	41.16	179 6 3	180 1 8

ore which made extra-refining necessary and added to the expense.

Spot Tin Scarce—Market Strong.

Even with the safe arrival of the s.s. Michigan, spot tin continued to be scarce and both prompt and nearby deliveries advanced to 41 to 41⅛c for October and to 40⅞ to 41c for November, December, January positions.

Great Britain's close control of the markets has made sellers, here, realize the advisability of carrying larger stocks. Prices continued to rise with the market growing stronger, and with only 600 tons known to be afloat and not due here until early November, emphasizing the tension existing in the spot tin situation, which daily grew in interest. On the 26th, 42c was asked, this being the price quoted just before the U-boat fright.

On the next day, London prices declined 17s 6d on spot and future Standard and on spot Straits to £181 5s, £182 15s and £181 5s respectively. Business in spot was transacted at 42c, being shaded ⅛c in some cases, with futures ¼c lower but little was done. On the 30th London advanced 5s in each position; East Indies declined £1, but fluctuations abroad had small bearing upon the market here.

Month Closes Quietly.

The closing day was quiet, with far-off future positions easier and spot Straits difficult to quote, there being an indisposition among traders to give publicity to close prices. On the surface, the market was maintained, while special prices were made to meet the merits of individual cases. Spot Banca was scarce and firm, but concessions were made on metal to arrive in December, January.

The censoring of trade messages abroad caused much annoyance here, cables being so long delayed that out-of-town buyers could not be reached until the following day.

——o-O-o——

Spelter in October.

Market Strong and Active the Fore Part of Month—Then a Reaction, Followed by Resumption of Active Buying and Higher Prices—Submarine Activities An Unsettling Factor—Net Advance for Month 1c to 1¼c On All Positions—London Up 15s on Spot, £4 15s on Futures.

Spelter was active, strong and buoyant with a general advance of ¾ to 7/8c per pound during the first week of October, followed by recessions of 5/8 to ¾c per pound in the next ten days. Considerable excitement accompanied the large dealings on the rise and an unsettled nervous feeling attended the decline which was inaugurated by the German undersea craft raids on American commerce on the Atlantic coast. Increased activity developed during the third week, with a sharp upward turn in prices that continued to the end of the month resulting in a net advance of 1 to 1⅛c per pound, on this year's positions and a rise of 1¼c per pound on first quarter 1917 deliveries.

The English market was subject to wide fluctuations with a rise of £5 on spot and £6 on futures from the end of September to the 9th of October. From that time, prices slowly receded with slight reactions to the end of the month when spot closed at £52 15s, a net advance of 15s, and futures closed at £50 15s, a net rise of £4 15s from the closing price on September 29th.

Market Opens Firm and Higher.

The market opened firm at the beginning of the month with prices higher. Sellers were reserved, but there was a good demand from home consumers for early deliveries while exporters succeeded in purchasing October-November-December metal to a moderate extent. On the third, with the market still firm and quiet, there was indifference on the part of both buyers and sellers, due to the unwillingness of either to yield ⅛c per pound in the prices asked and bid.

Following this, a strong tone developed with sales of October at 9⅜c f.o.b. East St. Louis, a substantial business being done with dealers and operators but consumers held aloof. One important feature demanding attention was the small difference between prompt and October-November and between spot and first quarter prices. The latter position sold within ¼c of the spot price.

Sharp Advance, Market Excited.

In the next day or two, there was renewed activity and prices advanced sharply amid great excitement. Large sales were made to trading interests and even producers feverishly searched the market for October-November-December metal. Prompt and October sold at 10c East St. Louis, while November-December sold at 9.75 to 9.87½c, and in one instance at 10c. Consumers eagerly sought the cause of the excitement but having accumulated a good supply previously, cautiously remained out of the market. Developments seemed to indicate that the speculative element was maneouvering for higher prices. The large business transacted, established the market firmly at 10c for all deliveries, East St. Louis—a flat rate—but subsequent trading was on a smaller scale. There was less metal to offer but some export orders were placed. The market was in a more healthful condition than when it reached the same high level last July, the supply being not so large, was in stronger hands and there was no pressure to sell as was the case three months previously. Consumers, however, maintained a reserved attitude.

U-Boat Activity.

The German submarine activity of the U-53 caused abrupt complications in the second week, which threatened to become serious if not immediately checked. London advanced £2 10s and insurance rates on shipments were increased but without a compensating strengthening of the market here; in fact, October receded to 9⅞c and October-November-December shipments were offered at 9¾c E. St. Louis in a

dull and unsettled market. On the 10th, a few sales of brass special were made at premiums of 5/8c to 1¼c per pound, a notable feature being the continued absence of consumers from the market. For October prime western 9⅞c East St. Louis was asked by small smelters; 9¾c for November and 9⅝c for December but dealers made sales ⅛c below these prices. Large producers made no change in their prices.

During the remaining days of the week, an apprehensive attitude, assumed by both buyers and sellers, prevented any important business being transacted, a drifting market being the result without essential change in prices.

Reawakened Demand.

By the 16th, some interest was developed, a few hundred tons of prime western being bought here and there with some sellers making concessions. Large producers, however, were contented to hold unsold supplies for higher prices which they anticipated would result from an advance in the price of ore in November-December because of curtailment in smelter operations, due to natural causes. Buyers, on the other hand, wisely adopted the policy of purchasing only on a declining market, retiring at the slightest indication of an advance. Their refusal to buy when the market was 10c helped to bring about the reaction that existed at this time. The London market declined £1 10s on prompt and 10s on future, the equivalents being 11.58c and 10.84c per pound, respectively. With the continued indifference of consumers and the independent attitude of the producers, prices declined here on the 17th, and London went down another £1 10s on prompt and £1 on futures without sending any orders to our markets.

On the 19th, occurred the first really good demand, since the disturbed conditions precipitated by the German interference with our shipping. Sheet galvanizers made inquiries for October-November-December, developing the fact that there was very little spelter in the market for these positions. Half a dozen producers reported October capacity all sold with November so well sold that they did not care to take more business at this time. Some sales of October, however, were reported a 9½c East St. Louis, showing greate strength in nearby positions than ha been supposed to exist. November als sold for 9½c and December 9⅜c whil next year's deliveries were unchange at 9¼c. The next day, prices ad vanced ⅛c, sellers giving the impres sion that they preferred to retire fro the market rather than to sell for less Consumers were more disposed to bu at a slight advance; large amounts wer not obtainable. With producers' mind set upon 10c, some competition was ex pected to develop as soon as that leve was reached. London advanced £1 o prompt and futures but no new expor orders were reported in our market.

Market Stronger.

By the 23rd, the market had gath ered increased strength, with urgen inquiries from galvanizers and a smal volume of business was transacted a 10c for prompt and October; 9⅞c fo November-December and at 9.75c fo first quarter 1917. The reserved att

Spelter Prices in October.

Day.	New York. Cents.	St. Louis. Cents.	London £	s
2	9.55	9.37½	52	0
3	9.61¼	9.43¾	52	0
4	9.73¾	9.56¼	54	0
5	10.17½	10.00	54	0
6	10.17½	10.00	54	10
9	10.05	9.87½	57	0
10	9.98¾	9.81¼	56	0
11	9.92½	9.75	56	0
12	....	....	56	0
13	9.92½	9.75	56	0
16	9.80	9.62½	54	10
17	9.67½	9.50	53	0
18	9.67½	9.50	53	0
19	9.73¾	9.56¼	53	0
20	9.80	9.62½	54	0
23	10.30	10.12½	54	0
24	10.30	10.12½	54	0
25	10.30	10.12½	54	0
26	10.30	10.12½	54	0
27	10.30	10.12½	54	10
30	10.42½	10.25	53	5
31	10.42½	10.25	52	15
High	10.55	10.37½	57	0
Low	9.42½	9.25	52	0
Average	10.01	9.83½	54	3

ide of producers continued to be the ost significant feature and fore- adowed a further advance. Some ales by second hands were made at 0½c for prompt October-November nd 97⅛c for January-February-March, o.b. East St. Louis. Producers asked ⅛c more, with prime western scarcer ian brass special for early deliveries; he latter being held at ½c premium.

Wage scale controversies at several klahoma plants, to crystalize Novem- er 1st, was considered the main rea- on for the disinclination of producers o sell, but their reserved attitude was ot wholly explained and for several ays the market remained quiet and rm; prices being unchanged on the 7th. On the 30th, there was a good emand from dealers and the price ad- anced ⅛c all around; sales of brass pecial of good quality were reported t 10⅞c East St. Louis for prompt and or November-December shipments. Producers pointed to the gas fuel ituation, as the basis for their belief hat prices will remain firm and high hroughout the winter and they con- inue to show a disinclination to sell lthough the market has advanced to 0¼c for November-December and to 0c for January-February-March. The ecession in London was a surprise but was of small significance.

Month Closes With Good Demand.

On the closing day of the month, an important demand was encountered but with offerings light, sales were not large

Word came from Oklahoma that owing to the advance in the prices of spelter the contemplated reduction in wages would not be put into force on November 1st, and consequently there would be no strike as had been previously expected. London again declined 10s on prompt to £52 15s making the total decline from the highest point, £4 5s and brought the closing price within 15s of the level at the close of September. The recessions abroad were attributed to more abundant supplies that had been shipped from New York in September and early in October.

Spelter (Monthly Averages.)

	New York		St. Louis	
	1915.	1916.	1915.	1916.
Jan.	6.52	18.18	6.33	18.01
Feb.	8.86½	20.09	19.92	19.92
Mar.	10.12½	18.09½	9.80	17.91
Apr.	11.51	18.61½	11.22	18.44
May	15.82½	15.93	15.52½	15.75½
June	22.62½	12.80	22.14	12.62
July	20.80	9.70	20.54	9.52½
Aug.	14.45	9.10	14.19	8.92
Sept.	14.49	9.23½	14.10½	9.06
Oct.	14.07	10.01	13.89	9.83½
Nov.	17.04		16.87½	
Dec.	16.91		16.72	
Av'ge	14.44		14.16	

Sheet Zinc Price Changes.

The following table gives the changes in the price of sheet zinc since January 26, 1916, together with the price of spelter ruling on the same day.

1916—	Sheet Zinc.	Spelter St. Louis.
January 26	24.00	19.00
February 17	25.00	20.87½
April 22	25.50	18.75
May 15	24.50	15.50
May 23	23.50	14.87½
May 26	22.50	14.12½
June 2	21.00	13.12½
June 13	20.00	13.37½
June 21	19.00	12.00
June 28	18.00	11.37½
July 6	17.00	9.37½
July 13	15.00	8.62½
October 26	16.00	10.12½

Waterbury Spelter Averages.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	21.20
June	7.25	5.50	5.37	25.60	17.40
July	7.46	5.61	5.26	24.90	15.20
Aug.	7.34	5.99	5.66	19.30	13.60
Sept.	7.72	6.13	5.91	17.85	13.70
Oct.	7.83	5.74	5.23	16.85	12.95
Nov.	7.74	5.60	5.38	19.36	
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

Lead in October.

Market Quiet but Steady at the High Level of Prices Established in Septem ber—U-Boat Scare Not a Factor in This Metal.

Lead in October, was well sustained at the high level established in September, but there was less animation. Current production, which is liberal, is going steadily and rapidly into consumption, there being no evidence of surplus stocks in the hands of either producers or melters. The prospect is that this state will continue throughout the winter.

Although there were rumors that another advance in price was contemplated by the American Smelting & Refining Company, there was scarcely a ripple in the trade to indicate such action. The outside market remained firm with scarcely a fluctuation of importance. The Germau submarine escapade that unsettled markets in other metals, had no effect upon lead.

The market was narrowed by the retirement of several producers who had sold October-November output, but the demand from consumers was also reduced while there was not enough change from day to day to tempt dealers to operate to any extent. Second hands made a few sales.

The main feature of interest in the second week, was renewed demand for export to the Orient. Early in the month, large shipments were made on previous contracts to Archangel but there was no new demand from Russia. In September the United States exported 8,857 tons to Europe. Domestic consumers with needs well covered for sixty days made few efforts to purchase except to fill-in contracts. Producers were generally well satisfied. It was pointed out that the average price of lead during the first nine months of the year—6.68c East St. Louis—was 50% higher than during the corresponding period last year, when the average price was 4.44c per pound. The 1916 price is 1c per pound above the high record in 1906 and 2½c per pound higher than the average price during the past thirty years.

The output of lead in 1915, according to the final report of the Geological Survey, was 550,055 tons, being th heaviest production in the history o the industry or 14½% greater than i 1914, the previous maximum recor when 542,122 tons were produced. Com pared with 1914, when the output wa 462,460 tons; the gain was nearly 16%

In the third week, a few sales wer made for export to Japan, but it wa difficult to secure any metal for earl delivery from producers; independen interests as well as the American Smelt ing & Refining Company having capaci ty fully engaged to December. All th metal available was being readily ab sorbed but there was small demand fo late positions such as December-Jan uary-February. All of the ore in th Joplin district was going rapidly t the smelters.

In the fourth week, there was smal change in the general situation beyon

Lead Prices in October.

Day.	New York.* Cents.	St. Louis. Cents.	London £ s
2	7.06¼	6.87½	31 10
3	7.06¼	6.87½	31 15
4	7.06¼	6.87½	31 15
5	7.06¼	6.87½	31 0
6	7.06¼	6.87½	30 15
9	7.06¼	6.87½	30 10
10	7.06¼	6.87½	30 15
11	7.06¼	6.87½	30 10
12	....	....	30 10
13	7.06¼	6.87½	30 10
16	7.06¼	6.87½	30 10
17	7.06¼	6.87½	30 10
18	7.06¼	6.87½	30 10
19	7.06¼	6.87½	30 10
20	7.06¼	6.87½	30 10
23	7.06¼	6.87½	30 10
..	7.06¼	6.87½	30 10
25	7.06¼	6.87½	30 10
26	7.06¼	6.87½	30 10
27	7.06¼	6.87½	30 10
30	7.06¼	6.87½	30 10
31	7.06¼	6.87½	30 10
High	712½	6.90	31 15
Low	7.00	6.85	30 10
Average .	7.06¼	6.87½	30 14

more ample supply to meet the small emand for prompt and November ipment. Regular customers, apparently, were taking less than earlier in he month but there was no important ecumulation and prices were well naintained.

The London market declined £1 10s n spot, and £1 on future G.M.B., during the first eleven days of the month, o £30 10s for spot, and £25 10s for utures, and these prices remained unhanged to the end of the month. English lead receded from £33, established early in the month, to £32 10s on October 25th; this price being current on the closing day of the month.

Lead (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19	7.50	3.70	4.11	7.67
May	3.90	4.23½	7.50	3.81	4.16	7.28
June	3.90	5.86	7.04	3.80	5.76	6.77
July	3.90	5.74	6.52	3.75	5.52	6.20
Aug.	9.30	4.75	6.27	3.73½	4.59	6.27
Sep.	3.86	4.62	6.75	3.67	4.53	6.71
Oct.	3.54	4.59½	7.00	3.39	4.51	6.97½
Nov.	3.68	5.15		3.58	5.07	
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

American Pig Lead.

The accompanying table gives a series of analyses from authoritative, original sources, of representative American brands of pig lead at the present time. It is not, however, considered advisable to identify the brands, but simply to group them according to class.

The first class, which we have designated as "extra-fine" is a grouping of our own, including lead that is 99.97% fine or better. In certain cases these leads are produced by extra-refining, including electrolytic refining; in other cases they owe their high purity to the excellence of the ore from which they are smelted. These leads are sold for corroding, but also they fill some special needs for which lead as nearly chemically pure as possible is required.

Ordinary corroding lead is about 99.95% fine.

Ordinary desilverized lead ranges from about 99.85 to 99.91% Pb.

Common Missouri lead (southeastern) is rather uniform with 99.90 to 99.92% Pb. or about the same as ordinary desilverized. The main differences between these classes of lead are the higher copper in the Missouri and in some cases the higher antimony in the Missouri lead, which renders it slightly harder and especially adapted for the rolling of sheet that is to be used in chemical work.—Eng. & Min. Journal.

Recent Analyses of American Pig Lead.

	Extra Fine				Ordinary Corroding
Silver		0.0008	0.0004	0.0005	0.0003
Arsenic		none	none	none	0.0006
Antimony		0.0130		0.0077	0.0045
Tin			0.0028		
Bismuth	0.0080	0.0032	none	0.0040	0.0500
Copper		none	0.0002	none	0.0006
Iron		0.0010	0.0007	0.0010	
Zinc		0.0019	0.0005	0.0014	
Cobalt and nickel		none	none	none	
Lead	99.9700	99.9801	99.9941	99.9890	99.9440
	— Ordinary Desilverized —			Common Missouri	
Silver				0.0106	0.0070
Arsenic		0.0003		none	trace
Antimony		0.0046	0.0060		0.0030
Tin				0.0132	
Bismuth	0.0800	0.0794	0.1200	none	0.0030
Copper		0.0010		0.0600	0.0600
Iron			0.0045	0.0060	0.0015
Zinc	0.0040	0.0008	0.0040	none	
Cobalt and nickel				trace	0.0080
Lead	99.9050	99.9135	99.8655	99.9102	99.9175

0.0050	0.0010			
0.0040	0.0100			
0.0025	0.0100			
0.0010	0.0015			
99.9875	99.9775			
0.0006				
0.0008				
0.0056				
0.0750				
0.0006	0.0800			
99.9174	99.9032			

Antimony In October.

Market Firm and Higher at Opening of Month With Considerable Business Done—Quiet and Easier at the Close.

Antimony was quiet and easier during the first few days of October but on the 4th inst. on active demand for round lots in bond, developed suddenly, resulting in sales of spot October and November shipments at 9½ to 9⅝c in bond; late in the day some business was done at 9¾c. Dealers who took these orders were inquiring for December, January and February positions, bidding 9⅜c in bond for shipments over the first two months of next year. Additional large sales were made to munition manufacturers on the following day at 10c in bond, for shipment over the last quarter of the calendar year. Dealers also endeavored to buy spot, October and November shipments at 11¼c duty paid, evidently to replace previous sales but little was available except at a further advance and small lots did sell at 11½c per pound duty paid. Importers solicited bids on October, November and December shipments from China and Japan but were not offering at definite prices. An interesting phase of the market was that jobbing lots were available at the same or at less price than were 25 to 50 ton lots.

Early in the second week, a stronger tone prevailed with a further fractional advance with additional sales of round lots in bond at 10½c for prompt, October and November shipments. The jobbing trade was quiet but prices were stronger at 11½ to 11¾c, duty paid. Before the end of the week, prices had advanced sharply and substantial contracts for October and November were placed at 11½c in bond. A few contracts also were closed for October shipment from the Orient. Jobbing lots were advanced to 12¾c duty paid. Most of the metal sold in bond was for export to Canada but there was also considerable animation in trading among local dealers. Sales during the first half of the month aggregated between 2,500 and 3,000 tons.

On the later transactions, as high as 12c was paid in bond and 13c duty paid. The advance in prices during th first fortnight was 2½c per pound.

The largest Canadian manufacture had apparently covered requirement before the third week but there wer several other inquiries for 25 to 50 to lots, from the Dominion as well a more small inquiries of 5 to 15 ton from domestic interests. On the 16th there were offerings at 12c in bond fo shipments from China and Japan i thirty days, while jobbing lots sold a 13⅛c to 13¼c duty paid. More Can adian orders were quietly placed i the next few days but otherwise ther was a lull in the market, during whic

Aluminum, Silver, and Antimony Prices in October.

	— New York —		
	Aluminum.	Silver.	Antimony
Day.	Cents.	Cents.	Cents.
2	62.50	69.12½	10.93¾
3	62.50	68.87½	10.93¾
4	62.50	68.37½	11.00
5	62.50	67.50	11.37½
6	64.00	68.25	11.62½
7	.....	68.25	.....
9	66.00	67.12½	11.62½
10	66.00	67.50	11.62½
11	66.00	67.12½	11.87½
13	66.00	68.87½	12.75
14	.....	68.00	.....
16	65.00	68.25	13.12½
17	65.00	67.75	13.12½
18	65.00	67.75	13.12½
19	65.00	67.75	13.12½
20	65.00	67.87½	13.12½
21	.....	67.87½	.....
23	65.00	67.25	13.12½
24	65.00	67.37½	13.12½
25	64.50	67.37½	13.12½
26	64.50	67.37½	13.12½
27	64.50	67.37½	13.12½
28	.....	67.62½	.....
30	64.50	67.75	13.12½
31	64.50	68.12½	13.12½
High	67.00	69.12½	13.25
Low	62.00	67.12½	10.87½
Average ...	64.55	67.84	12.44

ome resale lots were made at 13c duty aid but home consumers wanting 5 to 0 ton lots found difficulty in placing rders at this price, while jobbing lots ere held at 13¼c and November-December shipments from the Orient were eld at 12c in bond. Cables reported stronger tone in Japan but limits ere were somewhat lower.

In the fourth week, an easier feeling eveloped and in the absence of large emand and prices for shipment from the Orient receded ¼ to ½c. The local market was better sustained but there was scarcely enough trading to seriously test the temper of sellers. In the last two days of the month, dullness prevailed and prices were lower, wholesale lots being offered at 11¾c in bond for quick shipment, and at 11½c for November shipment from Japan. Jobbing lots were held at 13 to 13¼c per pound but there was small demand.

Aluminum In October.

Market Strong and Active—Prices Up 2c per Pound.

Aluminum was strong and higher in October, the net advance in the price for Virgin ingots in the open market being 2c per pound. The export and home demand readily absorbed all the metal available; in fact, the supply for several weeks was entirely inadequate to meet current requirements. The official contract price of ingots for shipment in 1917 remained 35 to 37c per pound but the largest producers had nothing to offer for shipment over the balance of this year. At the beginning of the month, No. 1 Virgin ingots were quotable at 62 to 63c per pound but by the 6th prices had advanced to 63 to 65c for spot with scarcely any metal available. Sales of 200 to 300 tons for export in November were made at close to 63½c but prompt or October shipment was difficult to obtain, irrespective of price, in 100 ton lots. Small lots are understood to have sold at 65c per pound. Pure remelted, 98-99% pure, was also in light supply and firmer at 61½c to 62c per pound. Sheet aluminum sold for nearby shipment at 80 to 85c per pound.

In the second week, the urgent demand and the small supplies were reflected in asking prices of 66 to 66½c per pound for ingots for export. The gain in our export trade this year, after making due allowance for advance in prices, is shown in the Government returns, the value of exports in the first eight months this year, being $4,867,743 against exports during the entire year of 1915, valued at $2,994,072.

After the first ten days, the advance in prices brought out freer offerings from invisible supplies and the export demand being satisfied, temporarily, the tone of the market was less firm and prices of ingots that had advanced 3c per pound from the beginning of the month, receded 1c per pound. Sales of round lots of ingots for November-December - January shipment, were made during the third week, to dealers at even lower prices. In the last week, the market receded further under freer offerings and relatively smaller demand. Dealers were bidding only 62c for November-December shipment and succeeded in making some purchases on this basis but ingots for prompt shipment were difficult to buy under 64 to 65c per pound. Remelted metal was even weaker than Virgin and prices receded sharply 2 to 3c per pound under the prices current at the end of September.

Aluminum and Silver Prices.

New York

	Aluminum.		— Silver —	
	1915.	1916.	1915.	1916.
Jan. ...	19.01	54.33	48.89½	56.77½
Feb. ...	19.20	57.50	48.48	56.75½
Mar. ...	18.94½	60.52	50.24	57.92½
April ..	18.83	60.00	50.25	64.37½
May ...	21.85	60.00	49.91½	74.27
June ...	29.66	62.09	49.03	65.02½
July ...	32.50	60.15	47.52	62.94
Aug. ...	34.00	59.48	47.18	66.08
Sept. ..	46.75	61.90	48.68	68.51½
Oct. ...	54.17½	64.55	49.38½	67.84
Nov. ...	57.85	.....	51.71	.....
Dec. ...	56.80½	.....	54.97	.....
Av'ge..	34.13	.....	49.69	.....

Aluminum Prices in New York.

Extreme price fluctuations of pure aluminum (No. 1 Virgin 98-99%) in New York; by months.

	— 1913—		— 1914 —	
	High.	Low.	High.	Low.
Jan.	26.50	26.00	19.00	18.50
Feb.	26.50	26.00	19.00	18.50
Mar.	27.12½	26.25	18.75	18.00
April ...	27.12½	26.62½	18.25	17.75
May	26.62½	25.00	18.12½	17.75
June	25.75	23.00	18.00	17.50
July	24.00	23.00	17.25	17.37½
Aug. ...	23.50	21.50	21.50	18.00
Sept. ...	22.50	21.50	20.50	18.25
Oct.	22.00	19.75	18.50	18.00
Nov.	19.75	19.00	19.50	18.00
Dec.	19.00	18.50	19.25	18.75
Average.	27.12½	18.50	21.50	17.37½

	— 1915 —		— 1916—	
	High.	Low.	High.	Low
Jan.	19.25	18.75	56.00	53.00
Feb.	19.50	18.75	63.00	53.00
Mar.	19.25	18.75	63.00	58.00
April ...	19.50	18.75	61.00	59.00
May	26.50	19.25	61.00	59.00
June	33.00	26.00	65.00	59.00
July	33.00	32.00	62.00	59.00
Aug.	37.00	32.00	62.00	58.00
Sept. ...	50.00	36.00	63.00	60.00
Oct.	57.00	49.00	67.00	62.00
Nov.	60.00	55.00	.....	.....
Dec.	60.00	53.00	.....	.....
Average.	60.00	18.75	.....	.....

Quicksilver Prices.

Monthly average prices of **Quicksilver** in New York (flasks of 75 pounds).

	1913.	1914.	1915.	1916.
Jan.	40.00	38.05	50.90	214.76
Feb. ...	40.00	38.00	58.05½	288.50
Mar.	39.50	38.00	62.93½	223.91
April ...	39.14	38.00	65.71½	140.10½
May	39.19	38.00	72.65	96.95
June	39.67	37.73	87.91	73.04½
July	39.00	35.87	93.33	80.95
Aug.	39.00	74.19½	91.79½	75.04
Sept. ...	39.00	73.57	89.09½	75.85
Oct.	38.59	50.59½	92.40	79.28½
Nov.	38.00	51.72	102.25	....
Dec.	38.50	51.61	126.52	....
Average.	39.13	47.11	82.80	.....

Lead Price Changes.

The changes in the Trust price of lead i New York since January 1, 1916 have bee as follows:

1916—		
Opening price		5.3
January 4	Advanced	.25c to 5.7
January 7	"	.15c to 5.9
January 21	"	.20c to 6.1
February 9	"	.15c to 6.2
February 16	"	.05c to 6.3
March 3	"	.10c to 6.4
March 7	"	.20c to 6.6
March 14	"	.40c to 7.0
March 30	"	.50c to 7.5
June 2	Reduced	.50c to 7.0
July 5	"	.50c to 6.5
August 2	"	.50c to 6.0
August 17	Advanced	.25c to 6.2
August 18	"	.25c to 6.5
September 15	"	.25c to 6.7
September 19	"	.25c to 7.0

Chinese and Japanese Antimony.

Average monthly price of **Chinese** an **Japanese** (ordinary brands) in New York

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	32.20½
June	7.07	7.62	5.62½	36.53½	20.40
July	7.37	7.55	5.44	35.98	14.55
Aug.	7.58	7.48	13.05	32.57	12.62
Sept.	8.00	7.31	9.79½	28.50	11.57
Oct.	9.11	7.31	9.79½	28.50	11.57
Nov.	9.11	6.28	14.14	37.88	.....
Dec.	9.05	6.05	13.15	39.36½	.....
Av.	7.63	7.43	8.53½	29.52	.....

IMPORTS OF ANTIMONY.

The imports of antimony metal an regulus in August amounted to 3,414 693 pounds, which we believe to be th largest imports for any one month o record. A comparison of the imports o metal and ore are shown below:

	Metal and regulus. Pounds.	Ore (antimon content.) Pounds.
August, 1916	3,414,693	596,97
August, 1915	661,030	772,69

Brands of Copper in the United States

LAKE.

	Refined at:	Branded.
Adventure	Hancock, Michigan.	Adv. C. Co.
Atlantic	Houghton, Michigan.	A.
Calumet & Hecla	Hubbell, Michigan.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	C. & H. M. Co.
Calumet & Hecla	Buffalo, N. Y.	B. L.
Centennial	Hancock, Michigan.	C. C. M. Co.
Copper Range	Houghton, Michigan.	C. R.
Franklin	Hancock, Michigan.	F. M. Co.
Isle Royale	Dollar Bay, Michigan.	I. R. C. Co.
Mass.	Hancock, Michigan.	Mass.
Michigan	Houghton, Michigan.	M. C.
Mohawk	Houghton, Michigan.	M. M.
Osceola	Dollar Bay, Michigan.	T. O.
Quincy	Hancock, Michigan.	Q. M. Co.
Tamarack	Dollar Bay, Michigan.	T. O.
Victoria	Hubbell, Michigan.	V. C.
Winona	Hubbell, Michigan.	W. A.
Wolverine	Houghton, Michigan.	W.

ELECTROLYTIC.

	Refined at:	Branded.
American S. & R. Co.	Perth Amboy, N. J.	P. A.
Balback S. & R. Co.	Newark, N. J.	Bb.
Baltimore Copper Works	Baltimore, Md.	B. E. R.
Boston & Montana Co.	Great Falls, Mont.	B. & M.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Copper Queen	Laurel Hill, L. I.	C. * Q.
Miami	Laurel Hill, L. I.	A. L. S.
Nichols Copper Co.	Laurel Hill, L. I.	L. N. S.
Orford Copper Co.	Chrome, N. J.	O. E. C.
Raritan Copper Works	Perth Amboy, N. J.	N. E. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. R. W.
United Metals Selling Co.	Laurel Hill, L. I.	R. M. C.

CASTING.

	Refined at:	Branded.
Balbach S. & R. Co.	Newark, N. J.	N. B. C.
Boston & Montana Co.	Great Falls, Mont.	M. A.
Chicago Copper Ref. Co.	Blue Island, Ill.	C. C. R.
Duquesne Reduction Co.	Pittsburgh, Pa.	D. E. C.
Nichols Copper Co.	Laurel Hill, L. I.	C. N. C.
Phelps, Dodge & Co.	Laurel Hill, L. I.	P. D. Co.
Tottenville Copper Co.	Tottenville, N. Y.	C. T. C.
U. S. Metals Ref. Co.	Chrome, N. J.	D. S.
White & Bro., Inc.	Philadelphia, Pa.	W. B.

Trade Notes.

The Maryland Tube Corporation, Baltimore, has been incorporated with $500,000 capital stock by Herbert B. Stimpson, 400 Equitable Bldg., Baltimore; Charles H. Birmingham and Heyward Taylor. It has acquired a tract in South Baltimore and it is stated that it is planned to construct a tube, bar and sheet mill and a brass foundry. Mr. Birmingham will be in charge.

The Cleveland Copper and Brass Rolling Mills Company, Cleveland, O. To manufacture brass and copper. Capital $10,000. Incorporators: H. J. Klosser, G. L. Branch, A. C. Altman, J. C. Quayle, and B. M. Duncan.

The Interstate Steel Mfg. Company, Milwaukee, has been incorporated with a capital stock of $60,000 by James J. Devlin, Walter B. Potter and Harry F. Bayley, president of the Bayley Structural Iron Company, Milwaukee.

The Premier Special Machine Company, New York, has been incorporated with $50,000 capital, to manufacture tools, gauges, machines, etc. C. A. Davidson, 125 West 115th street, and A. A. Greenberg, 600 Academy street.

The Perkins Appliance Company, Springfield, Mass., has been incorporated with capital stock of $50,000 to manufacture steel, iron and other metals. The directors are J. L. Perkins, president; Harry R. Elder, 423 Main street, Springfield, treasurer; and R. S. Miles.

The Carwen Steel Tool Company, No. Philadelphia, manufacturer of milling cutters and similar steel tools, is planning to increase the capacity of its plant by the installation of new equipment.

The Dayton Screw Company, Dayton, O., is a new company headed by W. P. Anderson, formerly general superintendent of the Delco Company. The company will fit up a plant in the Webb Building for the manufacture of cap screws.

The LaCrosse Tractor Company, La crosse, Wis., has been organized i Delaware with a capital stock of $1 500,000 to manufacture tractors an other farm machinery and will tak over the business of the Stay-Rite En gine Company, maker of gasoline en gines. The incorporators are L. Hirsh heimer, J. M. Fixon, L. F. Easton an L. C. Colman, all of LaCrosse.

The New England Drawn Steel Com pany,, Mansfield, Mass., incorporate with $250,000 capital, will commenc work at once on a large factory whic it expects will be in operation in fou months.

The Toothill Rolling Mills, Inc., o Brooklyn, N. Y., has been charterec with $10,000 capital, to deal in whit metals and carry on a rolling mill. L Smith, Jr., B. L. Bennett and D. Brod are directors.

The Standard Tool & Mfg. Company 237 Laurel Avenue, Arlington, N. J. has been incorporated with a capital o $25,000 by John Stranberg and Bernard Keating, Arlington and Fred Roach, 5 Howard street, Newark.

It is announced that the Holl Stamping & Mfg. Company, in which H. C Holl and other Cleveland men are interested, will be established in Mansfield, O., in the plant of the Cornell Company has been incorporated with electric equipment.

The National Type Foundry, Bridgeportport, Conn., has been incorporated with $175,000 capital by William J. Platt, G. S. Platt and Edward E. Atkins.

The Massillon Foundry & Machine Company, Massillon, O., will increase its capital stock from $100,000 to $300,000 for the purchase of a site and erection of a new plant. It will be 100x300 feet, of brick and steel, and located near the plant of the Central Steel Company.

The Steel and Metal DIGEST

VOL. VI. NEW YORK, DECEMBER, 1916. NO. 12.

Published Monthly by the American Metal Market Company, 81 Fulton St., New York.
C. S. Trench, President,
C. S. J. Trench, Secretary and Treasurer,
Branch Office, 627 Oliver Bldg., Pittsburgh.

Subscription Price Two Dollars a year for United States, Canada and Mexico; for other countries $2.25.

Advertising rates on application.

Entered at Post Office of New York as second class mail matter.

CONTENTS.

We Wish All Our Readers A MERRY CHRISTMAS.

The Business Situation.

Have We Over-Exploited Our Flood of New Wealth.

The Secretary of the Treasury in his report to Congress this week, dealing with the most remarkable year in the financial history of the United States summed up the present situation in a single paragraph as follows:

> "The financial strength of the United States—the greatest in our history—gives us a commanding position in world finance. We have been transformed from a debtor into a creditor nation. On November 1, 1916, the stock of gold coin and bullion in the United States was estimated at $2,700,136,976, an increase of $714,597,804 in the past 16 months. This is the largest stock of gold ever held in the United States or in any other country of the world. Through the operations of the Federal reserve system and with our abundant supply of gold as a basis, the credit resources of the United States have become more than sufficient for home demand, and we have been able to finance our great domestic and foreign trade without strain and to extend vast amounts of credit to other nations throughout the world."

The report went on to say that the functions of the new Federal reserve

banking system, have made it possible to develop the largest and most active credit operations the United States has ever known. Not only the vast domestic and foreign trade of the country in normal measure, but the unprecedented volume of exchanges connected with the war trade has been accomodated virtually without a single jar. The necessity of extending enormous amounts of credit to other nations all over the world in these times of commercial stress has been met in a manner that has commanded the admiration of financiers of every country, the Secretary sets forth, and inspired American financiers with a firm confidence in the stability of the present system, now hardly at the beginning of its third year.

On the same day on which this statement was issued, after several days on which the call money market in New York touched at times as high as 15%, the Federal Reserve Bank of New York issued a statement that the rediscount facilities of this system had been taken advantage of by several of the largest banks in this country including the National City Bank, National Bank of Commerce, American Exchange Bank and the Liberty National Bank of New York, for the first time since the Federal Reserve system was inaugurated.

A Warning To Go Slow.

The business interests of this country, to our minds, have received a warning that in spite of the flood of wealth that has come to this country the situation has been exploited to the limit, and it is quite impossible for this to be continued without danger. The financing of the enormous advance in values of securities and in prices of commodities would seem to have absorbed the new wealth of the country that has come to us by reason of the war. If present inflated values are to be continued, or advanced, if new undertakings are to go on at the rate at which they have lately been proceeding, and above all if the speculation in securities and "get rich quick" ventures are to go on unimpeded, new floods of wealth must come to us, and more quickly than seems probable, even with the further war profits that are before us. It is a warning to go slow.

Answer Found in Comparison of Co modity and Security Prices.

Compare the prices of commodit and securities to-day with those of t years ago and the answer is quite pla Compare the amount of capital or loa required to finance the extraordina business we are doing, and the pri at which it is being done, the new u dertakings, and the sensational specu tion and prices of securities.

To mention only a few items th have absorbed new capital. It is timated there has been invested sin the war began over

$167,500,000 in chemical industries
$521,600,000 in oil and gas companies
$10,000,000 in shipbuilding industry
$130,000,000 in war munitions
$200,000,000 in industries supplyi other war demands. Here we ha over one billion dollars. What abo the hundreds of other smaller dustries that have been stimulated the war and the great prosperity a increased demands of our country?

Take iron and steel for instance, pig iron output in 1914, estimated the basis of prices received at wor for material shipped, was valued about $300,000,000, in 1916 it was $63 000,000; finished steel in 1914 was v ued at $600,000,000, in 1916, it was $ 100,000,000. All the pig iron did n go into rolled steel and the value iron and steel castings and rol wrought iron would be additio to the value of the regular steel m product.

The mental faculties of business m have been under a terrible strain d ing the past two and one-half years reason of the extraordinary conditi in the world and in their own busin caused by the war, and if under it ma have not been able to think and act sanely as usual, and in some cases ha lost all sense of proportion, it is n surprising.

Is the Fear of Shortage of Supplie Justified?

How much of the enormous purch es running far into the future has be caused by panic fears of buyers, as iron, steel, copper and allied comm ities, that there would not be enou supplies to go round, and that if th

did not act at once and place contracts irrespective of price they would not get the material? Has this fear been justified? The future will tell. The highest prices in the history of modern times find buyers on many commodities apparently indifferent to what they are asked to pay provided they can find a seller, and this in spite of the fact that there must be going on an enormous increase in production. Speculation where it is free or where it is allowed to exist has gone the limit. Some day will come the movement to turn paper profits into hard cash, and it is to be hoped the effort will not be crowded into too short a period of time.

What Has Absorbed Our New Wealth?

It may be asked where all the money and capital and new wealth has gone? Why with such sensational prosperity should some of our banks have had to turn to the Federal Reserve Bank for rediscounts this week and why should call money this week command the highest rate since the war broke out?

What is the amount loaned by the banks compared with two years ago? What is the accommodation, in spite of their profits, that manufacturers and traders have been obliged to have in order to finance iron and steel and copper commodities at prices two to three times their normal level, just to mention one item that affects our readers. In other words, if a tabulation was possible of the amount of capital required to carry on business at its present enormous rate and at present prices, would it be found to be more than the new wealth and capital that has come to us by reason of the war?

War's End Further Off Than Ever.

Where all the material is going and how long the demand is to continue, we do not touch on, except to say, the former is a puzzle to us in view of the heavy increase in output. As regards the continuation of our war demand, the Rumanian developments would seem to put the end of the war still farther off than ever. While it continues America must continue to get richer through an enormous demand for our goods, but if the recent pace at which we have exploited the situation and which we think is showing signs of having reached the limit is not curbed, then there is danger ahead and need for a word of caution. It is our opinion that long before the war ends, a very sharp readjustment from the extreme limits that we have reached will take place, and if present warnings are not heeded and further advances and overconfidence continues we may reach a very dangerous position.

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Good Comes From War and Evi

The Great European War, however, much it may be deplored, is not an unmitigated evil. From a lofty attitude of mind, it must be assumed that the nations involved needed the chastening influence to be obtained only through the profound sorrow attending the shedding of precious blood in a vast war theatre. Those who are left, will receive a rich legacy from the deeds of valor and of self-sacrifice performed by the dead. They will also be morally better off because of the virtues they have themselves exercised in the service of humanity, however paradoxical this may seem, viewed from the standpoint of war's horrors. Ideals—silent, invisible and intangible—are preparing the way for new nations to be founded upon the ruins of the present, a people, who as a whole, will be actuated by higher motives, and be more susceptible to the finer forces of nations when restored to peace than they were prior to the war.

In this country too, the death struggle abroad is not without salutary influence. Sympathy, felt and expressed, and supported by helpful deeds is doing much to offset the thoughtless tendency to grow rich at the expense of others' woes without contributing to relieve some of the suffering resulting from the war.

From a material standpoint, our greatest gain from the war is not derived from the huge profits obtained on merchandise sold, but for the necessity which compels us to develop our own vast resources; to stand more firmly upon our industrial feet, to apply new-found energy and efficiency, backed by ample capital, to the manufacture of materials for which supplies we hitherto have been content to depend upon European nations. That we are now taking the requisite steps in industrial progress is evident in the investment of over $167,500,000 since hostilities began in Europe, in developing chemical science and art, that has been dormant under the paralizing influence of German vim and genius. The United States has at last awakened to the importance of manufacturing own chemical and dye stuffs and i most earnestly hoped that this inv ment will prove profitable and manent.

Heretofore there has been no lack activity in American oil and gas fie but under the stimulus of the war, forts and development have been doubled and expressed in the auth ization of $521,600,000 new capital oil and gas companies; of this amo over $400,000,000 is already employ

The shipbuilding interest of United States, much depressed years because of ignorance and pre dice at home, has taken a new lease life because of the war. Hundr of thousands of tons of steel are n going into merchant shipbuildi some 1,400,000 tons since January this year—and $62,000,000 new capi has been lodged in new plants. Si the war began over $10,000,000 been invested in the American sh building industry. Twelve other sh yards have been projected and am capital is available for building sl ways, but the scarcity of labor and m terial holds plans in abeyance.

In the manufacture of war munitio less than $50,000,000 new capital w called for this year, whereas nea $84,000,000 was employed in such dustries last year in this country. T capital authorized for this purpose the last two years is over $130,000,0 but it is significant that only $4,00 000 was needed in the last six mont for this purpose. When the war over, of course, much of this capi will be withdrawn to find employme in more peaceful but probably l profitable enterprise.

It is impressive that nearly one b lion dollars have been called into s vice in capitalizing the industri here referred to, in the last two yea as a direct result of the war, inclu ing the manufacture of war munitio but it is of vastly greater importan that new energy, skill, and genius ha been called into being, implying th the was is not an unmitigated evil.

Extraordinary Effect of 28 Months of War on Metal, Iron and Steel Prices.

METALS.	Before the War, July 31, 1914.	Highest Since War Began.	Lowest Since War Began.	To-day's Prices (Dec. 1, 1916)	Increases Since War Began.	Decreases From Highest Touched Since War Began.
Lake Copper	13.00c	34.00 (Nov. 20, '16)	11.30 (Nov. 2, '14)	34.00	160%	nil
Electrolytic Copper	12.75	34.75 (Nov. 28, '16)	11.10 (Nov. 2, '14)	34.75	173%	nil
Casting Copper	12.62½	32.75 (Nov. 21, '16)	11.00 (Nov. 2, '14)	32.37½	156%	1%
Tin	33.00	65.00 (Aug. 7, '14)	28.50 (Oct. 15, '14)	45.12½	37%	31%
Lead	3.72½	8.25 (Mar. 21, '16)	3.35 (Oct. 7, '14)	7.25	95%	12%
Spelter	4.85	27.00 (June 3, '15)	4.60 (Oct. 13, '14)	13.06¼	169%	52%
Aluminum	17.25	67.00 (Oct. 9, '16)	18.00 (Aug. 3, '14)	64.00	271%	4%
Antimony	5.50	45.00 (Feb. 29, '16)	6.00 (Aug. 3, '14)	14.50	164%	68%
Sheet Copper	18.50	42.00 (Nov. 29, '16)	16.50 (Oct. 22, '14)	42.00	127%	nil
Copper wire	14.25	41.00 (Nov. 27, '16)	12.50 (Nov. 2, '14)	41.00	184%	nil
Sheet Zinc	7.00	33.00 (June 9, '16)	7.00 (Aug. 3, '14)	21.00	200%	36%
PIG IRON.						
Bessemer, Valley	$14.00	$33.00 (Nov. 27, '16)	$13.60 (Feb. 8, '15)	$33.00	136%	
Basic, Valley	13.00	28.00 (Nov. 24, '16)	12.50 (Oct. 29, '14)	28.00	115%	
No. 2 Fdy. Valley	13.00	28.00 (Nov. 28, '16)	12.50 (June 25, '15)	28.00	115%	
No. 2 Fdy. Phila.	14.25	28.75 (Nov. 28, '16)	14.00 (Mar. 24, '15)	28.75	102%	
No. 2 Fdy. Cleveland	13.75	27.30 (Nov. 24, '16)	13.00 (July 7, '15)	27.30	99%	
No. 2 Fdy. Buffalo	13.00	28.25 (Nov. 15, '16)	12.25 (Oct. 29, '14)	28.25	117%	
No. 2 Fdy. Chicago	14.50	27.50 (Nov. 24, '16)	13.00 (Nov. 13, '14)	27.50	90%	
No. 2 Fdy. South. Cin.	13.25	24.40 (Dec. 1, '16)	12.15 (Mar. 27, '15)	24.40	84%	
IRON AND STEEL PRODUCTS.						
Bars	1.15	2.90 (Nov. 21, '16)	1.05 (Dec. 1, '14)	2.90	152%	
Plates	1.15	3.50 (Nov. 21, '16)	1.05 (Nov. 24, '14)	3.50	204%	
Shapes	1.15	3.00 (Nov. 21, '16)	1.05 (Dec. 1, '14)	3.00	161%	
Pipe (¾—3)	1.95	3.15 (Nov. 15, '16)	1.90 (Nov. 2, '14)	3.15	62%	
Wire (nails)	1.55	3.00 (Nov. 27, '16)	1.50 (Dec. 4, '14)	3.00	94%	
Sheets (28 ga.)	1.80	4.00 (Nov. 20, '16)	1.70 (July 2, '15)	4.00	122%	
Tin Plates	3.30	7.00 (Nov. 20, '16)	3.10 (Dec. 28, '14)	7.00	112%	

The prices ruling to-day, (Dec 1, 1916) are the highest since the war commenced.

American Metal Market War Relief Fund.

An Appeal to the Metal, Iron, Steel and Allied Trades for a United Offering for the Relief of the Sufferers of the Great War.

The "American Metal Market" makes an appeal to the American metal, iron, steel and allied trades for a Thanksgiving offering for the relief of sufferers of the great war. We have probably all of us contributed as individuals, in some form or other to alleviate the awful misery and suffering that has been caused by the war, but our total donations are as nothing in comparison with our wealth, and we can therefore afford to join in a united offering on the part of the trade.

At this season when we are preparing to give thanks for the peace, happiness and prosperity which we have enjoyed during the year, it is proper that our thoughts and sympathies should turn towards our unfortunate fellow men for whom the year has meant war and misery, suffering and disaster, and out of the greatness of our riches we should contribute some portion towards the relief of their misfortunes.

We are ending the greatest year the metal trade has ever experienced and with record-breaking operations and record-breaking prices, it is impossible to even approximate the wealth which we have accumulated. Had this prosperity resulted to us apart from any connection with the war, it would even then have been our duty and our privilege to generously aid and assist suffering humanity in Europe, but how much more are we bound to do so when we remember that it is this terrible calamity which has brought us our prosperity. Whether we are directly concerned in the manufacture of arms and munitions, or the raw or semi-finished material used in their construction, or whether, as is the case with the majority of us, we have profited from the prosperity arising to our country by the war, it is war and death, and disaster and destruction which is the basis of our recent prosperity. The fact that we have played no part in the causes and effects of this greatest disaster of all ages, does not relieve us from our obligation to contribute generously towards the mitigation of the distress in Europe.

Let us not forget that we alone of all neutral countries are in a position to furnish the aid required, and let us not sit back with the reflection that with total contributions to date of $34,000,000 our country has done and is doing all we are bound to do. We have sent $12,000,000 to poor Belgium, but England and France have themselves contributed many times that amount towards Belgian relief, and the urgent appeals for further funds ought to bring home to us the extent of the requirements for that country alone. There is need for all we can send, and we in the metal trade should properly take a front place in the relief provided by this great country of ours. If our contributions amounted to 5% of our net profits this year the sum would be an enormous one and yet what is 5% on profits which show an increase of 50% to 100% to 200% or more than they were in normal years. Let us celebrate this Thanksgiving with a really generous war relief offering and prove to the world that the American metal trade possesses sympathies in proportion with its greatness.

The "American Metal Market War Relief Fund" is non-partisan, as the contributions will be distributed according to the subscribers' wishes. Thus each subscriber is asked to designate what relief he desires his donation to be applied against, whether French, British, Russian, German, Austrian or any other of the belligerents or to the neutral American Red Cross, or to the innocent sufferers in Belgium, Armenia and Poland, or according to any race or creed. Subscriptions which are not specified will be divided equally among the Belgian, Armenian and Polish reliefs.

Mr. Alexander Gilbert, President of The Market and Fulton National Bank, New York, has kindly agreed to act as Honorary Treasurer of the "American Metal Market War Relief Fund," and checks should be drawn to his order as Treasurer. Therefore, please mail your liberal donation, stating its method of disposal to

Mr. Alexander Gilbert, Treasurer,
American Metal Market War Relief Fund,
c|o The Market and Fulton National Bank,
81 Fulton Street, New York.

All contributions will be immediately acknowledged and a list of contributions will be published regularly in the columns of our daily paper without reference to the individual method of distribution, to be followed later with an account of the amounts realized by the various reliefs.

The "American Metal Market" is pleased to start the subscriptions for this fund with a contribution of $2,000.

The blessings of peace, happiness and prosperity have never been thrown in greater contrast with the sacrifice and misery and suffering of war, than in this year which we are ending, and the President expresses the thought of all of us in his Thanksgiving Proclamation when he urges that we who have enjoyed such blessings shall aid our war stricken brothers. No other nation in all history has ever been called upon to relieve such countless millions of sufferers, and no other nation has ever before contributed in such large measure, but the ability to do so has been graciously bestowed upon us, and no one can believe that our prosperity does not carry with it the tremendous obligation of humanity to minister to the distress of our fellow men. Our large contributions of the last two years have accomplished untold good, but the sufferings in Europe are increasing and means of the countries at war to relieve them are decreasing, so we must carry on our relief on a still larger scale if we are to live up to the full measure of our obligation. It is no time to rest content with the good work that we are doing, but rather to plan to increase our contributions so that they more nearly approximate extent of the needs.

Yours respectfully,

AMERICAN METAL MARKET COMPANY,
81 Fulton Street, New York.

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Business Trends.

A History-Making Month In Stocks.

The events, both favorable and unfavorable which were brought to bear on the stock market during November were the most notable of any period since the opening months of the war. Both in Europe and in this country it was a history-making month. Many sensational advances took place in security prices and new records were established for Steel common and Bethlehem Steel, the former selling at 129¾ and the latter at 7.00, while many other specialties recorded gains of 10 to 30 points and, in one case, that of Gulf States Steel, the advance was about 90 points.

During the first half of the month, except for one or two days, the market was on a sharp upward grade. The pre-election boom was spirited owing to the expectation of a Republican victory but when it became known immediately after election day that the outcome was much in doubt, the market naturally hesitated. However, when the news was received that President Wilson had been re-elected, Wall Street soon cast aside all fears regarding the consequences of the Democratic victory and prices again rose on the belief that the present prosperity will continue, at least as long as the war lasts. This speculation came to a halt about the middle of the month when, because of talk of big mergers, copper shares were bought indiscriminately, these stocks advancing 3 to 12 points overnight. Following this, unfavorable events, from the stock market point of view, came in rapid succession, causing the market to be every irregular and as a result prices had a tendency to go lower during the closing days of the month.

One of the most important of these incidents was the word of warning in the form of an official statement from the Federal Reserve Board cautioning banks not to put too much of their liquid funds in unsecured notes of foreign governments. The issuance of this warning followed the announcement of the fiscal agents of the British Government that December 1st was the d set for the sale of British Treasury b in this country.

Commodity Prices Rising Rapid

It is an amazing condition of aff that prevails in connection with c modity prices. It matters little wh er one looks at products of the m field, loom or furnace, for the s leads nowhere but to higher levels as a result we find that the index n bers of both "Bradstreet's" "Dun's Review" register unusu heavy increases, establishing new h records. This condition, it is ha necessary to point out, is chiefly result of underproduction in the of enormous domestic consumption c bined with an extraordinary foreign mand. Speculation plays a promi part in some quarters, and the stre of many markets is accentuated by growing scarcity of materials and bor, the increasing car shortage, the ing costs of production and other ments. Indeed, the high prices obtaining may be accepted as pena of the prosperity that has spread over the country and of course the that the United States is practically only large free market in which warring nations, as well as foreign trals, may trade, is also an influenc

The price of practically every modity is rising higher and hi every day, and there is no assuran the outlook to indicate that this paralleled inflation will not cont In view, then, of what has been cit is not at all astonishing to find the est index numbers showing approxi increases of 5% over October 1st of year, of 25% over October 1st a ago, of 35% over that date in 1914 of 40% over October 1st 1913.

Yes, it is an amazing condition o fairs that exists, but some day balloon will burst with painful suc ness (of course not while the Euro war continues) and then what? A lyzing panic of over-expansion— 1907? Let us at least hope not.

Business Trends.

Enormous Foreign Trade Continues.

While statistics of foreign commerce continue to be characterized by huge figures, the October export return, showing, as it does, a falling off from the large aggregates of August and September, is noteworthy as possibly indicating that export trade for a time at least has reached its crest.

This inference rests largely on the known fact that high prices here should have a tendency to contract export trade; they certainly have done this in the ease of wheat exports, and as "Bradstreets" points out "the diversion of much vessel tonnage to Australia and other countries to load wheat may have the effect of decreasing the vessel room available for American shipments."

The decrease shown in October exports from the high-record total of September was about $25,000,000 or nearly 5%. Imports are on the increase, the gain over September being in excess of $12,000,000 or approximately 7%. The gain in imports over October, 1915, was more than $26,000,000 and over those of October, 1914, $38,000,000. It will be observed that there is some tendency in commerce to correct the vast difference between the eastward and the westward movements and thus put a check on gold importations—which, incidentally in October were the second largest ever reported.—but the change thus far is moderate compared with what yet must be done to make buying and selling balance, the excess of exports over imports for the tenth month of this year being $314,200,000, the second largest in the country's history.

It is interesting to note that exports for the war period of 27 months exceed imports by a trifle more than two dollars to one and gold imports since the war began were $955,595,662 or four times the exports.

In the following table will be found the totals of exports and imports for the month of October; for ten months ending October 31st and for the war period of 27 months:

October.	1915.	1916.
Exports ...	$336,152,009	$490,613,280
Imports ...	149,172,729	176,423,897
Exc. of Exp.	$186,979,280	$314,189,383

Ten months ended October 31st:

	1915.	1916.
Exports	$2,867,694,132	$4,441,125,633
Imports	1,451,267,515	2,007,598,565
Ex. Exp.	$1,416,426,617	$2,433,527,068

Summary of trade since the war began:

	Gold & Silver.	Mdse.
Exports	$ 358,211,263	$8,908,438,368
Imports	1,022,899,740	4,434,877,888
Ex. Exp.	*$664,688,477	$4,473,560,480

* Excess of imports

Smaller Iron Output.

November pig iron production, as was expected, did not measure up to the remarkable rate of October, says the "Iron Age". The total was 3,311,811 tons, or 110,394 tons a day against 3,508,849 tons in the thirty-one days of October, or 113,189 tons a day. However, no other month of the year equalled the November rate, in spite of coke and car troubles.

The daily average production of coke and anthracite pig iron in the United States by months since January, 1913, is given as follows by the "Iron Age."

	1913.	1914.	1915.	1916.
January ..	90,172	60,808	51,659	102,746
February .	92,369	67,453	59,813	106,456
March ..	89,147	75,738	66,575	107,667
April .. .	91,759	75,665	70,550	107,592
May	91,039	67,506	73,015	108,422
June	87,619	63,916	79,361	107,053
July	82,601	63,150	82,691	104,017
August ..	82,057	64,363	89,666	103,346
September	83,531	62,753	95,085	106,745
October .	82,133	57,316	100,822	113,189
November	74,453	50,611	101,244	110,394
December.	63,987	48,896	103,323	.....

Are We Riding Hobbies To Our Destruction?

Elementary truths are usually susceptible of close application to affairs in general. We all know that it is a good thing for a man to have a hobby as an avocation, and we also observe that when a man rides a hobby in his vocation, his regular business, he often rides it to destruction. The reason of the divergence is plain. When a man has a hobby outside his business it affords him relaxation and rest, by taking his mind from his business when it ought to be resting, whereas when the hobby is in his business it takes his mind from other features of the business and produces a lack of balance in the various efforts exerted to further the business.

Has the war made the American nation a rider of hobbies? If so it is a serious matter, for we are engaged in a serious business and don't need any hobbies for relaxation. The individual may relax, should relax, but a nation never.

It does seem as if we had acquired the hobby riding habit. Some time ago, after the war started, someone suggested export business and we all exclaimed, "What an excellent idea! Why didn't we think of it sooner?". Before the war we were a debtor nation, and growing more so every year. That was when we should have had more exports of merchandise, to try to pay our debts. Now we are becoming a creditor nation, and will certainly be one within a few months more. A creditor nation does not need an excess of merchandise exports and could not have it indefinitely if everyone of its citizens were endowed with all the wisdom of the ages.

Then there is another hobby, excellent in its way but very dangerous as the sole means of conveyance—preparedness. We do not know against whom or against what condition or against what time.

These two hobbies are all right in their way, but we are in grave danger because we have been riding them s hard as to lose the sense of proportio as to the importance of other things like the man in business who makes hobby of a few features and neglect the others.

This country is rapidly approachin an economic crisis, and neither ex port trade nor preparedness is go ing to delay that crisis one minute. A a nation we have paid off our indebted ness or will soon have done so, but th amount only represents something lik $50 per capita, $3 a year income if i vested equally for the benefit of eac person in the country, while in the di location that has attended the perforn ance the purchasing power of the i comes of millions of men has been cu tailed by tens of times that amount.

We have established a new bankin system, designed to avert financi panics, and have been happy that tha matter is settled, anyhow. We obtai ed what was called an "elastic" cu rency, but true elasticity in anythin involves an ability to return to the ori inal state when the force is remove Lately we have just begun to suspe that what we got was perhaps a stretc able currency instead of an elastic cu rency. If we had not been so busy ri ing hobbies we might have a clearer u derstanding of the matter by this tim

In the early months of the war w were driven into a perfect panic fear by the exports of gold. When th flow turned the other way we emitte a sigh of relief that another of ou troubles was gone, and proceeded the riding of hobbies. Now the ban ers are trying to devise means to ste the flow. A certain presidential ca didate once gained great popularit which did not last until election tim however, by refusing to countenan mankind's being crucified upon a cro of gold, but now we need one who sha deliver us from being crushed und an avalanche of gold. Sir George Pai told us early this year it was a del

sion to think we could derive any benefit from the war, but who was he—only the financial adviser to the British Government, which has been skating rings around us, deluging us with gold and thereby making a ready market for British, French and Russian bonds. Sir George even admits, we understand, that if the war lasts through 1917 England cannot continue specie payments. They are such masters of the game that they can tell us the moves in advance and still have their own way. We take passing notice and resume our pleasant occupation of riding hobbies. It is high time to awake and face what is coming to us while the war continues, before we complete our pretty plans what we shall do after the war ends.

High Iron and Steel Prices Of The Past.

Successively the rise in iron and steel prices has carried prices beyond various top points of the past, until so many have been passed that the question "When were prices so high?" becomes somewhat an intricate one. We have passed successively the high points of 1912, 1909, 1907 and 1902. The next thing to pass was the price level of the 1899 "boom," and that also has been done. Some top points in that boom were: Bessemer pig iron, $24, valley; Bessemer billets, Pittsburgh, $40; shapes, 2.25c; plates, 2.90c; bars, 2.50c. Other high prices are shown on page 11 in the last issue of our **Metal Statistics.**

When one has to go back of 1899 in a search for prices comparing with those now ruling he is lost with respect to the common steel products, for they were not made early enough to have higher prices. The transition from wrought iron to mild steel occurred in the decade of the eighteen-nineties, chiefly during the industrial depression. Thus for most steel prices the present are simply the highest in the history of the steel industry. Some of our steel products did not have their counterpart in wrought iron even. Beams, for example, did not amount to anything. The iron beam was a sorry affair, having too short a "radius of gyration," i.e., the proportion of metal in the web was too large.

Bars, of course, we have always had with us, so back past the gray dawn of steel price history we seek iron bars at 2.90c, Pittsburgh, and find them first in April, 1880. There was a high level at that time, 4.00c, in February and March of that year. From September, 1879, to April, 1880, the price was above 2.90c. Back still farther we find bars at 2.90c or higher in March, 1874, and in several years preceding. The high point was 5.10c, in September, 1872.

Billets, of course, we cannot find, as they only became an important market commodity about 1889.

Rails are a separate steel commodity, as steel rails were made in large tonnages long before there was any considerable production of ordinary soft steel. Bessemer rails are now $38. Late in 1899 the price was fixed at $35, for the 1900 season, but the market broke to $26 early in 1900. Going back farther, we first find $38 rails in July, 1887, the price having been $38 or higher from January to July of that year, with the top price at $39.50. From the beginning of steel rail manufacture until the latter part of 1883 the price had been higher than $38. Our references go back to 1867, in which year the average price, in currency, was $166, with 2,277 tons produced in the United States and the remainder of the consumption imported, under an ad valorem duty of 45%.

In the case of pig iron we must go back to a time when the grades and the districts were altogether different. The leading market was Philadelphia and the standard price for statistical purposes was No. 1 anthracite. Taking the present market of foundry iron, Philadelphia, at $29, we must go back

to April, 1880, in which month we find the market crossed below $29 much more rapidly than it is now crossing upwards, for the market was $41 in February and $25 the following May.

When we go back thus far and find prices higher than the present the success of the search is not due altogether to the fact that in the early years of the industry costs were so much higher that prices had to be higher. In 1803 and 1804 the average price of charcoal pig iron at Philadelphia was less than $30. There are no continuous records of prices f.o.b. furnace but as there were no railroads the price at furnace must have been much less. From 1855 to 1862 inclusive anthracite pig iron at Philadelphia was well under $30.

The high prices, higher than those now ruling, are to be found chiefly by reason of there having been two boom periods. That of 1879, lasting practically from May, 1879, to May, 1880, was very strictly a boom, following a prolonged industrial depression just as did the 1899 boom. It was said of 1879 that "people woke up one morning to find the country prosperous." The other period, not exactly a boom, was the period following the Civil War. The Jay Cooke panic of September, 1873, may be taken as having ended that period of extreme prosperity, but there is a lesson for us of to-day in the fact that the great break in prices did not occur at that particular time. In view of the possible lesson it may be well to cite details. There was a continuous decline for years. Starting with certain high points, pig iron at Philadelphia declined from September, 1872, to November, 1878. Iron rails declined from June, 1872, to October, 1877. Refined iron bars from store, Philadelphia, declined from October, 1872, to February, 1879. The period of continuous decline averaged about six years. The length of the decline was due, of course, to the fact that "costs were high" and it took time to reduce them. The same thing occurred during the depression of the eighteen-nineties. The same thing will occur in the next depression, if another of the same description is to come.

Was Sir George Paish Wrong?

Sir George Paish has been well known to American men of affairs for many years. As editor of London Statist he has occupied an important position, which he has well filled, and he is often spoken of as "the well known British economist" and for the war he has been officially commissioned as financial adviser to the British Government.

We wonder whether Sir George was wrong, or whether a great many people in the United States are now wrong. Perhaps there is a question. What he said last February, in an elaborate article in the New York Sun was:

"The idea that the United States is deriving or can derive any advantage whatever from the war, is a complete delusion. All that is happening to the advantage of your country is that it is suffering less than the belligerents as a result of this titanic contest."

Since Sir George reached his conclusion, say February 1st, our favorable merchandise trade balance, deducting an allowance for items against us in the unseen balance, appears to have made this country richer by nearly two billion dollars. It is the trade balance that occurs to us at once when we think of our profiting by the war.

When we hark back to the statement the suggestion comes that new developments make the case different, but such a suggestion must be dismissed. It is absurd to assume that Sir George did not expect these large trade balances. He points out that the war has meant an almost complete stoppage of American progress, and possibly there is something in that. We are feverishly making some new things, which will not be required after the war, but that is not the case throughout. We have developed a great deal along chemical lines and have made a great deal of progress that we might have made anyhow, but lacked the incentive.

To almost everyone it looks good

that we are buying back our securities held abroad. In future we shall not have to send interest and dividends out of the country. It is a well recognized fact that we are not investing money in new enterprises promising lasting returns to the amount that we usually do in normally prosperous times. It is also a fact, as Sir George pointed out in his article, that we are denied the usual immigration. We are not investing the money and we are not giving the men work, in other words not progressing towards larger and larger industrial activity in the way we otherwise should.

There was a silver tongued orator 20 years ago who coined many phrases, one of them being "The rich are growing richer and the poor are growing poorer." The people did not believe the phrases up to election time and so he was defeated for the presidency. Whether the statement was true or not all will admit it would be a bad thing for the country for it to be true. With quite a large number of people in the United States to-day it is true. Some are making enormous profits, while some have but little increased income and are faced with very high prices for what they need. If they are not growing poorer in pocket they are in receipt of less of this world's necessities and conveniences than formerly.

In this matter the real question is yet to be answered by the manner in which the accumulating wealth is eventually spent. There is no use trying to blink the fact that the situation is a dangerous one.

Railroad Earnings.

Railroad earnings per mile of road, of roads having annual operating revenues above $1,000,000, this being about 230,000 miles or about 90% of the total steam railway mileage; compiled by the Bureau of Railway Economics from reports furnished the Interstate Commerce Commission.

	1913-14			1914-15			1915-16		
	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.	Revenue.	Expenses.	Net.
July	$1,183	$837	$346	$1,127	$786	$341	$1,130	$750	$380
August ..	1,244	856	388	1,174	788	386	1,190	764	426
September	1,257	854	403	1,185	783	402	1,251	774	477
October ..	1,314	891	423	1,171	787	384	1,323	815	508
November	1,180	884	337	1,026	734	292	1,303	800	503
December	1,116	821	296	993	730	263	1,253	802	451
January ..	1,021	795	226	939	718	221	1,133	797	336
February .	914	746	168	900	680	220	1,140	800	340
March	1,091	801	290	1,015	722	293	1,260	844	416
April	1,038	782	256	1,013	724	289	1,223	827	396
May	1,047	800	247	1,044	735	309	1,307	857	450
June	1,097	789	308	1,094	732	362	1,302	851	451
Fiscal year	13,483	9,801	3,682	12,678	8,915	3,763	14,818	9,684	5,134

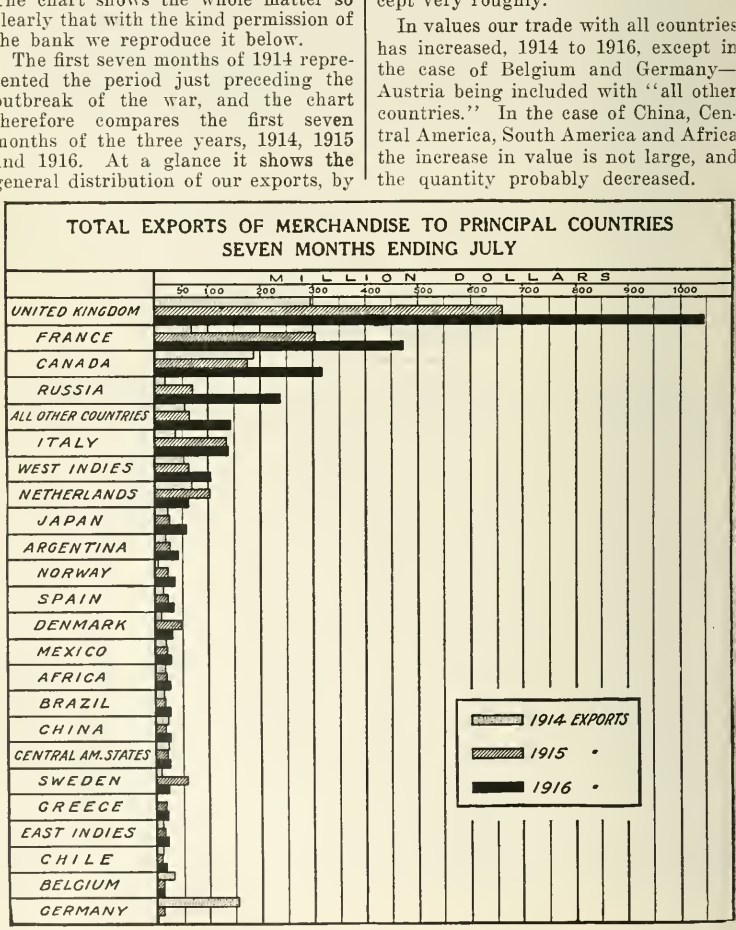
	1916-17		
	Revenue.	Expenses.	Net.
July	$1,315	$848	$467
August ..	1,418	882	536

Where Our Exports Are Going?

Everyone at all interested in the foreign trade of the United States has wondered where our merchandise exports are now going, as compared with the distribution of the trade before the war. The statistics, in figures, are very complicated and confusing. A concise, precise and accurate presentation has been developed by the First National Bank of Boston, and was given in its foreign trade letter dated October 31st. The chart shows the whole matter so clearly that with the kind permission of the bank we reproduce it below.

The first seven months of 1914 represented the period just preceding the outbreak of the war, and the chart therefore compares the first seven months of the three years, 1914, 1915 and 1916. At a glance it shows the general distribution of our exports, by countries, and in detail it shows how these exports have varied since the war started. The countries are arranged in the order in which the trade stood in the first seven months of this year, whereby the United Kingdom comes first, as it would if 1914 had been taken as standard instead, while Germany comes last, although it stood third in 1914. As values have greatly enhanced the chart is no index to quantities, except very roughly.

In values our trade with all countries has increased, 1914 to 1916, except in the case of Belgium and Germany—Austria being included with "all other countries." In the case of China, Central America, South America and Africa the increase in value is not large, and the quantity probably decreased.



Lake Iron Ore Prices.

Lake Superior iron ore prices for the 1917 season have been established at $1.50 advance over the 1916 schedule. Before the lake carrying rate had been established, an advance of $1 seemed to be in prospect. That was when it was expected that there would be a stiff advance in the lake rate, but not a doubling in the rate. Later the rate was established, by extensive chartering, at $1.00 net to the vessel, or a doubling, and when 50 cents additional had to be paid to the vessel the ore producers were naturally not content with an advance that would give them, with their precarious operations, merely the advance that the lake vessels would obtain.

The following table shows the dates of iron ore price announcements, with the price of Mesabi non-Bessemer, by far the most important grade marketwise, and our **composite pig iron** for the same date:

	Ore.	Pig.
March 20, 1912	$2.85	$13.675
November 19, 1912 ..	3.40	17.275
May 1, 1914	2.85	13.85
April 19, 1915	2.80	12.915
December 7, 1915	3.55	17.51
November 23, 1916 ..	5.05	25.96

When iron ore prices are named but once a year it is rather natural that there should be divergences between the price fixed and course of pig iron, and it has been a matter of comment in the blast furnace trade that advanced ore prices have frequently been followed by a declining pig iron market. The ore producers, however, can rejoin by citing many instances of low prices being named for iron ore and being followed quite promptly by a general advance in pig iron. The fact is that it is difficult for pig iron price movements to continue in the same direction long enough to justify either high or low iron ore prices, except when the pig iron movement is of unusually great proportions.

For the season of 1912 the ore producers delayed fixing prices as long as possible, doubtless hoping for an advance in pig iron, but the advance did not come in time. The next inning was theirs, however, as the pig iron advance of 1912 was about over when on November 19th the prices for 1913 were announced. Last year conditions seemed ripe for a pig iron advance, but it had not come by April 19th, when the ore interests had to put out practically the same low prices as obtained in 1914.

	(On Lake Erie Dock).			
	— Old Range —		— Mesabi —	
	Bess.	Non-Bess.	Bess.	Non-Bess.
1887 ...	6.00	5.00		
1888 ...	4.75	4.00		
1889 ...	5.00	3.75		
1890 ...	6.00	4.50		
1891 ...	4.75	3.75		
1892 ...	4.50	3.75		
1893 ...	4.00	3.25		
1894 ...	2.75	2.00	2.50	1.75
1895 ...	2.90	2.25	2.25	1.90
1896 ...	4.00	2.60	3.25	2.40
1897 ...	2.65	2.25	2.10	1.80
1898 ...	2.75	1.80	2.15	1.70
1899 ...	2.80	2.00	2.25	1.90
1900 ...	5.50	4.15	4.40	4.00
1901 ...	4.25	2.85	2.75	2.35
1902 ...	4.25	3.00	3.00	2.60
1903 ...	4.50	3.60	4.00	3.20
1904 ...	3.00	2.60	2.75	2.35
1905 ...	3.75	3.20	3.50	3.00
1906 ...	4.25	3.70	4.00	3.50
1907 ...	5.00	4.20	4.75	4.00
1908 ...	4.50	3.70	4.25	3.50
1909 ...	4.50	3.70	4.25	3.50
1910 ...	5.00	4.20	4.75	4.00
1911 ...	4.50	3.70	4.25	3.50
1912 ...	3.75	3.00	3.50	2.85
1913 ...	4.40	3.60	4.15	3.40
1914 ...	3.75	3.00	3.50	2.85
1915 ...	3.75	3.00	3.45	2.80
1916 ...	4.45	3.70	4.20	3.55
1917 ...	5.95	5.20	5.70	5.05

Particularly 1894 to 1899 some grades sold at materially higher prices. Base ore content (natural state) 1906 and some previous years; Bessemer, 56.70; non-Bessemer, 52.80; 1907 and later: Bessemer, 55.00; non-Bessemer, 51.50.

For the 1916 season the ore interests fared much better, as there had been quite an advance by December 7, 1915, when this year's prices were announced. More or less true to tradition, however, the pig iron advance did not run much farther. The advance of the past few weeks has been spectacular, justifying almost any iron ore advance that could be considered. The furnacemen, however, will not profit by the advance to any great extent until after the middle of next year, and as they will

not be using the new ore until about June there will be a better division than usual between the furnaceman and the ore producer.

The $1.50 ore advance means about $2.75 per ton of pig iron produced, as the average consumption of iron ore is 1.85 tons per ton of pig iron produced. That is not altogether a fair comparison, however, as the furnaces use more material than this 1.85 tons of ore, co siderable tonnages of mill cinder a scale being consumed also, and pric on these will of course increase al With the advances in labor, coke a supplies the total cost of making a t of pig iron at valley furnaces promis to be fully $20, against about $13 wh wages and materials were at th lowest.

By-Product Coke Plants.

The Latest Koppers Oven—What is Known and What is to be Learned in By-Product Coking.

There is a great deal to be learned as to the selection and mixing of coals for by-product coking, a great deal more than has been learned thus far. The ovens are, apparently, brought almost to perfection, but the very changes that have been made in recent years in by-product ovens have served to make useless much of the information about coking value of coals that it was thought had been acquired, for with changes in the ovens coals that had failed afterwards succeeded.

This is the gist of what was developed when the metallurgical and mining section of the Engineers' Society of Western Pennsylvania took up the subject of by-product coking at its meeting in Pittsburgh, November 28, 1916. The paper of the evening was by C. J. Ramsburg, second vice-president of the H. Koppers Company, the subject being "A personally conducted trip to the Koppers by-product coke and gas plant of the Laclede Gas Light Company, St. Louis, Mo." The use of the word "trip" had reference to the fact that there were two reels of movies, beautifully executed. The "movies" are really a great aid to the acquisition of knowledge. Mr. Ramsburg gave the audience the "pusher side" of a battery of 51 ovens, showing the pusher at its work, perhaps two feet a second, and then instantly whisked the audience around to the "coke side," saving a tramp of hundreds of yards, and exhibited the same coke issuing from the oven, and falling cleanly and clearly in two streams into the quenching car.

Mention of there being two streams brings us to the heart of the subject by-product coking, the very core, spe ing literally. The core is made by meeting of the two "tar films" and an extent it is left, for it is found b ter to err on the side of under coki rather than of over coking. To el date for the uninitiated, a Kopp oven has inside dimensions say 37 to feet long, 7 to 9 feet high and 18 to inches wide. The sides are heated a the pulverized coal within begins coke, not in a mass, but by the p gress of a tar film from each side ward, at the rate of about half an i an hour. What is between the tar f and the side, as the operation progr es, is coke, in more or less advan stages. What is nearer the center a between the two tar films, is coal, a Mr. Ramsburg asserted that after coking operation had been going on ten hours the inside would not be fo at a temperature much if any above boiling point of water. The tar f is impervious and the gases p through the incipient coke.

These ovens are built in batteries say 50 to 70 ovens. The Gary plan in two rows of four 70-retort batte each, making 560 ovens. Each re at Gary makes 12.7 net tons of coke charge, with a minimum coking time 16 hours. As it is really a question the rate of progress of the tar film, can build wider ovens and use a lon coking time, or narrower ovens an shorter time, all with practically same coke output per oven per y The latest type of Koppers ovens, one not likely to be changed further

18¼ inches wide, taking 16 net tons of coal and producing 12¼ net tons of coke, with a coking time of 18 hours. The second plant of this type to be built was that of the Youngstown Sheet & Tube Company, comprising four batteries of 51 retorts each, 204 ovens.

The Laclede plant was completed in June, 1915, primarily for the purpose of producing gas for the City of St. Louis, and comprises 56 ovens. It carbonizes 990 net tons of coal per charge (60% Elkhorn, Kentucky and 40% Pocahontas, West Virginia) equal to 17.7 tons per oven. At 12¼ tons of coke this would be a yield of 69.2%. It produces for municipal use 6,400 cubic feet of gas per ton of coal consumed, only the richer gas being furnished, the leaner being used for operating the ovens. Were the municipal standard slightly lowered it would be possible to sell all the gas produced, and then the retorts would be heated by producer gas, made from coke breeze, etc., at a very low cost.

Each oven has gas and air inlets at each side, both subject to regulation, with regenerators underneath. These heat the incoming air only, by means of the regenerators, with changes of regenerators every 30 minutes.

Coal is crushed, the major part passing through a ⅛-inch mesh screen, and mixed, being carried by a larry running over the battery of ovens, a charge being delivered to an oven through several holes in the top. The pusher, which which runs along the "pusher" side of the battery, is operated electrically. Besides the pushing mechanism it carries a leveling bar which passes throughout the top of the chamber after the charge has been delivered and levels it. At each end of the oven is a door. A door carrying mechanism removes the door upon occasion and carries it to one side, the pusher then thrusting the entire mass of coke out, to fall into the quenching car as already mentioned. This car quickly carries its load to the quenching tower, where it is deluged with water for 40 seconds, the quickness of the operation being designed to leave the coke hot whereby it dries itself, and showing eventually not over 2% or 3% moisture.

The By-Products.

Mr. Ramsburg gives the by-products in connection with one ton of coke as follows:

9,000 cu. ft. gas, 550 B. T. U. per ft.	$.60
12 gallons tar	.35
35 lb. ammonium sulphate	.99
4½ gallons benzol	.50
100 lbs. coke breeze	.12
Total value	$2.56

The gas value is calculated by using natural gas cost at ordinary works, taking account of respective heat units. The ammonium sulphate is taken at ordinary value, though the present value would be $1.40. The benzol is calculated on the basis of gasoline equivalent if used in a motor.

The gas production would be greater, though the average thermal value would be somewhat less, if none were used to operate the retorts. In Germany many coke ovens are operated by blast furnace gas.

Mr. Koppers, by the way, went to Germany a few months before the war and has since been engaged in building coke plants in Germany. No one in Germany is to be allowed to burn raw coal; all must be coked. Mr. Koppers occupies the position of consulting engineer to the H. Koppers Company, but of late they have been unable to consult him.

The Coals.

The antithesis brought out by the paper and discussion was that the Koppers oven, in its proportions, operation, etc., has been brought to practical perfection, for that type, while on the other hand there is but little known as to values of the different coals and their proper proportions, for coking purposes.

Oxygen seems to be the principal determining element in the coal. When a coal with too much oxygen is used the coke does not cohere. As one goes farther West he finds coal with more and more oxygen.

Apart from the matter of oxygen, there must be a mixing of high volatile and low volatile, to produce the best results in coke. Too much high volatile coal in the mixture makes too dense a coke, while increasing the proportion of

low volatile opens up the cell structure. Pocahontas, Somerset, Cambria, etc., are all low volatile coals. The Inland Steel Company formerly used 60%, 70% and 80% Pocahontas (low vol tile) and produced good coke, but now using larger proportions of hig volatile coal.

Topical Talks On Iron.

XLIV.—Heat.

The layman is apt to think that the measurements made in the iron and steel manufacturing industry are solely of quantities of material, the blast furnace manager weighing his ore, coke and limestone and the resultant pig iron, the steel mill weighing its pig iron and scrap and the resultant steel ingots, the rolling mill weighing its finished produets and measuring the dimensions, plates as to length, width and thickness, sheet bars as to weight per lineal foot, and so on.

There is something else that is being continually measured in the iron and steel industry, and that is heat. There is seareely an operation that does not involve the measuring of heat, which is a quantity just as important as the weight of materials or their dimensions.

The blast furnace manager, for instance, computes the quantity of heat that should be produced by the coke he charges, and he knows the amount of heat earried off by the gases, the pig iron and even the slag. In the steam power plant the quantity of heat the coal burned should produce is known, and the effort is made to account for all this heat, in power produced and in the various losses that occur. At the open-hearth steel furnace the thermal efficieney of the producer gas is measured. In the heating for rolling careful attention is paid to temperature. In some braneches of rolling consideration is even paid to the heat produced in the steel by rolling, the eonversion of the power used for rolling into heat that appears in the steel. The newest branch of heat measurement is in the heat treating of steel, to improve its quality whereby it is heated to certain precise temperatures in order to produce desired crystalline struetures.

The Reaumur scale of temperatures practieally never employed, the tv standards being Fahrenheit, in whi the melting point of ice is 32 degre and the boiling point of water 212 d grees, and the Centigrade or Celsius, which the melting point of ice is ze and the boiling point of water is 1 degrees.

These are measurements of the d gree of heat. For the quantity heat there are two standards, t British standard, used very largely the United States, and the metr standard, used on the Continent a to an extent in the United States a England.

The British standard is the "B. U." or British Thermal Unit, oft called merely the "heat unit," a ter never applied to the metrie standa whieh is always called the "calorie

One B. T. U. is the quantity of he required to raise the temperature one pound of water from 32 degre to 33 degrees on the Fahrenheit sca

The ordinary calorie is the large c orie, sometimes so ealled, while the is also the small ealorie, which shou always be so designated. The large c orie is the amount of heat required raise one kilogram (2.2 pounds) water from 0 degrees to 1 degree the Centigrade scale. The sm ealorie refers to one gram of water stead of one kilogram, and therefo it requires 1,000 small calories to ma one large calorie.

The conversion of calories into he units involves making allowanee f the difference in the temperature sca and the difference in weights. T heat unit is smaller than the ealorie the faet that a degree Centigrade 1.8 times a degree Fahrenheit and kilogram is 2.2 times a pound, so th it requires about four heat units

make one large caloric.

In many cases the conversion does not require the use of this factor. For instance, in considering the heat value of coal the metric system would express the heat value in calories per kilogram of coal, whereas the heat unit system would express it in heat units per pound and if the factor just mentioned were used the result would be the heat units per kilogram of coal, which is not what would be wanted. The weight conversions cancel each other, whereby the heat units per pound of coal equal 1.8 times the calories per kilogram of coal, so that 7,500 calories per kilogram of coal would precisely equal 13,500 B. T. U. per pound of coal.

The "mechanical equivalent of heat," is used for conversion. One B. T. U. equals 778 foot pounds, a foot pound being a quantity of power, the amount required to elevate one pound one foot against the force of gravity. Horsepower is not a quantity of power, but a rate of power, 33,000 foot pounds per minute. Dividing 33,000 by 778 one gets 42.4, the number of heat units required to furnish one horsepower for one minute. Thus the theoretical heat value of a fuel used can be compared with the power actually delivered by the motor, to determine the efficiency.

Conversion can also be effected between mechanical power and electrical power. The unit in electricity is the watt, which is a rate, not a quantity, being a flow of one ampere of current at one volt pressure. The common term is the kilowatt, or one thousand watts. One horse power is equal to 746 wats or .746 kilowatt.

It is of interest to reflect that while these measurements of the degree of heat, the quantity of heat, mechanical power, quantity of electricity, etc., are so common and so absolutely exact, we are dealing with something we know practically nothing about. It is, perhaps, as if we weighed a substance precisely, yet had no idea what the substance was. The foot pound is the amount of power required to move one pound one foot against the force of gravity, but the scientists have only lately begun to take courage enough to address themselves to the question what gravity is. Then in the case of temperature, there was a time when it was thought to be understood. It represented "molecular vibration" and simple experiments showed that the vibration of a gas would cease at 273 degrees below zero on the Centigrade scale or 459.4 degrees below zero Fahrenheit, hence that was called "absolute zero" but of late the question has been raised whether there could not be still lower temperatures. Then as to electricity, the nomenclature and the systems of measurement were built up when electricity was regarded as a fluid because what else could it be? In the new physics electricity is recognized as matter, and it doesn't flow through the conductor. We measure what appears to flow through a wire but the physicists assure us the electricity isn't in the wire at all, it is in the space outside. It is rather amusing, when we know how carefully sometimes we must insulate a wire, to prevent the electricity from leaking out, that it never got into the wire. However, the manufacturing industries can go along very nicely measuring these things without having any idea what they are.

Pig Iron Production.

Rates per annum, including charcoal pig.

April, 1915	26,000,000
May	26,800,000
June	29,250,000
July	30,300,000
August	31,800,000
September	35,000,000
October	37,100,000
November	37,350,000
December	38,000,000
January, 1916	37,850,000
February	39,200,000
March	39,600,000
April	39,600,000
May	39,800,000
June	39,500,000
July	38,350,000
August	39,200,000
October	41,700,000
On November 1st	40,000,000
Actual production:	
1910	27,303,567
1913	30,966,152
1914	23,332,244
1915	29,916,213

Steel Plants.

XIII.—Lukens.

There are iron making concerns in Sweden that have maintained an unbroken record of production for half a dozen centuries, the business being handed down from generation to generation. As that was before the discovery of America we cannot have iron making concerns as old, but considering the age of the country Lukens is quite an old institution. It was in 1810 that Isaac Pennock built the Brandywine rolling mill at Coatesville (which must not be confounded with the present Brandywine works at Coatesville, built by the Worth Brothers in 1881) and the plant was bought in 1816 by Dr. Charles Lukens, who it is claimed rolled at the works the first boiler plate made in America. In 1825 Dr. Lukens died, and his widow, Rebecca W. Lukens, conducted the business for 20 years. After her death the name of the works was changed to Lukens, in her honor.

In 1890 the present Lukens Iron & Steel Company was incorporated, th business having previously been co ducted under the firm name of Charl Huston & Sons. At that time the pla comprised three double puddling fu naces, two trains of rolls and one ha mer, the power being part steam an part water, and there was being erec ed what was probably the largest pla mill in the country, with three-hig rolls 34x120 inches. At various tim in its history, probably for the maj portion, the Lukens works have ha the largest plate mill in the countr The puddle mill was dismantled 1906, and the present steel-makin equipment comprises one acid and fi basic open-hearth furnaces, all of 4 tons capacity, the ingot capacity bein 360,000 gross tons a year, dating fro 1892 and 1896, while four 75-ton fu naces were completed in 1916. Th company owns the Allegheny Ore Iron Company, operating three bla furnaces and iron mines in Virginia.

Car Buying.

Freight cars ordered:

First half 1913	114,000	
Second half	33,000	
Year 1913		147,000
First half 1914	66,000	
Second half	14,000	
Year 1914		80,000
First half 1915	61,916	
Second half	69,217	
Year 1915		131,133
1916—		
January	21,337	
February	13,043	
March	10,725	
April	8,058	
May	6,204	
June	3,470	
Six months		64,287
July	1,883	
August	3,384	
September	15,683	
October	32,403	
November	29,283	

Wage Scale Averages.

Sworn averages of prices obtained f mills for shipments in months named, us in fixing wages under Amalgamated Ass ciation sliding scales. The figures represe the rates used, the actual ascertained ave ages lying between the figure given and th one five points higher. Base sizes of ir bars; average of 26, 27 and 28 gauges bla sheets; tin plate per base box, 100-pound.

Bar Iron.

	1914.	1915.	1916
January-February.	1.1590	1.024	1.40
March-April	1.176	1.087	1.60
May-June	1.1257	1.10	1.85
July-August	1.0928	1.15	1.95
September-October	1.0847	1.15	2.00
November-Dec'ber	1,037	1.30	....
Year's average	1.1125	1.144	....

Sheets and Tin Plates.

1916.	Sheets.	Tin Plate
January-February	2.25	3.50
March-April	2.50	3.70
May-June	2.60	3.90
July-August	2.70	4.05
September-October	2.75	4.10

The Iron and Steel Situation.

The Runaway Continues.

Finished steel prices advanced in November by an average of $5.75 per net ton, against a total of $20 a ton in the preceding ten months of the year. Pig iron advanced $5.35 per ton, against less than $10 in the whole preceding history of this unprecedented movement.

Perhaps the simile of driver and driven is a trifle rough to apply to the steel market, but with the kindest thoughts for all we venture to employ it. In the ordinary market movements we have had, in 1905-6, in 1909 and in 1912, there has been considerable suggestion of the steel producers skillfully handling the reins, applying a little jerk here and a little encouragement there, whereby the progress from lower to higher prices was orderly and a comfortable tonnage of business was amassed in the order books. The term "runaway" has often been used in the past, not as applying to anything occurring, but as referring to something that should be avoided. The steel interests handled the reins in such a way, they pointed out, as to avoid a runaway. Perhaps there was not much danger of a runaway in any of those movements, but we all recall how the possibility was referred to.

Now, of course, there is a runaway, which consists in the driven taking the bit in its mouth. This the buyers have done, by their bidding higher and higher prices, by their visiting sales managers and insisting that they must have the tonnage put upon books. Often the buyer does not venture to make a bid but assures the sales manager that he can name the price or even, in some cases, that he can name the price later, whenever he gets ready. The use of the simile permits us to observe that in the ordinary physical runaway the one who occupies the seat allotted to the driver is scared. In this runaway the one who occupies the driver's seat is not scared; it is only the runner who is scared. The steel mills have long passed the stage of being scared. They know that various mishaps are coming but they enjoy the ride, for unlike the conventional runaway, the course is leading towards safer and safer ground, in that surplus earnings are being accumulated and they are reserved against the collisions and smashes that are to occur some day.

Throughout this steel price movement there has been the natural tendency to assume that buying was prompted in considerable part through buyers observing that prices were advancing and hence being tempted to make further commitments. There has been room for the assumption that if the price advancing movement should halt, the buying would soon drop off. There was suspicion that such a time had arrived last June and July. In August prices began advancing sharply and at the same time buying increased. We all have our opinions but the writer doubts whether any of us really knows—certainly he does not pretend to know—which was the cause and which the effect.

Market events of the past month or two have not thrown light on that subject. Much of the buying has been of the most substantial character. The buying of ship material, which has run into large figures, has occurred when it was well known that the shipyards of the world would be engaged not only during the remainder of the war, but for years thereafter, in a feverish effort to restore the world's merchant marine, reduced by many sinkings and being depreciated by extremely hard driving, both of the commandeered vessels and of all others. The buying of freight cars, about 100,000 having been ordered in the four months August to November inclusive, was by railroads which had previously dropped out of the market because they thought prices too high. Even if the railroads were moved by sentiment, which they were not, as stern necessity dictated the ordering of the cars, the fact would remain that the orders are firm.

Prices and Consumption.

Doubtless there are many cases of

consumers being unable to pay present prices for steel. The cases are not observed, as those who can pay the prices, and are anxious to do so, occupy all the attention. The volume of unfilled orders on steel mill books has been increasing, since August 1st, and it has been increasing more rapidly in the past two months than in the preceding two months. Apparently very little of the new business is in the form of the familiar "open contract." It appears that most of the new business is in the form of definite orders for specific purposes. In many cases the regular contract buyers are held down to shorter periods than usual. Some of the jobbers are only now being covered on steel bars for first quarter. Their tonnages are reserved for them, if they are regular customers, but the price is fixed as late as possible.

Export Demand.

The export demand is in excess of the mills' willingness or ability to sell. If in the next few months domestic demand decreases, on account of high prices, it is expected that export demand will take up the slack, even before any slack becomes plainly visible. Export selling has been so light that the tonnage capabilities of the field have not been tested. Possibly they are over-rated, for it is one thing for buyers to bid certain prices when the supply is meagre and another thing for them to absorb a large tonnage at those prices. We venture to assert that in the export market is unable to absorb 50 or 75% more material than it has been furnished in the past six months the American steel market is not as secure as producers profess to consider it.

Pig Iron.

Our **composite pig iron** advance $5.35 during November and Decembe was entered with prices advancing a a still more rapid rate. The south

Pig Iron Prices.

(Averaged from daily quotations; at Philadelphia, Buffalo, Cleveland and Chicago, prices are delivered.

							No. 2 fdy.				
1915	Bessemer.	Basic, Valley	No. 2 fdy.	Basic, Phila.	No 2 Phila.	X fdy. Buffalo.	Cleveland.	Chicago.	Birmingham.	Ferro-manganese.*	Furnace coke
Jan. ..	13.75	12.50	12.75	13.50	14.45	13.25	13.25	13.45	9.50	68.00	1.55
Feb. ..	13.64	12.50	12.75	13.50	14.50	13.25	13.25	13.50	9.50	68.00	1.53
Mar. ..	13.60	12.50	12.75	13.50	14.05	12.74	13.25	13.39	9.42	78.00	1.53
April .	13.60	12.50	12.75	13.40	14.05	12.69	13.25	13.50	9.25	78.00	1.53
May ..	13.60	12.50	12.75	13.25	14.25	13.17	13.25	13.50	9.47	91.00	1.50
June ..	13.75	12.57	12.70	13.42	14.25	13.08	13.25	13.50	9.50	100.00	1.50
July ..	13.98	12.87	12.72	13.83	14.28	12.83	13.20	13.50	9.61	100.00	1.67
Aug. ..	15.12	13.98	13.71	14.83	14.91	13.83	14.08	13.88	10.77	100.00	1.54
Sept. .	15.93	14.80	14.50	16.70	15.91	15.43	15.04	14.30	11.22	107.50	1.66
Oct. ..	16.00	15.00	14.58	17.25	16.25	15.75	15.25	15.08	11.71	105.00	2.18
Nov. ..	16.67	15.88	15.82	17.40	16.95	16.73	16.47	17.50	13.14	100.00	2.33
Dec. ..	19.19	17.73	17.98	18.01	18.81	18.02	18.13	18.48	14.00	105.00	2.83
Year .	14.90	13.78	13.81	14.88	15.25	14.23	14.31	14.47	10.59	91.71	1.79
1916											
Jan. ..	21.00	18.00	18.50	19.24	19.71	18.25	18.80	19.00	14.92	115.40	3.14
Feb. ..	20.50	17.88	18.50	19.50	19.75	18.25	18.80	19.00	14.64	139.00	3.41
Mar. ..	20.67	18.48	18.50	19.60	19.77	18.77	18.86	19.24	15.00	175.00	3.45
April .	21.00	18.48	18.50	20.50	20.20	19.25	19.00	19.50	15.00	175.00	2.45
May ..	21.00	18.21	18.44	20.50	20.25	19.15	19.08	19.50	15.00	175.00	2.34
June ..	21.00	18.25	18.39	19.90	20.04	18.75	19.30	19.50	14.63	175.00	2.54
July ..	21.00	18.00	18.25	19.15	19.75	18.75	18.80	19.50	14.00	175.00	2.63
Aug. ..	21.00	18.00	18.27	19.00	19.58	18.75	18.57	19.17	14.00	175.00	2.75
Sept. .	21.32	18.27	18.58	19.50	19.50	19.04	18.67	18.75	14.38	165.00	2.94
Oct. ..	23.81	20.17	20.56	20.52	20.58	20.48	19.87	19.79	15.35	165.00	5.69
Nov. ..	29.40	24.80	25.60	24.68	25.00	27.31	24.58	25.70	19.72	165.00	5.73

* Contract price, f.o.b. Baltimore; x Prompt, f.o.b. Connellsville ovens.

rapidly approaching the condition of being sold out for the second half of 1917. Southern iron has lagged behind northern iron throughout the advance of the past few months, something unpreecedented. The really sharp advances in southern iron did not occur until some northern steel works, which ordinarily do not touch southern basic iron, were forced to seek iron in the south. It is quite clear that it is the demand for steel-making pig iron, not foundry iron, that has advanced this market, both north and south. In the case of valley iron the evidence was not on the surface, as for considerable periods foundry iron has been quotable higher than basic, but that was simply because the furnacemen saw the demand coming and changed from foundry to steel-making iron. By anticipating an extra demand for basic iron they produced a scarcity of foundry iron. It all comes out in the wash, however, as foundry, malleable and basic iron are all at the same level, and Bessemer iron is $5 a ton higher.

Lake Superior iron ore prices for the 1917 season were developed November 23d, at an advance of $1.50 per the 1916 schedule. A full tabular presentation of ore prices is given on another page.

On October 26th Connellsville furnace coke for spot shipment first sold at $8.00. By the middle of November the spot market was down to $6.00, but early in December $8.00 was again reached. Some interest is now manifested in furnace coke on contract for the first half at $4.00 to $4.50, the major portion of the first half coke having been covered some time ago at lower figures. There is even talk of contracting for the second half and some operators seem to have $5.00 in mind for that period.

Transportation.

Car shortages were serious in October and some regular blockades were expected for November, when usually there is decidedly inclement weath-

Finished Steel Prices.

(Averaged from daily quotations, f.o.b. Pittsburgh.)

						Grooved		Sheets				Comp.
1915	Shapes	Plates.	Bars.	Pipe.	Wire.	Wire Nails.	Steel Skelp.	Black.	Galv.	Blue Annld.	Tin plate.	Fin. steel.
January	1.10	1.10	1.10	81	1.34	1.54	1.13	1.80	2.80	1.30	3.10	1.4554
February ...	1.10	1.10	1.10	80⅜	1.38	1.58	1.13	1.80	3.09	1.30	3.10	1.4716
March	1.15	1.15	1.15	80	1.40	1.60	1.13	1.80	3.40	1.30	3.15	1.5098
April	1.20	1.20	1.20	80	1.37	1.57	1.13	1.80	3.40	1.33	3.20	1.5357
May	1.20	1.17	1.20	79	1.35	1.55	1.14	1.80	3.60	1.35	3.11	1.5381
June	1.20	1.15	1.20	79	1.35	1.55	1.15	1.75	4.80	1.33	3.10	1.5312
July	1.25	1.22	1.27	79	1.38	1.58	1.18	1.74	4.65	1.32	3.10	1.5692
August	1.30	1.26	1.30	79	1.38	1.61	1.25	1.85	4.40	1.37	3.10	1.6059
September .	1.33	1.33	1.35	79	1.54	1.69	1.28	1.91	3.68	1.51	3.10	1.6506
October	1.44	1.42	1.43	79	1.63	1.78	1.40	2.03	3.57	1.60	3.15	1.7264
November .	1.63	1.63	1.63	78	1.72	1.87	1.56	2.30	4.07	1.90	3.45	1.9089
December ..	1.75	1.75	1.75	78	1.88	2.03	1.70	2.53	4.75	2.26	3.60	2.0329
Year	1.30	1.20	1.31	79¼	1.48	1.69	1.27	1.85	4.40	1.49	3.10	1.6506
1916												
January	1.87	1.90	1.87	76¾	1.98	2.13	1.75	2.60	4.75	2.55	3.75	2.1410
February ...	2.06	2.16	2.06	75½	2.11	2.26	1.94	2.60	4.80	2.65	3.83	2.2988
March	2.36	2.53	2.36	73⅜	2.25	2.40	2.24	2.73	4.93	2.85	4.20	2.5579
April	2.50	2.75	2.50	71½	2.25	2.40	2.35	2.89	5.00	2.95	4.70	2.7166
May	2.50	2.83	2.50	70	2.45	2.50	2.35	290	5.00	3.00	5.46	2.8043
June	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.80	3.00	5.75	2.8300
July	2.50	2.90	2.50	70	2.45	2.50	2.35	2.90	4.40	2.90	6.00	2.8425
Aug.	2.54	2.94	2.56	70	2.53	2.58	2.35	2.90	4.20	2.90	5.54	2.8588
Sept.	2.60	3.00	2.60	69¼	2.55	260	2.35	2.91	4.20	2.90	5.75	2.9013
Oct.	2.63	3.07	2.62	69	2.59	2.64	2.40	3.23	4.50	3.15	5.77	2.9747
Nov.	2.86	3.33	2.76	68½	2.79	2.84	2.75	3.72	5.34	3.66	6.40	3.2036

Comparison of Metal Prices.

	Range for 1914		Range for 1915		Range for 1916		Closing,
	High.	Low.	High.	Low.	High.	Low.	Nov. 29, 1916.
Pig Iron.							
Bessemer, valley	14.25	13.75	21.00	13.60	33.00	20.00	33.00
Basic, valley	13.25	12.50	18.00	12.50	28.00	17.75	28.00
No. 2 foundry, valley	13.25	12.75	18.50	12.50	28.00	18.25	28.00
No. 2X fdy. Philadelphia.	15.00	14.20	19.50	14.00	28.75	19.50	28.75
No. 2 foundry, Cleveland	14.25	13.25	18.80	13.00	27.30	18.50	27.30
No. 2X foundry, Buffalo.	13.75	12.25	18.00	11.75	28.00	18.00	28.00
No. 2 foundry, Chicago	14.75	13.00	18.50	13.00	27.00	18.00	27.00
No. 2 South'n Birmingham	10.75	9.50	14.50	9.25	21.50	14.00	21.50
Scrap Iron and Steel.							
Melting Steel, Pittsburgh.	12.00	9.75	18.00	11.00	25.50	16.00	25.50
Heavy melt. steel, Chicago	11.00	8.00	15.25	8.75	22.50	14.50	22.50
No. 1 R. R. wrought, Pitts.	12.75	10.00	17.25	10.75	22.50	17.50	22.50
No. 1 cast, Pittsburgh	12.25	10.50	15.00	11.00	17.50	14.75	17.50
Heavy steel scrap, Phila.	11.25	9.00	16.25	9.50	23.50	14.75	23.50
Iron and Steel Products.							
Bessemer rails, mill	1.25	1.25	28.00	28.00	38.00	28.00	38.00
Iron bars, Pittsburgh	1.35	1.20	1.90	1.20	2.90	1.90	2.90
Iron bars, Philadelphia	1.27½	1.12½	2.06	1.12½	2.66	2.06	2.66
Steel bars, Pittsburgh	1.20	1.05	1.80	1.10	2.90	1.85	2.90
Tank plates, Pittsburgh	1.20	1.05	1.60	1.10	3.50	1.85	3.50
Structural shapes, Pitts.	1.25	1.05	1.80	1.10	3.00	1.85	3.00
Grooved steel skelp, Pitts.	1.20	1.12½	1.75	1.12½	2.85	1.75	2.85
Black sheets, Pittsburgh	1.95	1.80	2.60	1.70	4.00	2.60	4.00
Galv. sheets, Pittsburgh	3.00	2.75	5.00	2.65	5.00	4.15	5.00
Tin plate, Pittsburgh	3.75	3.10	3.60	3.10	7.00	3.75	7.00
Wire nails, Pittsburgh	1.60	1.50	2.10	1.50	3.00	2.10	3.00
Steel pipe, Pittsburgh	79½%	81%	79%	81%	68%	78%	68%
Connellsville Coke at ovens.							
Prompt furnace	2.00	1.60	3.50	1.50	8.00	2.50	7.75
Prompt foundry	2.50	2.00	3.75	2.00	10.00	3.25	9.50
Metals—New York.							
Straits Tin	65.00	28.50	57.00	32.00	56.00	37.50	45.00
Lake copper	15.50	11.30	23.00	13.00	34.00	23.00	33.75
Electrolytic copper	14.87½	11.10	23.00	12.80	34.75	23.00	34.62½
Casting copper	14.65	11.00	22.00	12.70	32.75	22.00	32.37½
Sheet copper	20.25	16.50	27.25	18.75	42.00	28.00	42.00
Lead (Trust price)	4.15	3.50	7.00	3.70	7.50	5.50	7.00
Spelter	6.20	4.75	27.25	5.70	21.17½	8.37½	13.23¾
Chinese & Jap. antimony.	18.00	5.30	40.00	13.00	45.00	10.50	14.50
Aluminum, 98-99%	21.50	17.37½	60.00	18.75	66.00	53.00	64.00
Silver	59¼	47⅝	56½	46¼	77¼	55⅞	74⅜
St. Louis.							
Lead	4.10	3.35	7.50	3.50	8.25	5.45	7.20
Spelter	6.00	4.60	27.00	5.55	21.00	8.20	13.06¼
Sheet zinc (f.o.b. smelter)	8.75	7.00	33.00	9.00	25.50	15.00	21.00
London.	£	£	£	£	£	£	£
Standard tin, prompts	188	132	190	148¼	205	163	189¼
Standard copper, prompts	66¾	49	86⅜	57⅛	151	84½	151
Lead	24	177/8	30¼	18¼	36⅜	27¾	30½
Spelter	33	21¼	110	28⅛	111	44	59½
Silver	27¼d	23¼d	27¼d	22 1/16d	37⅛d	26 11/16d	35 15/16d

Comparison of Security Prices.

	Range for 1914		Range for 1915		Range for 1916		Closing.
	High.	Low.	High.	Low.	High.	Low.	Nov. 29 1916.
Iron and Industrial Stocks.							
Allis-Chalmers Mfg.	14¼	6	49⅛	7¾	38	19	34½
Allis-Chalmers Mfg. pfd.	49	32½	85⅞	33	92	70½	90
American Can	35⅛	19¼	68½	25	68½	50¼	62
American Can pfd.	96	80	113½	89	115⅜	108⅛	114
American Car & Fdy.	53½	42¼	98	40	78	52	72½
American Locomotive	37¼	29¼	74¾	19	98¼	58	88⅞
American Smelt'g & Refining	71⅛	50¼	108⅞	56	123¾	88½	116⅞
American Steel Foundries	37½	27½	74½	24⅛	72½	44	66
American Zinc, Lead & Smelt'g	..	...	71	67¼	97⅞	29⅜	57½
Anaconda Copper	38¼	24¼	91⅝	49½	105⅜	77	98½
Baldwin Locomotive	52⅛	38½	154½	26⅝	118⅝	65⅜	77½
Bethlehem Steel	46⅝	29½	600	46¼	700	415	619
Bethlehem Steel pfd.	91⅜	68	184	91	168	126	155
Chino Copper	44	31⅝	57⅜	32¾	74	46⅛	68
Colo. Fuel & Iron Co.	34½	29½	66½	21¾	63¼	38⅛	56
Crucible Steel	...	...	109⅞	18¼	99½	52¾	83¾
Crucible Steel pfd.	...	...	112½	84	124½	108¼	124
Driggs-Seabury	...	...	...	...	119¾	69	73½
General Electric	150⅝	137½	185½	138	187¼	159	179
General Motors	99	37⅜	558	82	850	405	810
General Motors pfd.	95	70	136	90⅝	128½	108	120¾
Granby Consolidated	...	...	91	79¼	120	80	106
Great Northern Ore Prop	39¼	22½	54	25¼	50¾	33⅝	44½
Gulf States Steel	...	...	...	...	193	71	173½
International Harv. of N. J.	113½	82	114	90	126⅞	108½	125
International Harv. Corp.	112	82	85	55	87½	68⅛	84¾
Lackawanna Steel	40	26½	94¾	28	107	64	102⅞
National Enam. & Stamp.	14	9	36⅛	9½	36	19¾	32½
National Lead	52	40	70¾	44	74⅝	60½	97½
National Lead pfd.	109	105	115	104¾	117⅛	112	112⅞
N. Y. Air Brake	69	58	164¾	56½	186	118	179
Pressed Steel Car	46	26¾	78¼	25	88¼	42½	83½
Pressed Steel Car pfd.	104½	96⅝	106	86	108	98½	107⅜
Railway Steel Spring	34⅜	19¾	54	19	61¾	32	58⅞
Railway Steel Spring pfd.	101	88	102	86½	104¾	95¼	103¾
Ray Consolidated Copper	22½	15	27½	15¼	37	20	33
Republic Iron & Steel	27	18	57¼	19	93	42	87
Republic Iron & Steel pfd.	91¼	75	112⅝	72	117	106⅞	115⅛
Sloss-Sheffield	35	19½	66⅞	22	93¼	37	84
Sloss-Sheffield pfd.	92	85	102	85	103½	91½	102½
Tennessee Copper	36¾	24¾	70	29	66½	21⅛	24¼
Texas Company	149⅞	112	237	120	241½	177¼	207½
U. S. Cast Iron Pipe	13½	7¾	31⅞	8	28⅛	16⅜	25⅛
U. S. Cast Iron Pipe pfd.	49	30	55½	32½	67½	48½	65
U. S. Smelting & Refining	...	...	...	...	81½	62½	77
U. S. Smelting & Refining pfd.	...	...	...	...	53½	50	50¾
U. S. Steel Corporation	67¼	48	89½	38	129¾	79¾	127⅛
U. S. Steel Corporation pfd.	112¾	103¼	117	102	123	115	121⅞
Utah Copper	59⅜	45⅜	81¾	48½	130	74¾	121½
Virginia Iron, Coal & Coke	52	35	74	36	72¾	41	64
Westinghouse Elec & Mfg.	79½	64	74⅞	32	71⅝	52¾	62½

er. November weather was unusually favorable and the transportation situation is no worse. Serious difficulties are expected later, but one month th might have been bad has been safe passed through.

U. S. Steel Corporation's Operations.

Earnings and Unfilled Orders.

Earnings by Quarters.

Net earnings by quarters since 1911:

Quarter.	1916.	1915.	1914.
1st	$60,713,624	$12,457,809	$17,994,382
2nd	81,126,048	27,950,055	20,457,596
3rd	85,817,067	38,710,644	22,276,002
4th		51,277,504	10,935,635
Year	130,396,012	71,663,615	
	1913.	1912.	1911.
1st	$34,426,802	$17,826,973	$23,519,203
2nd	41,219,813	25,102,266	28,108,620
3rd	38,450,400	30,063,512	29,522,725
4th	23,084,330	35,181,922	23,155,018
Year ...	137,181,345	108,174,673	104,305,466

Unfilled Orders.

(At end of the Quarter.)

	First.	Second.	Third.	Fourth.
1904..	4,136,961	3,192,277	3,027,436	4,696,203
1905..	5,579,560	4,829,655	5,865,377	7,605,086
1906..	7,018,712	6,809,584	7,936,884	4,489,718
1907..	8,043,858	7,603,878	6,425,008	4,642,553
1908..	3,765,343	3,313,876	3,421,977	3,603,527
1909..	3,542,590	4,057,939	4,796,833	5,927,031
1910..	5,402,514	4,237,794	3,158,106	2,674,757
1911..	3,447,301	3,361,058	3,611,317	5,084,761
1912..	5,304,841	5,807,346	6,551,507	7,932,164
1913..	7,468,956	5,807,317	5,003,785	4,282,108
1914..	4,653,825	4,032,857	3,787,667	3,836,643
1915..	4,255,749	4,678,196	5,317,608	7,805,220
1916..	9,331,001	9,640,458	9,522,584	

Bookings and Shipments.

In this table, first two columns, perce ages of bookings and shipments to total pacity, our own estimates, while last colu is derived from official reports of "unfil tonnage" while third percentage column directly computed from this tonnage colun

1915—	Ship- ments. %	Book- ings. %	Dif- ference. %	Di feren Tons
January ..	44	81	+37	+411,9
February ..	57	66	+ 9	+ 96,8
March	67	60	— 7	— 89,6
April	71	63	— 8	— 93,8
May	76	85	+ 9	+102,3
June	79	113	+34	+413,3
July	83	104	+21	+250,3
August	91	89	— 2	— 20,0
September .	98	133	+35	+409,7
October ...	103	172	+69	+847,8
November .	102	186	+84	+1,024,0
December .	102	152	+50	+615,7
1916—				
January ...	102	112	+10	+116,3
February ..	102	157	+55	+646,3
March	104	164	+60	+762,0
April	104	146	+42	+498,2
May	104	82	—22	—297,3
June	104	82	—22	—297,3
July	90	86	— 4	— 46,8
September .	96	87	— 9	—137,7
October ...	106	145	+39	+492,0

Lake Superior Iron Ore.

Shipments of iron ore down the lakes have been as follows, in gross tons:

	1911.	1912.	1913.	1914.	1915.	1916.
April	331,645	204,042	866,386	269,686	503,832	1,658,41
May	3,684,819	5,919,074	7,284,212	3,852,063	5,012,359	8,449,58
June	4,819,996	7,567,555	7,974,444	5,502,367	6,005,591	9,507,57
July	5,221,373	7,600,233	8,204,416	5,784,514	7,204,021	9,750,15
August	5,548,311	7,760,248	7,677,601	5,869,477	8,081,117	9,850,14
September	5,231,069	7,287,230	7,258,413	5,438,049	7,863,146	9,600,78
October	4,769,965	7,010,219	6,526,103	4,242,392	7,146,873	9,116,19
November	2,523,253	4,072,674	3,270,958	1,068,682	4,445,129	*4,500,00
December		14,579	18,545	1,411	57,236	.....
Season Lake ..	32,130,411	47,435,777	49,070,478	32,021,987	46,318,804	*62,432,84

* Estimated.

Immigration Statistics.

Years mentioned refer to fiscal years ended June 30th. Aliens admitted include immigrant and non-immigrant, aliens departed include emigrant and non-emigrant.

Excess Arrivals Over Departures.

	Aliens.	Citizens.	Total.
1913	815,303	*61,098	754,205
1914	769,276	*82,211	687,065
1915	50,070	67,167	117,237
1916	125,941	11,197	137,138
July, 1915 ...	11,082	3,912	14,994
August	*14,324	*804	*15,128
September ..	*1,965	866	*1,099
October	4,877	662	5,539
November ..	3,292	*802	2,490
December ...	*570	*891	*1,461
January, 1916	7,303	*1,212	6,091
February	19,420	*1,826	17,594
March	23,791	4,198	27,989
April	26,143	4,471	30,614
May	24,708	2,021	26,729
June	22,184	65	22,249
July	18,244	3,634	21,878
August	21,413	304	21,717
September ..	29,310	1,443	30,753
October	28,339	*2,012	26,327
Four months .	97,306	3,369	100,675

October, 1916.

Immigrant aliens in	37,056
Non-immigrants in	7,006
Total aliens	44,062
Emigrant aliens out	7,153
Non-emigrant aliens out	8,570
Total aliens out	15,723
Citizens in	10,061
Citizens out	12,073
Excess citizens out	2,012
Change in population:	
Aliens	+28,339
Citizens	— 2,012
Net change	+26,327

* Excess of departures.

Our Foreign Trade.

Value of merchandise imports and exports, and favorable trade balance, calendar years.

	Imports.	Exports.	Balance.
1905	1,179,144,550	1,626,990,795	447,846,245
1906	1,320,501,572	1,798,243,434	477,741,862
1907	1,423,169,820	1,923,426,205	500,256,385
1908	1,116,374,087	1,752,835,447	636,461,360
1909	1,475,520,724	1,728,198,645	252,677,921
1910	1,562,904,151	1,866,258,904	303,354,753
1911	1,532,359,160	2,092,526,746	560,167,586
1912	*1,818,133,355	2,399,217,993	581,084,638
1913	1,792,596,480	2,484,018,292	691,421,812
1914	1,789,276,001	2,113,624,050	324,348,049
1915	1,778,596,695	*3,547,480,372	*1,768,883,677
1914—			
Jan.	154,742,923	204,066,603	49,323,680
Feb.	148,044,776	173,920,145	25,875,369
Mar.	182,555,304	187,499,234	4,943,930
Apr.	173,762,114	162,552,570	†11,209,544
May	164,281,515	161,732,619	†2,548,896
June	157,529,450	157,072,044	†457,406
July	150,677,291	154,138,947	†5,538,344
Aug.	129,767,890	110,367,494	†19,400,396
Sept.	139,710,611	156,052,333	16,341,722
Oct.	137,978,778	195,283,852	57,305,074
Nov.	126,467,062	205,878,333	79,411,271
Dec.	114,656,545	245,632,558	130,976,013
1915—			
Jan.	122,148,317	267,879,313	145,730,996
Feb.	125,123,391	298,727,757	173,604,366
Mar.	158,022,016	296,501,852	138,479,836
Apr.	160,576,106	294,745,913	134,169,807
May	142,284,851	273,769,093	131,484,242
June	157,695,140	268,547,416	110,852,276
July	143,099,620	267,978,990	124,879,370
Aug.	141,830,202	261,025,230	119,195,028
Sept.	151,236,026	300,676,822	149,440,796
Oct.	148,529,620	334,638,578	186,108,958
Nov.	164,319,169	331,144,527	166,825,358
Dec.	171,832,505	359,306,492	187,473,987
1916—			
Jan.	184,362,117	330,784,847	146,422,730
Feb.	193,935,117	402,991,118	209,056,001
Mar.	213,589,785	409,850,425	196,260,640
Apr.	217,705,397	399,861,157	182,155,760
May	229,188,957	474,881,255	245,692,298
June	*245,795,438	464,784,318	218,988,880
July	182,722,938	445,472,000	262,749,062
Aug.	199,247,391	509,778,680	310,531,289
Sept.	164,038,614	*515,007,408	*350,968,794
Oct.	176,423,897	490,613,280	314,189,383

* High record.

† Balance unfavorable.

Price Changes of Iron and Steel Products From September 15, 1915 to Date.

Price changes in merchant bars, structural shapes, plates, wire nails, merchant pi sheets and tin plates are given below, with dates. These are the commodities used compiling our composite finished steel. In some cases the dates named are those up which prominent producers announced price changes, but more frequently the rat are merely those upon which our quotations were changed. A few other pri changes are included.

1915—			
Sept. 15	Shapes	1.30	to 1.35
" 20	Wire nails	1.65	to 1.75
" 28	Sheets	1.90	to 1.95
" 29	Shapes	1.35	to 1.40
Oct. 1	Boiler tubes	72%	to 71%
" 6	Bars	1.35	to 1.40
" 6	Sheets	1.95	to 2.00
" 7	Blue ann. sheets	1.55	to 1.60
" 15	Bars	1.40	to 1.45
" 15	Plates	1.40	to 1.45
" 15	Shapes	1.40	to 1.45
" 15	Galvanized sheets	3.60	to 3.50
" 19	Black sheets	2.00	to 2.10
" 21	Wire nails	1.75	to 1.85
" 25	Blue ann. sheets	1.60	to 1.65
" 26	Bars	1.45	to 1.50
" 26	Plates	1.45	to 1.50
" 26	Shapes	1.45	to 1.50
" 28	Blue ann. sheets	1.65	to 1.70
" 29	Boiler tubes	71%	to 69%
Nov. 1	Steel pipe	79%	to 78%
" 1	Galvanized sheets	3.50	to 3.60
" 4	Black sheets	2.10	to 2.20
" 4	Galvanized sheets	3.60	to 3.70
" 4	Bars	1.50	to 1.60
" 12	Tin plate	3.30	to 3.60
" 12	Sheets	2.20	to 2.25
" 15	Sheets	2.25	to 2.40
" 15	Galvanized sheets	3.80	to 4.00
" 15	Blue ann. sheets	1.80	to 2.00
" 16	Wire nails	1.85	to 1.90
" 18	Bars	1.60	to 1.70
" 18	Plates	1.60	to 1.70
" 18	Shapes	1.60	to 1.70
" 18	Galvanized sheets	4.00	to 4.25
" 24	Galvanized sheets	4.25	to 4.50
" 30	Sheets	2.40	to 2.50
" 30	Galvanized sheets	4.50	to 4.75
" 30	Blue ann. sheets	2.00	to 2.25
Dec. 1	Wire nails	1.90	to 2.00
" 1	Boiler tubes	69%	to 68%
" 15	Bars	1.70	to 1.80
" 15	Plates	1.70	to 1.80
" 15	Shapes	1.70	to 1.80
" 21	Wire nails	2.00	to 2.10

1915—			
Dec. 22	Sheets	2.50	to 2.6
Jan. 3	Tin plate	3.60	to 3.7
" 3	Blue ann. sheets	2.25	to 2.3
" 4	Bars	1.80	to 1.8
" 4	Plates	1.80	to 1.8
" 4	Shapes	1.80	to 1.8
" 4	Pipe (with extra 2½%	78%	to 7
" 5	Blue ann. sheets	2.35	to 2.4
" 7	Boiler tubes	68%	to 6
" 12	Blue ann. sheets	2.40	to 2.5
" 14	Boiler tubes	66%	to 6
" 19	Blue ann. sheets	2.50	to 2.6
" 21	Bars	1.85	to 1.9
" 21	Plates	1.85	to 2.0
" 21	Shapes	1.85	to 1.9
" 21	Pipe	77%	to 7
" 24	Wire nails	2.10	to 2.2
Feb. 7	Bars	1.90	to 2.0
" 7	Plates	2.00	to 2.1
" 7	Shapes	1.90	to 2.0
" 14	Wire nails	2.20	to 2.3
" 15	Pipe	76%	to 7
" 21	Bars	2.00	to 2.2
" 21	Plates	2.10	to 2.3
" 21	Shapes	2.00	to 2.2
" 21	Tin plate	3.75	to 4.0
" 29	Pipe	75%	to 7
" 29	Boiler tubes	64%	to 6
Mar. 1	Wire nails	2.30	to 2.4
" 8	Black sheets	2.60	to 2.7
" 8	Blue ann. sheets	2.65	to 2.9
" 13	Bars	2.25	to 2.3
" 13	Plates	2.35	to 2.6
" 13	Shapes	2.25	to 2.3
" 15	Steel pipe	74%	to 7
" 15	Boiler tubes	63%	to 6
" 23	Bars	2.35	to 2.5
" 23	Shapes	2.35	to 2.5
" 28	Plates	2.60	to 2.7
" 29	Sheets	2.75	to 2.8
" 29	Steel pipe	73%	to 7
" 29	Boiler tubes	61%	to 6
April 5	Sheets	2.85	to 2.9
" 15	Boiler tubes	60%	to 5
" 19	Tin plate	4.50	to 5.0

April	24	Pipe	72% to 70%
May	1	Wire nails	2.40 to 2.50
"	3	Tin plates	5.00 to 5.50
"	16	Plates	2.75 to 2.90
June	7	Galv. sheets	5.00 to 4.75
"	16	Tin plate	5.50 to 6.00
July	7	Blue ann. sheets	3.00 to 2.90
"	7	Galv. sheets	4.75 to 4.50
Aug.	1	Tin plate	6.00 to 5.50
"	7	Wire nails	2.50 to 2.60
"	15	Bars	2.50 to 2.60
"	18	Shapes	2.50 to 2.60
"	18	Plates	2.90 to 3.00
"	25	Galv. sheets	4.25 to 4.15
Sept.	7	Pipe	70% to 69%
"	7	Boiler tubes	56% to 54%
"	20	Galv. sheets	4.15 to 4.25
"	28	Sheets	2.90 to 3.00
Oct.	3	Blue ann. sheets	2.90 to 3.00
"	3	Galv. sheets	4.25 to 4.30
"	6	Sheets	3.00 to 3.10
"	7	Tin plate	5.50 to 6.00
"	13	Sheets	3.10 to 3.25
"	13	Galv. sheets	4.30 to 4.40
"	13	Tin plate	6.00 to 5.75
"	16	Galv. sheets	4.40 to 4.50
"	19	Wire nails	2.60 to 2.70
"	20	Sheets	3.25 to 3.35
"	20	Blue ann. sheets	3.00 to 3.15
"	24	Plates	3.00 to 3.25
"	25	Bars	2.60 to 2.70
"	25	Shapes	2.60 to 2.70
"	25	Grooved skelp	2.35 to 2.50
"	26	Sheets	3.35 to 3.40
"	26	Galv. sheets	4.50 to 4.75
"	27	Blue ann. sheets	3.15 to 3.30
"	30	Tin plate	5.75 to 6.00
"	31	Shapes	2.70 to 2.80
Nov.	1	Boiler tubes	54% to 52%
"	6	Wire nails	2.70 to 2.85
"	8	Sheets	3.40 to 3.65
"	15	Tin plate	6.00 to 6.25
"	15	Grooved skelp	2.50 to 2.60
"	15	Pipe	69% to 68%
"	18	Galv. sheets	5.00 to 5.50
"	20	Tin plate	6.25 to 7.00
"	20	Sheets	3.65 to 4.00
"	21	Bars	2.70 to 2.90
"	21	Plates	3.25 to 3.50
"	21	Shapes	2.80 to 3.00
"	21	Blue ann. sheets	3.30 to 3.40
"	21	Boiler tubes	52% to 46%
"	25	Grooved skelp	2.60 to 2.85
"	27	Blue ann. sheets	3.40 to 3.50
"	27	Galv. sheets	5.50 to 5.75
"	27	Wire nails	2.85 to 3.00
Dec.	4	Pipe	68% to 66%
"	4	Sheets	4.00 to 4.25

Steel Making Pig Iron Averages.

Bessemer and basic pig iron averages, compiled by W. P. Snyder & Company from sales in the valley market of 1,000 tons and over.

	Bessemer.		Basic.	
Jan. ..	$13.6375	$20.645	$12.50	$17.833
Feb. ..	13.60	20.2136	12.50	17.984
Mar. ..	13.60	20.8625	12.50	18.25
April .	13.60	20.70	12.50	18.00
May ..	13.659	20.833	12.65	18.1607
June ..	13.75	21.00	12.724	18.00
July ..	13.991	21.00	12.959	18.00
Aug. ..	15.064	21.00	14.364	18.00
Sept. ..	15.906	21.9346	15.00	18.63
Oct. ..	16.00	23.6576	15.0147	20.3086
Nov. ..	16.615	29.12	15.518	27.229
Dec. ..	19.021		17.487	
Year ..	14.870		13.810	

Above prices are f. o. b. valley furnace; delivered Pittsburgh is 95 cents higher.

British Iron And Steel Exports.

	Pig Iron.	Rails.	Tin Plate.	Total.*
1912 ..	1,262,383	407,175	481,123	4,933,112
1913 ..	1,124,181	500,117	494,497	5,049,090
1914 ..	780,763	433,507	435,392	3,972,348
1915 ..	611,617	242,289	368,602	3,250,299
1915—				
Mar. ..	20,172	17,572	36,170	239,341
April ..	35,209	21,602	40,135	265,244
May ..	29,342	21,776	33,727	267,524
June ..	39,127	23,728	33,986	272,195
July ..	78,370	33,224	39,528	351,984
Aug. ..	73,283	32,962	22,572	295,260
Sept. ..	53,068	15,800	20,002	249,501
Oct. ..	78,973	13,640	31,968	312,141
Nov. ..	86,109	12,760	25,556	308,219
Dec. ..	74,892	9,937	30,641	259,782
Year ..	611,617	242,289	368,602	3,250,299
1916—				
Jan. ..	78,271	3,151	26,271	292,203
Feb. ..	84,351	3,905	27,289	283,250
Mar. ..	87,283	3,366	39,482	307,488
April ..	82,976	10,510	23,337	293,897
May ..	97,967	4,103	41,868	395,750
June ...	77,487	3,243	30,351	310,595
July ...	69,999	3,485	38,174	298,929
Aug. ..	95,655	1,983	34,124	319,928
Sept. ..	72,683	2,712	19,226	231,335
Oct. ..	72,187	6,929	10,929	241,261
10 mos..	818,868	43,387	291,051	2,974,666

* Includes scrap, pig iron, rolled iron and steel, cast and wrought iron manufactures, bolts, nuts, etc., but not finished machinery, boilers, tools, etc.

Composite Steel.

Computation for December 1, 1916:

Pounds.	Group.	Price	Extension.
2½	Bars	2.90	7.250
1½	Plates	3.50	5.250
1½	Shapes	3.00	4.500
1½	Pipe (¾-3)	3.15	4.725
1½	Wire nails	3.00	4.500
1	Sheets (28 bl.)	4.00	4.000
½	Tin plates	7.00	3.500
10 pounds			33.725
One pound			3.3725

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	1.5123	1.7737	1.5394	1.4554	2.1410
Feb.	1.4878	1.7625	1.5794	1.4716	2.2988
Mar.	1.4790	1.7646	1.5638	1.5098	2.5579
April	1.5206	1.7742	1.5337	1.5357	2.7165
May	1.5590	1.7786	1.5078	1.5381	2.8043
June	1.5794	1.7719	1.4750	1.5312	2.8300
July	1.6188	1.7600	1.4805	1.5692	2.8425
Aug.	1.6784	1.7400	1.5241	1.6059	2.8588
Sept.	1.7086	1.7093	1.5632	1.6506	2.9013
Oct.	1.7588	1.6779	1.5236	1.7264	2.9747
Nov.	1.7750	1.6203	1.4769	1.9089	3.2036
Dec.	1.7789	1.558	1.4324	2.0329	.....
Year	1.6214	1.7241	1.5182	1.6280	.....

Scrap Iron and Steel Prices.

	Melting Steel. Pitts.	Bundled Sheet Pitts.	No. 1 R. Wrought Pitts.	R. No. 1 Cast. Pitts.	No. 1 Steel. Phila.	Heavy Melt'g. Ch'go.
1915—						
Jan.	11.40	9.20	10.75	11.25	10.30	9.00
Feb.	11.70	9.25	10.75	11.25	10.70	9.20
Mar.	11.80	9.37	10.75	11.50	10.85	9.25
Apr.	11.65	9.37	10.75	11.85	11.10	9.13
May	11.65	9.37	10.75	11.85	11.25	9.50
June	11.75	9.37	10.75	11.85	11.25	9.75
July	12.62	9.60	11.00	12.00	11.85	10.90
Aug.	14.05	11.40	12.25	12.85	13.70	11.85
Sep.	14.25	11.90	13.15	13.10	14.70	12.15
Oct.	14.50	12.00	13.75	13.35	14.50	12.00
Nov.	16.12	12.55	15.35	13.90	14.65	13.95
Dec.	17.65	13.15	17.10	14.95	15.60	15.25
Year	13.25	10.54	12.26	12.40	12.54	10.90
1916—						
Jan.	17.75	13.40	18.00	15.10	16.30	15.60
Feb.	17.20	13.60	18.75	15.35	16.25	15.75
Mar.	18.40	14.80	19.15	15.75	17.15	16.75
Apr.	18.00	14.75	19.25	16.00	18.00	16.75
May	17.00	13.65	19.65	16.10	17.00	15.90
June	16.25	13.00	19.00	15.40	15.45	14.80
July	16.70	12.50	18.80	15.30	15.00	14.30
Aug.	16.25	11.70	18.15	15.00	15.00	15.30
Sep.	16.61	11.65	18.35	15.00	15.00	16.00
Oct.	18.25	11.65	19.30	15.80	15.65	17.35
Nov.	22.50	13.75	21.25	17.75	18.25	21.00

Composite Pig Iron.

Computation for December 1, 1916:

One ton Bessemer, valley	$33.00
Two tons basic, valley (28.00)	56.00
One ton No. 2 foundry, valley	28.00
One ton No. 2 foundry, Philadelphia	28.75
One ton No. 2 foundry, Buffalo	28.25
One ton No. 2 foundry, Cleveland ..	27.30
One ton No. 2 foundry, Chicago ...	27.50
Two tons No. 2 Southern, Foundry Cincinnati (24.40)	48.80
Total, ten tons	277.60
One ton	27.760

Averaged from daily quotations:

	1912.	1913.	1914.	1915.	1916.
Jan.	13.240	17.391	13.492	13.070	18.690
Feb.	13.427	17.140	13.721	13.079	18.564
Mar.	13.581	16.775	13.843	12.971	18.857
April	13.779	16.363	13.850	12.914	19.021
May	13.917	15.682	13.808	13.206	18.965
June	14.005	14.968	13.606	13.047	18.553
July	14.288	14.578	13.520	13.125	18.585
Aug.	14.669	14.565	13.516	14.082	18.514
Sept.	15.386	14.692	13.503	14.895	18.697
Oct.	16.706	14.737	13.267	15.213	20.192
Nov.	17.226	14.282	13.047	16.398	25.243
Dec.	17.475	13.838	13.073	17.987	.....
Year	14.823	15.418	13.520	14.150	.....

Unfinished Steel and Iron Bars.

(Averaged from daily quotations.)

	Billets. Pitts.	Sheet Bars. Pitts.	Rods. Pitts.	—Iron bars, deliv.— Phila.	Pitts.	Ch'go.
1915—						
Mar.	19.30	19.80	25.00	1.13	1.20	1.10
Apr.	19.50	20.00	25.00	1.18	1.20	1.14
May	19.50	20.00	25.00	1.18	1.20	1.15
June	20.00†	20.50†	25.00	1.20	1.20	1.17
July	21.40†	21.90†	25.75	1.32	1.20	1.20
Aug.	23.50†	24.00†	27.00	1.43	1.25	1.22
Sep.	26.50†	26.00†	29.75	1.49	1.35	1.30
Oct.	26.00†	26.00†	31.50	1.57	1.45	1.38
Nov.	26.20†	26.50†	36.00	1.72	1.54	1.51
Dec.	30.73†	30.73†	39.50	1.99	1.83	1.69
Year	13.26	10.54	12.26	12.40	12.54	10.90
1916—						
Jan.	32.50†	32.50†	42.00	2.24	2.02	1.79
Feb.	34.00†	34.00†	48.00	2.41	2.25	1.92
Mar.	41.00†	41.00†	56.00	2.56	2.40	2.17
Apr.	45.00	45.00	60.00	2.62	2.50	2.35
May	43.00	43.00	59.00	2.66	2.60	2.35
June	42.00†	42.00†	58.00	2.66	2.60	2.35
July	42.50†	42.50†	58.00	2.66	2.60	2.35
Aug.	46.00	46.00	58.00	2.66	2.60	2.35
Sep.	47.00	45.00	58.00	2.66	2.70	2.35
Oct.	48.00	48.00	59.00	2.66	2.75	2.35
Nov.	52.75	54.00	65.00	2.66	2.85	2.50

† Premium for open-hearth.

Iron and Steel Imports and Exports.

Value of Tonnage and Non-Tonnage.

	1911.	1912.	1913.	1914.	1915.	1916.
January	$18,738,391	$18,451,914	$25,141,409	$16,706,836	$18,053,421	$51,643,807
February	18,690,792	21,801,570	24,089,871	16,520,260	16,470,751	54,155,386
March	22,591,991	24,474,799	27,221,210	20,551,137	20,985,505	58,300,297
April	24,916,912	26,789,853	27,123,044	20,639,569	25,302,649	58,722,411
May	20,616,795	28,050,247	26,718,970	19,734,045	26,536,612	72,918,913
June	20,310,053	24,795,802	25,228,346	18,927,958	31,730,132	76,257,884
July	17,454,772	24,917,952	24,170,704	16,737,552	35,892,106	70,745,162
August	20,013,557	25,450,107	23,947,440	10,428,817	37,726,657	86,296,703
September ...	19,875,308	23,286,040	22,831,082	12,531,102	38,522,175	90,895,592
October	20,220,833	25,271,559	25,193,887	16,455,832	43,602,741	.....
November ...	20,823,061	26,406,425	20,142,141	15,689,401	48,056,220	.....
December ...	22,186,996	23,750,864	22,115,701	14,939,613	45,825,277	.....
Totals ...	$249,656,411	$289,128,420	$293,934,160	$199,861,684	$388,703,720	$619,853,667

Exports of Tonnage Lines,---Gross Tons.

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.
January	70,109	118,681,	152,262	151,575	249,493	118,770	140,550	357,122
February	84,837	110,224	150,919	204,969	241,888	121,206	139,946	368,867
March	94,519	124,980	216,360	218,219	257,519	159,998	174,104	438,058
April	100,911	117,921	228,149	267,313	259,689	161,952	223,587	384,924
May	109,808	135,306	178,589	307,656	242,353	139,107	263,113	540,549
June	114,724	120,601	174,247	273,188	243,108	144,539	356,431	526,772
July	100,850	127,578	162,855	272,778	237,159	114,790	380,336	503,685
August	105,690	131,391	177,902	282,645	209,856	86,599	405,952	597,750
September	97,641	119,155	181,150	248,613	213,057	96,476	382,118	643,767
October	110,821	129,828	186,457	251,411	220,550	147,293	350,955	.....
November	116,105	155,138	187,554	233,342	175,961	140,731	362,766	.....
December	137,806	150,102	190,854	235,959	181,715	117,827	353,840	.....
Totals	1,243,567	1,540,895	2,187,724	2,948,466	2,730,681	1,549,543	3,532,432	4,361,494

Iron Ore Imports.

	1913.	1914.	1915.	1916.
Jan. ..	175,463	101,804	75,286	89,844
Feb. ..	188,734	112,574	78,773	93,315
Mar. .	164,865	68,549	88,402	93,383
April.	174,162	111,812	91,561	75,712
May .	191,860	125,659	98,974	148,599
June .	241,069	188,647	118,575	134.154
July .	272,017	141,838	119,468	156,755
Aug. .	213,139	134,913	126,806	127,094
Sept. .	295,424	109,176	173,253	452,876
Oct. ..	274,418	114,341	138,318	.....
Nov. .	179,727	90,222	113,544	.....
Dec. .	223,892	51,053	118,321	.....
Totals	2,594,770	1,350,588	1,341,281	1,029,603

Iron and Steel Imports.

	1912.	1913.	1914.	1915.	1916.
Jan. .	20,008	21,740	17,776	10,568	15,824
Feb. .	11,622	25,505	14,757	7,506	20,280
Mar. .	15,466	27,467	27,829	8,025	15,162
April.	12,481	25,742	30,585	16,565	20,175
May .	15,949	28,728	28,173	28,916	32,113
June .	21,407	36,597	23,076	32,200	26,886
July .	17,882	36,694	25,282	20,858	14,774
Aug. .	20,571	18,740	28,768	27,557	32,257
Sept..	18,740	19,941	38,420	23,344	25,558
Oct. .	25,559	20,840	22,754	34,319	.....
Nov. .	24,154	25,809	24,165	37,131	.....
Dec. .	21,231	26,454	9,493	35,455	.....
Total	225,072	317,260	289,778	282,443	203,029

Stop, Look and Listen!

Everyone will recall, when reminded of the matter, the interview given to the press early last January by Chairman Gary of the Steel Corporation. Few will think of it without being reminded. It is a duty we owe ourselves to consider from time to time this tremendous inflation and where it is likely to land us some day. Judge Gary's interview was misunderstood at the time in many quarters. There was an exclamation "Why what's the matter?" and when nothing happened everyone went on at a fiercer pace than ever. Judge Gary was warning people about the end of the war, not about something that was going to occur in a few weeks or months. His words are truer than ever now, because we have had a great deal more of the expansion he observed had occurred and the inflation which he "feared" is now rampant. He counseled us to "stop, look and listen." Perhaps we cannot stop now, having no time, but we can look and we cannot help listening for the facts cry out. We no longer need to be advised to listen, at any rate. We cannot stop our ears.

That interview, as related to the steel industry, was precisely timed by the chairman of the great steel corporation, once a dominant factor, but now with not even a voice, for the buyers have been making the market and no seller is justified in committing suicide by refusing to accept higher prices offered for his wares. The time was January 6th, and according to our statistics, often quoted since, it was at the beginning of January that the average level of finished steel prices crossed the top point that had been reached in 1907. Prices since then have been war inflation prices, and the amount to-day is $24 a net ton, disregarding the premium prices paid for deliveries.

Of course everyone realizes that there will be a complete readjustment once peace abroad becomes assured, but there is a disposition to "let it go at that." Judge Gary did not think the war would last much longer, while it has already lasted longer than he expected, but the longer it lasted the worse, he felt, would be the condition thereafter. The common view seems to be that the news will come suddenly and then everybody will readjust, but those who are expecting a trumpet to call to everybody to readjust may find that there were some who anticipated and that the trumpet sounded not at the first moment but at the last.

Tin Plate Movement.

United States imports and exports of tin plate in gross tons have been as follows, the imports of course including those for drawback purposes:

	Imports.	Exports.
1906	56,983	12,082
1907	57,773	10,293
1908	58,490	11,878
1909	62,592	9,327
1910	66,640	12,459
1911	14,098	61,466
1912	2,053	81,694
1913	20,680	57,812
1914	15,411	59,549
1915	2,350	154,541
January, 1915	1,608	7,014
February	265	5,834
March	53	10,500
April	44	9,084
May	24	7,218
June	75	7,582
July	71	13,895
August	50	21,939
September	31	22,271
October	15	16,922
November	54	15,538
December	62	16,792
January, 1916	62	12,178
February	107	13,534
March	44	20,364
April	179	21,385
May	39	25,585
June	91	29,751
July	150	18,760
August	105	18,757
September	51	18,770

Copper in November.

Market Very Strong and Active With Violent Advances Here and Abroad—Prices Here Up 5c to 6c per Pound, Electrolytic in London Up £26 10s, Spot Standard Up £26, Futures £22 10s.

Copper prices in November advanced violently at home and abroad. The rise at New York was 5c to 6c per pound. The foreign trade centers followed dutifully in the wake of the American market. At London the rise was £26 10s on Electrolytic, £26 on spot and £22 10s on future Standard. The advance abroad was steady and continuous, the only ephemeral reaction being on Standard, November 28th, followed by an immediate advance on November 29th to the highest level ever reached. At home the prices prvailing at the close of the month established a new maximum record for Electrolytic, while Lake sold at the highest price since 1872 when sales were made at 44c. Prior to that time to-day's prices were exceeded only in 1866, 1865 and 1864. In the latter year Lake metal sold at 55c, the highest price ever recorded.

November Sales Next to Largest on Record.

November sales of refined metal were startlingly heavy—600,000,000 pounds—being next to those of last September, the largest for a single month in trade history. The September transactions, amounting to 650,000,000 pounds, included 448,000,000 pounds in one block for the Entente Allied Governments, whereas the November contracts were placed mainly by domestic consumers. Some substantial export business was done on account of France, Italy and Russia, however, last month, and it was the large French Government inquiry, for 100,000 tons of Electrolytic—still unsatisfied—that awakened home buyers to the necessity for prompt and energetic action.

Buying was most vigorous about the middle of the month when in one week 300,000,000 pounds were sold, amid feverish excitement, while prices advanced sharply after the closing of each important contract, causing consternation among buyers and leading to the exercise of more conservatism in the following two weeks, when sales did not aggregate over 100,000,000 pounds. The reduced buying, however, was largely due to the sold-up capacity of the refineries; it being estimated, at the close of the month, that 90% of the prospective output for the first half of 1917, and 60% of the entire output for 1917, had been sold. This statement is based upon sales of 1,450,000,000 pounds in the last three months. It becomes equally evident that only 30% of the prospective production during the second half of 1917 has been sold. The fact that consumers have placed liberal orders for delivery in the third and fourth quarters of next year, however, in itself is a phenomenal development and expresses the strenuosity due to war conditions.

Consumers Forced to Pay Premium Prices for Near Deliveries.

Although large producers reported this year's capacity entirely sold, needy consumers came into the market at the eleventh hour for November and December shipments and were forced to pay 34.75c to 35c per pound to those who had the metal to sell. Melters also found it difficult to place orders for shipment during the first quarter of next year and prices for this position advanced to 33.50c to 34c per pound in the closing week of the month. The main buying was for shipment during the second quarter, at 32.50c to 33.50c, or for shipment in the second and third quarters combined, at 32c to 33c per pound. A few contracts for fourth quarter delivery were consummated at 31c to 32c and at the close of the month producers were asking 31.50c to 32c for this position.

Strength is a predominant feature of the market to-day, although there is less buying, because of the large unsatisfied foreign inquiries and the heavy prospective needs of domestic consumers for melting in the second half of next year. For a few days in the last

Lake Copper Prices.

Monthly average prices of Lake Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.37½	16.89	14.76	13.89	24.10
Feb.	14.38½	15.37½	14.98	14.72½	27.44
Mar.	14.87	14.96	14.72	15.11	27.42
Apr.	15.98	15.55	14.68	17.43	28.91½
May	16.27	15.73	14.44	18.81	29.28½
June	17.43	15.08	14.15	19.92	27.44
July	17.37	14.77	13.73	19.42	25.81
Aug.	17.61	15.79	12.68	17.47	26.58
Sept.	17.69	16.72	12.43½	17.76	27.86
Oct.	17.69	16.81	11.66	17.92½	28.37½
Nov.	17.66	15.90	11.93	18.86	31.71
Dec.	17.62½	14.82	13.16	20.37½	.....
Av. .	16.58	15.70	13.61	17.64	.....

Electrolytic Copper Prices.

Monthly average prices of Electrolytic Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.27	16.75½	14.45	13.71	24.10
Feb.	14.26	15.27	14.67	14.57	27.46
Mar.	14.78	14.92½	14.33½	14.96	27.44
Apr.	15.85	15.48	14.34	17.09	29.31
May	16.16	15.63	14.13	18.60	29.81
June	17.29	14.85	13.81	19.71	27.49½
July	17.35	14.57	13.49	19.08	25.60
Aug.	17.60	15.68	12.41½	17.22	27.36½
Sept.	17.67	16.55	12.08½	17.70½	28.26
Oct.	17.60	16.54	11.40	17.86	28.64
Nov.	17.49	15.47	11.74	18.83	32.22½
Dec.	17.50½	14.47	12.93	20.35	.....
Av. .	16.48	15.52	13.31½	17.47	.....

Casting Copper Prices.

Monthly average prices of Casting Copper in New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.02	16.57	14.27½	13.52	23.06½
Feb.	14.02	15.14	14.48	14.17	26.03
Mar.	14.53	14.76	14.18	14.34	25.90
Apr.	15.72½	15.33	14.18	16.48	27.16
May	16.01	15.45½	14.00	17.41	27.37
June	17.08	14.72	13.65	18.74½	25.10
July	17.09	14.40½	13.34½	17.76½	23.61
Aug.	17.35	15.50	12.27	16.46	24.67
Sept.	17.51	16.37½	12.00	16.75	25.93
Oct.	17.44	16.33	11.29	17.32	27.17
Nov.	17.34	15.19	11.63	18.41	30.37½
Dec.	17.34	14.22	12.83½	19.73	.....
Av. .	16.29	15.33	13.18	16.76	.....

Sheet Copper Price Changes.

The changes in the base price of sheet copper this year are given below, with the price of Lake copper on the same date.

1916—	Sheet Copper.	Lake Copper.
January 22	31.00	24.75
January 24	31.50	25.25
January 31	32.00	25.25
February 5	33.00	26.00
February 11	34.00	27.50
February 23	35.00	28.25
March 1	34.00	28.12½
March 25	34.50	27.37½
April 13	35.50	29.25
April 20	36.50	29.75
May 5	37.50	29.75
August 2	35.50	25.50
August 18	37.50	27.00
November 10	38.50	29.75
November 14	40.00	31.75
November 20	41.00	33.75
November 29	42.00	33.75

Waterbury Copper Averages.

	1912.	1913.	1914.	1915.	1916.
Jan.	14.50	17.00	14.75	14.12½	24.75
Feb.	14.50	15.50	15.12½	15.25	27.75
Mar.	15.00	15.12½	15.00	15.75	28.00
Apr.	16.00	15.75	14.87½	18.50	29.00
May	16.37½	15.87½	14.75	22.50	29.87½
June	17.50	15.37½	14.37½	22.50	28.25
July	17.75	14.75	14.12½	22.25	27.25
Aug.	17.75	15.62½	13.00	19.50	27.00
Sept.	17.87½	16.87½	12.87½	18.50	28.00
Oct.	17.75	16.87½	12.25	18.25	28.87½
Nov.	17.75	16.25	12.25	19.37½	33.25
Dec.	17.75	15.00	13.50	20.75	.....
Av. .	16.71	15.83	13.91	18.94	.....

Exports of Copper From the United States.

(In tons of 2,240 lbs.)

	1913.	1914.	1915.	1916.
January ..	25,026	36,018	26,193	23,663
February .	26,792	34,634	15,583	20,648
March ...	42,428	46,504	30,148	26,321
April	33,274	35,079	18,738	21,654
May	38,601	32,077	28,889	16,062
June	28,015	35,182	16,976	39,595
July	29,596	34,145	17,708	35,066
August ..	35,072	16,509	17,551	32,160
September	34,356	19,402	14,877	29,803
October ..	29,239	23,514	24,087	33,224
November	29,758	24,999	23,168	*21,433
December	30,653	22,166	42,426	.....
Totals ..	382,810	360,229	276,344	299,659

* Exports from Atlantic ports only.

week there was some hesitation in the market due to new-found caution among some producing and large selling interests and the belief that consumers had over-bought. In the last day or two this feeling seems to have been dissipated.

Exports Very Small.

One feature of interest was the falling off in November exports, 21,433 tons only, being the smallest foreign shipments since last May. Deliveries into domestic consumption also were less heavy, due to freight embargoes into New England and at Pittsburgh. Domestic deliveries probably did not exceed 112,000,000 pounds. Thus the total deliveries into home and foreign consumption were about 162,000,000 pounds. These are the smallest shipments into consumptive channels in five months. On the other hand there was some labor difficulty at refineries, and output, for this and other reasons, was probably cut down 5,000,000 pounds.

Copper In November.

	New York			London.		
	Lake.	Electro.	Casting.	Standard.		
Day.	Cents.	Cents.	Cents.	£	s	d
1	28.50	28.75	27.50	124	0	0
2	28.50	28.87½	27.50	124	0	0
3	28.50	29.00	27.62½	124	0	0
6	28.75	29.75	27.62½	124	0	0
7	.....	.....	.....	124	10	0
8	29.25	30.25	28.50	124	0	0
9	29.75	30.50	28.75	124	10	0
10	29.75	32.00	29.00	124	10	0
13	31.75	32.25	29.75	126	10	0
14	31.75	32.50	30.25	128	10	0
15	32.25	32.75	30.25	129	10	0
16	32.25	32.75	30.25	135	0	0
17	33.25	33.25	30.75	139	0	0
20	33.75	33.75	32.25	141	0	0
21	33.75	33.75	32.62½	144	0	0
22	33.75	33.75	32.62½	144	0	0
23	33.75	33.75	32.50	144	0	0
24	33.75	33.75	32.37½	144	10	0
27	33.75	34.00	32.37½	147	0	0
28	33.75	34.50	32.37½	145	0	0
29	33.75	34.62½	32.37½	150	0	0
30	.....	.....	.....	151	0	0
High ..	34.00	34.75	32.75	151	0	0
Low ..	28.37½	28.62½	27.37½	124	0	0
Av'ge.	31.71	32.22½	30.37½	134	13	2

The estimated output was about 185,000,000 pounds, exceeding shipments by 28,000,000 pounds, affording some relief to the previous scarcity of spot metal. Foreign shipments, however, probably will be renewed with greater vigor in December when more ships are available to carry copper to Europe.

Thus far this year the total exports of American copper have been 299,659 tons of which the Entente Allied countries have taken between 93 and 94%. Only relatively small lots have gone to Holland, to Scandinavia and to the Orient.

Emphasis should be placed upon the fact that the smaller exports in November were more virtual than real. Much heavier shipments were made from the works than could be accommodated on steamships and belated government returns will probably show larger exports from the South. The copper that has left the refineries consigned to European points is not available for use in this country and hence many millions of pounds already shipped will come to light in the December movement. Those in close touch with the situation believe that exports during the year will average at least 30,000 tons per month which would give a total of approximately 806,000,000 pounds outgo to foreign lands.

Quicksilver Prices.

Monthly average price of **Quicksilver** in New York (flasks of 75 pounds).

	1913.	1914.	1915.	1916.
Jan.	40.00	38.05	50.90	214.76
Feb.	40.00	38.00	58.05½	288.50
Mar.	39.50	38.00	62.93½	223.91
April ...	39.14	38.00	65.71½	140.10½
May	39.19	38.00	72.65	96.95
June	39.67	37.73	87.91	73.04½
July	39.00	35.87	93.33	80.95
Aug.	39.00	74.19½	91.79½	75.04
Sept. ...	39.00	73.57	89.09½	75.85
Oct.	38.59	50.59½	92.40	79.28½
Nov.	38.00	51.72	102.25	79.80
Dec.	38.50	51.61	126.52	.....
Average.	39.13	47.11	82.80	.....

Tin in November.

Markets, Both Foreign and Domestic, Strong Throughout the Month—Net Advance Here 3¼c on Near Delivery; 3 to 3⅛c on Futures—London and Singapore Market Up £9—Permit Situation Still a Source of Considerable Worry.

A strong tone prevailed for tin throughout November, the net result of the fluctuations in prices at home being an advance of 3¼c per pound on nearby positions and of 3c to 3.12½c per pound on future deliveries; that is, for arrivals here during the first five or six months of next year. The general tendency of the market was upward during the first three weeks with no important reactions. The advance culminated on the 22nd and 23rd instants, when spot and nearby tin scored a rise of 3.75c to 4c per pound, while future positions were 3c to 3.50c per pound higher than at the beginning of the month. Subsequently there was a fractional decline, the latter positions yielding only ⅛c to ¼c per pound while spot and early shipment prices declined ½c to ⅝c per pound.

The course of the foreign markets was very similar to the progress of events here; indeed, the strength of the metal was derived mainly from primary sources and the American market was largely a reflection of developments abroad. At London, both Straits and Standard tin advanced steadily from the 1st to the 23rd of the month. The few reactions that occurred within this time were slight, and confined to the third week. On the 23rd, spot Straits had advanced £11 5s while Standard had risen £11 5s on spot, and £12 on futures. The Singapore market during the same time was subject to more frequent and wider oscillations but the general tendency was strongly upward, the full advance being £12 15s.

All of the foreign centers, while still possessed of a strong undercurrent, receded from £1 10s to £2 10s during the last week of the month, the result for the month being a net advance of £9 on spot and £8 15s on future Standard and £8 15s on spot Straits tin at London, while the net rise at Singapore was £9 5s.

Permit Situation Still a Disturbing Factor.

At the beginning of the month the American trade was still plagued by delays in foreign cables and while there was a fair jobbing demand some cutting in prices was indulged to secure orders. Large consumers, apparently, were indifferent and the difficulty of securing permits for shipment from the English authorities narrowed the London market and caused higher prices to be asked for the smaller supplies available. A moderate business was done in nearby positions but domestic consumers were strangely complacent concerning March to June positions.

Tin Lost on "Glenlogan" Cause of Strength in London—Dullness Here Due to Election Uncertainty.

The stronger tone at London during the first week was attributed to the loss of several hundred tons of tin by the sinking of the steamer "Glenlogan" and the dulness here was due to the anxiety as to the outcome of the Presidential election. Foreign sellers of Straits tin made small effort to sell future positions, anticipating higher prices but there were frequent offers to sell future positions of Banca tin at ¾c per pound under the nominal market for Straits metal. The London view was that the needs of the trade were in excess of the supply available and sufficient to cause and to sustain higher prices with the market free from speculation or manipulation.

About the 10th inst. a better demand from consumers led to some sales of March and April as well as spot and November at advancing prices. The strength of the market was attributed to the increased output of tin plate here, to the larger use of tin in the manufacture of war munitions, to the difficulty in securing English permits, to the tendency to reduce output at the Straits,

Visible Supplies.

Visible supply of tin at end of each month:

	1912.	1913.	1914.	1915	1916.
Jan.	16,707	13,971	16,244	13,901	17,041
Feb.	14,996	12,304	17,308	14,548	16,511
Mar.	15,694	11,132	16,989	15,467	18,782
April	11,893	9,822	15,447	15,785	19,739
May	14,345	13,710	17,862	14,646	19,614
June	12,920	11,101	16,027	15,927	19,363
July	13,346	12,063	14,167	16,084	18,404
Aug.	11,285	11,261	14,452	15,127	18,042
Sept.	13,245	12,943	14,613	15,191	16,192
Oct.	10,735	11,857	10,894	13,154	17,415
Nov.	12,348	14,470	11,483	16,451	21,186
Dec.	10,977	13,893	13,396	16,216	.....
Av'ge	13,207	12,377	14,907	15,208	.....

Shipments From the Straits.

Monthly shipments of tin from the Straits Settlements to Europe and United States:

	1912.	1913.	1914.	1915	1916.
Jan.	4,018	6,050	5,290	5,200	6,095
Feb.	5,260	4,660	6,520	5,584	6,250
Mar.	5,150	4,810	4,120	4,970	5,170
April	4,290	4,400	4,930	5,270	4,685
May	5,760	6,160	6,900	6,759	3,965
June	4,290	4,280	5,870	6,665	6,210
July	4,580	4,770	4,975	5,606	5,410
Aug.	5,210	6,030	3,315	4,712	4,526
Sept.	5,430	5,160	4,973	5,296	3,270
Oct.	4,450	5,020	4,610	4,441	5,868
Nov.	5,600	5,560	5,155	6,713	5,380
Dec.	4,980	5,110	6,435	5,301	....
Total	59,018	62,550	63,093	66,517	....
Av'ge	4,918	5,213	5,258	5,543	....

Consumption In the U. S.

Monthly deliveries of tin in the United States exclusive of Pacific Coast:

	1912.	1913.	1914.	1915.	1916.
Jan.	3,700	3,700	3,600	2,300	4,452
Feb.	4,050	3,500	3,300	3,375	6,388
Mar.	4,000	5,900	4,450	3,200	4,726
April	5,400	3,450	4,300	3,200	4,202
May	4,250	3,350	3,800	5,600	5,455
June	2,850	3,800	3,650	3,900	6,398
July	5,150	3,900	3,900	5,300	4,432
Aug.	4,300	3,600	2,900	4,500	4,335
Sept.	3,600	3,100	3,600	4,300	4,025
Oct.	3,850	3,700	3,700	4,900	4,556
Nov.	4,300	2,800	2,600	2,975	3,165
Dec.	4,050	3,100	1,900	5,200	....
Total	49,500	43,900	41,700	48,750	.....
Av'ge	4,125	3,658	3,475	4,062	....

Monthly Tin Statistics.

Compiled by New York Metal Exchange.
(Tons of 2,240 lbs.)

	Nov. 1916.	Oct. 1916.	Nov. 1915.
Straits shipments			
To Gt. Britain..	1,407	2,455	1,838
" Continent ..	498	730	825
" U. S.	3,475	2,683	4,050
Total from Straits	5,380	5,868	6,713
Total from Australia	315	100	298
Consumption			
London deliveries	1,197	1,208	1,402
Holland deliveries	119	109	147
U. S.	3,165	4,556	2,975
Total	4,481	5,873	5,524
Stocks at close of month:			
In London—			
Straits, Australian	3,662	2,858	1,569
Other kinds	1,048	887	1,430
In Holland	.....	.....	.....
In U. S.	2,850	3,419	1,849
Total	7,560	7,164	4,848
Afloat close of month:			
Straits to London	2,532	3,630	2,515
" to U. S. ..	6,368	4,427	8,213
Banca to Europe .	4,726	2,194	875
Total	13,626	10,251	11,603
	Nov. 30, 1916.	Oct 31, 1916.	Nov. 30. 1915.
Total visible supply	21,186	17,415	16,451

Straits Tin Prices In New York.

	1912.	1913.	1914.	1915.	1916.
Jan.	43.24	50.45	37.74	34.30	41.88
Feb.	43.46	48.73	39.93	37.32	42.63
Mar.	42.86	46.88	38.08	49.93½	50.42
Apr.	44.02	49.12	36.10	47.98	51.75
May	46.12	49.14	33.30	38.78	49.15
June	47.77	44.93	30.65	40.37	42.18
July	44.75	40.39	31.75	37.50	38.46
Aug.	45.87	41.72	50.59½	43.39	38.54
Sept.	49.18	42.47	32.79	33.13	38.70½
Oct.	50.11	40.50	30.39½	33.08	41.16
Nov.	49.90	39.81	33.50	39.37½	44.17
Dec.	49.90	37.64	33.60	38.75	.....
Year	46.43	44.32	35.70	38.66	.....

to the smaller supply available outside of the Straits and to the stronger attitude of the Dutch Government controlling the Banca output.

Ocean Freight Charges Advanced 25 to 30%.

A large business was reported about the 15th to have been quietly going on for some time, if not in Straits, at least in Banca and other brands but outside of prices for nearby shipments there was considerable irregularity in quotations. The small arrivals here and the light supplies afloat caused considerable uneasiness, especially as most of the store stocks here were not available for resales. The alarm was increased by the stringent policy exercised in granting shipment permits and the cable advices on the 20th that the British Government had pre-empted more East India steam tonnage causing an advance of 25 to 30% in ocean freight carrying charges.

Tin Other Than Straits Becoming More Popular.

On the 21st, some much needed tin arrived from London and the cheerful announcement was made that 1,050 tons more were afloat for New York, but the spot situation was only slightly relieved. In the next few days, prices advanced to the highest point of the month with considerable business done in Banca and Chinese brands. America cabled some larger orders for late futures to London at the beginning of the fourth week but with a reaction in the English market buyers were inclined to be more conservative. In the last few days of the month the indifference of large American consumers was more pronounced so far as Straits tin is concerned, but there was evidence that other brands are finding more favor.

The arrival of the s.s. Suruga with 850 tons from Singapore and Penang on the 28th. was reassuring although the tin was not received in time to apply against November contracts. On the other hand, reports that the German Government had bought the stock of Banca tin held by the Dutch Government for delivery after the war and that the supply of Chinese tin which had been coming here regularly was about to be cut off, caused some uneasiness.

November deliveries of tin into d mestic consumption proved to be lar er than was anticipated—3,165 tons, which 2,800 tons were shipped from A lantic ports and 365 tons came ea from Pacific ports. Stocks in war house and landing on November 30t were 2,850 tons, a decrease of 569 to during the month. Arrivals at Atlant ports were only 2,285 tons.

Tin Prices in November.

	New York.	London — Spot.	London — Future
1	41.75	180 5 0	181 10
2	41.75	180 10 0	181 15
3	42.12½	182 5 0	183 10
6	42.50	182 15 0	184 5
7	.....	183 10 0	184 15
8	42.75	183 10 0	184 15
9	43.00	184 5 0	185 10
10	43.25	185 0 0	186 5
13	43.87½	186 5 0	187 15
14	44.37½	188 0 0	189 10
15	45.00	189 15 0	191 2
16	45.00	189 0 0	190 15
17	45.12½	188 15 0	190 2
20	45.25	188 10 0	190 5
21	45.25	188 15 0	190 10
22	45.62½	191 0 0	193 0
23	45.50	191 10 0	193 10
24	45.50	190 5 0	192 0
27	45.50	190 10 0	192 5
28	45.25	190 0 0	192 0
29	45.00	189 0 0	190 15
30	.....	189 5 0	191 5
High	45.62½	191 10 0	193 10
Low	41.75	180 5 0	181 10
Average	44.17	186 18 8	188 10

Chinese and Japanese Antimony.

Average monthly price of Chinese an Japanese (ordinary brands) in New York

	1912.	1913.	1914.	1915.	1916.
Jan.	6.89	8.77½	6.03	15.24	42.26
Feb.	6.78	8.16	6.00	17.62½	43.87½
Mar.	6.78	7.91	5.94½	20.93½	44.71
Apr.	6.87	7.82	5.82	23.97	41.35½
May	6.98	7.75	5.78	34.71	32.20½
June	7.07	7.62	5.62½	36.53½	20.40
July	7.37	7.55	5.44	35.98	14.55
Aug.	7.58	7.48	13.05	32.57	12.62
Sept.	8.00	7.31	9.79½	28.50	11.57
Oct.	9.11	7.31	9.79½	28.50	11.57
Nov.	9.11	6.28	14.14	37.88	13.65
Dec.	9.05	6.05	13.15	39.36½	.....
Av'ge	7.63	7.43	8.53½	29.52	.....

Spelter in November.

Market Strong and Advancing Throughout the Month—Prices Up 2¼ to 2¾c per Pound—Ore in Joplin District Advanced $30.

Spelter in November was strong and higher. The advance in prices ranged from 2¼ to 2¾c per pound. The rise was due mainly to the increased cost of production which made smelters reluctant sellers until late in the month. Consumers were constantly in the market for nearby shipments from the beginning of November but found exceeding difficulty in placing orders. Producers wanted future contracts but later, were even reserved in taking such orders. There were few export order inquiries, England and France finding Japanese more amenable to their overtures than were American producers and operators. The closing prices here were the highest of the month for all positions but during the last few days, dealers, receiving metal against their November contracts were shading producers' prices for prompt shipment but took no chances in offering future positions.

The course of the foreign markets was of small importance and of less interest here while the price of zinc ore steadily advanced in the West. It is notable, however, that while England satisfied its unusually moderate requirements in the Orient, prices at London steadily advanced from November 1st, to November 17th, when the rise was £5 on spot and £4 15s on futures. A reaction of 15s to £1 on the following day was followed by a further sharp advance to the end of the month when the net rise for the month was £7 on spot and futures.

Producers Well Sold Up—Market Demoralized on Election Uncertainty.

Producers were extremely indifferent sellers when the month opened, having already sold all the November-December metal they cared to offer and some had even over-sold. Stocks at smelters had been much reduced and with manufacturing costs rising, most smelters turned a deaf ear to consumers' inquiries for more November-December metal. On the other hand, consumers were not ready to buy for future delivery, which positions producers were ready to sell. Some orders were placed, however, for nearby positions but with the daily demand exceeding the available supply prices advanced ⅛ to ¼c daily up to the eve of the presidential election. Immediately following first reports of the results of the balloting the market was excited and unsettled with producers and consumers alike anticipating and preparing for a "boom." Confusion and disappointment resulted from later reports but the undertone continued strong, based upon the rise of ore in the Joplin district. Dealers, anxious buyers before the election, were less keen to place orders subsequently, but there was a wide variation in prices.

Ore Price Scores Another $10 Jump.

On November 13th, another advance to $10 on the price of ore to $90 per ton in the Joplin district caused producers to be even more conservative and some retired from the market as sellers for shipment in the first and second quarters of 1917. Not a few of the smelters were short of raw material and the rise in ore prices was due to the scramble of such producers to cover requirements. The strength of spelter was increased, too, at this time by the sudden cold snap in the West that decreased the fuel supply of the gas-fired smelters in Kansas. The coal supply, also, was uncomfortably short with other smelters.

Market Active and Advancing—Ore Up Another $5.

Up to the middle of the month, prices of prime western spelter had advanced 1 to 1¼c per pound. Brass special, too, had appreciated sharply and now commanded 1c premium per pound over prime, for November-December shipment. Intermediate and high grades were also in good demand and higher. Up to and including the 20th, there was good buying of brass special at steadily advancing prices for early next

year's delivery. Dealers at this time were competing with consumers as buyers of all kinds of metals. Another advance of $5.00 per ton in the price of ore at Joplin on the 20th, making the total rise on the movement $30.00 per ton, made sellers more reluctant to sell, and dealers and consumers more anxious to buy, resulting in accelerating the advance. None of the producers were free sellers of spelter this side of April, and more than half of them were out of the market. Up to November 22nd, metal prices had advanced 3c per pound in a month and 4c per pound since the upward movement began; even at the advance it was difficut for buyers to induce producers to accept orders but dealers took not a few orders for nearby shipments.

Producers Freely Offer Future Positions but Very Reserved on Near Deliveries.

Galvanizers came into the market in force about November 24th, buying December-January and January-February-March positions in as large tonnages as could be secured at steadily advancing prices. Dealers continued to take orders for early shipments, buying futures against sales while producers accepted most of the future contracts for prime western. Brass special also was sold far into the future. The active buying extended over several days followed by smaller transactions but a firm tone continued to prevail as might be expected, when on the 28th, the price of ore in the Joplin district advanced to $105 for top grades.

Consumers having relieved most pressing needs were less anxious to buy during the last two days of the month while producers were readier to entertain offers for future positions but they were still reserved on sales for early shipment. There was a better supply of prompt metal, however, available through dealers who were receiving metal against November contracts and were shading the nominal asking prices of the producers 1/8 to 1/4c per pound. When the month closed prompt and December shipment metal was being sold at a net advance of 2 3/4c per pound; first quarter shipments at an advance of 2 5/8c to 2 3/4c and second quarter shipment at an advance of 2 1/4c per pound over the prices current when the month opened.

Spelter Prices in November.

Day.	New York. Cents.	St. Louis. Cents.	London. £	s	d
1	10.55	10.37½	52	10	0
2	10.67½	10.50	52	10	0
3	10.73¾	10.56¼	52	15	0
6	10.80	10.62½	53	5	0
7	.....	.....	53	15	0
8	11.05	10.87½	53	15	0
9	11.30	11.12½	54	5	0
10	11.30	11.12½	55	0	0
13	11.36¼	11.18¾	55	15	0
14	11.48¾	11.31¼	56	0	0
15	11.80	11.62½	56	0	0
16	12.05	11.87½	56	15	0
17	12.17½	12.00	57	10	0
20	12.30	12.12½	56	10	0
21	12.55	12.37½	56	10	0
22	12.80	12.62½	57	5	0
23	12.86¼	12.68¾	58	0	0
24	13.05	12.87½	58	0	0
27	13.17½	13.00	58	10	0
28	13.23¾	13.06¼	59	0	0
29	13.23¾	13.06¼	59	10	0
30	.....	.....	59	10	0
High	13.30	13.12½	59	10	0
Low	10.42½	10.25	52	10	0
Average	11.92½	11.75	56	0	5

Consumers having relieved most pressing needs were less anxious to buy during the last two days of the month while producers were readier to entertain offers for future positions but they were still reserved on sales for early shipment. There was a better supply of prompt metal, however, available through dealers who were receiving metal against November contracts and were shading the nominal asking prices of the producers 1/8 to 1/4c per pound. When the month closed prompt and December shipment metal was being sold at a net advance of 2 3/4c per pound; first quarter shipments at an advance of 2 5/8c to 2 3/4c and second quarter shipment at an advance of 2 1/4c per pound over the prices current when the month opened.

Spelter (Monthly Averages.)

	New York		St. Louis	
	1915.	1916.	1915.	1916.
Jan.	6.52	18.18	6.33	18.01
Feb.	8.86½	20.09	19.92	19.92
Mar.	10.12½	18.09½	9.80	17.91
Apr.	11.51	18.61½	11.22	18.44
May	15.82½	15.93	15.52½	15.75½
June	22.62½	12.80	22.14	12.62
July	20.80	9.70	20.54	9.52½
Aug.	14.45	9.10	14.19	8.92
Sept.	14.49	9.23½	14.10½	9.06
Oct.	14.07	10.01	13.89	9.83½
Nov.	17.04	11.92½	16.87½	11.75
Dec.	16.91		16.72	
Av'ge	14.44		14.16	

Lead in November.

Market Strong but Quiet During Larger Portion of the Month—Prices Up ¼ to ½c per Pound—Trust Prices Unchanged Despite Predictions to the Contrary.

Lead was strong but quiet during the first half of the month. On the 17th, and 18th, activity suddenly developed at New York and at St. Louis with prices higher in the open market. In the next ten days considerable business was transacted mainly in January-February-March shipments. Predictions were constantly made that the official price of the Trust would be sharply advanced from day to day, but the month closed without any definite action by the American Smelting & Refining Company; at least, so far as the public was concerned. Some export business was reported to have been quietly done in the West, mainly for shipment to Japan but it was difficult to obtain authentic information concerning details. The month closed upon a dull but strong market with prices largely nominal but at an advance of ¼ to ½c per pound over the prices prevailing when November began.

No Change in London Price.

The London market was negative so far as having any bearing here. For "military reasons" the English market was fixed at £30 10s for spot and at £29 10s for futures on October 6th, and to all intents and purposes it remained at that level throughout November. According to foreign advices, however. some business was quietly done at higher prices.

Apparently, the American Smelting & Refining Company had a similarly restraining influence upon the American market by simply making no change in its open official base price but the outside market finally broke from confinement.

Election Outcome Disappointing—Market Very Dull.

When the month opened producers occupied a strong position, having sold capacity well through November but consumer's requirements had also been quite fully covered. The result was an extremely dull market for ten days. Disappointment over the election outcome intensified the dullness. On the tenth some inquiries came from Japan but the market was too well supported to permit of any foreign sales except at an advance. Exporters had previously scoured the western markets but the prices asked were above buyers' views. Independent producers were too busy filling previous contracts to make any serious effort to secure new orders and found much difficulty in securing cars to make shipments on current obligations.

Market Becomes Slightly Active.

Buyers maneouvered to secure lower prices for later delivery but to small purpose. Ore remained firm or was

Lead Prices in November.

Day.	New York.* Cents.	St. Louis. Cents.	London. £ s d
1	7.06¼	6.87½	30 10 0
2	7.06¼	6.87½	30 10 0
3	7.06¼	6.87½	30 10 0
6	7.06¼	6.87½	30 10 0
7	....	....	30 10 0
8	7.06¼	6.87½	30 10 0
9	7.06¼	6.87½	30 10 0
10	7.00	6.87½	30 10 0
13	7.00	6.87½	30 10 0
14	7.00	6.87½	30 10 0
15	7.00	6.87½	30 10 0
16	7.02½	6.90	30 10 0
17	7.02½	6.90	30 10 0
20	7.05	6.90	30 10 0
21	7.18¾	7.00	30 10 0
22	7.22½	7.12½	30 10 0
23	7.22½	7.12½	30 10 0
24	7.20	7.12½	30 10 0
27	7.22½	7.12½	30 10 0
28	7.22½	7.12½	30 10 0
29	7.37½	7.20	30 10 0
30	....	....	30 10 0
High	7.50	7.25	30 10 0
Low	7.00	6.85	30 10 0
Average .	7.11	6.96	30 10 0

* Outside market.

slightly firmer in the Joplin district, although an increased output was expected because of the large percentage of lead to zinc in ore mined in most fields. It was notable that second hands had little or nothing to offer and consequently the few orders that were placed went to the few producers who were willing to make sales. Consumers' interests pushed by greater needs became more serious in the third week and on the 17th, some substantial orders for December-January shipment were placed in New York. On the following day the western market was awakened from its torpid state to meet an active demand from domestic and from foreign buyers. Depressing forces were eliminated and prices advanced slightly with China as well as Japan in the market to fill delayed requirements.

Month Closes Quiet and Unsettled.

On November 20th, 7.00c was freely bid for future positions but sellers asked and obtained 7.10c New York and on the following day advanced asking prices 1/8 to 1/4c after refusing large orders from dealers and consumers. The Trust was reported to have sold capacity for the year and to have taken orders for January shipment at 7.15c, New York. Some independent producers withdrew from the market. On the 27th, 7¼c per pound was paid for prompt and December shipment and on the following day 7¼c was paid for January shipment. Some of the independent producers reported capacity sold through January. The market wa quiet and somewhat unsettled on th closing day of the month with a wid range in prices but the inside price quoted were 7¼c, New York, and 7.15 East St. Louis for prompt and Decem ber shipment, and 7¼c, New York and 7.10c East St. Louis for January ship ment. Other quotations were 10 to 2 points higher.

Lead (Monthly Averages.)

	New York*			St. Louis		
	1914.	1915.	1916.	1914.	1915.	1916.
Jan.	4.11	3.74	5.94	3.99½	3.57	5.80
Feb.	4.06	3.82	6.23	3.95	3.72	6.17
Mar.	3.97	4.03	6.83	3.80	3.98	7.46
Apr.	3.82	4.19	7.50	3.70	4.11	7.67
May	3.90	4.23½	7.50	3.81	4.16	7.28
June	3.90	5.86	7.04	3.80	5.76	6.77
July	3.90	5.74	6.52	3.75	5.52	6.20
Aug.	9.30	4.75	6.27	3.73½	4.59	6.27
Sep.	3.86	4.62	6.75	3.67	4.53	6.71
Oct.	3.54	4.59½	7.00	3.39	4.51	6.97½
Nov.	3.68	5.15	7.00	3.58	5.07	6.96
Dec.	3.80	5.34½		3.67	5.26½	
Av.	3.87	4.67½		3.74	4.57	

* Trust price.

Sheet Zinc Price Changes.

The following table gives the changes in the price of sheet zinc since January 26 1916, together with the price of spelter ruling on the same day.

1916—	Sheet Zinc.	Spelter St. Louis.
January 26	24.00	19.00
February 17	25.00	20.87½
April 22	25.50	18.75
May 15	24.50	15.50
May 23	23.50	14.87½
May 29	22.50	14.12½
June 2	21.00	13.12½
June 13	20.00	13.37½
June 20	19.00	12.00
June 27	18.00	11.37½
July 6	17.00	9.37½
July 11	15.00	8.62½
October 26	16.00	10.12½
November 10	17.00	11.12½
November 17	18.00	12.00
November 20	19.00	12.12½
November 24	20.00	12.87½
November 24	21.00	12.87½

Waterbury Spelter Averages.

	1912.	1913.	1914.	1915.	1916.
Jan.	6.78	7.56	5.54	6.55	22.25
Feb.	6.85	6.81	5.70	11.85	22.70
Mar.	7.17	6.56	5.59	12.15	23.15
April	7.07	6.08	5.50	13.85	23.20
May	7.13	5.77	5.38	20.55	21.20
June	7.25	5.50	5.37	25.60	17.40
July	7.46	5.61	5.26	24.90	15.20
Aug.	7.34	5.99	5.66	19.30	13.60
Sept.	7.72	6.13	5.91	17.85	13.70
Oct.	7.83	5.74	5.23	16.85	12.95
Nov.	7.74	5.60	5.38	19.36	14.10
Dec.	7.65	5.44	5.90	21.15	
Av'ge	7.33	6.06½	5.53½	17.50	

Antimony in November.

Market Firm and Active With Prices Up 1 to 1½c per Pound—Munition Orders the Main Factor.

Shrapnel manufacturers in November proved a boon to importers of antimony. The advance in the market of 1 to 1½c per pound was due mainly to purchases of the metal to be used in the manufacture of war munitions and incidentally there was a better jobbing trade demand from domestic consumers.

At the beginning of the month, there was no indication that large lots would be needed, but upon the development of an easier tone buyers came into the market, taking 25-ton lots at 11½c in bond and at 13c duty paid, for prompt shipment. There was also some nibbling for future positions with importers offering to sell at 12¾c, duty paid, for December-January shipments. There was also some effort to sell at 11c in bond, for November shipment from the Orient. Jobbing lots were sold at 13c, duty paid, and dealers who quoted 13¼c, lost orders. Buyers not taking hold promptly, would-be-sellers yielded slightly, offering spot and November shipment in wholesale lots at 12⅞c duty paid; jobbing lots were easier, too. Late on November 3rd, concessions granted, resulted in sales of several lots at 11¼ to 11⅜c in bond for November-December shipment from the Orient. These sales were followed in the next few days by liberal sales of the same position at fractional advances. In all, 500 to 600 tons of November-December metal from Japan and China were sold and there was a better demand for spot with 11½c bid in bond. The largest purchases were made by Canadian war manufacturers of munitions, but some quiet buying was also evident on American account. After the closing of large contracts there was some desultory buying of 25-ton lots for November shipment from the East and of 5-ton lots of spot here.

A few days of dullness succeeded the activity but prices were well sustained and later, more inquiries came out for November-December shipment from the Orient, buyers bidding 11¼c while sellers asked 11½c in bond. There was also a better demand for small spot sales made on fractional advances. After the middle of the month, shrapnel manufacturers again placed contracts, paying 11⅞c, in bond, for November-December shipment from the Far East. Jobbing lots were advanced to 13½c. On the 17th, buyers were more anxious to cover November-December-January contracts but importers were offering guardedly. On the 20th, buyers succeeded in purchasing spot, and from steamships afloat, nearing port, at 13c in bond, while jobbing lots sold at 13⅞c duty paid. Evidence that ammunition manufacturers full requirements were still uncovered, caused some ex-

Aluminum, Silver, and Antimony Prices in November.

	— New York —		
	Aluminum.	Silver.	Antimony.
Day.	Cents.	Cents.	Cents.
1	64.50	68.12½	13.12½
2	64.50	68.12½	13.12½
3	65.00	68.12½	13.00
4	.....	68.37½	.....
6	65.00	69.50	13.00
8	65.00	71.62½	13.00
9	65.00	71.87½	13.00
10	65.00	71.87½	13.00
11	.....	71.50	.....
13	65.00	71.75	13.00
14	65.00	71.75	13.00
15	65.00	71.50	13.12½
16	65.00	71.37½	13.12½
17	65.00	71.37½	13.50
18	.....	71.62½	.....
20	65.00	72.12½	14.50
21	65.00	72.50	14.50
22	65.00	72.87½	14.50
23	65.00	73.12½	14.50
24	65.00	73.12½	14.50
25	.....	73.62½	.....
27	64.00	74.00	14.50
28	64.00	73.87½	14.50
29	64.00	74.37½	14.50
High	66.00	74.37½	14.50
Low	63.00	68.12½	12.87½
Average ...	64.80	71.59	13.65

citement and prices advanced. Later, some orders as far forward as March, 1917, were understood to have been closed. Jobbing lots sold at 14½c, duty paid.

Following the closing of large contracts for future delivery some sellers withdrew from the market but a moderate business was still done on the 22nd, in spot and future positions, at 12½c in bond. Spot also sold at 14½c, and January-February-March deliveries, at 14c, duty paid. On the following day, holders were asking ½c per pound advance but consumers were more reserved.

Dullness developed on the 24th, when war munitions manufacturers had satisfied their requirements and even the activity in jobbing lots ceased. In th next few days consumers were not co spicously in the market but prices r mained firm at 12¾c in bond for D cember-January shipments from t Orient and at 14½c, duty paid, f spot jobbing lots. On the closing da of the month, the market was qu with some interest shown by deale and by consumers and with a few sa for December delivery at 14c, du paid. Dealers were bidding 13c spot in bond, but importers were a ing ½ to 1c per pound more. Nove ber-December shipment from the Ori was held at 13c in bond, but the l sale was at 12½c in bond. Jobbi lots of spot were held at 14½c pound, duty paid.

Aluminum in November.

Market Opens Firm With Advancing Tendency But Reacts at the Close—D Decline for Month ½ to 1c Per Pound on Virgin; Remelted Unchanged.

Aluminum was well sustained in November; in fact a moderate advance was established early in the month on No. 1 Virgin which was in light supply for prompt shipment but in the last week a more adequate supply resulted in an easier tone and some recession in prices, the net result of the month's developments being a decline of ½c to 1c per pound on Virgin but remelted remained quiet and steady throughout the entire month.

At the beginning of the month, some small sales were made to consumers at 64 to 65c for Virgin and in the next few days as high as 66c per pound was asked and obtained for spot. Under present conditions no change in the official contract price for ingots is to be expected. The largest interests have capacity well sold and there is sufficient foreign demand to take up any surplus supplies that may become visible from time to time without seriously disturbing the market.

November shipments were difficult to buy under 64c so far as consumers were concerned and even dealers could find little metal available under 63c for November-January, until late in the month, when an easier feeling resulted from more ample offerings and sc business was done at 62 to 63c, but the close of the month, little was av able under 63c and sales of ingots w made to consumers at 64 to 65c. Sh continued scarce and firm with m asking 80 to 85c for shipment in si eight weeks. Occasionally odd come to the surface through sec hands who sell between 75 to 80c pound.

It is an interesting fact, that price ingot aluminum have advanced 7 t per pound since the first of this y and since January, 1915, the rise been 43¾c to 44¼c per pound. lowest price reported this year 53c in January and February, or cents per pound lower than the in price prevailing to-day.

Apparently there was but l movement in remelted metal in No ber and prices did not change e tially.

It becomes evident from time to that progress is being made in th forts to increase output in this cou but it requires many months for plans to come to flower. As havi bearing upon this phase of the situ it is announced that the Alumi

Company of America has just placed another contract for plant extension in Tennessee with the American Bridge Company calling for 1,000 tons of structural steel.

Aluminum Prices in New York.

Extreme price fluctuations of pure aluminum (No. 1 Virgin 98-99%) in New York; by months.

	— 1913—		— 1914 —	
	High.	Low.	High.	Low.
Jan.	26.50	26.00	19.00	18.50
Feb.	26.50	26.00	19.00	18.50
Mar.	27.12½	26.25	18.75	18.00
April ...	27.12½	26.62½	18.25	17.75
May	26.62½	25.00	18.12½	17.75
June	25.75	23.00	18.00	17.50
July	24.00	23.00	17.25	17.37½
Aug. ...	23.50	21.50	21.50	18.00
Sept. ...	22.50	21.50	20.50	18.25
Oct.	22.00	19.75	18.50	18.00
Nov.	19.75	19.00	19.50	18.00
Dec.	19.00	18.50	19.25	18.75
Average.	27.12½	18.50	21.50	17.37½

	— 1915 —		— 1916—	
	High.	Low.	High.	Low
Jan.	19.25	18.75	56.00	53.00
Feb.	19.50	18.75	63.00	53.00
Mar.	19.25	18.75	63.00	58.00
April ...	19.50	18.75	61.00	59.00
May	26.50	19.25	61.00	59.00
June	33.00	26.00	65.00	59.00
July	33.00	32.00	62.00	59.00
Aug.	37.00	32.00	62.00	58.00
Sept. ...	50.00	36.00	63.00	60.00
Oct.	57.00	49.00	67.00	62.00
Nov.....	60.00	55.00	66.00	63.00
Dec.	60.00	53.00	.....	.....
Average.	60.00	18.75	.....	.....

Aluminum and Silver Prices.

	—— New York ——			
	Aluminum.		— Silver —	
	1915.	1916.	1915.	1916.
Jan. ...	19.01	54.33	48.89½	56.77½
Feb. ...	19.20	57.50	48.48	56.75½
Mar. ...	18.94½	60.52	50.24	57.92½
April ..	18.83	60.00	50.25	64.37½
May ...	21.85	60.00	49.91½	74.27
June ...	29.66	62.09	49.03	65.02½
July ...	32.50	60.15	47.52	62.94
Aug. ...	34.00	59.48	47.18	66.08
Sept. ..	46.75	61.90	48.68	68.51½
Oct. ...	54.17½	64.55	49.38½	67.84
Nov. ..	57.85	64.80	51.71	71.00
Dec. ...	56.80½	.....	54.97	.....
Av'ge..	34.13	.....	49.69	.....

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Act of August 24, 1912 of The Steel and Metal Digest, published monthly at New York, N. Y., Oct. 1, 1916:

State of New York, County of New York: Before me, a Notary Public in and for the State and County aforesaid, personally appeared A. R. Trench, who, having been duly sworn according to law, deposes and says that he is the Business Manager of The Steel and Metal Digest, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, circulation, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations.

That the names and addresses of the publisher, editor, managing editor, and business manager are:

Name of— Post Office Address.

Publisher, American Metal Market Co. ..... 81 Fulton St., N. Y.
Editor, C. S. Trench .. 81 Fulton St., N. Y.
Managing Editor, C. S. J. Trench ..... 81 Fulton St., N. Y.
Business Manager, A. R. Trench ..... 81 Fulton St., N. Y.

That the owners name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock are:

American Metal Market Company (Corporation) .. 81 Fulton St., N. Y.
C. S. Trench ..... 81 Fulton St., N. Y.
C. S. J. Trench ..... 81 Fulton St., N. Y.
I. Trench ..... 81 Fulton St., N. Y.

That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiants full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. (Signed) A. R. Trench, Business Manager. Sworn to and subscribed before me this second day of October, 1916.

John Bowen,
Notary Public, Kings County
Ctf. filed in New York County
(My commission expires March 30th, 1918.)

Trade Notes.

The Sandusky Forge Company, Sandusky, O., has been incorporated with a capital stock of $300,000 and will establish a plant in the building formerly occupied by the Peoples Cement Company. The officers are: President, J. Barrows, Jamestown, N. Y.; vice-president, M. C. Crow, president Crow-Elkhart Motor Company, Elkhart, Ind.; secretary and treasurer, W. H. Collier, Painesville, O.

The Maryland Tube Corporation, Baltimore, Md., with a capital of $500,000, has been incorporated by H. B. Stimpson, C. H. Birmingham and H. Taylor, A tube, bar and sheet mill and brass foundry will be constructed on a tract of land acquired by the company in South Baltimore.

The Interstate Steel Mfg. Company, Milwaukee, has been incorporated with $60,000 capital stock by Harry F. Bayley, J. J. Devlin and W. B. Rotter.

The T. K. Bell Engineers, Inc., Harrison Building, Philadelphia, has been established by Thomas K. Bell and others and has leased the former Rittenhouse foundry and machine shop on Main Street, Norristown, Pa. It will be devoted to the production of iron and steel specialties now being manufactured in Philadelphia.

The Pressed Metals Company, Toronto, has been incorporated to manufacture iron, steel, metals, machinery, tools, etc., with $60,000 capital by John W. Leighton, Owen J. P. Crick, James H. Chewett, and others of Toronto.

The Silvertown Cycle Mfg. Co., Worcester, Mass., has been incorporated with a capital stock of $500,000 to manufacture bicycles. The directors are Charles A. Persons, president; Albert D. O'Donnell, clerk; and Orville A. Jones. Plans for a factory have not yet matured, but it is the intention of the company to begin manufacturing soon so that its product may be on the market next summer.

The United States Alloys, Inc., Buffalo, N. Y., which was lately organized has purchased a 16 acre site on River Road and N. Y. C. R. R., where it will build an extensive plant for the production of alloys used in steel making.

B. F. Avery & Sons, manufacturers of agricultural implements, Louisville, K have increased their capital stock fro $1,500,000 to $2,300,000. Charles Huhlein is president.

The Sterling Engine Works, Lt Winnipeg, has been incorporated wi a capital stock of $25,000 by Vincent Maddock, Roy M. Wolvin, William Leaney, and others, to manufactu steam and gasoline engines, boilers, a ricultural implements, etc.

The Tillsonburg Foundry & Machi Company, Tillsonburg, Ont., has be incorporated with $25,000 capital manufacture machinery, motors, gines, iron, steel, tractors, etc., by Sy ney E. Dykeman, David J. Downs, Fr erick J. Bushmell and others of Tills burg.

The Elkhart Stamping & Tool Co pany, Elkhart, Ind., has been incor rated with $25,000 capital stock manufacture tools. The directors Alexander H. Hyndman, Oliver A. a Bert D. Gause.

The Packard Fuse Company, Ltd., Catharines, Ont., has been incorpora with a capital stock of $200,000 by R Hamilton, G. C. Rough, S. R. Cru hank, and others, to manufacture fu projectiles, etc.

The Ames Shipbuilding & Dry D Company, Seattle, has been incorpo ed for $800,000 by Edgar Ames, pr dent of the Seattle General Cont Company, and plans the erection shipbuilding plant in Seattle and a dock of 7,000 tons capacity. The c pany has contracts for three steel ste ships of 8,800 tons each.

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