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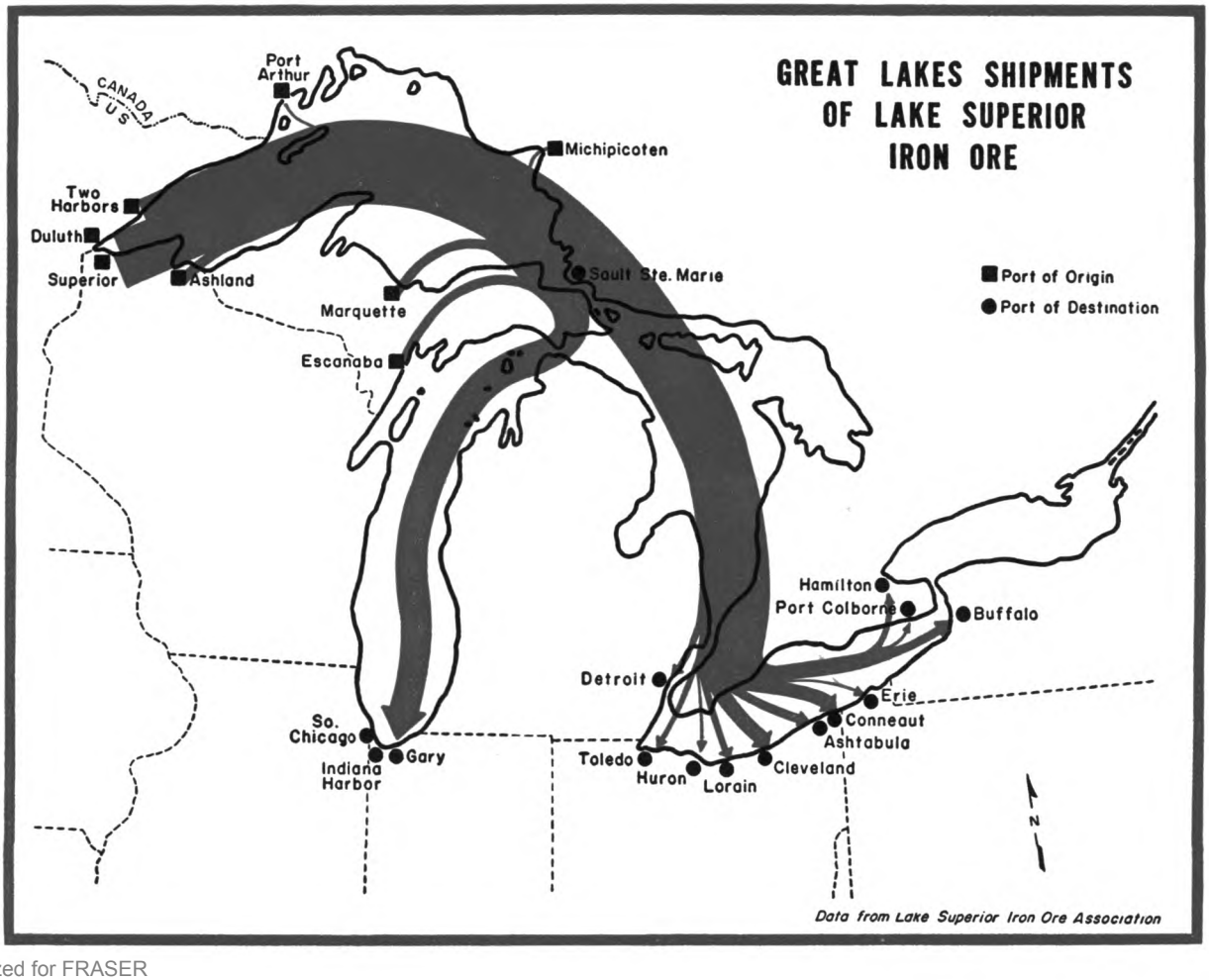
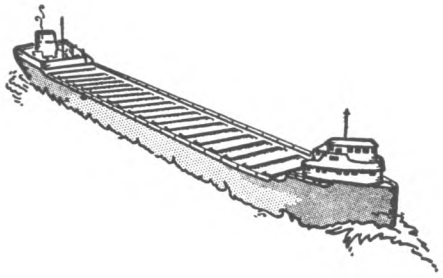




The Great Lakes Ore Fleet

A HUNDRED YEARS AGO the opening of the first locks at Sault Ste. Marie provided the connecting link between Lake Superior and the rest of the Great Lakes that brought into being the greatest fresh water fleet in the world.

During the past century, mines clustered around the head of Lake Superior have supplied the bulk of the iron ore consumed by the nation's steel mills. Practically all of the iron ore mined in the Mesabi and other Lake Superior ranges is carried at least part of the way to the steel mills by the Great Lakes ore fleet, moving from the head of the lakes through the Soo Canal to ports on Lake Michigan and Lake Erie. The volume of this lake ore traffic is more than twice that of the total tonnage handled by the Panama Canal.

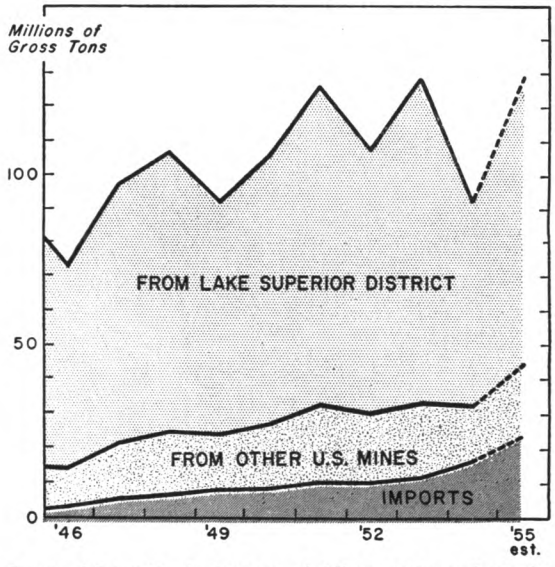
The Soo's centennial year finds a modernized ore fleet at work on the Great Lakes. It also finds the Lake Superior region's relative importance as an iron ore supplier diminishing as imports of foreign ore mount at a rapid rate. But, reserves of iron ore in the Lake Superior ranges will keep the ore fleet busy on the customary lake routes in the foreseeable future.

The Ore Fleet's Job

The Great Lakes ore fleet literally moves a small mountain of ore down the lakes each year. Generally speaking, it takes about 1⅔ tons of iron ore to make a ton of pig iron and about one-half ton of pig iron plus an equal amount of steel scrap to make a ton of steel. Thus, feeding a steel industry capable of gobbling up more than 125 million net tons of iron ore in a year is no small task.

The accompanying chart shows the relative

DOMESTIC SHIPMENTS AND IMPORTS OF IRON ORE



Source of data: U. S. Bureau of Mines. 1955 estimate by Fed. Res. Bank of Cleveland.

importance of the Lake Superior district[1] in supplying this country's appetite for iron ore. About two-thirds of the nation's iron ore requirements are being met currently by U. S. mines around Lake Superior. Other U. S. mines scattered over a dozen states supply nearly one-sixth of the iron ore consumed and the remainder of the nation's needs is imported. Prior to 1954, the proportion supplied by the Lake Superior district was above three-fourths, but imports of foreign ores have increased sharply in recent years.

This year, steel mills should receive around 128 million gross tons of iron ore from domestic and foreign mines. Of this total, about 82 million tons will be loaded into vessels at Upper Lake docks. In addition, a small amount of Lake Superior iron ore will go to blast furnaces by all-rail movement.

The boatloads of ore will be distributed among ports on the Lower Lakes in the pattern shown by the map on the front cover, with about one-third of the ore destined for Lake Michigan ports and two-thirds going to Lake Erie ports.[2] At some Lower Lake ports, the ore will be transshipped to inland steel mills. At other ports, such as Cleveland and Lorain, part of the ore will be unloaded directly into the stockpiles of local steel mills.

Growth of the Ore Fleet

The job of transporting millions of tons of iron ore down the lakes each year is done by 314 bulk freighters comprising the Great Lakes ore fleet. Bulk freighters can be used in the lake coal and grain trades too, of course. But, of the 260 American vessels normally considered ore boats (the balance of the ore fleet is Canadian), all but 6 are in commission, with 254 American vessels currently active in the ore trade.

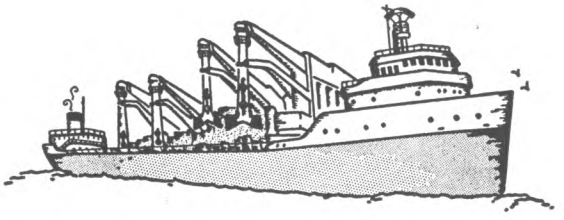
The lake ore freighter has a rather utilitarian appearance. From the side, its elongated, cigar-like shape is relieved only by the pilot house and deck crew's quarters at the bow, and its stack, engine room, after crew's quarters, and galley at the stern. The long row of hatches stretching amidships covers a spacious hold capable of carrying more than 20,000 tons of payload in the newer vessels.

The modern ore boat evolved in its present form at about the turn of the century.

The great Mesabi range, with its still-unmined billions of tons of iron ore, was opened in 1892 and rapidly developed. The Mesabi was linked with Lake Superior by rail and modern dock facilities were built at Duluth, Superior and Two Harbors.

By 1890, steel steamers had clearly demonstrated their superiority over wooden sailboats as being faster, safer, and able to carry greater payloads more economically. The trend towards steel and steam for all lake shipping was under way. Then, in the late 'nineties, George H. Hulett developed a stiff-legged unloader, revolutionizing ore handling at Lower Lake ports. A boatload of ore could be emptied in a matter of hours, where days had been required formerly. Boats were designed to accommodate the new equipment.

The prototype of the modern ore boat emerged. It was made of steel and powered by steam. It was long and broad of beam, enabling it to carry about 11,000 net tons of ore through the shallow portions of the St. Marys and Detroit Rivers. Its cargo was easily accessible through large hatches amidships so it could be quickly unloaded by the newly developed Hulett equipment.



(1) The Lake Superior district encompasses mines in Minnesota, Wisconsin and Upper Michigan. Shipments from Canadian ranges in Ontario also come down the lakes, as indicated on the cover, but are included among imports in this chart.

(2) The map on the cover depicts the flow of iron ore from the Lake Superior district in 1954 by port of origin and port of destination. The relative amount of ore coming from, or going to, any one port this year will not vary enough to affect significantly the proportions shown.

The speedy development of the Mesabi range made its rich ore available in quantity. A growing nation clamored for steel, and output doubled in the first five years of the century. To bring the Mesabi ore to the steel centers around the Lower Lakes, more than 125 new boats were built between 1900 and 1909.

Most of the ore boats built at the turn of the century are still in use. In fact, about half of the ore vessels in operation today were built prior to 1910 in the biggest round of boat-building on the lakes. By comparison, the recent round of expansion and modernization completed in 1954 appears small at first glance. The top panel of the trio of bar charts gives the distribution of ships of United States registry in the Great Lakes ore fleet, according to the decade in which the vessels were originally constructed or last rebuilt.

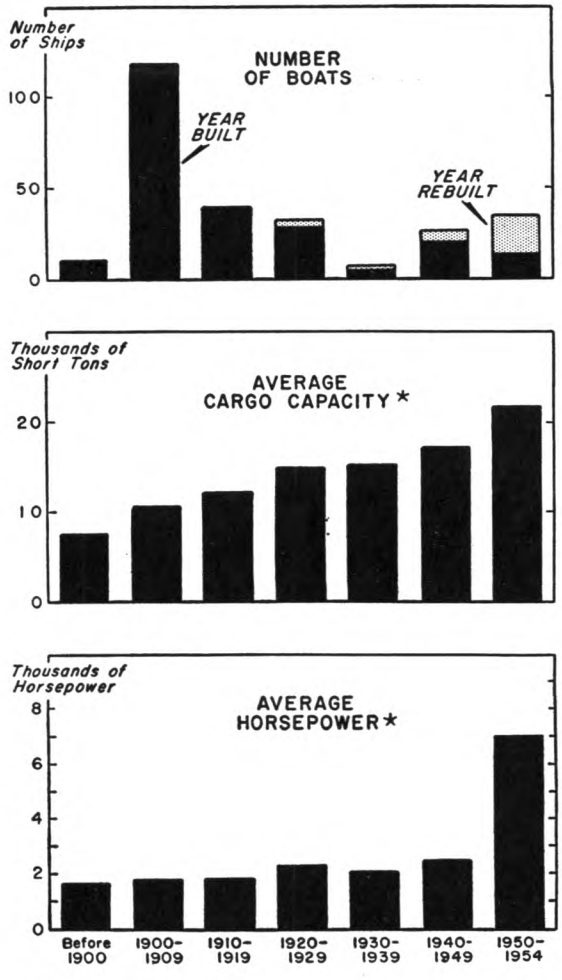
The size of the ore boats has grown steadily larger over the years, as bigger locks have been built at the Sault falls on the St. Marys River and as river channels have been deepened. The first two locks at the Soo were only 350 feet long, 70 feet wide and 9 feet deep, or more than adequate by pre-Civil War standards. In contrast, the Davis and Sabin Locks opened in 1914 and 1919, respectively, each measured 1,350 feet in length, 80 feet in width and 24½ feet in depth. The MacArthur Lock, completed at the height of World War II, was not quite so long but had a depth of 30 feet.

Ore vessels launched since 1950 are, naturally, the biggest and fastest in the lake fleet. They can carry about twice as much ore as their 50-year-old prototypes, make the round trip to the head of the lakes and back in 5 days as against 7 days for the older boats, make about 45 trips a season instead of the 30 trips made by the old timers. In short, one new ore boat can just about do the work of three old ones each shipping season. Thus, the 15 new boats added to the lakes ore fleet since 1950 are roughly the equivalent of 45 boats built at the beginning of the century.

The typical modern ore carrier is 647 feet long and 70 feet across the beam and is capable of carrying about 22,000 net tons of ore. The average vessel built between 1900 and 1909, on the other hand, measured 500 by 54 feet and carried close to 11,000 net tons each trip.

The average carrying capacity and horsepower of the U. S. ore fleet according to the

GREAT LAKES ORE VESSELS
According to Year Built



* Rebuilt ships excluded

Source of data: M. A. Hanna Co.; U. S. Army, Corps of Engineers.

year the boats were built[3] is illustrated in the lower two panels of the accompanying trio of charts.

The modernization of the ore fleet during the past few years has not been limited to the launching of 15 new ships. Since 1950, 21 vessels have been rebuilt, increasing further the ore fleet's speed and cargo capacity. Five of the rebuilt vessels are ocean-going freighters, modified for the lake ore trade. These vessels were towed to the lakes through the Mississippi River, the Illinois Waterway and the Chicago Sanitary Ship Canal. New sections were installed between the bow and stern making their over-all length in excess of 600 feet. The speed, cargo capacity, and general performance of these converted ocean-going freighters rank them amongst the newest boats built specifically for the lake ore trade.

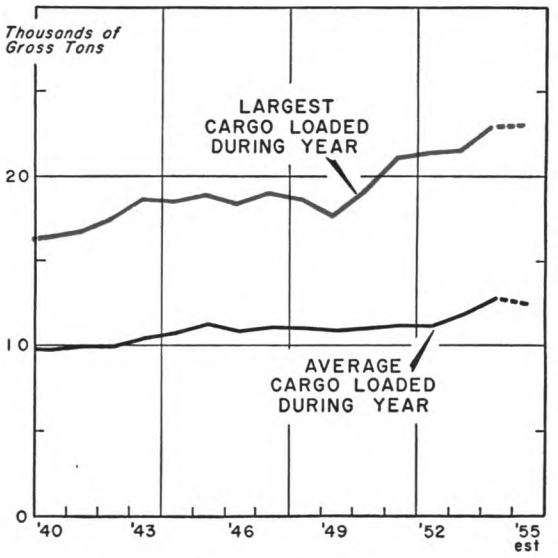
The round of expansion and modernization completed by the lake ore carriers last year expanded substantially the fleet's ability to move millions of tons of iron ore down the lakes. New single-trip cargo records have been set since 1950, as the new boats joined the fleet and the average cargo loaded at Upper Lake docks has risen nearly one-sixth. (See chart.) This year, lower water levels on the lakes, plus the use of a greater number of older vessels in the ore trade, caused the average cargo to decline slightly.

Canadian shipyards have also been busy adding to their fleet and have set some records of their own.[4]

Rising Imports and Future Lake Ore Trade

The rising tide of imports from new ore fields abroad, coupled with the dwindling

IRON ORE CARGO LOADED AT U. S. UPPER LAKE DOCKS



Source of data: Lake Carriers Association. 1955 estimate by Fed. Res. Bank of Cleveland.

reserves of high-grade open pit ores in the Lake Superior region might, at first thought, seem to throw a shadow over the probable future of the lake ore fleet. Such is not the case. The biggest vote of confidence given the future ore trade on the Great Lakes was cast by steel companies and fleet owners themselves when they undertook the last round of shipbuilding.

It is true that imports of iron ore have risen sharply in the past several years. Following World War II, the steel industry launched a broad search for new sources of iron ore. Substantial deposits were discovered and developed in Liberia and Peru. These mines currently ship several million tons of ore a year to U. S. mills. The most extensive fields were uncovered in Labrador and Venezuela, however, and it is the large tonnages of ore beginning to arrive from these developments that have pushed imports up so rapidly. Most of this ore goes to East and Gulf Coast mills and has not affected the lake ore trade as yet. However, a large Southern

(3) The median cargo capacity or horsepower is used here as the average. Rebuilt ships are excluded from the average since they are more prone to have the characteristics of the ships in the year they were originally constructed than those of the year in which they were rebuilt.

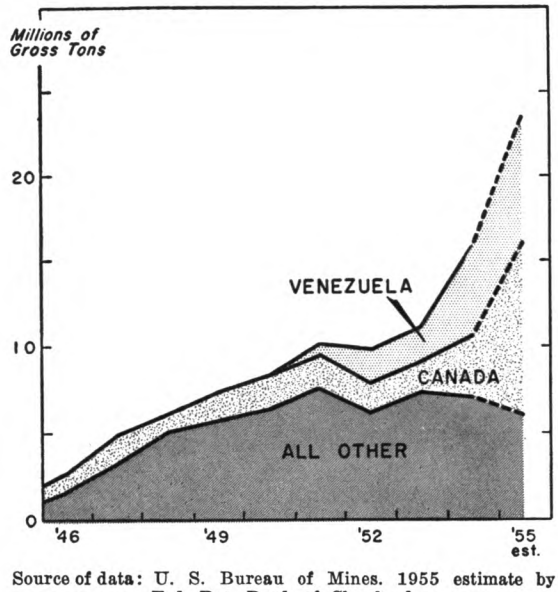
(4) The Canadian grain-carrier *T. R. McLagan* is the longest steamer on the Great Lakes and measures 715 feet in over-all length. The biggest boat on the lakes is the American ore carrier *George M. Humphrey*, launched at Lorain last October. Although the *Humphrey* is 5 feet shorter, its 75-foot breadth is five feet greater than that of the *McLagan*.

Ohio mill will use about 30 percent Labrador ore this year, most of it coming in by rail from the Atlantic seaboard.

An estimated 15 million gross tons of iron ore will come from Labrador and Venezuela mines this year. Several million tons of Canadian ore will also come down the lakes. Thus, imports from Canada and Venezuela may be about 18 million tons this year, or two-thirds more than the total quantity imported in any year prior to 1954. The accompanying chart illustrates the sharp upturn in imports that has occurred in the past two years. (To get the proper perspective on the present relation of imports to total supply, see the earlier chart on total iron ore shipments.) Foreign sources will probably supply an increasingly larger proportion of U. S. needs in the foreseeable future.

In the recent search for iron ore, the Lake Superior region, which had supplied the country for so many years, was not neglected. In fact, the biggest "find" was made in this area by developing a way to process the billions of tons of low-grade taconite and jasper remaining in the area.

IRON ORE IMPORTED FOR CONSUMPTION IN U. S.



Source of data: U. S. Bureau of Mines. 1955 estimate by Fed. Res. Bank of Cleveland.

In the Mesabi range, only about ten percent of the accessible formation was high grade open pit ore. The balance was taconite, an extremely hard rock containing about one-third iron. With so much high-grade ore available in the range, taconite was virtually ignored for years. The iron particles in it were so fine and so thinly spread throughout the ore that solving the difficult mining and processing problems presented by this tough rock did not appear worthwhile.

To make a long and interesting story short, an economically feasible way to mine and process taconite into a form usable in blast furnaces was found in 1948. To date, half a billion dollars have been spent or committed to develop taconite mines and processing plants in the eastern end of the Mesabi range. Entire new towns are being built near the ore fields and along Lake Superior, north of Duluth. Shipments of taconite pellets down the lakes this year are expected to total several million tons.

Iron concentrates are also being recovered from the jasper deposits of the Marquette range in Northern Michigan. Jasper is similar to taconite but has a slightly higher iron content.

Taconite concentrates cost more than natural ore, since it takes roughly three tons of taconite to get one ton of concentrates. But, the concentrated ore contains at least 62.5 percent iron as compared with about 51 percent iron in natural Lake Superior ores.

By 1957, some 7 to 8 million tons of iron concentrates should be coming down the lakes. The capacity of present processing mills is expandable to about 27 million tons a year. The potential is an abundant supply of concentrates for many years to come. Other types of low-grade ore may be found in the Lake Superior ranges. Tentative estimates of the potential supply of low-grade iron ores in the Mesabi and Marquette ranges alone exceed 5 *billion* tons.

(Continued on Page 11)

Eyes are on Commodity Prices

COMMODITY price trends are bound to be very much in the public eye for some time to come, as the business boom and related developments have generated new upward pressures on prices and as public policy is directed toward heading off any new inflationary threat.

Industrial prices, which had been rising slowly since the business recovery began in the fall of 1954, quickened their advance after the steel and auto wage settlements in July of this year. The industrial component[1] of the Bureau of Labor Statistics' Wholesale Price Index rose two percent between June and September to reach an all-time record high. Prices of building materials have been rising at an accelerated rate since June, reinforced by a definite upward movement among most metal products, lumber, paper and rubber products. At least some further price increases seem inevitable as the new wage pattern works its way through the economy and as record industrial demand continues to press against supplies in those "bottleneck" areas of the economy where output is not readily expandable.

Meantime, prices of farm products and of foodstuffs have followed irregular paths, with a general downward trend apparently still predominating. The broad price averages — whether measured by the Wholesale Price Index, the Consumer Price Index, or the Spot Market Price Index — have so far continued to show little movement away from the horizontal.

[1] All commodities other than farm products and foods.

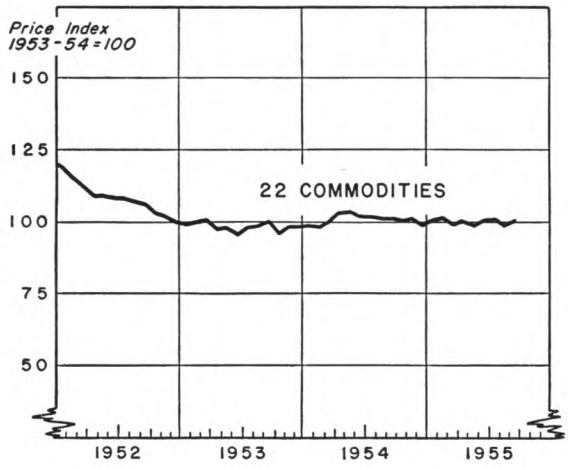
Spot Market Prices

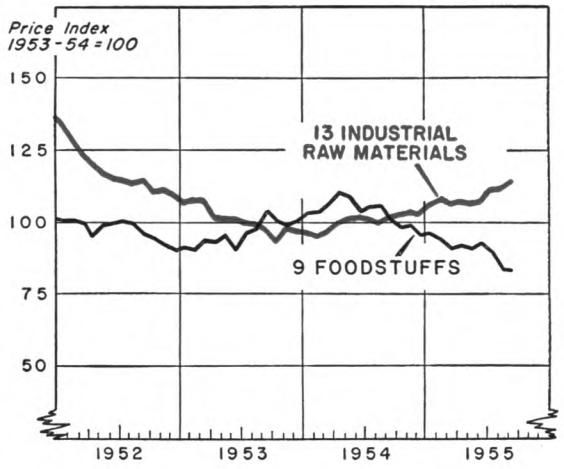
Usually, one of the first indications of an increase in general inflationary pressures is a marked rise in the prices of basic commodities, as businessmen and traders attempt to increase their commodity holdings in order to profit from further (anticipated) price increases and to insure against shortages which might interrupt normal productive processes.

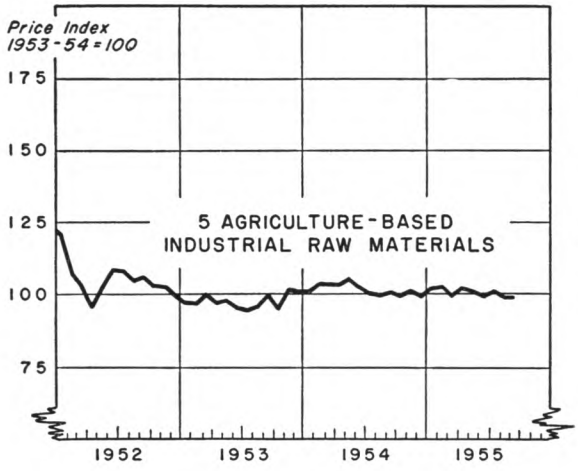
The Bureau of Labor Statistics has developed an index of 22 spot market commodities especially selected because of their sensitivity to economic forces and conditions. These commodities are traded on open markets and organized exchanges, where their prices are primarily determined by the interaction of competitive supply and demand. The components of the index are all primary commodities which are close to the initial production stage and contain a minimum of fixed cost rigidities built into their prices. It is for this reason that the 22 commodities, although they are not a representative cross section of the 2,000-item wholesale price index, usually are quick to reflect shifts in underlying supply-demand conditions of the type most likely to cause important fluctuations in the more broadly based wholesale price index.

The charts and discussion which follow are addressed almost entirely to the Spot Market Price Index. The fact that the latter is weighted more heavily on the side of farm products and foodstuffs than is the general wholesale price index should not be overlooked.

Have sensitive commodity prices been rising lately? As a matter of fact they have not



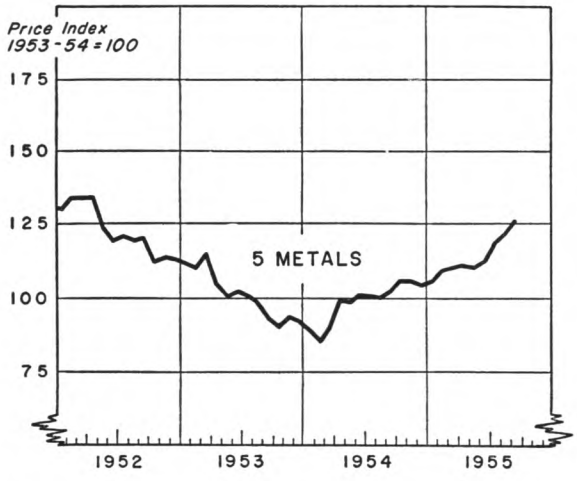


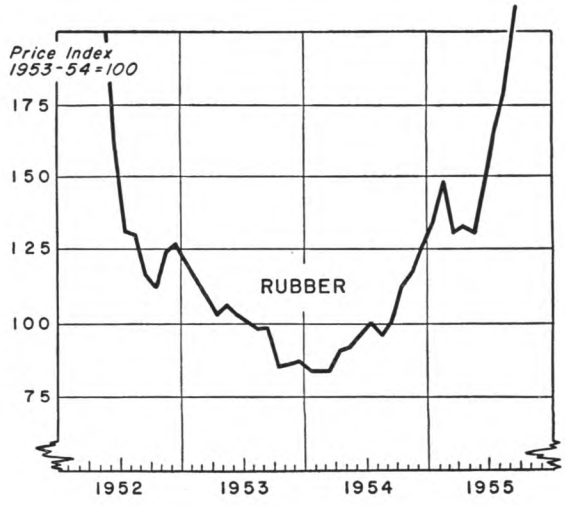


Spot market prices have been stabilized during the past two and one-half years by the offsetting price movements of industrial and agricultural commodities.

In the recent period of booming business activity, foodstuffs have declined in price while metals and rubber prices have soared to levels exceeded only during the Korean War emergency. The prices of industrial materials originating on farms have followed a middle course, with very little fluctuation.

Latest entry: September





been rising, at least up to press time. The spot market price index, like the wholesale and consumer prices indexes, has been unusually stable for more than two and one-half years. However, the over-all steadiness of the index has been deceptive. The accompanying charts show how the stability of the 22-commodity index since early 1953 has actually been based upon the offsetting fluctuations of its two principal component groups — foodstuffs and industrial raw materials.[2]

Industrial Materials and Foodstuffs

At the beginning of this period of stability — in 1953 and early 1954 — rising foodstuffs prices were balanced by declines among most industrial raw materials. Falling prices for raw materials during the industrial boom of 1953 may seem anomalous. Rising industrial activity usually exerts an upward pressure on raw material prices, but in 1953 another influence — reaction to the scare buying and stockpiling of the Korean War period — was having an even stronger effect. Industrial raw materials prices declined steadily from early 1951 through the end of 1953. The business recession beginning in the fall of 1953 helped carry the industrials' price decline into 1954.

The foodstuffs component of the 22-commodity index had strengthened during 1953 and early 1954 primarily because of spectacular price advances by hogs, lard and cocoa beans. Excessive cutbacks in hog production after a market glut in 1952 laid the groundwork for the upward price spirals in hogs and lard. Cocoa prices soared when European consumption increased sharply (due to derationing and prosperity) at a time when plant diseases, adverse weather conditions and political policies were holding down output in West Africa's principal producing area.

The pattern of price movements now dominating the spot market commodity index had its origin in the spring of 1954. At that time, the relative positions of foodstuffs and raw industrials were reversed; declining food prices began offsetting a rising trend in the prices of industrial raw materials.

At first, the upturn in industrial materials prices appeared artificial. War scares in the Far East (Indo-China and Formosa) bolstered the prices of imported commodities for several months. In addition, a decision by the U. S. Government to substantially expand its purchases of domestically produced minerals for the national stockpile gave the prices of nonferrous metals an initial lift, which was followed by continuous support.

The war scares proved to be temporary, but the climb in the prices of industrial raw materials did not. The decline in industrial production in this country ended in the spring of 1954 and business activity in Europe continued the expansion that had persisted throughout the brief recession here.

Metals and Rubber

As indicated by the accompanying charts, the price movements of metals and rubber have dominated the rising trend of the industrial raw materials component of the 22-commodity index. With the government absorbing surplus stocks that had accumulated during the brief recession, metals prices[3] strengthened during mid-1954 and quickly responded to the improved industrial demand in the fall of that year.

Lead and zinc benefited most from government stockpile purchases. Primarily as a result of the government program, lead and zinc prices rose gradually from lows of 12.5c and 9.8c per pound, respectively, in early March 1954 to 15c and 12c per pound in

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2 The 22 commodities making up the Bureau of Labor Statistics' index of spot primary market prices are as follows: butter, cocoa beans, corn, cottonseed oil, hogs, lard, steers, sugar, wheat, burlap, copper scrap, cotton, hides, lead scrap, print cloth, rosin, rubber, steel scrap, tallow, tin, wool tops, and zinc. The first 9 items are classified as foodstuffs and the remaining 13 as industrial raw materials. It should be noted that 5 of the raw industrials are metals. The 5 agriculture-based industrial raw materials which have been charted are cotton, hides, rosin, tallow and wool.

A recent 1953-54 base period was used in constructing all of the charts in order to facilitate the comparison of relative price movements.

3 Represented in the 22-commodity index by copper scrap, lead scrap, steel scrap, tin and zinc.

January 1955. Thereafter, with the government absorbing successively smaller offerings, expanding industrial demand pushed zinc to 13.5c per pound and lead to 15.5c per pound in September of this year.

The purchase by the U. S. Government of 100,000 tons of surplus Chilean copper in the spring of 1954 set the stage for a gradual rise in the market price of that metal. A series of strikes against copper producers both here and abroad together with climbing industrial consumption had created a shortage of copper by the late spring of 1955. Before an expanding world output could restore market equilibrium, a new strike against U. S. copper producers took place in July, with the result that copper prices soared to an all-time peak of more than 50c per pound on the world market.

Stimulated by record demand from the auto and construction industries, the steel industry chewed up increasing quantities of scrap during late 1954 and 1955, while greatly expanded exports cut into scrap supplies. Steel scrap prices, like those of most other metals, climbed along with the rising pace of business activity.

Natural rubber prices have more than doubled since the first quarter of 1954. Increased buying by Iron Curtain countries coincided with the record demand generated by the booming auto industries in Europe and the United States. Because rubber trees take several years to mature (and the capacity of existing synthetic rubber factories is limited), the world supply of rubber cannot be readily increased on short notice. Increased demand is quickly reflected in higher prices.

Agricultural Prices

Further examination of the "industrial raw materials" group reveals that those raw materials produced in the farm sector of the economy have not participated in the rising price trend evidenced by metals and rubber. Cotton, hides, rosin, tallow and wool tops together, as shown in an accompanying chart, have tended to follow a middle course. Expanding industrial demand for these commodities in 1955 has been tempered by the existence of abundant supplies and competition from substitute materials.

Abundant supplies are not something peculiar to the agriculture-based industrial raw materials. They are currently an overriding characteristic of almost all the commodities produced in the farm sector of the economy. Agricultural abundance has been manifested in the 22-commodity index primarily by the steady decline in foodstuffs prices which has been in progress since April 1954.

A variety of factors lie behind the price weakness in the farm commodity group. For a precise understanding, each product needs to be interpreted both on its individual merits and in terms of the more complex interrelationships among the various farm products. To generalize, however, the principal underlying factor is the failure of supplies to adjust down to a normal peacetime level of demand. Wheat, cotton, corn, and other storable commodities have backed up into inventory rather than moving into consumption. Land forced from production of such surplus products has found its way into production of other products creating still additional excesses. Abundant feed supplies at reduced prices have tended, furthermore, to spur the production of hogs and cattle and consequently their by-products, lard, tallow and hides. Wool and butter, as alluded to previously, have fallen victim to competition from lower priced substitutes and, in the case of wool, a cheaper source through foreign suppliers.

The flexible farm price support program in several cases has resulted in the lowering of support levels; consequently, downward price pressures have been expressed in lower market prices.

So far as the agricultural outlook is concerned, the accumulation of stocks held by the Commodity Credit Corporation will in effect provide a rather specific price ceiling on many farm products for some time to come, as these stocks will move onto the free

market whenever prices rise much above support levels.

On the industrial side, the question is whether the present pressures can be contained. Whether higher wage costs will be fully passed all the way forward to the commodities and services purchased by consumers depends largely upon the intensity of competitive pressures at the various levels of industry and trade. Although the retail prices of most services have risen steadily during recent years, many cost increases bearing on manufactured commodities have been absorbed by shrinking producer and distributor margins. In the final analysis, the strength of consumer demand and availability of purchasing power, both in the form of personal income and credit, will be important factors influencing the prices of manufactured commodities at retail.

ORE FLEET

(*Continued from Page 6*)

The development at Steep Rock, in Ontario, also deserves mention in any round-up of Lake Superior iron ore. Here, rivers were diverted and a lake was drained in order to get at the rich iron ore deposits lying under water. Steep Rock ore is beginning to move over the docks at Port Arthur in appreciable tonnage with shipments expected to reach 2,200,000 tons this year.

The future of the Lake Superior region as a major supplier of the country's iron ore needs seems secure. Over two-thirds of the nation's steel-making capacity is clustered around the Lower Lakes in such centers as Chicago, Detroit, Cleveland, Lorain, Buffalo, Pittsburgh, Youngstown and Wheeling. Five large steel companies in this area have recently announced major expansions which will increase their future demand for iron ore. The lake ore fleet, as the connecting link between the Lake Superior supply and the Lower Lakes demand, will continue to prosper.

At this time, it is virtually impossible to assay the impact of the opening of the St. Lawrence Seaway (scheduled for 1959) upon the present pattern of the lake ore trade. The Seaway will make it possible to bring large shipments of rich Labrador ore directly into the Lower Lakes. In fact, the locks and canals of the seaway will accommodate the largest vessel now in the lake ore fleet. The competitive advantage of Labrador ore will be determined, in part, by the rate of tolls charged for traffic through the Seaway. The fixing of such charges is still under advisement.

FOURTH FEDERAL RESERVE DISTRICT