

Silver: End of an Era

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MONTHLY REVIEW SUPPLEMENT

Revised November, 1973

From Surplus to Shortage

... The Populist movement of the 1890's and the New Deal of the 1930's both used silver legislation to combat falling prices—and both failed.

Shortage of the '60s

... Finally, the market accomplished what a century's legislation could not do for silver's cause, as demand and prices soared.

No Longer Money

... Demonetization was achieved by June, 1968; prices slumped for a while, but then soared again during the speculative boom of the 1970's.

Comstock Revisited

... Western mines have suffered a long-term production decline, although the price upsurge of the 1960's helped spur renewed mine activity.

From Surplus to Shortage

Populist orators, finding no rational explanation for the grinding deflation that racked the nation's economy before the turn of the century, argued that hard times were the result of a monstrous conspiracy organized by London bankers and their Wall Street minions. When asked for evidence, these orators automatically cited the "Crime of 1873"—the (temporary) demonetization of silver.

"A crime, because it has brought tears to strong men's eyes and hunger and pinching want to widows and orphans. A crime because it is destroying the honest yeomanry of the land, the bulwark of the nation. A crime because it has brought this once great republic to the verge of ruin, where it is now in imminent danger of tottering to its fall." (*Coin's Financial School*)

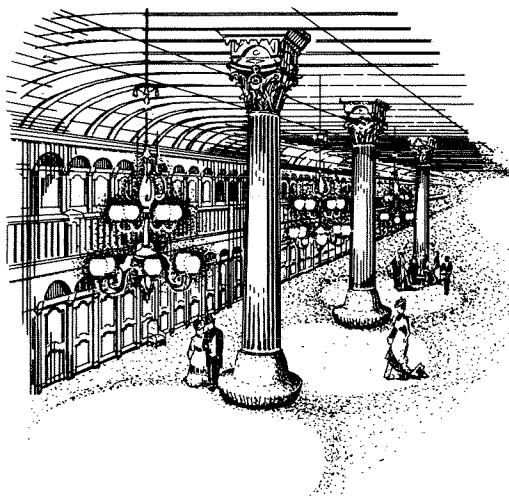
The Populists denounced this "crime" so fervently because they equated the dethronement of silver with a deliberate policy of deflation. In their eyes, the "crime" was compounded in 1900 with the formal adoption of the gold standard, and it was only partly assuaged in the 1930's with the discarding of gold as a domestic means of payment and the adoption of a silver-purchase program.

Yet in the late 1960's, when the Treasury ceased redeeming silver certificates in silver, and when it began to mint its quarters and dimes out of baser metals, few observers if any suggested that the republic was on the verge of ruin. Aside from a few nostalgic editorials, the news of this final dethronement of monetary silver was confined to the financial pages.

Perils of success

The nation easily survived this latest episode in silver's checkered career, in large part because the turn-of-the-century monetary battles had eventually led to the enactment of the Federal Reserve Act, and thus to the institution of flexible methods of monetary control. But more to the point, this time it was silver's rebirth as an industrial and artistic material that contributed to its problems as a monetary metal.

Silver prices almost tripled between 1960 and the 1968 peak, and they doubled just between mid-1967 and mid-1968. Speculative pressures eased over the next three years, so that prices fell back again to the mid-1967 level. By late 1973, however, prices had soared to new peaks, in response to a worldwide industrial boom and heavy speculative demand associated with a series of international financial crises. Basically, however, the upward price pressures of the past dozen years have reflected the deficit in the major sources of supply — Western mines and



Treasury stockpiles — in relation to the significant increase in the worldwide demand for silver. The white metal has very impressive physical characteristics; it is foremost in electrical and thermal conductivity, highest in optical reflectivity, and second only to gold in ductility. Silver in recent years has gained new luster among dentists as well as debutantes, and among spacemen as well as shutterbugs.

The latest episode, in brief, has been closely involved with the metal's extremely strong price performance of the past decade. The major episodes in silver's earlier monetary history, by way of contrast, were products of prolonged price declines for silver, and for everything else, in the Great Depression of the 1890's and the even greater catastrophe of the 1930's. So, just as the "Crime of '73" epitomized the earlier time of monetary troubles, the virtual repetition of that act typifies a performance of a somewhat different kind.

Now that a major chapter in silver's long, emotion-drenched monetary history has come to a close, some perspective may be gained from a review of the legislative highlights. The record dates back to 1792, when the new nation set up two units of value: a gold dollar containing 24.75 grains of pure gold and a silver dollar containing 371.25 grains of pure silver.

Silver's monetary value of \$1.2929 per ounce, although not defined in such terms in the law, could be derived by dividing the number of grains in an ounce (480) by the number of grains of pure silver in the silver dollar (371.25). Silver's monetary value was still measured in the same way in the 1960's, but that apparently was the only sign of stability that could be found in the metal's volatile behavior.

The Founding Fathers—specifically, Alexander Hamilton—had opted for a bimetallic standard, with the unit of account and all types of money kept at a constant value in terms of gold and also in terms of silver. Practically, however, an alternating standard

developed because of the implacable workings of Gresham's Law. Although the relative values of the two metals *at the mint* were constant by legal definition, the relative values in commodity markets fluctuated continuously, producing "bargain" prices at the mint now for one metal and again for the other; the metal that was overvalued at the mint consistently drove out of monetary use the metal that was undervalued for such purposes.

The original 15-1 mint ratio of silver to gold (by weight of equivalent value) was below the market ratio existing at that time, and the consequent gold outflow tended to make silver the nation's standard money until the 1830's. Gold was then revalued, however, and the resultant 16-1 mint ratio caused a reversal of the situation and led to a disappearance of silver.

Greenbacks and Gresham

Then came the Civil War—and then came the losing thirty-year battle on the part of debtor groups to maintain prices at the high wartime levels at which they had contracted their debts. The postwar price decline had developed partly because of the cessation of the war-induced demand for commodities and partly because of the sudden buildup in farm surpluses resulting from the rapid expansion of the trans-Mississippi West—but also because of a shift in monetary policy toward contraction of the paper currency and resumption of specie payment.

The struggle of Populist farmers and other debtors to restore wartime price levels through currency inflation was led initially by the Greenbackers. That doughty group, which demanded the redemption of war bonds in paper and not in gold, suffered a crucial defeat when the Administration resumed specie payments in 1879. But even before that event, the inflationists had arrived at the view that they could attain their ends by injecting silver into the monetary system at an inflated ratio.

In accordance with Gresham's Law, silver at the 16-1 mint ratio had been undervalued and had long since disappeared from circulation. In fact, such a long time had elapsed since any silver had been presented to the mints for coinage that Congress in 1873 stopped the further minting of the standard silver dollar, and thereby effectively demonevized silver. Whether deliberately or through oversight, Congress simply failed to include in a long, very detailed and technical revision of the coinage laws any provision for the continuing coinage of the standard (371.25-grain) silver dollar. Thus was the "Crime of '73" perpetrated.

No cries of outrage greeted the event at the time it occurred, since every ounce of silver was then worth \$1.30. But within three years the situation altered drastically: the price of silver dropped to \$1.16 and below, on the heels of a glut occasioned by the opening of new mines in Nevada and the closing of silver markets in the new gold-standard countries of Western and Southern Europe.

Cross of gold

The Populists cried conspiracy, for if silver could have been coined freely at the old 16-1 ratio the debtors could have paid their debts with the easier-to-earn white metal. In order to repair the ravages of the crime, therefore, these inflationists demanded that Congress restore the free and unlimited coinage of silver at the old 16-1 ratio.

The best they could obtain, however, was the passage of the Bland-Allison Act of 1878, which required the Treasury to buy not less than \$2 million of silver every month for coinage or for backing of silver certificates. But the net increase in currency, which amounted to \$253 million in the 1879-90 period, failed to match the hopes of the backers of this legislation; the new silver certificates simply took the place of national bank notes which were being retired in connection with the reduction of the national debt.

The price of silver dropped to \$0.94 within the following decade, so the inflationists demanded that more be done. This time the best they could accomplish was the passage of the Sherman Silver Purchase Act of 1890, in a trade whereby Westerners voted for a tariff bill which they disliked while Easterners voted for a silver bill which they feared.

The Sherman Act directed the Secretary of the Treasury to buy 4.5 million ounces of silver bullion—almost the entire domestic production—every month. The bullion was to be paid for through the issue of new legal-tender Treasury notes, which were to be redeemable in either gold or silver—a provision which permitted an "endless chain" of gold withdrawals in the panic of 1893.

Despite these efforts, the Sherman Act did not succeed in its purpose. It failed to raise the price of silver, and moreover it failed to increase the amount of money in circulation and to reverse the steady decline in farm prices. (Senator Sherman's influence obviously was far more lasting in the antitrust field.)

President Cleveland and other gold supporters wanted to abandon silver to its fate and to adhere formally to the gold standard. The silverites, on the other hand, continued to favor the unlimited coinage of silver and the pegging of the silver price at the traditional 16-1 ratio. For a while, Cleveland had his way; faced with the panic of 1893 and with a substantial gold outflow which reduced the gold reserve below the tacitly recognized floor of \$100 million, he forced through Congress the repeal of the Silver Purchase Act. Yet this led to his repudiation by his own party and to the mighty Populist upsurge which in 1896 brought William Jennings Bryan to the verge of the Presidency.

Gold triumphant

Nonetheless, within four years the money question was no longer at the center of public controversy—in fact, was hardly in the public eye at all. Early in 1900 the victorious "gold-

bugs" secured the passage of an act providing that the gold dollar of 25.8 grains nine-tenths fine should be the unit of value and that all other forms of currency should be maintained at parity with this dollar. (Parity was to be maintained through a \$150-million gold reserve which the Treasury would hold available for the redemption of paper money.) Then, later in 1900, Bryan's second defeat sealed the doom of silver as a dominant political issue.

The issue died out simply because of the long-awaited reversal of the downward trend in prices. Between 1896 (the low point) and 1914, the general price level increased 40 percent. But inflation and farm prosperity were achieved not through the Populists' chosen instrument, silver, but rather through several unexpected developments — developments related to the metal which they detested (gold) and to the center of the gold "conspiracy" which they despised (the city).

New gold discoveries in South Africa and North America, along with the development of new processes for extracting the precious metal from the ore, flooded the world with

gold during these critical years. Over two decades, the amount of gold coinage increased by half, and thereby permitted a corresponding expansion of the currency supply. After 1896, therefore, the gold inflation helped bring about the happy situation which the farmers for so long had tried to win with silver. The evidence was apparent on every hand—wheat rising from 72 cents a bushel in 1896 to 98 cents a bushel in 1909, corn rising from 21 cents to 57 cents, and so on throughout the list.

But the American city itself, and not simply the gold inflation, saved the American farmer. Throughout that golden age, the foreign market for many of his products sharply declined. Yet his income situation sharply improved, because of the very thing that was cited as evidence of his political submergence—the great increase of the urban population. In 1890, 4.6 million American farms supplied a domestic urban population of 22 million; in 1910, 6.4 million farms supplied 42 million city-dwellers. The larger, more efficient, and more mechanized farms which developed over

Poor Man's Money

Mr. President, I urge the Senate not to fiddle while the silver dollar melts—while the symbol of hard money, of poor man's money, disappears from our midst. We ought not to dismiss the cause of the silver dollars as unimportant. This is not a tempest in a teapot. There is a deep resentment and an understandable reaction of public dismay at the imminent passing of a coin which for more than a century has existed and continues to exist in our midst as a reminder of the past and as a functional and preferred medium of exchange even today. If we fail to act, Mr. President, we do so at the expense of the small merchant in the West, and to the chagrin of decent hardworking and honest folk who prefer the cartwheel both as money and as distinctive tradition.

They like the feel of heft in their pockets. To them, the jingle of silver dollars is the sound that signifies liquidity. It is the echo of cash on the barrelhead. They prize it, Mr. President, as the New Yorker might prize the Empire State Building; as the Californian, the Hawaiian, or the Floridian, might prize year-round sunshine; as the southerner, black-eye peas; as a New Englander, a lobster and baked beans; and as a Texan, a 10-gallon hat.

—*Senator Mike Mansfield*

those two decades produced an increasing part of their total produce for the home market (and less for the foreign market), under far stabler and more advantageous conditions of transportation and finance than had prevailed in the past. And yet this favorable trend—labeled “From Pathos to Parity” by one historian—was achieved without any aid whatsoever from the Populists’ favorite weapon, silver inflation.

Gold forlorn

The second major development in silver’s dramatic history occurred in another major period of deflation—the 1930’s. Once again a movement arose to halt a prolonged deflationary spiral by restoring currency values to the level at which wartime and postwar debts had been contracted. And once again a remedy was proposed, in the Thomas amendment to the Agricultural Adjustment Act of 1933, that envisioned both the printing of more paper money and unlimited coinage of silver. The Amendment, in addition, authorized increased open-market purchases of Government securities and a reduction in the gold content of the dollar.

The last-named of these alternatives received the most emphasis in early New Deal days. Under the authority of the Gold Reserve Act of 1934, the value of the dollar was officially fixed at 59.06 percent of its formerly established (1900) value in terms of gold.

But much to the surprise of the theorists who influenced the Administration’s decision—theorists who posited a close relationship between the price level of commodities and the gold content of the monetary medium—the price level did not automatically respond. True enough, the wholesale price index increased somewhat in line with the general expansion of demand following the Depression low, but the increase was only about half of what the inflationists expected in view of the 41-percent reduction in the gold content of the dollar. Silver inflation, therefore, was

brought forward as a supplement to the incomplete gold inflation—and as an answer to the perennial legislative demand to “do something for silver.”

Since 1873, the downward trend in the price of silver had been interrupted only twice, during the silver-purchase period around 1890 and again during World War I. After the turn of the century, in fact, the market price rarely exceeded one-half the nominal mint value.

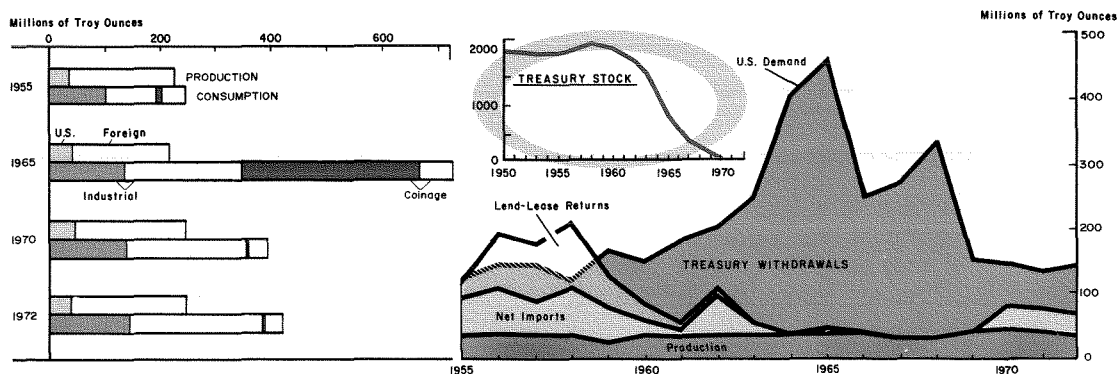
Silver had remained in a monetary limbo with respect to new acquisitions; some was used for subsidiary coins, some circulated in the West in the form of standard silver dollars, and a roughly fixed stock of silver certificates remained as a relic of the 1890’s. Thus, by the 1930’s, only about 650 million ounces were in use as coin or as currency backing at the Treasury.

Silver, silver everywhere

At the end of 1933, with the market price of silver standing at about \$0.44 an ounce—75 percent above the Depression low—unlimited purchases of newly mined silver were initiated at \$0.6464 cents an ounce under the authority granted by the Thomas amendment. But inflationist pressure then brought about even further action, in the form of the Silver Purchase Act of 1934. Under its terms, the Secretary of the Treasury was directed to purchase silver at home and abroad until the market price reached the traditional mint price of \$1.2929 an ounce, or until the monetary value of the Treasury’s silver stock reached one-third of the monetary value of its gold stock. The support price at which purchases were made was changed on several different occasions during the ensuing dozen years; originally \$0.6464, it was eventually set at \$0.9050 in 1946.

Under the authority of the silver-purchase legislation of the 1930’s and subsequent Presidential proclamations, the Treasury acquired some 3,200 million ounces of silver—about

Treasury stocks completely depleted as sharply rising consumption for industrial and coinage purposes outstripped stable mine production



half of it in the four-year period 1934-37, and the remaining half in the subsequent quarter-century. A minor part (about 110 million ounces) consisted of silver that was “nationalized” in mid-1934, when the Administration required nonmonetary silver to be turned in at \$0.5001 per fine ounce, so as to capture the profits expected to be realized from the increased government purchase price. About 2,210 million ounces consisted of metal purchased abroad at prevailing market prices, and the remaining 880 million ounces consisted of newly mined domestic silver.

Until 1955, the Treasury support price for newly mined domestic silver was higher than the market price, so the U. S. Government purchased domestic metal at the higher price while U. S. silver-using industries purchased low-priced foreign metal. But from 1955 to late 1961, the market price approximated the support price, and silver users then began to purchase some supplies from the Treasury as well as from foreign and domestic mines.

In little over a quarter-century, the Treasury purchased \$2 billion in silver, and sextupled the physical quantity used as currency or held in stockpiles. Nevertheless, the silver program during that period failed to achieve either of the objectives specified in the 1934 Silver Purchase Act: a market price equal to the monetary value of \$1.2929, or a 1-to-3 ratio of the monetary stocks of silver and gold.

Prior to the 1960's and to the upsurge of world demand, market pressures failed to push prices above the \$0.9050 floor. Meanwhile, the ratio of monetary silver to monetary gold stocks—both at their nominal monetary values—failed to reach the 1-to-3 target figure. (The ratio ranged around 1-to-5 in the prewar period, then rose to 1-to-7 as a consequence of the early postwar gold inflow, and finally dropped to 1-to-4 during the following decade as gold began to flow out instead of in.) Then, when silver's supporters achieved the price upsurge they wanted, it turned out to be a mixed blessing indeed.

Shortage of the '60's

Eventually, the market accomplished what a century's legislation could not do for the cause of silver price support. In the late 1950's, world consumption of silver increased about 4 percent annually, while world production rose only about 1.5 percent annually. Sales from Treasury stockpiles filled the gap—and held the price line—for almost a decade, but the depletion of stocks finally brought the process to a halt.

The first scene in a long drawn-out final act occurred in late 1961. By that time, the worldwide industrial and coinage demand for silver approximated 300 million ounces annually, about half of which was American demand, whereas worldwide production approximated 235 million ounces annually, about one-sixth of which was from American mines. The gap had to be filled by sales from the Treasury's "free silver" stocks—that is, stocks that were not earmarked for currency backing or coinage.

Beginning of the end

The Treasury's supply of free silver had reached its peak in early 1959 at 222 million ounces. But by the end of 1960, half that supply was gone and by late 1961, only 22 million ounces were left. There remained, however, nearly 1,700 million ounces in a bullion reserve held against the issuance of part of the nation's paper currency. About one-fourth was held against \$5 and \$10 silver certificates, and the remainder was used to support \$1 and \$2 silver certificates. The larger denominations could have been issued in the form of Federal Reserve notes, but then-existing legislation authorized only silver certificates for the smaller denominations.

The legislative stage was thus set for the beginning of the final act. In November 1961, President Kennedy wrote Treasury Secretary Dillon, "I have reached the decision that silver metal should gradually be withdrawn from our monetary reserves"—and with that, he instructed the Secretary to suspend further sales of the Treasury's free silver, to suspend the use of free silver for coinage, and to obtain the silver required for coinage needs through the retirement from circulation of \$5 and \$10 silver certificates. By this measure, some 400 million ounces of the total reserve of 1,700 million ounces were released for coinage purposes. (Interpreting the President's statement as a Treasury withdrawal from the supply side of the market, the market responded with a 10-percent jump in price the very next day, and with a further 30-percent rise the following year.)

The next scene occurred with the passage of Public Law 88-36 (June 1963). The Act repealed the Silver Purchase Act of 1934 and subsequent silver legislation, repealed the tax on transfers of interest in silver bullion, and confirmed the redeemability of silver certi-



ates for silver dollars or bullion at the monetary value of \$1.2929 an ounce. But in particular, the Act authorized the issuance of Federal Reserve notes in the smaller denominations, thereby providing for the eventual elimination of silver as backing for \$1 and \$2 bills. The new policy, in effect, “provided for the eventual demonetization of silver except for its use in subsidiary coinage.”

Silver rush of '64

In Congressional hearings which preceded the passage of this new law, Secretary Dillon argued that the new legislation would not mean the disappearance of the silver dollar, since the Treasury had ample supplies of “cartwheels” and other traditional coins. But the market felt otherwise, and soon thereafter staged the dramatic epilogue to the Act of 1963—the great silver rush of '64.

Part of the explanation was the inability of the Philadelphia and Denver mints to keep up with the public's burgeoning demand for coin. The amount of circulating coin, which had increased roughly 50 percent in the first postwar decade, more than doubled in the following decade because of the heavy toll levied by vending machines, sales taxes, school lunches, parking meters, and coin telephones—and because of the insatiable demands of the growing band of coin collectors and speculators.

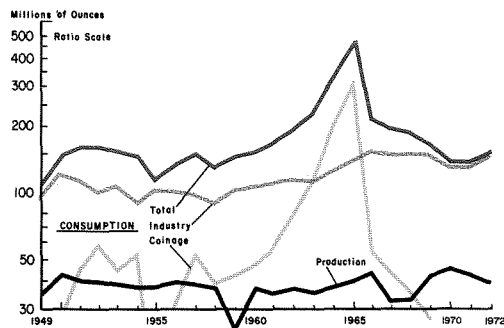
The mints, intent on supplying the public demand for minor coin, had not minted standard silver dollars during the entire post-war period; in fact, the last of these “cartwheels” came out in 1937. Yet, for some time, there appeared to be no problem. Out of a total supply of 485 million silver dollars, about one-third were circulating in 1950, and about two-thirds in 1960. But then the outflow increased sharply, and accelerated even more in the months following the enactment of the new silver legislation.

Only 28 million “cartwheels” were left in Treasury hands at the beginning of 1964.

Many of them went into circulation by early March, and then, when the House Appropriations Committee rejected a Treasury request for authorization to begin minting these pieces again, the rush was on. In two weeks' time the Treasury shipped out more than 11 million pieces to the tradition-loving Western states—and meanwhile distributed more than 3 million pieces to a jostling, haggling crowd which besieged the Treasury building in search of choice “Morgan” dollars of turn-of-the-century vintage.

Only 2.9 million “cartwheels” were left when, in the *Wall Street Journal's* description, “Secretary Dillon drove the money changers out of his temple.” Exercising the option open to him under the terms of the 1963 legislation, the Secretary decreed that silver certificates thenceforth would be redeemable only in silver bullion at the monetary value of \$1.2929 per ounce. Holders of silver certificates could continue to exercise their legal right to demand an amount of silver precisely equal to the silver content of a standard silver dollar, but they would be assured of getting only several slivers of metal in an envelope instead of a coin of considerable numismatic value.

Coinage demand soars, then falls, while industrial usage trends upward



Still, most observers continued to feel that silver dollars represented only a special case, and that a silver shortage was practically out of the question in the foreseeable future. In his 1963 Congressional testimony, Secretary Dillon argued that, with the passage of the proposed legislation, the Government's silver reserves would "assure an adequate supply of silver to meet our coinage requirements for the next ten to twenty years." But over the next two years alone, consumption of silver came to exceed all earlier expectations, and it became readily apparent that even the Act of 1963 had failed to provide a lasting solution to the Treasury's problems.

Growing deficit

Production of silver in this country had fallen short of U. S. consumption consistently throughout the postwar period, but the gap began to widen appreciably after 1958. In fact, domestic production actually declined slightly from 1958 to 1963, while domestic consumption for coinage and industrial use rose sharply, from 124 to 222 million ounces. As a result, the annual deficits increased from a sizeable 100 million ounces or so in the 1950-58 period to an even more substantial 187 million ounces in 1963. But then, in 1964, the deficit jumped to 289 million ounces, as production remained level in the face of a soaring demand of 326 million ounces.

Moreover, the same type of situation existed elsewhere, as total world consumption (outside the Soviet Bloc) grew to more than 2½ times total new production. With total metal usage at 556 million ounces, the world supply deficit in 1964 amounted to 338 million ounces.

Foreign sources came to fill less and less of the U. S. deficit over the 1958-63 period, because of the expanding needs for the metal abroad. At the same time, returns of lend-lease silver which had been shipped out during World War II dropped steadily, from a peak of 103 million ounces in 1958 to zero in 1963. In making up the growing deficiency, Treas-

ury stocks receded by 523 million ounces in the five-year period, to 1,583 million ounces in 1963.

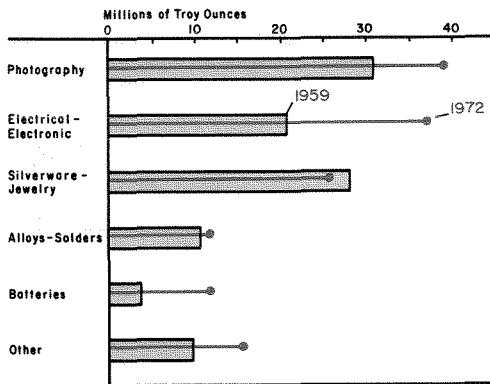
In 1964, moreover, foreign demands actually comprised a drain on Treasury stocks, and this country became a net exporter of silver for the first time since the lend-lease shipments of World War II. Total exports during the year amounted to 110 million ounces, more than triple the 1963 figure, while imports declined from 64 to 55 million ounces. In meeting both this new export demand and the soaring domestic demand, Treasury stocks of the metal dropped 23 percent in 1964 alone, to 1,214 million ounces.

An increase in industrial consumption of silver—mainly for use in photographic film, electronic components, and storage batteries—helped to intensify the growing shortage. Industrial consumption in this country, which had dropped from an annual average of 100 million ounces in the early 1950's to 86 million ounces in 1958, rose by more than 5 percent annually over the next five years, and then jumped 11 percent more in 1964, to 123 million ounces.

Overseas, the expansion in industrial consumption had been even more impressive, particularly in West Germany and Japan. Between 1950 and 1958, foreign industrial consumption doubled, and by 1964 it increased again by half, to 163 million ounces. Thus a shortage existed from industrial demands alone, since world industrial consumption exceeded total mine production by 71 million ounces in 1964.

The sharp upsurge in silver usage took place even in the face of a 40-percent increase in silver prices between November 1961 and June 1963. The demand for silver evidently was quite inelastic—unresponsive to an increase in price—because no known alternative equaled its high electrical and heat conductivity, resistance to corrosion, and sensitivity to light.

Photo and electrical firms account for bulk of silver demand



Industrial requirements

Consumption of silver for photographic film, plates, and sensitized paper—the largest single market in this country for the metal—increased at an annual rate of about 2 percent between 1959 to 1963, and then jumped 20 percent, to 40.3 million ounces, in 1964 alone. The photographic industry's consumption would have increased even more rapidly had it not learned to economize on its supplies. By extracting silver from photographic solutions used in developing film, for example, it was able to reclaim as much as 10 million ounces in 1964.

Under the stimulus of the sharp run-up in silver prices, the photographic industry also accelerated its research aimed at the development of substitutes. In many of silver's most important applications, however, no other material could be found with silver's unique ability to record an image when exposed to light. (The only major alternative was the use of electrostatic copying methods in office equipment.) Because silver was all but indispensable to the photographic process, its use in this field tended to increase along with the continued growth of the industry.

The electrical-equipment and electronics industry represented another rapidly growing outlet. Consumption of silver in these fields

rose almost 50 percent between 1959 and 1964, from 20.5 to 30.3 million ounces, and, as a result, the electrical industry surpassed silverware and jewelry to become silver's second largest market.

Unequaled as an electrical conductor, silver's use as an electrical contact had expanded until it could be found in practically every on-off switch and electrical appliance. Silver-wire contact relays also were at the heart of most computers and almost every piece of telephone and aviation equipment. Besides, suitable substitutes were not available for applications accounting for perhaps three-fourths of the entire market—primarily voltage connections for space-vehicle guidance systems, military electronic systems, and the like.

Consumption in brazing alloys and solders, another rapidly growing field, expanded from 10.5 million ounces in 1959 to 15.8 million ounces in 1964. During World War II the use of silver alloys as industrial joining media gained impetus in the manufacture of shells, gun parts, and ordnance. After the war, silver brazing alloys became important in air-conditioning and refrigeration equipment, electrical appliances, and automobile parts—in fact, in virtually every end-product where joining or bonding was involved. And entirely new applications also arose: silver-infiltrated tungsten for rocket fuels, as well as silver brazing alloys capable of withstanding heat and pressures generated at supersonic speeds. For these applications, which require high-temperature soldering, substitution of other materials was completely impractical.

Consumption of silver in storage batteries, a relatively new use, almost tripled between 1959 and 1964, reaching 9.0 million ounces. Batteries utilizing silver (in association with zinc or cadmium) can be recharged, and they are very useful for applications requiring high output in relation to weight, for example, in spacecraft and portable tools and appliances. Because these batteries rely on the chemical

reactance of silver, the substitution of other materials again was impractical.

For all these reasons, the industrial demand for silver expanded inexorably in the early '60's, even in the face of stable or declining demand for the metal in its more traditional uses. (Silver consumption for silverware and jewelry had actually declined, as a result of the rising price of sterling silver and the increasing acceptance of stainless-steel flatware of modern design.) But industry had to meet much of its rapidly increasing needs through the redemption of silver certificates. With each dollar exchangeable for .7734 ounces of silver, the availability of Treasury supplies held the market price at \$1.2929, the level first reached in September 1963. But because of this drain, as well as additional withdrawals for speculative holdings and inventories, redemptions amounted to 141 million ounces in 1964.

Soaring coinage

Nevertheless, by far the largest drain on Treasury stocks resulted from the tremendous expansion in silver usage for coinage. The actual silver crisis might have been delayed for years had not a terrific coin shortage developed. Consumption of silver for U. S. coinage began to rise sharply in 1961, and in fact doubled over the next two years, reaching 112 million ounces in 1963. Even with this, the demand could not be met, and the shortage of coins turned critical around mid-1964.

At one time limited to relatively few geographical areas, to particular coins, and to particular seasons of the year, the shortage eventually became a general problem affecting the entire economy. Merchants found it difficult, and in some instances impossible, to make change. Banks, unable to satisfy their customers' requests for coin, found it necessary to ration their supplies. In fact, coin rationing was instituted down the line—from the mints, to the Federal Reserve, to the commercial banks, to the public.

A new type of entrepreneur, "the money merchant," appeared on the scene, acquiring coins by the bagful and selling them to the highest bidder. The American Bankers Association staged a "Calling All Coins" campaign, in an attempt to bring to market the large supply of coins stored in the nation's piggy banks. And one chain of food stores conceived of the idea of issuing scrip, in denominations of 1, 5, and 10 cents, redeemable at the company's stores. (The chain dropped the plan when it found that it might be violating Federal law.)

Some observers blamed the shortage upon the growing use of some 12 million automatic coin-operated vending and service machines—ranging from parking meters and telephone pay stations to machines that dispense hot and cold drinks, sandwiches, candy, cigarettes, music, and laundry and drycleaning services—and upon the growing coin requirements of toll roads, sales taxes, and school lunches. Other observers simply traced the shortage to the burgeoning demands of a rapidly growing population and a rapidly expanding economy.

According to Treasury officials, the expansion in coin production should have been more than adequate to compensate for all these developments. From fiscal 1959 through fiscal 1964, the Mint had nearly tripled the production of coins, from 1.6 to 4.3 billion pieces—yet during that same period, population had increased only 8 percent, gross national product 28 percent, and vending machine sales by 47 percent. Furthermore, the 48 billion coins available for circulation provided an average of 240 coins for every man, woman, and child in the entire country.

Availability vs. supply

The Committee on Government Operations, investigating the coin shortage, drew attention to the problem of availability as opposed to the actual supply of coins. Large amounts had been placed in circulation, but large amounts had been withdrawn, by businessmen anxious

to assure themselves of an adequate supply for the needs of trade, by the nation's 8 to 10 million coin collectors—and by speculators, who bought up new coin by the roll, by the bag, and even by the ton in the hope of profiting from a possible increase in the price of silver or coin. Incidentally, vending industry spokesmen argued in their own defense that only about \$22 million remained in their machines at any one time, even though the machines swallowed some \$3,500 million in coins every year.

As commercial banks found themselves with less and less coin, the “flowback” of coin returned to the Federal Reserve Banks had dropped sharply, from 11.4 billion coins in fiscal 1962 to only 6.7 billion pieces in fiscal 1964. Deliveries of new coin from the Mint had risen, but the added supply had been more than offset by the drying up of return flows from circulation.

By mid-1964, the return flow had shrunk to the point where it was less than the amount of new coin received from the Mint, whereas in more normal times the return flow was nine times as great as Mint deliveries. Consequently, the Reserve Banks were unable to deliver coin on request and had to ration the limited supply.

The rise in the price of silver to \$1.2929 an ounce—that is, the development of a situation where the silver dollar was worth a dollar of silver—had encouraged the run on the Treasury's depleted stock of silver dollars, as described above. Thus, broad new public interest in coins was stimulated when the Treasury found itself with less than 3 million “cartwheels” and, amidst great publicity, was forced to restrict redemption of silver certificates to bullion.

The withdrawal of coins gathered further momentum when the Treasury issued the Kennedy half-dollar in March 1964. The coin was not a commemorative piece and was intended to circulate freely as just another coin. Instead people all over the world sought to

keep it for sentimental and esthetic reasons. The demand was so great that the coin sold at a premium wherever it became available. In Italy it brought \$15, in Hong Kong \$5. In this country, many people were unable to obtain even a single coin, although each sold for as much as double face value when first issued. (Coin fanciers with short memories should be reminded that the same type of situation developed when the Lincoln-head pennies first made their appearance in 1909.)

Crash cure

Whatever the reasons for the coin shortage, Treasury officials decided that it could be overcome only by a rapid and substantial increase in production. By flooding the economy with coins, they hoped to convince those who held them for speculative reasons that the market would soon be saturated.

The Treasury previously had planned to boost production at the existing mint facilities gradually over time, while waiting for the completion of the new Philadelphia mint authorized by Congress in 1963. This new mint was designed to have as much production capacity as the Denver and old Philadelphia mints combined.

Events, however, forced the adoption of another approach. In mid-1964, the Treasury placed its two operating mints on a round-the-clock seven-day-a-week intensified “crash program,” in an attempt to double the annual production of coins from 4 to 8 billion in a year's time. It pushed into production all possible equipment and facilities—including the San Francisco assay office, which was assigned to produce annealed blanks for nickels and pennies—and also purchased metal strip for coinage from private industry. Moreover, it obtained Congressional authorization to continue the 1964 date on new coins indefinitely, so that it could flood the market with 1964 coins and thus destroy the incentive for dealers and hoarders to divert such coins from normal commercial uses.

As 1964 drew to a close, the Treasury was well along in its crash program. During that calendar year the Mint produced 5.5 billion coins, compared with 3.4 billion pieces the year before—and in the second half of the year, it produced as many coins as it did in all of 1962. But about 203 million ounces of silver were consumed during 1964's rapid upsurge of Mint production. In fact, about 73 million ounces alone went into the production of some 200 million Kennedy half-dollars, which collectors, hoarders, and souvenir hunters snapped up as soon as they went into circulation.

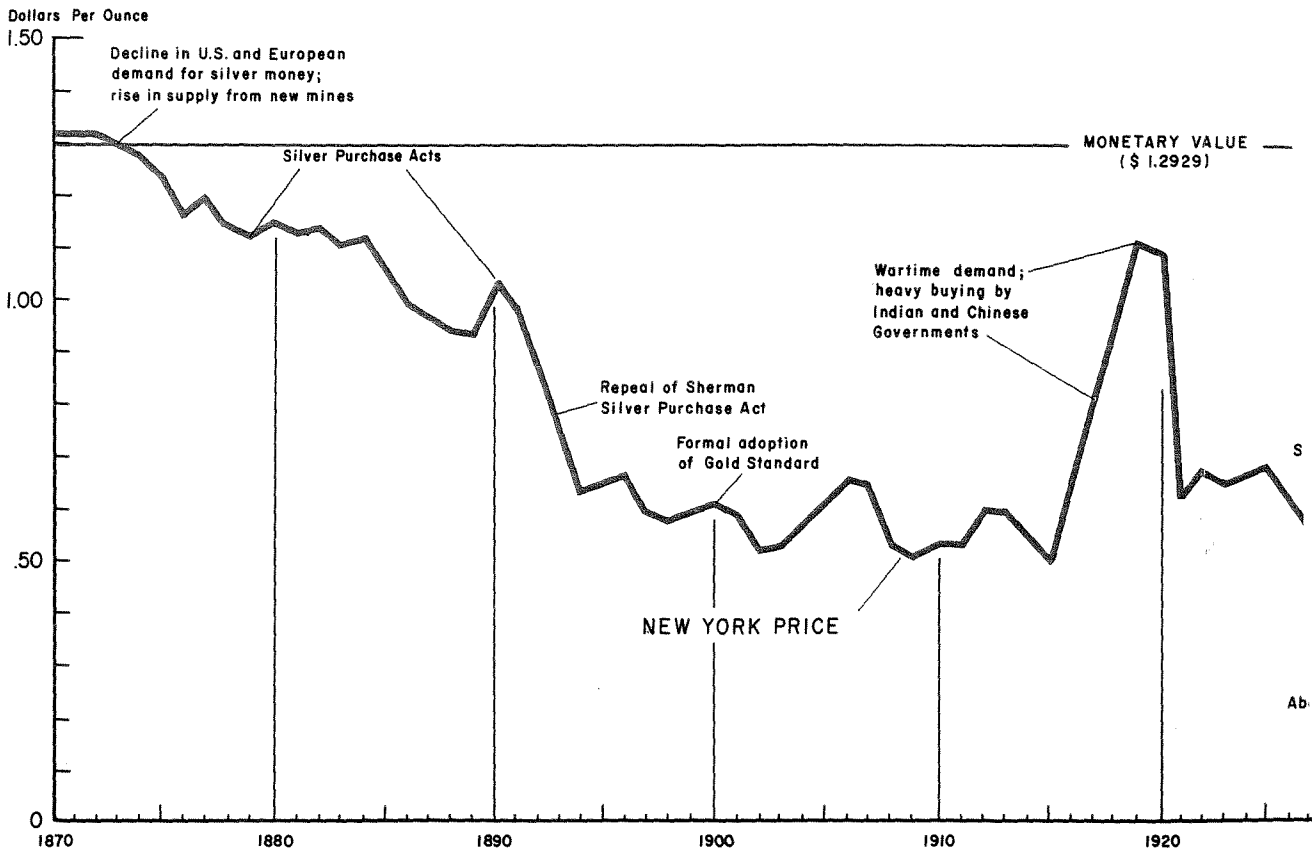
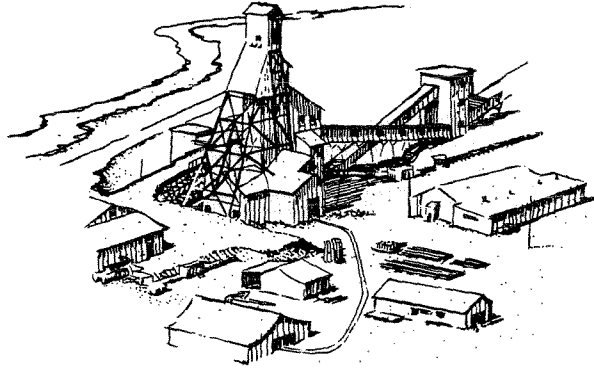
By early 1965, the Director of the Mint was able to report a definite improvement in the coin situation. Businessmen were able to get through 1964, including a busy Christmas, without an actual crisis, even though consumer spending was up \$26 billion (7 percent) for the year. The shortage of pennies, which at one point had been critical, was completely relieved, while the shortage of nickels was

almost over. Nonetheless, shortages continued in the minor silver coins, and the half-dollar was not circulating at all.

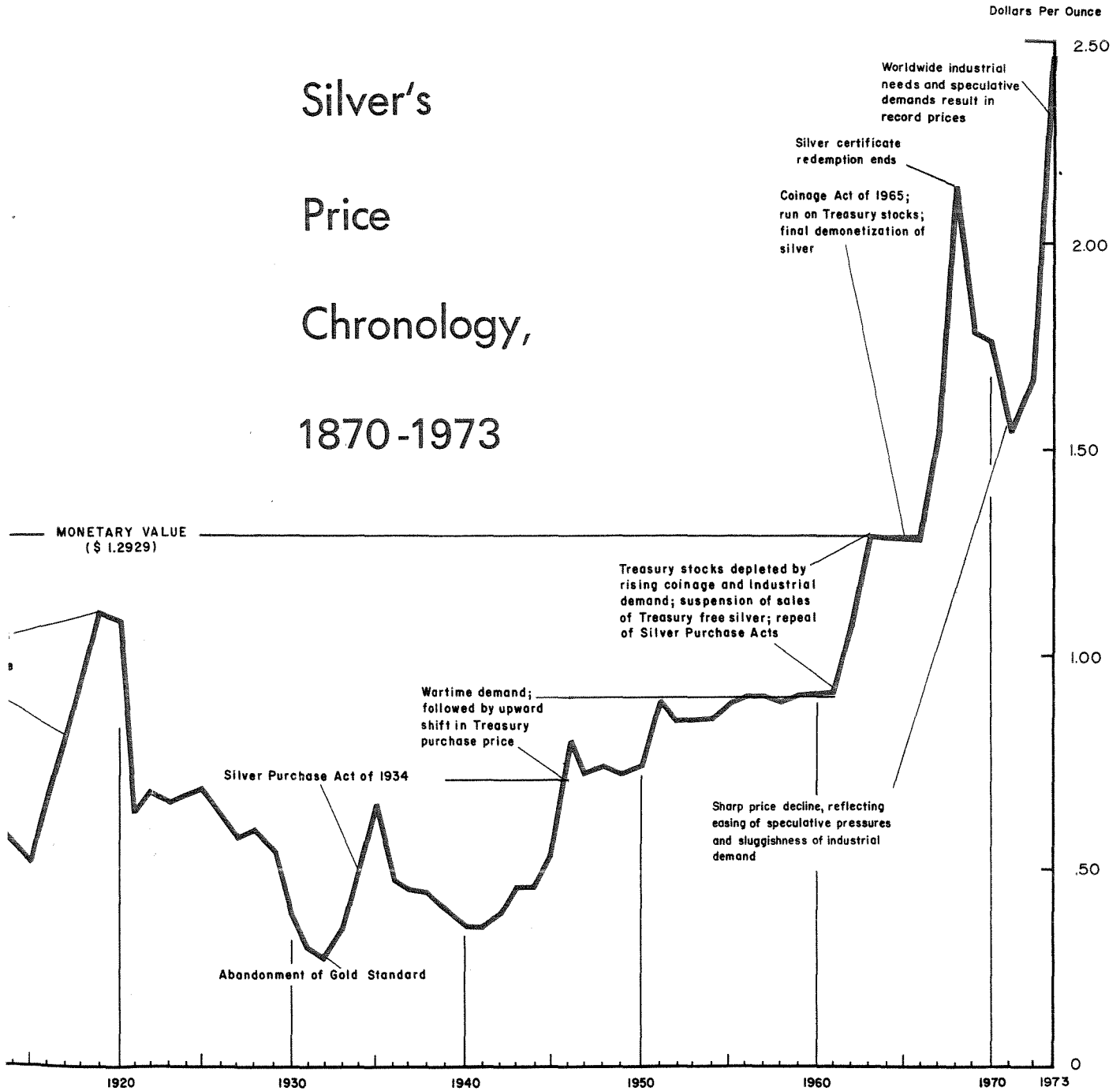
At the same time, the problem of silver supplies had grown more acute. By June 1965, consumption for coinage purposes was running at a 300-million-ounce annual rate, and the Treasury's supply was down to 1,000 million ounces.

The Treasury thus faced the prospect of total depletion of its stocks within a relatively short period of time. In that event, the mints would have had to stop coining dimes, quarters, and halves of the kind then in use. The Treasury would no longer be able to offer silver to all comers at \$1.2929 an ounce. The price of the metal could rise beyond \$1.3824—the point at which the silver content of these minor coins would be equal to their face value—and coins would begin to disappear from circulation. Obviously, drastic new action was required.





Silver's Price Chronology, 1870-1973



No Longer Money

The soaring industrial and coinage demand for silver and the rapid depletion of the Government's silver stock forced the Treasury in May 1965 to make a momentous decision: "The world and the U. S. silver supply and production situation and outlook do not warrant continuation of the large-scale use of silver in the U. S. coinage." (*Staff Study of Silver and Coinage*)

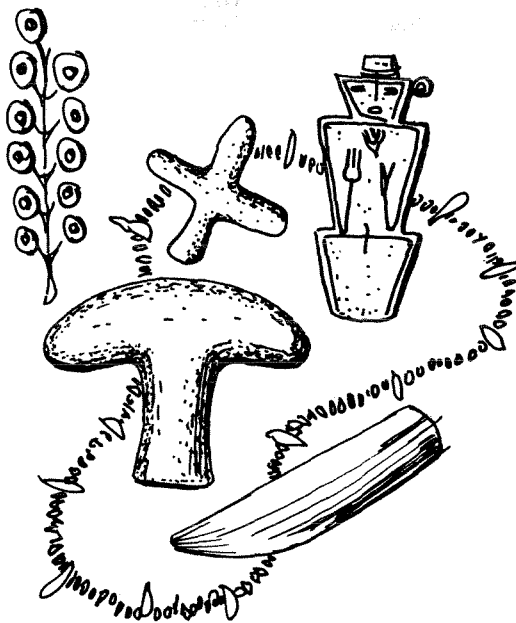
Moreover, the Treasury argued for a once-and-for-all change; otherwise, subsidiary silver coinage undoubtedly could suffer from difficult transitional problems and from the fear of future changes in silver content.

On the basis of technical studies, the Treasury recommended cupronickel clad on a copper core as the best metal for a new and permanent subsidiary coinage. This material had several desirable characteristics—ability to provide uninterrupted service as a medium of exchange; acceptability to the public in terms of weight, color, wearing qualities, and operation in vending machines; ease and certainty of production; cost and availability; and compatibility with present coinage.

Cupronickel was already the most widely used coinage material in the world. It was familiar as the basis for the American 5-cent piece, and it had circulated side by side with silver coinage in high-denomination coins in the United Kingdom. Coins of cupronickel clad on a copper core could operate readily in vending machines without the difficulty, expense, and inconvenience of modifying existing rejectors. Furthermore, the Mint had made

sizeable production runs using the cupronickel material and had not encountered any serious difficulties.

According to the Treasury, the cost of the alloy—45 cents a pound, based on 33-cent copper and 79-cent nickel—would be much less than silver at \$18.81 a pound. Coinage at the projected fiscal-1965 rate would require approximately 5,355 short tons of copper and 1,785 short tons of nickel annually. In both cases, the tonnages would represent a small fractional part of total domestic consumption and could be drawn from surpluses in the strategic stockpile.



The Coinage Act

Many of these Treasury recommendations were contained in the legislation which President Johnson submitted to Congress in June 1965, and which was passed soon thereafter as Public Law 89-91, the Coinage Act of 1965. In the President's words, the legislation was designed to "insure a stable and dignified coinage, fully adequate in quantity and in its specially designed technical characteristics to the needs of our 20th-century life."

The need for this legislation was evident: "There is no dependable or likely prospect that new, economically workable sources of silver may be found that could appreciably narrow the gap between silver supply and demand. . . . The one part of the demand for silver that can be reduced is governmental demand for use in coinage."

Under the Coinage Act, some 90 percent of the silver formerly used for coinage would be made available for other purposes. The new half-dollar was a composite—an outside layer (80-percent silver, 20-percent copper) clad on an alloy core (21-percent silver, 79-percent copper). To the naked eye the coin would be almost indistinguishable from the old half-dollar, but it would be 40-percent instead of 90-percent silver.

The new dimes and quarters, although identical in size and design to the former 90-percent silver coins, were made silverless. Each of these also was a composite—an outer layer (75-percent copper, 25-percent nickel) clad on a core of pure copper. The legislation did not call for any change in the silver dollar, but it specified that none be minted for five years.

The Government's readiness to sell silver bullion from its stocks at \$1.2929 an ounce had previously provided protection against the melting of silver coins, since it effectively prevented the price of silver from rising above the face value of the coins. Now, since the Treasury intended the silver coins to circulate alongside the new coins, the Act provided

further protection for the silver coinage by authorizing the Secretary of the Treasury to prohibit the melting, treating, or export of any U. S. coin. Again, to discourage hoarding, it stipulated that any 900-fine coins minted after the law's enactment would be inscribed with the date 1964.

Finally, the legislation authorized the President to establish a Joint Commission on the Coinage, a 24-man body representing the legislative and executive branches as well as the general public. The Commission, when convened, would be expected to make recommendations on such matters as the economy's need for coins, technological developments in metallurgy and coin-selector devices, the supply of the various metals, the future of the silver dollar, and the Government's future role in maintaining the price of silver.

Consumers vs. producers

Public opinion—as expressed in the Congressional hearings which preceded the passage of the Coinage Act—was virtually unanimous in regard to the need for reducing the silver content of the nation's subsidiary coinage. Emotions ran high, however, on the question of "how much," as would be expected from the diversity of interests with a stake in silver's future.

Silver users, anxious to have ample supplies of the metal available at stable or declining prices, wanted silver to be completely eliminated from the coinage. They pointed out that total world production could fall 100 million ounces below annual industrial demand alone, so that even under the most favorable circumstances, Treasury stocks could disappear within a half-decade.

In their analysis, silver-consuming industries projected a sharp reduction world-wide in silver usage for coinage. In this country, Mint requirements could drop perhaps 90 percent from the 1965 peak to about 30 million ounces; in other countries coinage requirements could drop 50 percent, also to about

30 million ounces. (Most countries throughout the world had already eliminated or drastically reduced the use of silver for coinage.) However, consumers projected an increase in world-wide industrial consumption to 360 million ounces by 1970, even assuming a reduced growth rate in that segment of the market. The resultant world-wide demand, 420 million ounces annually, would substantially exceed the projected supply, which (optimistically) could be estimated at about 340 million ounces from mine production and secondary sources.

Silver producers took a somewhat different view of the future. Fearing that a sharp swing away from silver might trigger a price break, they argued for the retention of silver in the coinage to the maximum extent feasible. They claimed that the supply deficit had been abnormally inflated in 1964 by the hoarding of well over 100 million ounces in the form of Kennedy halves and speculative stocks; furthermore, they claimed on the basis of current exploration that world mine production could increase by one-fourth or more within several years' time. (They were right on the first count, but wrong on the second.) Thus,

they argued that increased mine production, along with the gradual recovery of the 1,800 million ounces of silver outstanding in coins, would permit the retention of some silver in both the half-dollar and the smaller denominations.

Western legislators argued that Treasury stocks would soon be depleted unless the Government permitted the price of silver to rise in a free market. Moreover, they felt that the Treasury approach failed to attract increased production and thereby in effect aggravated the coin shortage. Thus, the Western governors' conference in 1965 resolved "that Congress provide for retention of silver in reduced amounts in all coins now silver, that an affirmative program be adopted to increase exploration for and development of domestic silver supplies, and that silver be permitted to seek its own price in the market place."

The vending industry, with its \$3.5-billion annual take in coins, wanted coins that would be "compatible" with the nation's 12 million coin-operated merchandising devices. About half of these machines tended to reject coins that lacked the correct electrical properties,

Special Coins

Morgan dollars—The last remnant of the 485 million silver dollars coined prior to 1937—some 2.9 million "Morgan dollars"—are being auctioned off by the General Services Administration during the 1972-74 period. (This supply of 90-percent-silver coins was left in the Treasury's vaults at the end of the 1964 silver rush.) Revenue from the two auction sales held to date has totaled \$33 million for 1.3 million coins, or roughly \$25 per coin.

Kennedy halves—About 433 million of these 90 percent-silver coins were produced in 1964, but then rapidly disappeared. Even larger quantities of 40-percent-silver Kennedy halves were minted in later years, but these also dropped out of circulation. Finally, in line with 1970 legislation, cupronickel was specified for future issues of these coins.

Eisenhower dollars—Unlike the Morgan and Kennedy coins, Eisenhower dollars were not meant to be circulated. Instead, Congress in 1971 set aside 150 million ounces of silver for 40-percent-silver commemorative coins, at prices of \$10 for "proof" and \$3 for "uncirculated" pieces. (However, some cupronickel Eisenhower dollars were also minted for general distribution.) Despite strong initial interest, only about 18 million of these coins were sold during the 1971-73 period. Congress thus decided to use some of the silver set aside for this purpose for 45 million 40-percent-silver Bicentennial commemorative coins, again limited to proof and uncirculated pieces.

and major changes in them could require several years' time and could cost perhaps \$100 million. Furthermore, the industry wanted coins that would pose no inconvenience to the consuming public, which plunked 30 billion pieces into these machines annually for over 12 billion cups of coffee, milk and soft drinks, about 4.5 billion candy bars, and numerous other goods and services.

Finally, almost every company with a material in any way suitable for coinage—from aluminum to zirconium—pressed its claim for inclusion in the new coinage.

Actually, the Coinage Act, like the new coinage, was a composite containing something for nearly everyone. For Western silver producers, silver kept at least a stake in the coinage, with the new half-dollars requiring at least 15 million ounces per year. Producers also received the assurance of a minimum of \$1.25 per ounce for their silver supplies.

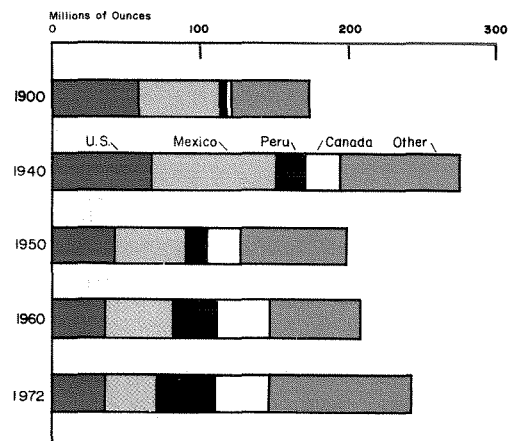
Silver users did not get an entirely silverless coinage, but they did get silverless dimes and quarters. In addition, the continued redemption of silver certificates by the Treasury provided an effective ceiling on the price—at least for awhile. The vending industry also was well enough satisfied, because the cupronickel and copper coins had the same electrical properties as the silver coins and worked satisfactorily in existing machines.

Stamping out the shortage

Considering the persistence of the coin shortage, the release of the new coins apparently did not come a moment too soon. Despite the continued expansion in production of silver coins under the "crash program," Federal Reserve inventories of quarters had shrunk to only 15 million pieces for the entire nation on the eve of the 1965 Christmas season.

But with the help of the new Coinage Act—which authorized the reactivation of coin production at the San Francisco Assay office, the construction of new facilities, and the acquisition of necessary metallic strip, equipment, and supplies—the Mint was able to

U.S., Mexico, Peru and Canada mine about two-thirds of world's silver



achieve an unprecedented production rate. In November 1965, the Mint released over 230 million new clad quarters, and scheduled the release of that many more pieces every single month—four times the highest production rate ever previously attained. These new coins carried the economy safely through the Christmas season without a crisis.

In early 1966, when almost 700 million new quarters already were in circulation and the first new dimes and half-dollars were about to be released, Assistant Treasury Secretary Wallace told a Senate subcommittee that "the supply of our most vital coins—the quarter, dime, nickel, and penny—is in better shape now than in any comparable period during the last ten years. . . . There is no shortage of those coins most vital to the transaction of business." Flow-back and inventories at the Federal Reserve Banks had increased in all denominations except the half-dollar. But relatively few of the latter were in circulation, despite the production of 480 million Franklin halves in the 1948-63 period and of almost that many Kennedy halves in the following several years.

The Treasury scheduled total production for the fiscal 1965-67 period at 34 billion coins—enough to provide every person in the

country with 180 additional pieces. Its objective was to manufacture enough of the new clad coins to replace over a relatively brief period all of the 13 billion old dimes and quarters then in circulation.

Disappearing stocks

The steps taken under the new Coinage Act were successful in overcoming the nation-wide coin shortage, but they failed to halt the continued drain on the Treasury's silver supplies.

As 1966 advanced, in fact, the feeling grew that the Treasury might not be able to hold the line until the completion of the transition to the new coinage. The Treasury used only 54 million ounces for coinage in 1966, as against the 1965 peak of 320 million ounces, but its stocks continued to decline as both domestic and foreign industrial users increased their demands. So Treasury stocks dropped, and then dropped some more—from 1,218 million ounces in December 1964 to 804 million ounces in December 1965, and then to 594 million ounces in December 1966.

Moreover, an ominous threat existed in the form of the silver certificates that had not yet been turned in for redemption. At the end of 1966, all but 154 million of the 594 million ounces in the Treasury's holdings were earmarked for redemption of certificates.

The Administration acted to meet this situation by introducing a new piece of silver legislation in March 1967. (As P.L. 90-29, it became law on June 24.) The law authorized the Treasury to write off \$200 million in certificates—on the assumption that at least that amount had been lost, destroyed, or held in collections, and thus would not be turned in for redemption. In addition, it limited the time for the redemption of certificates to one year after the passage of the legislation. Any stocks then remaining, aside from 165 million ounces earmarked for the strategic stockpile, could be sold at not less than \$1.2929.

The crisis would not wait, however, as the Treasury was hit by an unprecedented flood of orders for silver bullion during the spring

months. (During the first half of May alone, 33 million ounces flowed out—much of it out of the country.) Thereupon, the Treasury turned for advice to the Joint Commission on the Coinage. That 24-man commission—composed of 12 members of Congress concerned with silver policies, along with 4 members from the Executive branch and 8 public members appointed by the President—had been organized under the terms of the 1965 legislation to formulate long-range coinage plans for the post-silver era. Its first meeting was held in May 1967, when it was hastily convened to make recommendations dealing with the Treasury's current dilemma.

Discontinued sales

Immediately following the Commission's May 18 meeting, the Treasury moved to assure the continued availability of silver to the U. S. market by discontinuing silver sales to other than "legitimate domestic concerns" and by invoking its statutory authority to prohibit the melting or export of coins. The direct result was the creation of a dual market. While the dealer price in New York remained at \$1.30 an ounce, silver prices on the dealer and exchange markets abroad rose sharply.

Then, as soon as the President signed the new law on June 24, the Treasury wrote off \$150 million of certificates, thereby freeing 116 million ounces of previously earmarked silver stocks and raising its free stocks to 135 million ounces. But the spread between the unrestricted price on world markets and the Treasury price proved to be too wide to be long maintained. With the London price fluctuating around the \$1.70-level in early July, producers quite naturally sold their supplies in the premium markets while industrial users turned increasingly to the Treasury for their purchases.

By mid-July, the Mint had produced 8¼ billion new dimes and quarters—virtually duplicating the entire old stock of circulating silver dimes and quarters—and it was minting

more of these clad coins at a 3½-billion annual rate. Thus the problem of transition appeared solved: even if all other silver coins followed the silver dollars out of circulation, sufficient numbers of clad coins would be available in circulation and in inventory to meet the foreseeable needs of a growing economy.

At that point, following the Commission's second meeting on July 14, the Treasury halted all sales of silver at the old monetary value of \$1.2929, and announced that it would sell thereafter only 2 million ounces a week, with the General Services Administration handling the sales at the metal's going market price. This reduction in Treasury offerings by itself would have pushed prices upward. But by an unfortunate coincidence, the very next day the copper strike shut down nearly all nonferrous-metals refineries, and thereby pulled off the market, for almost nine months' time, a large part of the normal refinery supply of silver.

These two developments in combination created an explosive price situation. The New York price immediately jumped from the old \$1.29 ceiling to \$1.87 an ounce, and after a brief period of stability, it surged upward again during the international financial crises of late '67 and early '68. In June 1968, the New York price reached a whopping \$2.56½ an ounce.

Final silver rush

These rousing price developments, along with the Treasury's June 24 deadline for redemption of silver certificates, set the stage for one final silver rush. In the *Wall Street Journal's* description, "Newcomers needn't pack picks, shovels, and Klondike maps, but just have wads of paper money (silver certificates, to be specific), a futures contract, and taxi fare to the nearest Federal Reserve bank." In May and June especially, when half of the final year's redemptions occurred, long lines

of people formed early each morning at the New York and San Francisco assay offices to make the guaranteed .77-ounce-per-dollar exchange. (Those with \$1,300 or more first had to exchange their certificates for a receipt at the Federal Reserve Bank.)

Altogether, 77 million ounces left the Treasury's coffers during this episode — roughly three times more than had been expected on the basis of the earlier pace of redemptions. With that transfer out of the way, and with allowances made for certain supplies earmarked either for the strategic stockpile or for such remnants of the silver-coinage system as part-silver Kennedy halves and (later) part-silver Eisenhower dollars, the Treasury's available stocks under the weekly-auction program were all disposed of by November 1970.

The Treasury's withdrawal from the silver market was complicated somewhat by a prolonged controversy over the production of an Eisenhower silver-dollar coin. The controversy was resolved by legislation, signed by the President on the last day of 1970, that called for the minting of 150 million Eisenhower coins containing 40 percent silver. In May 1971, the San Francisco Mint began producing these memorial coins, priced at \$3 for "uncirculated" coins and \$10 for "proof" coins. When general distribution of these collectors' prices began that fall, dealers reported very heavy domestic and foreign demand, sometimes at twice the Treasury's asking prices.

The 1970 legislation authorized non-silver Eisenhower dollars and Kennedy halves for general circulation, similar in composition to the present quarters and dimes. (The former 40-percent silver half-dollar was discontinued.) After 47 million ounces of silver were allocated for production of the memorial Eisenhower dollars, the only silver left in Government hands consisted of the 140 million ounces in a scaled-down strategic stockpile, plus 3 million old 90-percent silver dollars which may be disposed of at auction. By the time the curtain fell on this

decade-long drama, market forces had depleted Treasury stocks of roughly 2 billion ounces of silver.

Nonetheless, prices dropped from the \$2.56½ peak all the way down to \$1.54 an ounce between mid-1968 and mid-1969. This sharp price break reflected the improvement in the international situation, the growth of supplies resulting from decreased strike activity, the downturn in both coinage and industrial demand, and a fall-off in speculative buying. Speculative interest was dampened, not only because of the perverse movement of prices, but because of the prospect of increased supplies created by the Treasury's withdrawal of its coin-melting ban and by its announcement of continued auction sales through the following year. By late 1969, however, prices rose again to the \$2.00 level as legislators from silver-mining states began advocating a large mint run of Eisenhower silver dollars — a proposal that would have depleted the Treasury's remaining stocks much faster than had originally been anticipated.

Prices fell below the \$2.00 level in early 1970 as the Eisenhower-dollar proposal became bogged down in Congressional debates, and

then dropped as low as \$1.60 an ounce during the spring months. This decline reflected not only the underlying factors described above, but also the severe stock-market decline. In many cases, margin calls forced stock-market participants to sell their silver holdings to raise cash, and falling silver prices then led to margin calls in *that* market. As this downward spiral in the silver market continued, many speculators were forced out of business.

Growing disillusionment

The market atmosphere during both 1970 and 1971 reflected a growing disillusionment among speculators, because of the persistent failure of the market to live up to their price expectations. In particular, as could have been expected, speculators expected prices to soar with the end of Treasury silver sales in November 1970, but most consumers evidently had covered their major needs prior to that date, and most speculators too had already bought in because this "sure thing" had been so well advertised. Consequently, with no new buying, and no upward price action, speculators began to bail out of the market, and prices tumbled sharply. Prices, which had risen as high as

Seigniorage: Treasury Makes Money

The Treasury's general fund became \$2.3 billion richer during the 1966-70 period simply because of seigniorage — that is, because of adding to the Treasury's assets the difference between the face value of its coins and the cost of their component materials. The coinage system, of course, is designed not to maximize seigniorage but rather to meet the country's needs for an adequate supply of circulating coins. Nonetheless, the seigniorage windfall did reduce the Government's borrowing needs by an equivalent amount during a period in which the Treasury was hard pressed for cash.

The shift to a cupro-nickel currency was the major reason for this substantial seigniorage return since copper and nickel are considerably less costly than silver. Seigniorage totaled only \$113 million in fiscal 1965, but it soared to \$650 million in 1966 and \$834 million in 1967 because of the heavy minting of cupro-nickel dimes and quarters in those two years. As the transition to a clad coinage was completed, seigniorage trended downward, reaching \$255 million in fiscal 1970. In addition, during the fiscal years 1968-70, the Mint turned \$132 million into the general fund as profit on sales of silver bullion.

\$1.85 an ounce in the wake of the mid-1970 stock-market recovery, fell sharply during November, and traded in a \$1.60-\$1.75 range from then until the spring of 1971.

Further weakness then again developed, and prices fell about 25 percent between the spring and late fall, even in the face of an international crisis that normally would have sent prices soaring. In early November, the low point was reached at \$1.28, only slightly above the \$1.25 level at which the Treasury would have been required to buy newly-mined domestic metal under the terms of the Coinage Act of 1965.

U.S. industrial consumption moved downward over the 1969-71 period from 142 to 129 million ounces, narrowing the gap between production and consumption from 100 to 87 million ounces. Meanwhile, in the face of declining silver needs, industrial consumers had become increasingly aware that there was no physical shortage of silver. Industrial and investor stocks had grown rapidly in the five years preceding the government's withdrawal, and these private holdings, as well as other supply sources, were available to meet industrial needs at relatively low prices.

In sharp contrast, the tenor of the silver market changed dramatically in late 1972 and 1973, so that the New York market price exceeded even its 1968 peak and reached a new high of \$3.04 by mid-October of 1973. The worldwide industrial boom played a major role in this upsurge, but the universal commodity inflation and several devaluations of the dollar also contributed by increasing the demand for silver by those who viewed the metal as a safe store of value during periods of currency uncertainty and persistent inflation. Supply difficulties, partly caused by production problems and partly by price controls, aggravated the upward pressure, and heavy speculative demand due to new international crises then capped the climax.

U.S. industrial consumption increased by 10 percent in 1972, and as the boom reached its peak in the first half of 1973, silver usage jumped 41 percent above the level of the first-

half of 1972. Demand boomed for the metal in the photographic and electrical industries, the two largest end-users. Still, the largest percentage increases in demand occurred in sterling ware and jewelry, at least partly because gold had priced itself out of these markets.

In the face of this burgeoning demand, new U.S. mine production dropped in 1972 for the second straight year, and then fell 8 percent below the year-ago level during the first half of 1973. (Worldwide mine output also dropped, largely as a consequence of this decline at U.S. mines.) The sharp fall-off in production came about because of a tragic fire last year at Idaho's Sunshine mine, which led to a nine-month shutdown of that major facility, and also because of a four-month strike this past spring. Supplies have also been affected by the closure of some lead and zinc smelters that failed to measure up to new environmental codes.

Silver users thus have had to rely increasingly on inventories and secondary supplies (scrap) to cover the ever-growing shortfall. On the heels of a 27 million-ounce decline in 1971, inventories in the hands of industrial consumers and stocks on the New York and Chicago exchanges dropped another 33 million ounces in 1972 and have continued to fall at an even steeper rate in 1973.

World-wide stocks of silver bullion are still large — perhaps as much as 350-400 million ounces — despite substantial reductions over the past three years. Another 117 million ounces is potentially available from the U.S. government depending upon whether or not Congress authorizes its release from the strategic stockpile. These stocks, together with recycled metal, will provide a reserve upon which to draw to meet the future worldwide deficit between consumption and production of the metal. As these stocks are drawn down, a long-range upward price trend for silver appears inevitable; but over the short-run, the price is still likely to be subject to the vagaries of the business cycle and the reactions of speculators to monetary and political developments.

Comstock Revisited

As a major mining center, the West has always had a vital interest in the fortunes of silver. And on frequent occasions since the opening of the Comstock lode, the white metal has dominated the regional as well as the national stage. The voice of silver has been heard in the halls of Congress; and the economy, the society, and the politics of the West have harkened to its voice.

Prosperity has been only a fitful visitor to silver mining camps, however. Prices have fluctuated violently over the years, while the long-term trend of output and employment has been downward. But, as of today, the versatile metal can bask in the upsurge of industrial demand which—along with the speculation which accompanied depletion of Treasury stocks—has caused prices to triple within the past several decades. In the context of this new situation, the silver camps of the West are bustling with new life.

Across the High Sierra

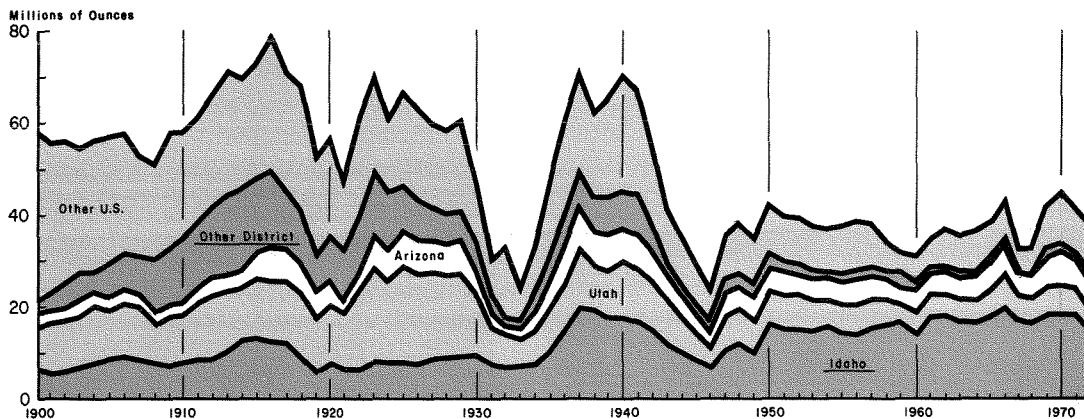
The birth of the nation's silver industry occurred in the Washoe Hills of Nevada in 1858, as thousands of miners rushed across the Sierra from the already failing placers of California's Mother Lode to stake a claim in the fabulously rich Comstock Lode. Over the next twenty years, the Comstock bonanza helped finance the Civil War, provided the foundation for a transcontinental railroad, and established San Francisco as a glittering and opulent metropolis. By the time the lode played out at the end of the century, the bonanza had yielded over \$200 million worth of silver and almost as much in gold.

But Comstock was only one of a series of rich silver finds. In the late 1860's, there was Black Hawk Canyon (Colorado), Cottonwood Canyon (Utah), Butte (Montana), and Owyhee County (Idaho). The 1870's and 1880's saw the development of the great silver deposits at Leadville, Colorado, as well as the mines in the Calico District of California.

From this series of beginnings, the Western states, as the center of U. S. mining activity, soon made this country the world's leading silver producer. (After 1900, however, Mexico took first place.) Colorado and Montana, topping the roster of producing states in 1900,



Idaho produces almost half of nation's silver, and Utah and Arizona account for another third . . . but region's output lags behind earlier peaks



accounted at that time for 60 percent of the domestic total of about 58 million fine ounces. Utah, Idaho, and Arizona were next — and then came Nevada, despite the virtual exhaustion of the Comstock.

Twelfth District states have dominated the industry during this century; in 1972, even with the problems at the Sunshine mine, they supplied almost 70 percent of the 38 million ounces produced domestically. Idaho's share began to rise dramatically in the late 1930's, and normally produces almost half of the nation's silver. Most of it emanates from the rich silver-base deposits of the Coeur d'Alene District in northern Idaho, the home of the nation's two largest silver mines.

Arizona and Utah are also major producers, each accounting for about one-sixth and one-tenth of the nation's total output respectively. Arizona's share of the total has increased in recent decades, but Utah's share is somewhat below what it was a generation ago. Nevada reached its best position in this century in 1913, when development of major deposits at Tonopah gave her 7 percent of the domestic total, while California's share reached a peak of about 8 percent in 1924, at the height of operations

at the California Rand Mine in San Bernardino County. Today, however, those two states each account for less than 1 percent of U. S. production.

Declining production

In terms of the value of output and the number of employees, the silver industry throughout this century has been relatively unimportant in the Western economy. This has been especially true since the short-lived boom created by the Silver Purchase Act of 1934. While the total value of mineral production has more than quadrupled over the past three decades, the value of silver production (at about \$64 million in 1972) has increased only slightly. Thus, silver's share has dropped from 5 to 1 percent of total mineral production in the District over this period. Currently, silver is significant only in the economy of Idaho, where, as the leading mineral, it accounts for about one-fourth of the state's mineral output.

The world's silver production is concentrated in the mountain ranges of the Western Hemisphere. In 1972, four countries alone — Canada, Peru, the U.S., and Mexico — accounted for about two-thirds of total production in the

non-Communist world. Those four nations generally boast roughly equal shares of the total market, with the actual figures shifting from year to year as dictated by changing production or marketing factors.

The U.S. led the world production race in 1970 with 45 million ounces, followed closely by Canada. But by 1972, the U.S. dropped behind Canada and Peru, continuing a long-term decline in production which, in the face of expanding mine production elsewhere, helped reduce the U.S. share of total output over time. This country's market share dropped from about 25 percent to just under 20 percent between 1940 and 1950, and fell even lower in some years of the 1960's and early 1970's to only 16 percent by 1972.

Inelastic supply

Expansion of silver production has always been made difficult by a simple fact of technology. Two-thirds of the nation's (and the world's) silver is traditionally recovered as a co-product or by-product in the treatment of base metal ores — copper, lead, and zinc. As such, demand and price factors for these metals influence production of silver to a larger extent than silver's own demand and price developments. Production of these metals has been generally sluggish for several decades — aside from an upsurge in 1969-70 — so that silver's sluggish production performance has been practically inevitable. And to complicate the matter, 90 percent of the nation's measured silver reserves are located in base metal deposits of this type.

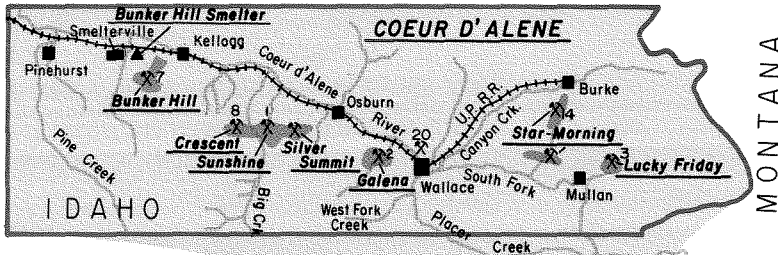
Furthermore, silver production from these mines depends on the quality as well as quantity of the ores being worked. Porphyry copper deposits, a major source of primary copper in this country, contain a very low percentage of silver—0.02 to 0.11 ounce recovered per ton of ore — but they are a major source of silver because of the vast tonnages mined and processed each year. Yet production of silver has failed to increase over the

Fabulous Coeur d'Alene

Almost one-half of the nation's total silver output comes from the fabulous Coeur d'Alene mining district in the northern Idaho panhandle. This 20-by-30-mile strip in Shoshone County is the location of some of the world's greatest silver mines, primarily in the "Silver Belt" between Wallace and Kellogg along the south fork of the Coeur d'Alene River. The "Silver Belt" contains the nation's two largest silver producers — the Sunshine and Galena mines — along with the Crescent and Silver Summit mines.

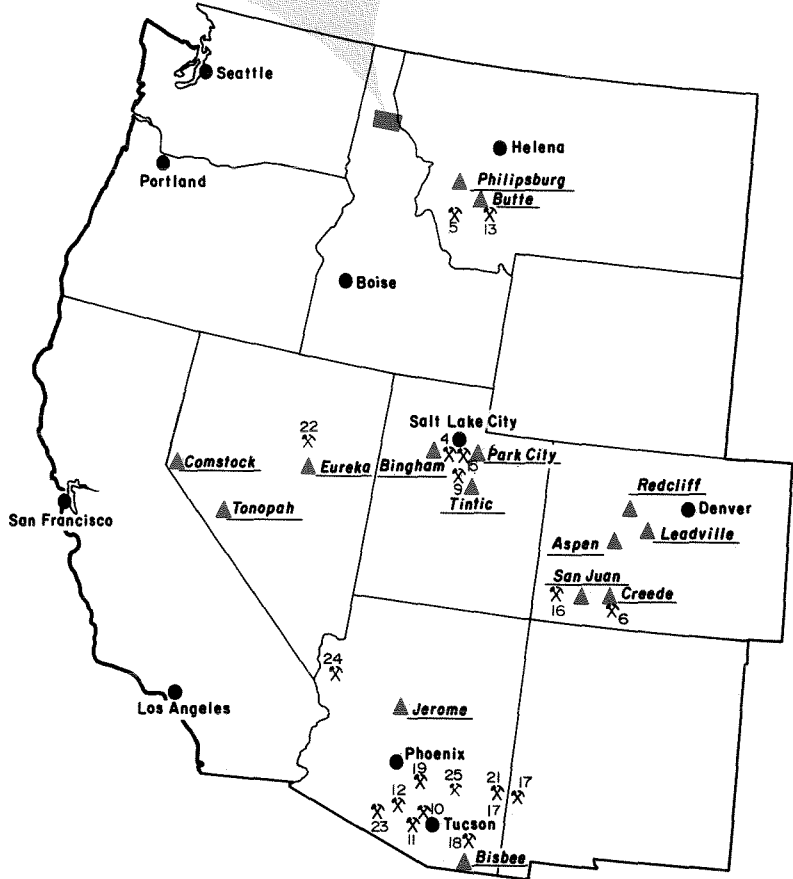
The mining history of the Coeur d'Alene district began in 1880 with the discovery of gold, and the foundations of a permanent industry were laid several years later with the discovery of silver and lead-silver deposits. Production got under way at a number of important sites by the turn of the century, but silver remained only a by-product of most Coeur d'Alene mines until the Sunshine mine came into large-scale production in the late 1920's. Rising production at the Sunshine mine helped Idaho become the nation's leading silver producing state in the 1930's, and its position was assured in the late 1940's as the Galena, Lucky Friday, and Silver Summit mines joined the ranks of the nation's major producers. On the basis of the Coeur d'Alene region's growing output, Idaho's silver production reached over 19 million ounces in 1971 before declining temporarily the following year as a result of the fire at the Sunshine mine.

Idaho's Coeur d'Alene is one of the nation's true "El Dorados"— that is, areas which have given up \$2 billion or more in metallic wealth. It thus ranks with such fabulous areas as California's Sierra Nevada (gold), Minnesota's Mesabi (iron), Utah's Bingham (copper, lead, zinc, silver, gold). In terms of silver alone, the Coeur d'Alene region has produced 760 million ounces over the past 80 years, or more than three times the total output of Nevada's famed Comstock Lode.



- ▲ Mining districts with over 50 million ounces production or reserves
- ✕ Leading mines today, in order of production

Western Silver Mines



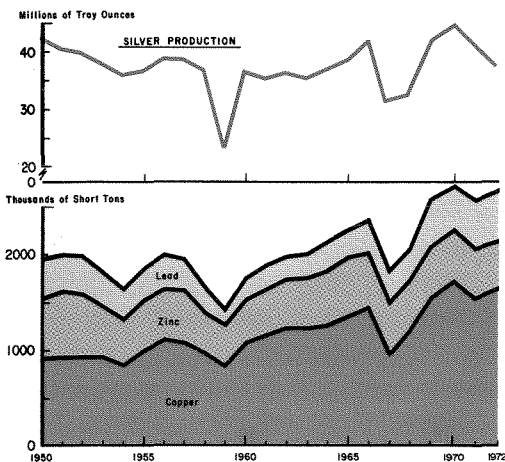
last several decades, even in the face of a 90-percent rise in copper production, because of increasing dependence on ores with lower silver content.

The facts of technological life thus tend to keep silver production secondary to that of other metals, and somewhat unresponsive to developments within the silver industry itself. Nonetheless, the sharp improvement in the price of the metal during the mid-1960's contributed to a sharp improvement in mine supplies. Except for the strike-beset period of 1967-68, production at U.S. mines averaged 43 million ounces annually during the 1966-70 period, as opposed to an average of 35 million ounces during the first half of the 1960's. Moreover, production averaged 40 million ounces during the 1971-72 period despite production problems.

Rising production

Increased U. S. production came from a number of sources: in Utah, the high-grade lead-silver deposits in the East Tintic district and the huge copper deposits in Bingham Canyon; in Montana, the Twin Buttes and Flathead mines; in Idaho, the Sunshine, Crescent, and Silver Summit mines, and so on.

Silver — as a by-product — reflects output trends of associated metals



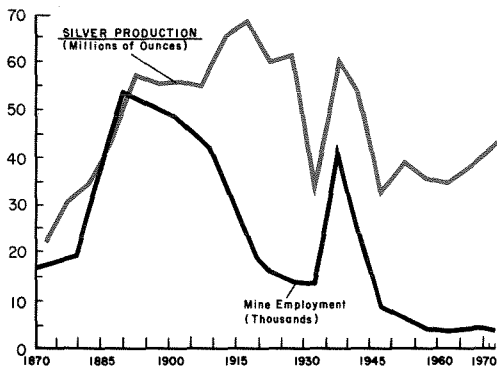
Increased Canadian production came from these sources: a new lead-zinc mine in New Brunswick, a copper-zinc mine at Lake Du-fault, Quebec, the Granduc and Western copper mines in British Columbia, and in 1967 from the vast bonanza discovered several years before at Timmins, Ontario. Ore reserves at the Timmins site were originally estimated at 55 million tons, with each ton containing 4.85 ounces of silver along with substantial deposits of zinc and copper. When the new Kid Creek mine and 9,000 ton/day concentrator began operations at the site in 1967, the Timmins property became the largest silver producer in the world.

Recognizing the pressing need for new silver discoveries, Interior Secretary Udall in late 1964 directed several agencies to expand exploration activities. To begin with, the Office of Minerals Exploration increased the percentage of Federal financial assistance from 50 percent to as much as 70 percent of the total cost of new exploration ventures.

In addition, the Geological Survey initiated a reconnaissance program designed to indicate likely areas of near-surface silver deposits in various Western states. The program included geologic mapping and geophysical and geochemical studies of target areas, utilizing the latest instruments and techniques—including an instrument capable of detecting mercury, which is generally located with silver deposits. Old districts such as the Comstock and the Tonopah were studied with the new techniques in the hope of discovering additional reserves.

Some unexpected target areas showed definite promise. Bedded sandstone deposits in various areas, especially the Silver Reef deposits of Utah, were found to contain appreciable amounts of silver, and the same was true of black calcite deposits located in other Western mining districts. Also, on the basis of a Geological Survey report, a deposit near Battle Mountain, Nevada, was tested as a potential copper-gold-silver producer.

As silver production goes, so goes employment in the mines



Projects such as these—and the rise in silver prices—sent prospecting teams scouring the West for new deposits. As an indication of the great interest in the metal, over 2,000 new claims were staked in the Wallace-Kellogg district of Idaho alone during 1967, compared with a total of just over 1,200 recorded during all of the previous half-decade.

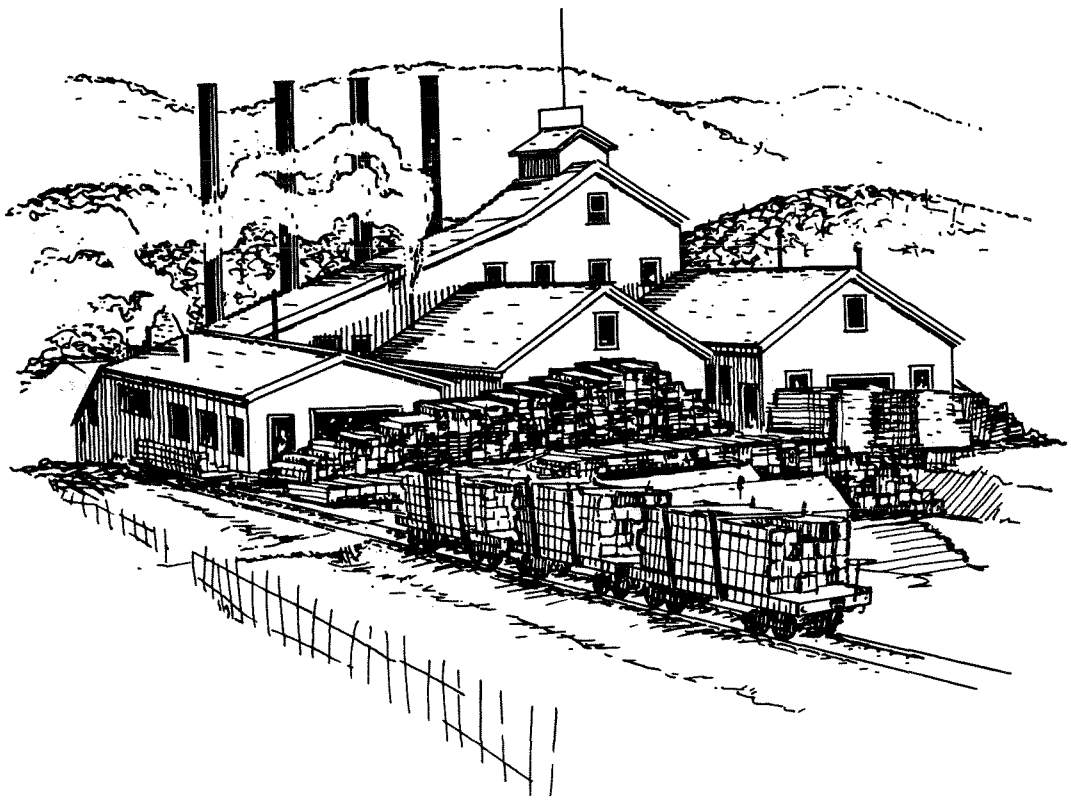
But since prospectors could not hope to find another Comstock lode—or even another Timmins bonanza—every day, the industry also reactivated old mines and developed previously by-passed marginal veins. Most of this activity centered in the Coeur d'Alene district of Idaho, the only major district in the world where the value of silver constitutes over half the value of all ore mined. These projects, along with the improvement in base-metal production, had borne fruit in increased silver supplies before the Sunshine mine fire and subsequent strike sent production heading downward.

From shortage to . . . ?

Industrial silver usage in the non-Communist world as a whole increased from 225 to 358

million ounces annually during the decade of the 1960's, largely because of the rapid increases recorded in markets abroad. (Industrial consumption rose 80 percent in foreign markets and 30 percent in U.S. markets between 1960 and 1970.) In contrast, new silver production worldwide rose only 20 percent, from 207 to 247 ounces, over the same time-span. Thus, a growing gap developed between industrial usage and production in the 1960's, after a decade in which the trend had been just the other way. Consequently, despite the precipitate decline in coinage usage, a wide disparity of about 138 million ounces still existed as of 1970 between *total* consumption and production. Moreover, this gap widened to 180 million ounces by 1972 with the further expansion of consumption. As the industrial expansion continues, the gap could easily widen over time. There are ample speculative supplies and secondary sources to cover the global deficit for several years to come, and their release from private hoards is just a question of price.

At this point, silver's history continues to be full of ironic touches. Despite all the efforts of the Populists to raise silver prices and restore prosperity through the silver legislation of the late nineteenth century, success came only through the inflation generated by the hated golden metal and through the growing market created by the distrusted city multitudes. Despite all the efforts of late-model Populists to achieve the millenium through the silver legislation of the 1930's, prosperity returned only as increased demands were generated by a war which Populists and everyone else sought fervently to prevent. And when the price of the metal soared to record levels because of the demands generated during the affluent 1960's, silver's newfound success led to its demise as a major monetary metal.



Publication Staff: R. Mansfield, Artist; Karen Rusk, Editorial Assistant.
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San Francisco, California 94120