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The Controlled Materials Plan

THIS year the month of May is notable for carefully calculated preparations by industry and government for the inauguration of the Controlled Materials Plan. The CMP is scheduled to go into effect July 1 to govern the distribution of steel, copper and aluminum for a considerable range of defense and industrial uses.

The Plan in its present stage is "open-ended" insofar as a proportion of the available supplies of the controlled metals will be beyond the scope of CMP; that is, supplies of the metals destined for manufacture of automobiles and many other consumer durable goods will be subject to less detailed types of distribution controls.(1)

As is well known, the Plan is comprehensive. It is taken over directly from World War II experience where it had evolved, after much experiment with earlier devices, as the most effective instrument for accomplishing allocation of strategic materials in an emergency program. As an instrument, therefore, the Plan has already demonstrated its potential effectiveness. The price paid is a great deal of paper work.

The CMP is called into being at this time partly in response to a genuine demand for it on the part of numerous and important segments of American business affected by the defense program. Underlying the demand is an increasing restlessness with the results of the present single-band system of priorities, as preferred claims for metals in the form of "DO" orders have multiplied.

General Character of the Plan

The Controlled Materials Plan in essence is a type of quantitative allocation linked with production scheduling. By contrast with the priorities system, which in part it supersedes, the CMP views all preferred claims for materials simultaneously, and in the light of supplies which are expected to be forthcoming. It is designed to assure the fulfillment of definite production plans by means of assuring the availability of the necessary metals at the proper time and the proper spot. A "cashier's check" against a known supply of metals replaces the "hunting-license" type of priority.

A double-spread color diagram of the Controlled Materials Plan is shown on pages 6-7.

The CMP, however, is not the only type of quantitative or scheduled allocation which is possible under similar circumstances. In fact, during 1943 the CMP was constructed on the basis of previous experience with the Production Requirements Plan which was also a comprehensive allocation plan of the quantitative type. What distinguishes CMP from PRP is mainly the vertical chain of allocation, which is the hallmark of CMP. The vertical feature is one whereby over-all allotments of the metals are subdivided and passed along a chain from authorized

(1) Even the approximate proportion of the total metals supply to be covered by CMP has not yet been released at press time. Public discussion in terms of a 40-50% coverage has never been confirmed by mobilization authorities. In fact, some statements by NPA officials give grounds for believing that the proportion covered is likely to be higher than 50%.

(CONTINUED ON PAGE 5

Physical Volume of Department Store Trade

THE new records established in department store trade since the outbreak of the Korean war cannot be explained solely in terms of price appreciation. The physical volume of sales, notwithstanding a succession of ups and downs, also appears to have reached unprecedented levels during the past nine months.

The accumulation of inventories (in physical terms) likewise has been substantial. And over the same interval, certain contrasting trends appeared from time to time, with respect to men's wear, women's wear and the hard-goods lines.

These are the main conclusions reached after examination of the relation of price changes to sales and inventories, thus yielding estimates of changes in physical volume. It requires more than a superficial examination to bring out the salient facts concerning physical volume. A brief explanation of the nature and origin of the problem may be in order at the start.

The Question of Physical Volume Department store sales, customarily used as one indicator of general business conditions, have received more public attention than usual during the past year especially in connection with the waves of consumer "scare-buying". For instance, the consumer buying wave of December and January was followed by this year's pre-Easter slackness, which in turn was one of the principal factors of the "lull" in general business widely discussed during March and April. (At press time there were some signs of improvement in department store sales.)

At the very periods that store sales were particularly in the spotlight, handicaps were encountered in the making of fully accurate interpretations because of the fact that the regular reports by the stores, as well as the summaries by the Federal Reserve System, run in dollar terms, which are unstable indicators of physical changes during periods of rapid price movement. For example, how much of the sales gains since the outbreak of the Korean war is attributable merely to higher prices?

In order to allay over-emphasis on the dollar data, business analysts have frequently given partial interpretations or guesses as to physical volume of trade. Sometimes a quick estimate on this score has been more useful than none at all. In other cases, however, the guesses as to physical volume of store sales have proved to be wide of the mark. It is for the purpose of bringing available information to bear on this question, at least with respect to department store trade in the Fourth Federal Reserve District, that a study has been undertaken with the results described below.

The accompanying charts portray estimates of physical volume of trade alongside of dollar volume. The charts apply to department store trade in the Fourth District only, and represent averages of half-year performance since the beginning of 1947, as well as the first quarter of this year. The year 1947 is used as base period; that is, each half-year entry is expressed as a percentage of the average performance for 1947. Adjustment is made for seasonal variation throughout.

The broken black lines in each of the charts represent the course of *dollar* sales (or stocks, as the case may be) while the red lines indicate estimated *physical* volume. The latter is derived from the dollar sales by means of correction for the estimated influence of price changes.(1)

The two charts at the top of the page apply respectively to *sales* by all departments taken together, and to average end-of-month *inventories* of all departments. The other four charts show sales in broad departmental groupings: women's wear; men's and boys' wear; furniture and bedding; household appliances, radios and television.

Sales by All Departments In the first chart the well-known rise in department store dollar sales during 1947 and 1948 may be seen by following the broken black line and noting the rise by each half-year interval. Adjustment for price change yields the red line, which is the estimated physical volume of sales, as related to the year 1947. For most of the 1947-48 period the correction for price change involves a deduction from (or deflation of) the dollar-sales position.

During 1949, however, dollar sales, as shown by the black line, declined; physical volume (red) also declined, but less sharply than dollar sales for the reason that prices then were falling. (The fact that the black line is above the red even in 1949 simply means that prices did not decline all the way to the 1947 average level.)

During the first half of 1950 both dollar sales and physical volume show a rise. The red line is still under the black because prices are still higher than in 1947, but the "deduction" for price is about the same during the first half of 1950 as in the preceding half year, indicating that there was little net movement of prices in that particular interval.

During the second half of 1950, post-Korea, the situation changes. Prices are climbing sharply. (Thus, the margin between the black and the red lines is increasing.) Dollar volume of sales rises markedly but physical volume also rises. This is true for the

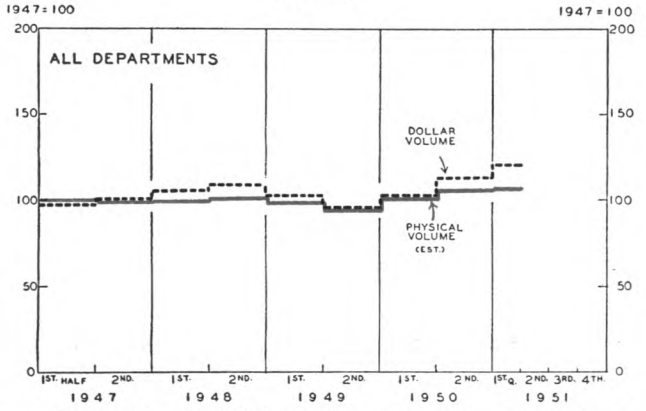
(1) For more details on the computation underlying these charts see the supplementary "Note on Method" at the end of this article.

DOLLAR VOLUME AND ESTIMATED PHYSICAL VOLUME

Fourth District Department Store Trade

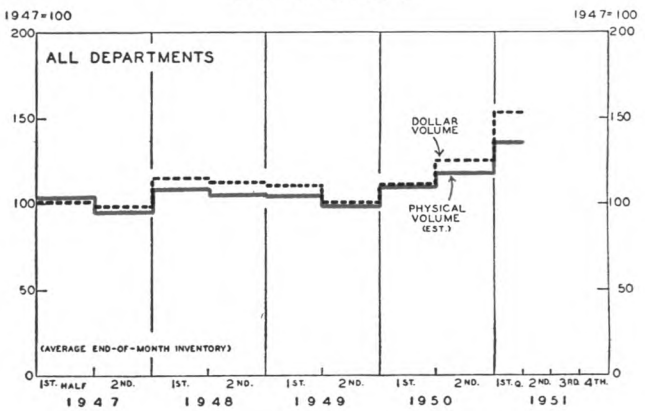
Half-Year Totals, Seasonally Adjusted

SALES



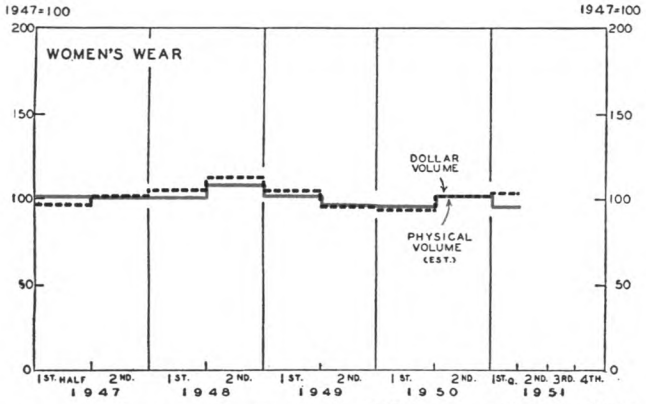
. . . during the second half of last year, the physical volume of department store *sales* exceeded the previous high of late 1948; this year's first-quarter total was maintained at about the same relative level, while dollar sales rose further.

INVENTORIES

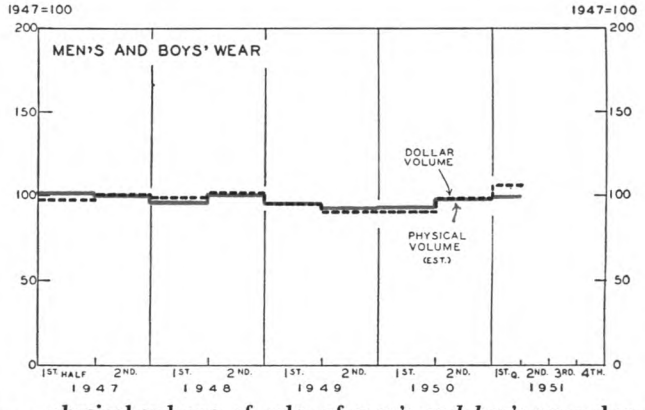


. . . the physical volume of *inventories* reached successive new highs last year and early this year; the rise in dollar terms was even sharper.

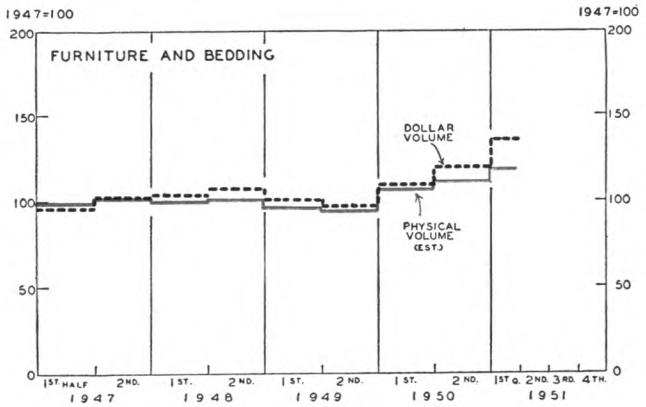
—— SALES ——



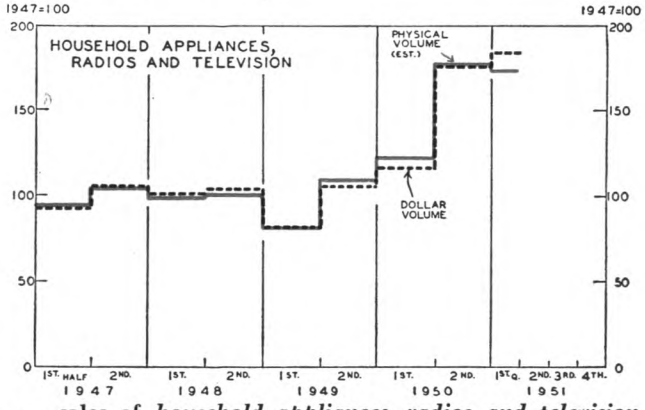
. . . sales of *women's wear* have failed to regain the high position averaged during the second half of 1948; this applies both to physical volume and dollar volume.



. . . physical volume of sales of *men's and boy's* wear during the first quarter of the year were approximately on a par with peaks reached in 1947 and 1948; dollar sales were at new highs.



. . . in spite of sharp contrasts between physical volume and dollar volume, sales of *furniture and bedding* have risen on both counts to record heights since the low second half of 1949.



. . . sales of *household appliances, radios and television* posted spectacular gains both in physical volume and dollar volume during the second half of last year; the past quarter showed a slight decline in physical volume but a further rise in dollar volume.

second half of the year as a period, in spite of the fact that July sales were phenomenally high due to the first impact of the Korean war, while November sales were abnormally low because of the blizzard.

During the first quarter of this year the spread between dollar volume and physical volume widens as prices rise further. Physical volume remains at the very high position averaged during the preceding half year.(2)

At this point it is possible to correct at least two types of misunderstanding which were common during early 1951. First, the relative slackness of the pre-Easter season was so widely emphasized that many observers failed to recognize that the first quarter *total* results were high because of the extraordinary sales at the start of the quarter. Second, it was widely understood that dollar sales should be discounted for the factor of price increase, but in many instances the assumptions about the size of the correction factor were unfounded; the dollar sales volume was not quite so "illusory" as sometimes assumed.

Inventories The top right-hand chart depicts the course of department store inventories, expressed both in terms of physical-volume estimates and dollar totals. As in the case of the preceding chart, which has been described in detail, the inventory chart shows the substantial allowance which must be made for price increases during 1947 and 1948, and again in the latter half of 1950 as well as early '51. In the intervening period, affected by the recession of 1949, the allowance for price change (as measured by the margin between the black and red lines) becomes smaller, as prices were falling.

The chief difference between the all-department inventory chart and the all-department sales chart lies in the fact that the inventory rise was sharper than the sales rise (both in dollar and physical terms) during the latter half of 1950 and early 1951. The inventory accumulation at that time was "real"; it was not a mere matter of valuation.

Some caution, however, should be employed in appraising the significance of the relatively sharp spurt in inventories in recent periods. It should be recalled that measurement is here made in the form of accumulated change since 1947. It is a fact that the inventory-sales ratio in 1947 was appreciably below the traditional ratio of prewar times. Whether the inventory rise in late 1950 and early '51 carried the ratio much above a true "normal" in any realistic sense is difficult to determine in the absence of agreed-upon norms for the postwar period. In any event, a conclusion on such a question is beyond the scope of the present article.

(2) It may be added the first quarter physical volume was well above that of the final *quarter* of 1950, but below that of the third quarter of 1950, seasonally adjusted.

Contrasting Trends

Sales of Women's Wear The first of the four charts showing trade by department groups applies to sales by the women's wear group. Included are the apparel lines such as coats and suits, dresses, etc., as well as the accessories departments such as millinery, gloves, shoes, etc. For most department stores these lines constitute the largest departmental grouping in the store.

Sales gains by the women's wear group of departments have been smaller than those of many other lines during much of the period under review. In fact, the peak which was reached in the second half of 1948 has not since been regained either in respect to dollar volume or physical volume. (This statement, of course, is to be taken in the context of half-year averages, or quarterly average in the case of early 1951.)

It will be noted from the charts that women's wear is one of the very few departmental group of the series where physical volume of sales during the first quarter of this year was lower than the average for the second half of last year. The weakness of the Easter season was especially felt in this group of departments.

Sales of Men's Wear Sales of men's and boys' wear were relatively stronger than women's wear during the early part of this year, as shown in the next chart. First-quarter performance showed a definite gain in physical volume over the previous period. Furthermore, the physical volume of sales of the men's wear group has recovered all of the ground lost by the recession of 1949, although little if any new ground has been reached.

A comparison of the chart for men's wear with that for women's wear reflects some interesting differences as regards the impact of the two Korean buying waves. In the case of the first wave, as of last summer, certain items of women's wear, especially nylon stockings, were leaders in the scare buying; men's clothing shared in the summer spurt, but not so spectacularly. The situation was reversed during the second buying wave which reached its climax in January of this year. Men's clothing was an outstanding leader, along with the familiar hard goods which paced the forward buying. No doubt the men's clothing spurt at that time was associated with the prominence given to published stories of wool shortages and rising wool prices. It appears that some men were thinking of suits and overcoats as a partial hedge against inflation. Such developments help to explain why the chart shows a first-quarter advance for sales of men's clothing, in terms of physical volume.

(CONTINUED ON PAGE 10)

CONTROLLED MATERIALS PLAN

(CONTINUED FROM PAGE 1)

claimant agencies (such as the armed services) to prime contractors, and from the latter in turn to subcontractors. The allotments pass along paths which previously have been traced by the building up of estimates of requirements.

While vertical allocation is the principal distinguishing feature of CMP, it does not follow that CMP is exclusively vertical, either in its World War version or in the present one. It is easy to understand that the vertical type of allocation has great advantages of flexibility and decentralization for many "made-to-order" types of operations such as those found in the building of a tank or a warship.[2] But in the case of standardized pieces of industrial equipment which are manufactured in large quantities both for defense and civilian purposes, and where the number of customers is legion, it is clear that the industrial customers are hardly in a position to be a link in the chain of issuance of allotments.

Hence, for industrial equipment producers and for makers of standardized component parts (both for the military and civilian industry) the allotments for metals *even under the CMP* are made exclusively by the industry divisions of the National Production Authority. Allotments of the latter type are made in the same way whether the producer is a manufacturer of a finished product or a part; they are, therefore, called "horizontal" allocations. (The PRP which preceded CMP during the war was entirely horizontal.)

A and B Products The distinction between "A" products and "B" products under the CMP is by definition one between vertical allocation and horizontal allocation as just outlined. Thus, an A product is defined as one for which the metals are allotted vertically; that is, a prime contractor receives his allotment from one of the authorized claimant agencies, and a subcontractor receives his allotment from his customer. The B products, on the other hand, are those which are designated on a CMP list of B products, and which are by definition allotted horizontally. That is, the producer of a B product receives his metals allotment directly from the NPA industry division which has jurisdiction over the product in question; this holds true whether the manufacturer is a prime contractor, a subcontractor, or neither. In fact, the subcontracting system is not widely employed in the production of B products.

The accompanying charts make clearer the difference between A and B products. The distinction is of central importance, and serves to correct mistaken assumptions that certain products are classified as "A" simply because they are more essential than B products. In point of fact, A products and B products, as such, have *equal* priority status within the operation of the Plan; this holds true in spite of the fact that as a rule the A products tend to be of a direct military character.[3]

Crucial decisions are yet to be made, however, as to how extensive the list of B products is to be, as distinguished from products not included at all within the CMP. The wartime CMP at its height had many thousands of commodities on the B list which were, therefore, allocated horizontally. While it would be difficult to estimate the relative sizes of the sectors of industry covered by the A and B areas, it is clear that the B area was very large during the war. Likewise, the B area will be far from negligible under the present Plan in spite of the fact that it has been cut down appreciably by the "open end."

Requirements and Supplies A brief review now follows of the principal steps involved in the actual operation of the CMP.

At an early stage in the preparatory work for any given calendar quarter, estimates of prospective requirements flow up the line in a vertical chain, and in a sideways direction on the horizontal path,—the latter in the case of the B products. (See the first of the accompanying charts.) Expressed in other terms, for A products the subcontractors inform their primes about their needs for steel, copper and aluminum in order to meet the projected production schedules; the prime contractors pass the estimates to the armed forces or other claimant agencies, etc. At the same time, in the case of the B products, the various manufacturers are sending their estimates of requirements directly to the appropriate industry divisions of NPA.

All claimant agencies (including NPA industry divisions) then put together the sum of requirements for their various programs and submit them to the Requirements Committee which is charged with making a final balance of requirements against available supplies.

Simultaneously with the flow of estimates of requirements, the sources of metals supplies (e.g., the steel, copper and aluminum mills, as well as warehouses) are delivering estimates of supplies which they can make available during the quarter in question. Such estimates are delivered directly to the NPA which forwards the net results to the Requirements Committee for balancing against requirements.

(2) During late 1942 when the first CMP was in gestation, one school of thought within the War Production Board advocated a *complete* system of vertical allocation.

(3) No doubt in the coming experience with CMP, as was the case during the war, administrative problems will lead to the designation of a limited number of mixed types of products which cannot be consistently classified as either A or B. Thus, at various times during the war we had "Class A civilian-type end products" and "mixed A and B products" etc. Situations of this type add to the difficulties of public understanding, but the problems are not insuperable.

GENERAL FRAMEWORK of CONTROLLED MATERIALS PLAN

CHART 1: Flow of REQUIREMENTS estimates (red) and SUPPLIES estimates (black)

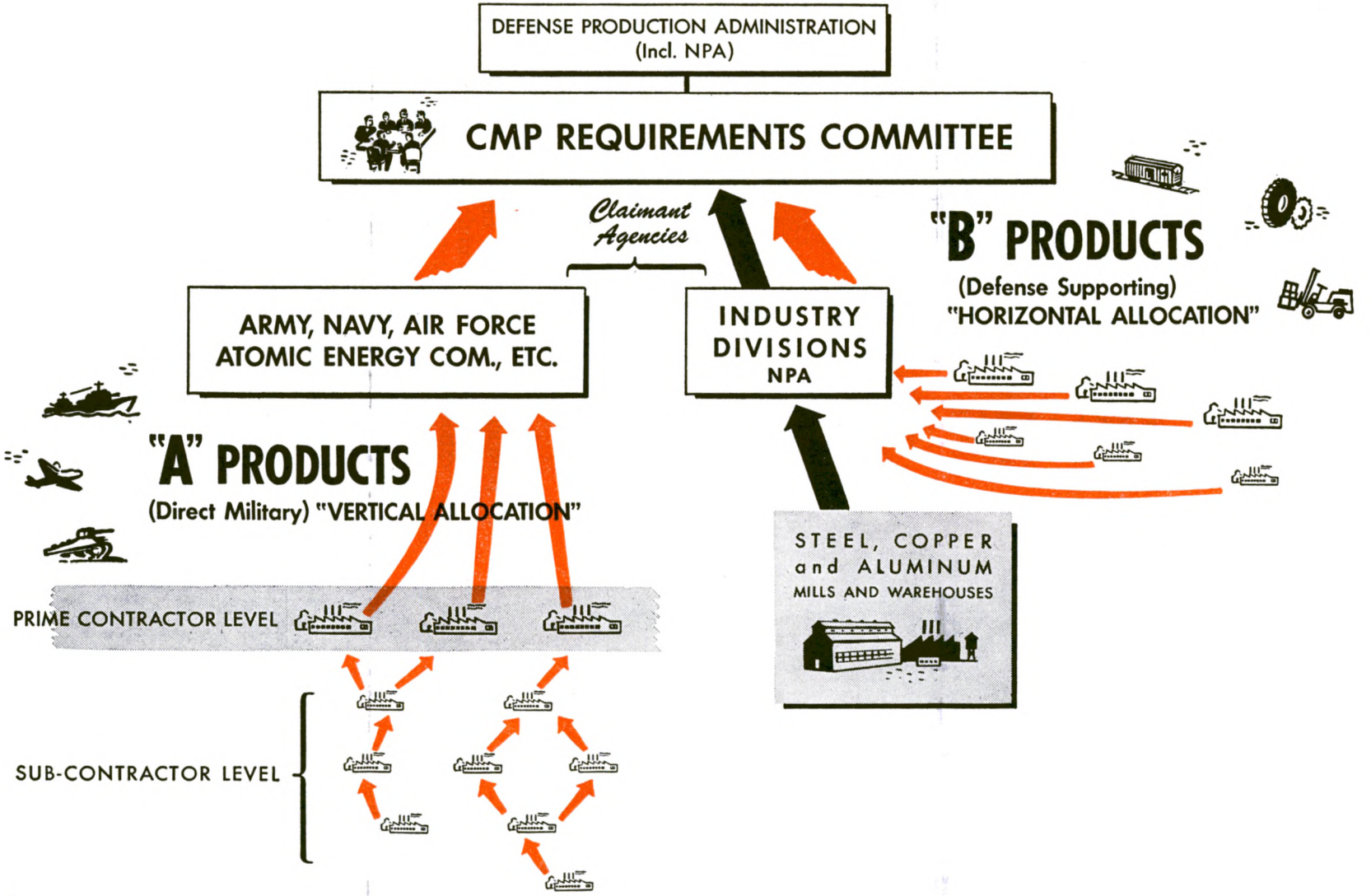
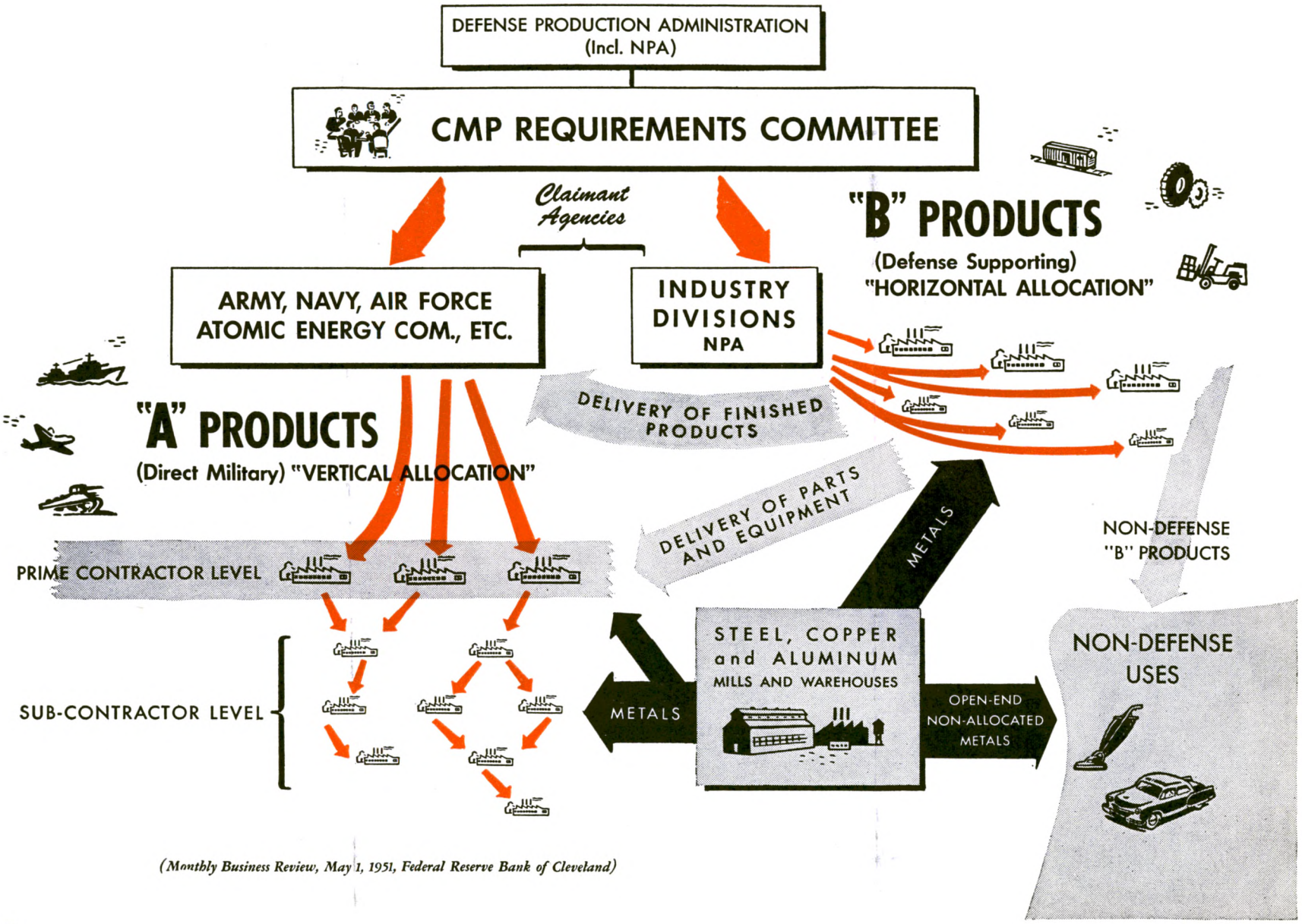


CHART 2: Flow of ALLOTMENTS (red) and PRODUCTS (black)



(Monthly Business Review, May 1, 1951, Federal Reserve Bank of Cleveland)

Balancing and Adjustment The Requirements Committee of the Defense Production Administration is the fulcrum of the balance. On the Committee sit representatives of the various claimant agencies, including the armed forces, and the industry divisions of the NPA serving chiefly in their capacity as claimants.

In its relation to the Requirements Committee the NPA plays a triple role.[4] First, it is itself a claimant agency insofar as it requests a given proportion of the total supply of metals for allotment to the B producers. Second, the metals branches of the NPA have been the collectors of information on forthcoming supplies of the metals. Hence, they act as experts on the supply end of questions. Third, the NPA draws up a preliminary balance of the requirements of the various claimant agencies (including itself as one) in the light of the expected supplies, and presents such a preliminary draft to the Requirements Committee.

The Requirements Committee in turn makes cuts or revisions where it is deemed appropriate, and makes final decisions which will presumably assure an equitable and practicable division of the total "pie" of metals in the light of defense and civilian needs.

Allotments and Products Once the allotments for broad programs have been determined at the top level, they are passed down the line (in the case of A products) and crossways (in the case of B products) through exactly the same channels previously followed by the flow of requirements estimates, but in the reverse direction. (See the second chart.) In the case of the vertical process for the A products, the distinguishing feature of the operation is the discretion for the subdivision of allotments which is delegated along the respective links of the chain. This not only makes for a flexibility which comes with decentralized operations, but it also carries the possibility of greater exactness in the fitting of supplies to needs, and hence an all-important net saving in the use of materials.

All that has been discussed above in terms of requirements, supply estimates, and allotments occurs at stages prior to the actual placing of industrial orders, the flow of metals, and the manufacture of products made from the metals. After the completion of the paper-work stages for any given quarter-year of the CMP, the actual orders for metals in accordance with the final allotments are placed with the steel, copper and aluminum plants. The resulting flow of metals is indicated on the second chart.

The flow of products made from the allocated metals is also shown on chart No. 2. Here it should be observed that the flow of B products runs in two different directions. In the one case, B products in the form of finished items or parts are delivered to the armed forces or other *defense* claimants, or their suppliers. (Whenever producers of A products receive component parts in the form of B products, the metals allotments involved in the B parts have previously been "charged" against the over-all allotments of the armed services; they are not part of the A system of allotments.) In the other case, B products are delivered in the form of finished products to *civilian* consumers, or in the form of parts and equipment to industries producing for civilian consumption. This double flow of B products highlights the essential nature of the B list. B products are by nature civilian-type products which happen also to be important to the defense program.

The Open End A description of the wartime CMP would stop at this point. The circle would be complete and the total supply of strategic metals would be accounted for, including civilian uses. In the case of the present or open-end plan a further modification is required. A significant fraction of the total metal supply is laid aside from the detailed operation of the Plan. In a sense it is the "remainder", but the size of this left-over part is determined in the course of the balancing operations of the Requirements Committee in the light of over-all mobilization policies.

The detailed distribution of the open-end share of metals is made in accordance with market forces operating under the broad limitations or restrictions contained in non-CMP instruments of the NPA, such as "M" orders, as well as under price controls. The relation of the open-end sector to the CMP as such is indicated in the lower righthand corner of chart No. 2.

Implications of Open End The inclusion of the open-end feature in the present plan is, of course, a reflection of the limited character of the present mobilization as contrasted with all-out war. The mobilization authorities in the present period have shown an understandable reluctance to make decisions about relative preference in the production of strictly civilian commodities. At base this reluctance is associated with a sincere effort to maintain the foundations of our enterprise system.

There is a technical angle, however, which supplements the policy consideration. Even if the emergency production controllers wished to do so, they would find it extremely difficult to make choices for purely civilian products in a situation short of full-scale war. For example, should automobiles be preferred to vacuum cleaners? This is a question ordinarily answered by the state of consumer demand in

(4) As an agency the National Production Authority continues to carry on many activities outside the scope of CMP. These include among others; rules for the conservation of strategic materials other than the three CMP metals, inventory controls, specific directives for the channeling of production toward defense goals.

the market place. What *criterion* should be substituted by the controllers? There are no clear civilian "goals" under our economic system comparable to the ones established in the defense sector where a given tank program implies certain requirements for motors and steel. Lacking the goals, the DPA or NPA authorities would soon run into operational snarls.

The decision in favor of the open-end principle was made in the face of numerous demands by producers of purely civilian items that the latter be included within the framework of the CMP, with the hope that a better opportunity of obtaining metals would result. Emphasizing the protective rather than the restrictive feature of CMP, such producers have been anxious to share in the protection afforded by the Plan. Part of the reluctance of the mobilization authorities to grant such pleas has been explained by the fact that even an open-end CMP is designed to alleviate the metal-procuring problems of purely civilian producers, insofar as the Plan affords a closer check on the share of the metals taken by the defense sector, thus freeing larger tonnages for civilian use than would otherwise be the case.[5] This is an important point and should be carefully weighed in any general appraisal of the partial or open-end CMP.

No doubt the pressure for the extension of the Plan will continue, or even intensify, as CMP swings into operation. Whether a partial CMP can be maintained for an indefinite period, is indeed, a serious question. In this connection, however, it should be recalled that one of the reasons for having a CMP at all is to have an effective allocation apparatus in working order in case international developments should force the country into full-scale war. In the latter event, the "open-end" problem would be solved by a quick shift to complete allocation of metals, but other more serious problems would take its place.

(5) "At the present time the Army and certain other programs have a priority . . . On the other hand, when they are required to schedule their needs quarter by quarter, a great deal of water is wrung out of the requirement immediately." — NPA Administrator Manly Fleischmann, April 12, 1951.

CMP in the Fourth District

The importance of the CMP to industry in the Fourth Federal Reserve District can scarcely be overemphasized. In the first place, the major concentration of the nation's primary steel industry is in Pittsburgh, Cleveland and the Mahoning Valley. (Of the three metals, steel is commonly regarded as the "controlling" metal of the Controlled Materials Plan.)

In respect to the A products there are the tank and plane production programs which are important in the Fourth District. Furthermore the city of Cleveland has often been referred to as an outstanding center of subcontracting.

As regards B products, business in the Fourth District is also vitally concerned. The machinery industries, which are perhaps at the core of the B products list, are heavily represented in Cleveland, Cincinnati and Pittsburgh as well as in many smaller centers of the District. Numerous products which were on the B list during the war and which are likely to reappear on the new B list are manufactured to an important extent in this District, and yet are hardly known to the general public. Two examples among many others are electric lift trucks (important to civilian manufacturers and also to the military) and earth-moving equipment.

Finally, in the open-end sector, the automobile and appliance industries are also very important to this District.

DEPARTMENT STORE TRADE

(CONTINUED FROM PAGE 4)

Furniture Sales Turning to the charts for some important hard goods departments, it now becomes clear where new ground in physical volume has been reached.

In the case of furniture and bedding it is apparent from a first glance at the chart that there has been a persistent tendency since 1947 for the prices of these commodity lines to rise. (This is indicated by a tendency for the black line to diverge from the red.) Over the years this fact is undoubtedly associated with the underlying strength of the housing boom and recent population increases. It seems probable that such strong factors on the demand side have not been offset by new cost-reducing techniques, nor by temporary oscillations in demand, to such an extent as has been the case in products such as television and some of the household appliances.

In spite of the price rises clearly visible in the chart, the physical volume of furniture sales rose persistently from its half-year low during late 1949. It is notable that in this case the recovery after the recession was earlier and stronger than in the case of soft goods discussed previously.

Appliances and TV In the appliance and television field, the charts exhibit not only the postwar strength in general, but also a noticeable tendency toward fluctuations capped by spectacular highs during the two buying waves. Towards the end of the first quarter of this year, sales of such products dropped sharply from their previous high positions.

On the price side, this group of departments showed marked price reductions during the 1949 recession. In fact, it is the only group here depicted which shows an average decline of prices from 1947 levels for any sustained period of time. (This is indicated on the chart by the fact that the red line appears above the black during the last half of 1949 and both halves of 1950.) The price behavior of this group was once more reversed as prices rose sharply in late 1950 and early 1951.

During the first quarter of the year, physical volume of sales in the appliances and television group declined slightly from the previous half-yearly average while dollar sales increased further. Both measures should be understood to refer to quarterly averages, seasonally adjusted.

Note on Method

Physical volume data mentioned throughout this article are referred to as estimates. The degree of reliability of such estimates may be better appreciated if the method of obtaining them is explained.

The price "deflators" applied to the dollar-sales series are taken from the Department Store Inventory Price Index, issued semi-annually by the Bureau of Labor Statistics of the U. S. Department of Labor. This is a special type of price index, which appeared first during the postwar period; it is designed primarily to assist retailers to use the LIFO method of inventory accounting for tax purposes. Its usefulness for the present purpose lies particularly in the fact that the price data apply exclusively to department stores, as distinguished from other retail outlets selling similar goods, and also to the fact that the departmental breakdowns in the index are reasonably close to those used in the regular sales summaries computed by the Federal Reserve System. Its use for the present purpose of correcting dollar-sales series for price changes is qualified, however, by at least two factors.

The first qualification is that in the Inventory Price Index the weights of the commodity lines are based on their proportions of store *inventories* rather than of store *sales*. The second qualification is that the Inventory Price Index applies to nation-wide averages of prices, whereas the dollar-sales data used in this study are from the Fourth Federal Reserve District only. The two qualifications are significant. Nevertheless, repeated experiments with this method of estimating physical volume, as well as certain improvements in the method, have given ground for confidence that the results are significant and broadly accurate for the purpose at hand.

The above explanation refers to the divisors or "denominators" applied to dollar sales in order to obtain physical volume. With reference to the numerators, or the dollar-sales series, some recasting of usual classifications was necessary in order to obtain comparability between dollar sales and the price deflators. Certain conventionally recognized departments were regrouped so as to obtain dollar aggregates for classifications used here, such as "women's wear" and the composite of "major household appliances, radios and television". In the case of men's and boys' wear, and of furniture and bedding, regrouping was not necessary.

In all cases, adjustment of the dollar-sales series for seasonal variation was required, since the desired comparisons cut across annual calendars. For this purpose, use was made of Fourth District seasonal-adjustment factors previously computed by this Bank on a departmental basis. (See for example, *Monthly Business Review,* issues of September 1949, May 1950 and January 1951.) Because of the regrouping of certain departments, a few new studies of seasonal variation were made for the purpose of this article.

A final qualification relates to the chart entries for the first quarter of 1951. For this period, the semi-annual inventory price indexes were not yet available. Accordingly, the necessary estimates for the price deflators were obtained from the clothing and housefurnishings components of the regular Consumers Price Index of the BLS, using a link method for obtaining the net price change between the latter part of 1950 and the first quarter of this year.

FINANCIAL AND OTHER BUSINESS STATISTICS

Time Deposits at 55 Banks in 12 Fourth District Cities

(Compiled April 6, and released for publication April 7)

City and Number of Banks	Time Deposits Mar. 28, 1951	Average Weekly Change During: Mar. 1951	Feb. 1951	Mar. 1950
Cleveland (4)	$ 867,986,000	—$ 931,000	—$1,346,000	—$ 337,000
Pittsburgh (9)	484,648,000H	+ 280,000	+ 179,000	+ 600,000
Cincinnati (8)	174,403,000	— 120,000	— 52,000	+ 332,000
Akron (3)	98,694,000	— 108,000	— 221,000	+ 7,000
Toledo (4)	105,909,000	+ 55,000	— 5,000	+ 184,000
Columbus (3)	85,937,000	— 112,000	+ 60,000	+ 173,000
Youngstown (3)	61,405,000	— 25,000	— 56,000	+ 47,000
Dayton (3)	44,037,000	— 61,000	— 150,000	+ 74,000
Canton (5)	41,155,000	— 104,000	+ 87,000	+ 28,000
Erie (3)	40,713,000	+ 9,000	+ 278,000	+ 92,000
Wheeling (5)	26,345,000	— 21,000	+ 21,000	+ 20,000
Lexington (5)	10,601,000	+ 15,000	+ 97,000	+ 12,000
TOTAL—12 Cities	$2,041,833,000	—$1,123,000	—$1,108,000	+$1,232,000

H—Denotes new all-time high.

Time deposits in twelve Fourth District cities edged downward another notch during March, to the lowest level since last November. The year-to-year shrinkage, however, is only slightly over 1%. Fluctuations in recent months have been comparatively slight when measured against the over-$2 billion total of such deposits, but they tend to reflect, at least in some measure, current economic changes, including the waves of accelerated buying by consumers.

Lexington has the distinction of being the only city in which time (or savings) deposits increased more rapidly this year than in the comparable month of 1950.

Pittsburgh is the only city in which time deposits reached a new all-time high of nearly $485 million, but the March increment was considerably smaller this year than last.

In **Cleveland** time deposits were being drawn upon a little more extensively than during March 1950, but at the end of last month such deposits were still within 2% of the year-ago aggregate.

In **Columbus** and **Erie,** despite some declines, time deposits continue to hold above year-ago levels.

Cincinnati, Akron, Youngstown, Dayton, Canton and **Wheeling** experienced small reductions in time deposits this March, as against moderate increases in the same month last year.

Adjusted Weekly Index of Department Store Sales*

Fourth District

(Weeks ending on dates shown, 1935-39 average = 100)

1950r	1951	1950r	1951
Jan. 7.....278	Jan. 6.....425	July 1.....327	July 7.....
14.....310	13.....412	8.....322	14.....
21.....320	20.....443	15.....354	21.....
28.....308	27.....398	22.....388	28.....
		29.....418	
Feb. 4.....293	Feb. 3.....287		Aug. 4.....
11.....308	10.....359	Aug. 5.....374	11.....
18.....279	17.....354	12.....344	18.....
25.....255	24.....365	19.....330	25.....
		26.....323	
Mar. 4.....258	Mar. 3.....302		Sept. 1.....
11.....279	10.....293	Sept. 2.....295	8.....
18.....264	17.....266	9.....324	15.....
25.....263	24.....251	16.....345	22.....
	31.....293	23.....318	29.....
Apr. 1.....285		30.....335	
8.....279	Apr. 7.....297		Oct. 6.....
15.....262	14.....311	Oct. 7.....297	13.....
22.....283	21.....323	14.....307	20.....
29.....334	28.....	21.....287	27.....
		28.....298	
May 6.....299	May 5.....	Nov. 4.....280	Nov. 3.....
13.....296	12.....	11.....281	10.....
20.....299	19.....	18.....288	17.....
27.....295	26.....	25.....221	24.....
		Dec. 2.....195	Dec. 1.....
June 3.....295	June 2.....	9.....328	8.....
10.....314	9.....	16.....334	15.....
17.....309	16.....	23.....314	22.....
24.....306	23.....	30.....342	29.....
	30.....		

* Adjusted for seasonal variation and number of trading days. Based on sample of weekly reporting stores which differs slightly from sample reporting monthly.

r—Revised

Bank Debits*—March 1951 in 31 Fourth District Cities

(in thousands of dollars)
(Compiled April 13, and released for publication April 14)

No. of Reporting Banks		Mar. 1951	% Change from Year Ago	3 Months Ended Mar. 1951	% Change from Year Ago
186	ALL 31 CENTERS	$9,887,610H	+32.7%	$27,637,535H	+34.1%
10	LARGEST CENTERS:				
5	Akron, Ohio	356,020H	+51.1%	977,828H	+47.5%
5	Canton, Ohio	154,850H	+37.6	427,867H	+37.1
15	Cincinnati, Ohio	1,181,769	+25.2	3,441,337H	+30.3
10	Cleveland, Ohio	2,508,021	+34.5	7,063,325	+35.7
7	Columbus, Ohio	640,992	+ 6.8	1,784,584	+ 9.9
4	Dayton, Ohio	319,096H	+33.7	863,931H	+27.0
6	Toledo, Ohio	483,051H	+35.8	1,324,389	+34.2
4	Youngstown, Ohio	216,839H	+41.6	594,818H	+34.7
6	Erie, Pa.	124,875H	+36.9	337,916H	+35.2
47	Pittsburgh, Pa.	3,062,340H	+40.0	8,415,262H	+43.2
108	TOTAL	$9,047,853H	+33.4	$25,231,257H	+35.1
	21 OTHER CENTERS:				
9	Covington-Newport, Ky.	$ 47,793	+10.8	$ 137,361	+15.7
6	Lexington, Ky.	73,455	+19.9	278,199	+ 9.3
3	Elyria, Ohio	29,557H	+41.5	79,362	+42.5
3	Hamilton, Ohio	51,381	+29.6	144,991	+25.4
2	Lima, Ohio	63,771H	+40.1	174,742H	+38.8
5	Lorain, Ohio	20,193	+17.8	58,397	+20.6
4	Mansfield, Ohio	61,382H	+37.8	167,270H	+35.7
2	Middletown, Ohio	49,302	+18.6	145,133H	+28.7
3	Portsmouth, Ohio	25,379	+20.1	69,206	+19.9
3	Springfield, Ohio	57,511H	+20.3	163,655H	+22.5
4	Steubenville, Ohio	28,618H	+23.7	81,203H	+26.3
2	Warren, Ohio	55,384H	+42.8	152,012H	+42.0
3	Zanesville, Ohio	32,991H	+24.6	89,899H	+21.9
3	Butler, Pa.	38,971H	+31.7	107,566H	+27.8
1	Franklin, Pa.	8,553	+28.2	23,670	+30.5
2	Greensburg, Pa.	27,054	+28.6	74,979	+32.0
4	Kittanning, Pa.	12,164H	+60.8	35,334	+43.7
3	Meadville, Pa.	15,932H	+15.2	44,726	+24.0
4	Oil City, Pa.	20,855	+ 4.5	58,525	+13.2
5	Sharon, Pa.	34,993	+26.1	97,994	+26.6
6	Wheeling, W. Va.	84,518	+24.5	222,054	+20.9
78	TOTAL	$ 839,757	+26.2	$ 2,406,278	+25.1

*—Debits to all deposit accounts except interbank balances.
H—Denotes all-time high.

Debits to deposit accounts (except interbank) at banks in 31 Fourth District cities jumped sharply in March from the seasonally low February figure to establish an all-time high total of $9,887,610,000. This represented an increase of 32.7% over the corresponding month of 1950 and a gain of 2.0% over the previous record January volume, attributable in part to the heavy concentration of income-tax payments in March.

TEN LARGEST CENTERS

The year-to-year expansion in debit volume was again more pronounced at the large centers than in the smaller localities, as has been the case in each month this year. A majority of the large centers reported all-time highs for March debits.

Akron and **Pittsburgh** remained among the leaders in year-to-year comparisons with margins of 51.1% and 40.0% respectively over the debit volume for March last year. **Youngstown,** another "defense industry" center registered a similar gain of 41.6%.

For the first quarter as a whole, the large cities as a group reported debits 35.1% in excess of the first quarter last year, the widest margin of increase for comparable periods since the end of World War II. With the exception of **Columbus** and **Dayton,** all the large cities registered increments of more than 30% over the first quarter totals for 1950.

TWENTY-ONE SMALLER CENTERS

With half of the small cities reporting new all-time highs for debits during March, the group together registered a year-to-year expansion of 26.2%, although failing to equal the record debit volume established in December.

Kittanning, Warren and **Elyria** led the small cities in year-to-year gains with increases of 60.8%, 42.8% and 41.5% respectively. These cities also registered the largest percentage gains over the comparable period of 1950 for the first quarter as a whole. **Kittanning's** gain over March 1949 and 1948, however, was less than the average.

Indexes of Department Store Sales and Stocks

	Daily Average for 1935-1939—100 Adjusted for Seasonal Variation Mar. 1951	Feb. 1951	Mar. 1950	Without Seasonal Adjustment Mar. 1951	Feb. 1951	Mar. 1950
SALES:						
Akron (6)	278	347	272	278	305	249
Canton (5)	355	391	335	334	286	302
Cincinnati (8)	253	321	285	292	253	274
Cleveland (11)	269	298	245	263	238	233
Columbus (5)	302	343	288	314	274	282
Erie (4)	332	352	300	319	281	276
Pittsburgh (8)	257	323	249	267	268	249
Springfield (3)	274	302	251	271	245	239
Toledo (6)	287	306	254	284	248	241
Wheeling (6)	230	260	220	239	203	216
Youngstown (3)	338	394	298	345	327	286
District (98)	286	333	270	286	266	256
STOCKS:						
District	396	369	276	392	343	273

Light Metals in Heavy Demand

by CLYDE WILLIAMS, *Director, Battelle Memorial Institute*

The country's growing need for immense quantities of light-weight, high-strength metals presents a new challenge to American industry and technology. This is especially true of aluminum and magnesium which occupy a central role in the national defense program.

Demand for aluminum, the metal that has had so much to do with aviation progress, is running far ahead of current supply. But prospects for greatly expanded production in the near future appear favorable. Expansion plans of the three principal producers of primary aluminum, Alcoa, Reynolds and Kaiser, plus output of two new prospective producers, Harvey Machine Company and Apex Smelting Company, would increase U. S. production about 70 per cent, from 715,000 tons in 1950 to 1,200,000 tons by 1953.

This seems a large order but the record of the aluminum industry and its technology in World War II indicate that the job can be done. Technical progress during the war years featured the development of higher strength alloys, and improved methods of rolling, extruding and fabrication. The cladding of strong aluminum alloy surfaces with pure aluminum for greater corrosion resistance made rapid progress.

Supplies of bauxite ores, from which aluminum is obtained, are ample to support immediate expansion unless a submarine menace should cut off the Guianas and other Caribbean sources. The discovery of workable ore deposits in Jamaica and Haiti has augmented total Western Hemisphere reserves. In addition, as a result of developmental work during World War II, it is now possible to use large quantities of lower grade domestic bauxites.

Believed by some to be a potential bottleneck to expansion plans is the shortage of low-cost power in the United States. Two avenues exist for overcoming this obstacle. One is the wider use of natural-gas-generated power which can be developed more cheaply than coal-generated steam power. New plants being set up by Alcoa and Reynolds, in Texas, and by Kaiser, in Louisiana, will use this type of power. In spite of the trend, however, highly efficient coal-generated steam power plants are still in the picture.

The other avenue is to use the extensive low-cost hydroelectric power resources of Canada and Alaska. It is reported that the Aluminum Company of Canada is considering a $500 million project in British Columbia for producing around 500,000 tons of metal annually. Alcoa would like to set up a 400,000-ton plant in Alaska. These longer term projects, if realized, could supplement continental U. S. capacity considerably beyond its own immediate expansion goals.

It may be questioned whether the domestic and world economy will be able to absorb expanded aluminum production when normal peacetime conditions return. But the postwar spurt in popularity of the metal for building materials, ships, trucks and trailers, railroad tank cars, irrigation pipe, and household appliances should allay such doubts. Its versatility has already made aluminum competitive on some levels with well established metals.

Though not yet as extensively used as aluminum on a volume basis, magnesium is following a similar successful pattern of development. Ample supply of raw materials, constant improvement in production and fabrication techniques, and a continually widening variety of industrial and military applications have worked together to assure magnesium an increasingly important position in the light metals group. As a result of these factors, the price of the metal has shown a steady downward trend from a high of $5.00 per pound in World War I to the current 24½ cents.

Production of primary magnesium, estimated at 16,000 tons in 1950, was pushed up to an annual rate of 24,000 tons during the latter part of that year. All of this has been from Dow's Freeport (Texas) electrolytic plant which gets its magnesium from sea water. With the planned reopening of six government plants and capacity output at Dow's Freeport operation, production is expected to reach an annual rate of 122,000 tons by late this year. This is about five times present output, but still far short of the record 184,000 tons attained in 1943 from plants having a rated capacity of 293,000 tons. Among leading fabricators of present output are Wyman-Gordon (forgings), Howard (foundry products), and Brooks and Perkins (wrought products).

Shortage of low-cost power also stands as a potential bottleneck to expansion plans for the magnesium industry. As a result, more attention is being focused on production by the so-called ferrosilicon furnace process, originally employed during World War II to reduce the need for critical direct-current conversion equipment. This process has not been as economical as the conventional electrolytic method. It has the great advantage, however, of needing only about half as much electricity, most of which is consumed in making the ferrosilicon used in the process. At the war's end, the operating costs (not including amortization) of plants using the Pidgeon version of this process had been reduced to a point below the selling price of magnesium. Three of the six government plants being reopened use the Pidgeon process, and further reduction in operating costs is anticipated.

Of significance to the future of the industry is the plan announced by Dow in 1950 to construct a continuous rolling mill for magnesium at Madison, Illinois. It is designed to increase present capacity from 20 tons of sheet monthly to 150 tons. Through narrowing the spread between the low price of ingot and the high price of sheet magnesium, this facility should boost the growth rate of the industry.

Major use today for magnesium is for aircraft, and for other forms of transportation where advantage is taken of its high strength-weight ratio to convert dead load into payload. Recently, plans have advanced to construct a wing for the F-80 airplane made entirely of magnesium alloys. Such a design is expected to leave space for larger fuel tanks, thereby providing a 30 percent increase in range. Like aluminum, magnesium's lightness has also made it a useful material for some household appliances.

Editor's Note:—While the views expressed on this page are not necessarily those of this bank, the *Monthly Business Review* is pleased to make this space available for the discussion of significant developments in industrial research.