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DEFENSE PROGRESS

NUMBER 50 AUGUST 1, 1941

PART A - ANNUAL REVIEW

OFFICE OF PRODUCTION MANAGEMENT
BUREAU OF RESEARCH AND STATISTICS - STACY MAY, CHIEF

DEFENSE PROGRESS

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STATISTICS · STACY MAY, CHIEF

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FOREWORD

Throughout the past year we have presented each week--with two exceptions--a report on Defense Progress.

In this, the fiftieth issue of Defense Progress, we attempt in Part A a review of the first twelve months of the defense program.

Because of the scope of the program, this review is necessarily a bulky one. It is intended as a reference volume as well as a current survey of the first year of the defense effort.

In spite of the length of Part A, our treatment has necessarily been selective; some phases of the defense program and their impacts on our economy have been treated in summary fashion and others have been omitted entirely. Nonetheless, we venture to hope this will prove a useful compilation.

In Part B we present a twelve-month's retrospect of Defense Progress Series.

To the many agencies and individuals whose cooperation has made this review possible, we express our sincere appreciation.

Stacy May

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August 1, 1941

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GROWTH OF THE PROGRAM

The purpose of the defense program launched a year ago was to make the United States impregnable on land, on sea, and in the air. To achieve this objective within a relatively short period of time, a great economic effort was and still is necessary.

A year ago, the United States was a long way from such a goal. Before the fall of France, the United States Army was but a skeleton organization. It included less than 270 thousand officers and men and had little modern equipment. Although there were probably at least a dozen ultra-modern armored divisions and a far larger number of mechanized divisions in the German land forces at that time, there was not a single modern medium or heavy tank in our Army.

Again, there were then about 4,500 planes in our Army and Navy airforces and of this total about one-third were trainers. In mid-1940 it is estimated that Britain had over 12 thousand planes and Germany over 25 thousand.

On the other hand, our Navy compared favorably with those of the United Kingdom and Japan, as the following table shows, although it was somewhat undermanned and underequipped for full operation.

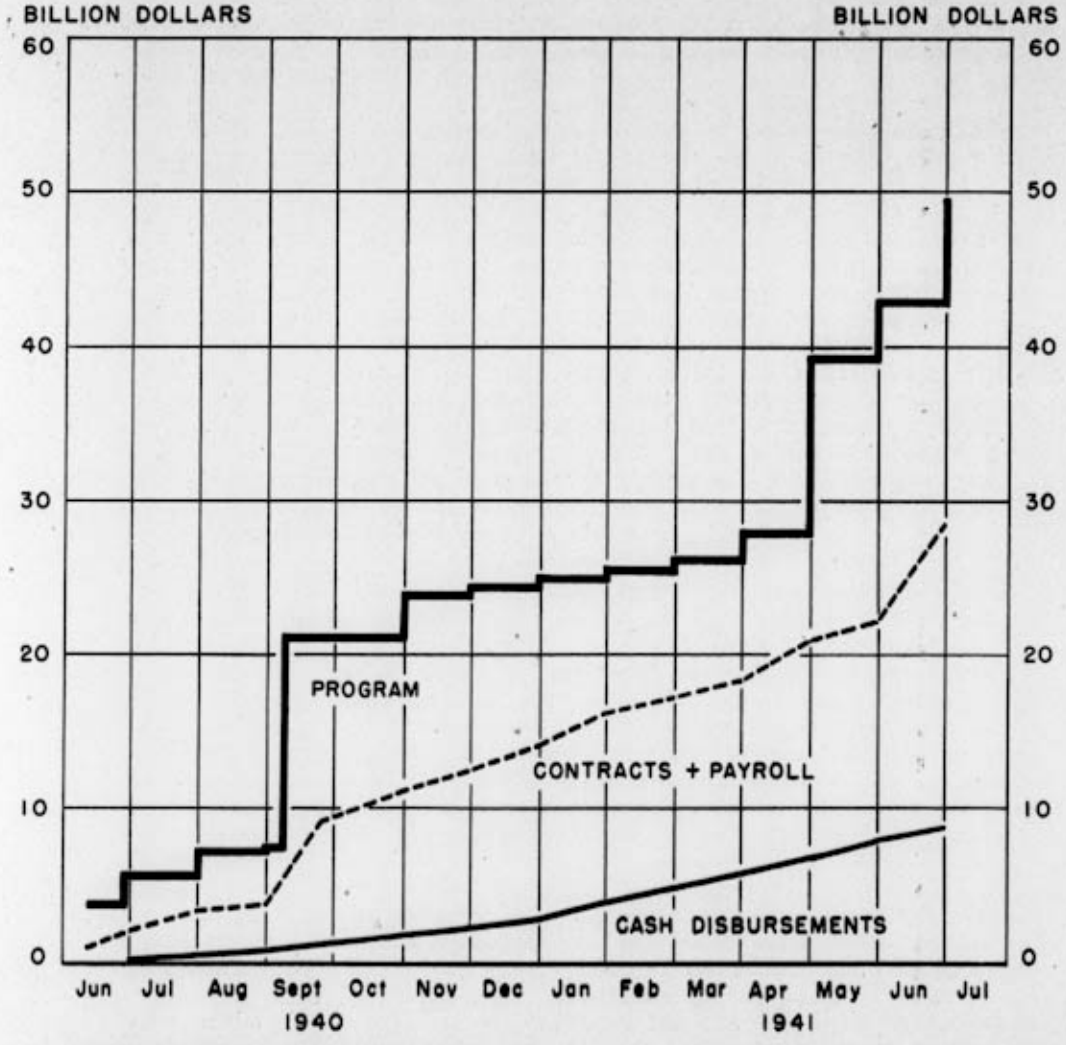
	Major Combat Vessels	
	Total Tonnage (Millions)	Under-age Tonnage (Millions)
United States	1.3	1.0
Britain	1.3	1.1
Japan	1.0	.8

Nonetheless our Navy was not large enough for two oceans. The total expenditures for the entire military establishment were at the rate of less than $150 million a month.

Since the program's inception, its original purpose has been broadened. In line with the foreign policy of the United States the program has been expanded to include extensive aid to Britain and other anti-Axis countries. The effort required to accomplish these purposes and the lengths to which we must go before the safety of the country is assured cannot now be expressed in final terms. The program is still growing. Figures which a year ago appeared fantastic are now accepted as representing only modest beginnings. Already the 50 thousand plane program is overshadowed by the reali-

CHART I - ENACTED DEFENSE PROGRAM* AND CONTRACT AWARDS FOR DEFENSE PURPOSES

JUNE 11, 1940 - JULY 1, 1941



* United States and British Programs.

zation that needs are much greater. The magnitude and the direction of the ultimate program are still to be determined.

By June 30, 1941 the program amounted to $50 billion. The overall development of the program in the past 12 months as reflected in dollar transactions is presented in Chart 1. The funds available for the entire defense program inclusive of British orders at the end of August 1940 totaled less than $7 billion. It did not pass the $30 billion mark until the end of April 1941. Contractual commitments (including pay rolls) were slightly under $10 billion at the end of September 1940. From that point, they increased rapidly, reaching a total of $27 billion by June 1941.

Table 1 shows the growth of the volume of funds made available to various agencies for the financing of the total defense effort in the United States and the funds for each major object.

The $50 billion defense program as of the end June 1941 included the following items: Congressional appropriations and authorizations, Reconstruction Finance Corporation credits, and British orders placed in this country. In addition to this total, bills were pending before Congress, providing for about a billion and a quarter. Of the $50 billion of funds authorized as of June 30, $34 billion were put at the direct disposal of the Army and Navy. More than $5 billion are being used by other Federal agencies for a variety of purposes ranging from the construction of plant facilities and the accumulation of stockpiles to the training of pilots and skilled mechanics. The funds provided for aid to foreign countries in accordance with the Lend-Lease Act amount to $7 billion.

The British orders for munitions and other supplies which have been placed in the United States amount to $3.7 billion. This sum must be added to the funds provided for and spent by the Federal Government in order to indicate the total defense effort put forth by our economy. More than 40 percent of the total funds constituting the so-called enacted program of the United States was provided in the first six months of the defense program. Of the $20 billion provided by October 1940, about $10 billion were placed at the disposal of the Navy Department for a two-ocean navy, and of this more than one-half represented the estimated cost of naval vessels (exclusive of ordnance).

Analysis of the money provided quarterly during the first year of the program is shown by objects in the lower part of the table. The material represented by naval vessels, ordnance, and aircraft comprises nearly $27 billion or 54 percent of the total program to date. Nearly $5.9 billion was provided for new plant and equipment. Merchant ships represent about $2 billion. Construction of posts, depots, airfields, fortifications, and the like account for more than

TABLE . 1 - THE DEFENSE PROGRAM BY AGENCIES AND MAJOR OBJECTS
FISCAL YEAR 1941

Agency and Object	1940 Third [a] Quarter	1940 Fourth Quarter	1941 First Quarter	1941 Second Quarter	Total
	(Million Dollars)				
Agency					
War Department	7,001	1,377	861	11,107	20,346
Navy Department	3,189	6,797	2,109	1,429	13,524 [b]
U.S. Maritime Commission	154	-	415	180	749
RFC and Subsidiaries	594	318	429	1,453 [c]	2,794 [c]
Other U. S. Agencies	650	341	-31	686	1,646
Defense Aid	-	-	7,000	-	7,000
Total United States	11,588	8,833	10,783	14,855	46,059
British Orders [d]	1,885	1,307	420	57	3,669
Total	13,473	10,140	11,203	14,912	49,728
Object					
Airplanes, Engines, Parts & Accessories	3,864	749	2,320	4,795	11,728
Naval Ships and Parts	897	5,174	522	203	6,796 [b]
Ordnance and Combat Vehicles	2,464	1,896	2,364	1,501	8,225
Other Equipment & Supplies	658	214	277	949	2,098
Total Materiel	7,883	8,033	5,483	7,448	28,847
Merchant Ships and Parts	148	112	1,020	279	1,559
New Industrial Facilities	1,317	438	1,611	2,514	5,880
Posts, Depots, etc.	1,400	98	932	1,230	3,660
Housing (Nonmilitary)	133	150	5	155	443
Stockpile	398	105	252	225	980
Other	1,011	505	1,622	493	3,631
Total Contractual Items	12,290	9,441	10,925	12,344	45,000
Pay Roll	638	409	48	1,713	2,808
Subsistence, Travel	126	126	7	444	703
Miscellaneous	419	164	223	411	1,217
Total	13,473	10,140	11,203	14,912	49,728

[a] Includes appropriations made in Fiscal Year 1940 for Fiscal Year 1941.
[b] These figures include estimated cost of tonnage authorizations and are subject to revision.
[c] Through June 15, 1941.
[d] Includes orders placed prior to July 1, 1940.

$4 billion. The total volume of contractual items including materiel, construction, and other industrial items, amounts to $45 billion.

The progress in the first stage of the procurement of materiel and other commodities and services, is represented by contract awards and direct expenditures. These are shown in Table 2.

Nearly $10 billion of commitments were made before September 1940. Contract awards plus military pay rolls and other direct expenditures in the subsequent two quarters amounted to about $5 billion each, and in the quarter ending June 1941, they amounted to a little more than $9 billion. The total amount so committed in the first year of the program was about $28 billion, leaving an unobligated balance of about $22 billion on July 1, 1941.

However, the large amount of unobligated balances on July 1, 1941 does not necessarily indicate a failure on the part of the various defense agencies to initiate production as rapidly as possible. Over $8.25 billion included in the total of unobligated balances were not made available to the program until the last week in June 1941. A considerable amount of the funds available is for items not calling immediately for full contractual arrangements. For example, in the case of ships requiring several stages of construction over a long period of time, it is not necessary to let contracts for all the operations at one time. Likewise, in the case of funds provided for Army and Navy subsistence throughout F.Y. 1942, there may be little need for speed in placing of contracts since there is no occasion for stimulating new production. Nonetheless, in a number of fields the letting of contracts has been too slow to secure needed additional production with maximum speed. A rough comparison, excluding funds not immediately available, is presented in Table 3.

Because defense disbursements afford a broad, if rough, measure of actual accomplishment, the figures shown in Table 4 are of special interest.

Of the total disbursements shown in the table, 37 percent was for ships, ordnance, and aircraft; 25 percent was for the construction of industrial facilities, stations, bases, etc.; 21 percent was for the procurement of other equipment and supplies, including such items as transportation, equipment and stockpiles; the remaining 17 percent went for pay, subsistence, and miscellaneous services.

Total payments for defense goods and services, including pay rolls and payments on British orders, amounted to something over $9 billion, or about 18 percent of the program so far enacted.

TABLE 2 - DEFENSE CONTRACT AWARDS AND DIRECT EXPENDITURES
FISCAL YEAR 1941

Agency and Object	1940 Third Quarter	1940 Fourth Quarter	1941 First Quarter	1941 Second Quarter	Total
	(Million Dollars)				
Agency					
War Department	2,632	2,284	2,187	2,889	9,992
Navy Department	4,560	1,306	1,395	2,655	9,916
U.S. Maritime Commission	n.a.	n.a.	n.a.	810	810
RFC and Subsidiaries	342	270	343	187 [a]	1,142 [a]
Other U. S. Agencies	86	125	121	170	502
Defense Aid	0	0	0	2,466	2,466
Total United States	7,620	3,985	4,046	9,177	24,828
British Orders	1,884	1,310	420	57	3,671
Total	9,504	5,295	4,466	9,234	28,499
Object					
Airplanes, Engines, Parts & Accessories	1,816	1,527	729	2,757	6,829
Naval Ships and Parts	3,816	622	62	500	5,000
Ordnance and Combat Vehicles	1,513	790	1,132	1,543	4,978
Other Equipment and Supplies	217	222	141	373	953
Total Materiel	7,362	3,161	2,064	5,173	17,760
Merchant Ships and Parts	33	113	13	1,303	1,462
New Industrial Facilities	409	743	750	859	2,761
Posts, Depots, Etc.	370	344	703	795	2,212
Housing, (Nonmilitary)	10	95	69	101	275
Stockpile	160	88	140	82	470
Other	693	553	267	236	1,749
Total Contractual Items	9,037	5,097	4,006	8,549	26,689
Pay Roll, Subsistence, Travel, Miscellaneous	467	198	460	685	1,810
Total	9,504	5,295	4,466	9,234	28,499

[a] Through June 15, 1941.

At this $9 billion rate of annual expenditure it would take more than four years to carry out the remainder of the program enacted as of June 30, 1941. There was, however, a marked acceleration in the volume of disbursements during the winter. Nearly two-thirds of the total for the past 12 months was disbursed in the second half of that period. The last quarter alone accounted for more than one-third of the total for the entire year. In the last four months of the year, as the cantonment construction program approached completion, construction expenditures declined, and the total monthly expenditure curve has shown a tendency to flatten out around the billion dollar mark. However, it may be expected to resume its upward course shortly.

TABLE 3 - FUNDS AND CONTRACT AWARDS
June 30, 1941

OBJECT	Total Program	Funds made Available After June 15 or otherwise deferred	Net Program	Commitments
	(Million Dollars)			
Airplanes, Engines, Parts & Accessories	11,728	3,239	8,489	6,829
Naval Ships & Parts	6,796	1,000 [c]	5,796	5,000 [a]
Ordnance & Combat Vehicles	8,225	286	7,939	4,978
Merchant Ships & Parts	1,559	0	1,559	1,462
New Industrial Facilities	5,880	500	5,380	2,761
Posts, Depots, etc.	4,103	522	3,581	2,487
Other	7,926	967	6,959	4,621
Pay Roll & Subsistence, of Army & Navy	3,511	2,777 [b]	734	361
Grand Total	49,728	9,291	40,437	28,499

[a] Estimated figure. Navy now reports the total cost of the ship (hull, machinery, equipment, but not ordnance) as a commitment. The total reported by the Navy is $6,264 million.

[b] Includes total funds for pay roll and subsistence for 1942.

[c] Estimated cost of contracts under tonnage authorization, which cannot well be let now.

This review of the first year's growth of the defense program shows that important steps have been taken to provide the United States with defense equipment. If they have been to a considerable extent in the form of preparation, nevertheless, they have laid the groundwork for the flood of production that is scheduled to take place in the second year of the defense effort.

TABLE 4 - DEFENSE DISBURSEMENTS, FISCAL YEAR 1941

Agency and Object	1940 Third Quarter	1940 Fourth Quarter	1941 First Quarter	1941 Second Quarter	Total
	(Million Dollars)				
Agency or Administration					
War Department	269.0	604.0	1,440.8	1,554.2	3,868.0
Navy Department	344.1	480.7	652.0	844.9	2,321.7
U. S. Maritime Commission	31.6	38.5	36.5	49.9	156.5
RFC and Subsidiaries	12.8	38.9	91.9	189.1	332.7
Other U. S. Agencies	24.2	64.0	92.4	164.3	344.9
Defense Aid	-	-	-	26.4	26.4
Total United States	681.7	1,226.1	2,313.6	2,828.8	7,050.2
British [a]	816.6	542.0	465.9	256.6	2,081.1
Total	1,498.3	1,768.1	2,779.5	3,085.4	9,131.3
Objects					
Airplanes, Engines and Parts	345.1	290.5	504.6	301.4	1,441.6
Naval Ships and Parts	105.8	148.9	180.1	225.2	660.0
Ordnance and Combat Vehicles	173.7	188.3	225.9	392.8	980.7
Other Equipment and Supplies	52.4	69.2	114.5	153.5	389.6
Total Materiel	677.0	696.9	1,025.1	1,072.9	3,471.9
Merchant Ships and Parts	79.7	54.5	51.8	72.7	258.7
New Industrial Facilities	105.3	96.0	233.3	396.7	831.3
Posts, Depots and Other Nonindustrial Construction	71.8	274.7	595.7	526.5	1,468.7
Stockpile	16.9	33.6	53.4	75.3	179.2
Other	305.1	300.6	381.7	329.8	1,317.2
Total Contracted Items	1,255.8	1,456.3	2,341.0	2,473.9	7,527.0
Pay Roll	191.8	242.0	328.2	438.1	1,200.1
Subsistence, Travel	32.8	45.8	69.7	100.7	249.0
Miscellaneous	17.9	24.0	40.6	72.7	155.2
Total	1,498.3	1,768.1	2,779.5	3,085.4	9,131.3

[a] Cash payments in the United States by the British Purchasing Mission. Payments prior to July 1, 1940 are included in the Third Quarter, 1940.

Chapter 2

PROGRESS TOWARD PREPAREDNESS

The defense program on July 1, 1941 amounted to approximately $50 billion. This program consists of two main parts: (1) $40 billion to provide modern equipment for the armed forces of the United States, to build a two-ocean Navy, to develop an air force, and generally to build up United States defenses; and (2) $10 billion inclusive of British orders to provide munitions for Great Britain and her allies. This chapter is devoted to an examination of the progress to date under this program.

SIZE OF THE ARMED FORCES

On June 30, 1940, the total active strength of the United States Army and Navy combined was less than half a million men. The Army consisted of about 270 thousand officers and enlisted men, and the Navy and Marine Corps consisted of around 185 thousand men. By December 31, 1940, the Army had increased to almost 700 thousand men and the Navy and Marine Corps to 270 thousand officers and sailors, so that the total armed forces were about twice as large as they had been when the defense effort first started. This rapid rate of increase of personnel has continued, and the Army is now composed of about 1½ million men, while the Navy and Marine Corps now include 325 thousand persons. The Army now includes about 600 thousand selective service trainees and 275 thousand National Guardsmen.

One of the most important segments of our military strength, the aviation personnel of the Army and Navy, has increased from about

TABLE 5 - AVIATION PERSONNEL OF UNITED STATES ARMY AND NAVY

	Total	Army	Navy
July 1, 1940			
Pilots	6,433	3,348	3,085
Other	77,401	49,294	28,107
July 1, 1941			
Pilots	11,204	6,763	4,441
Other	170,791	117,935	52,856
July 1, 1942			
Pilots	32,374	20,874	11,500
Other	n.a.	223,890	n.a.

84 thousand on July 1, 1940, to 182 thousand on July 1, 1941. A year ago, at the beginning of our defense effort, there were 6,433 pilots in the Army and Navy combined, compared with 11,204 pilots in July 1941. This increase represents largely the fruition of training programs started prior to the intensive effort of the past year. The current program provides for a much greater increase in aviation personnel, both pilot and other, during the next twelve months. By July 1942, as shown in the preceding table, the combined air services are expected to have over 32 thousand pilots.

An important adjunct to the military training program has been the work carried out by the Civilian Pilot Training Program. Although this program does not reduce the time period required for military training, the record indicates that the holders of private pilot certificates are considerably more successful in qualifying as military pilots than other trainees. There are now 41,360 C.A.A.-trained persons holding private pilot certificates. The program of the C.A.A. for fiscal year 1942 provides for training the following number of persons:

Primary course	30,000
Secondary course	9,000
Cross-country course	6,000
Instructor course	4,000

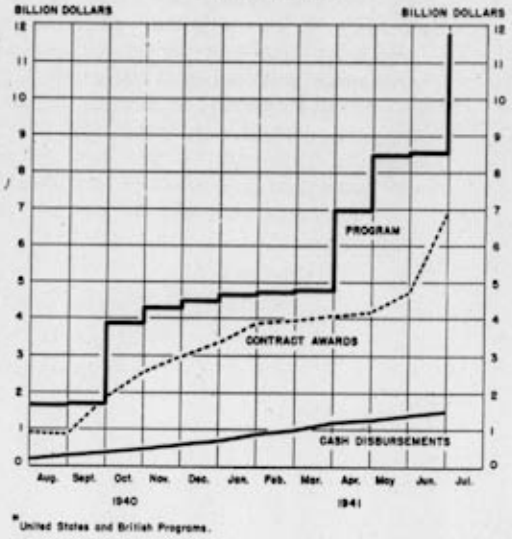
In addition to the pilot training program, the C.A.A. has conducted "refresher" courses to train commercial pilots as instructors. This instruction standardization program has supplied 690 instructors to aid the United States training program in addition to 170 instructors for Canada.

AIR POWER

At the start of the defense program the United States Army and Navy had about 4,500 airplanes, one-third of which were trainers. To build up our air fleet and to provide planes for Great Britain and her allies, more than $11 billion had been allocated for the purchase of airplanes in this country as of June 30, 1941. Chart 2 shows the rate at which this money has been made available and also shows the rate at which orders have been placed for airplanes and equipment. As can be seen from this chart, total orders at the end of the fiscal year amounted to more than half of the program. Cash expenditures for the purchase of airplanes are also shown on this chart, but these expenditures are a relatively poor measure of production expecially because

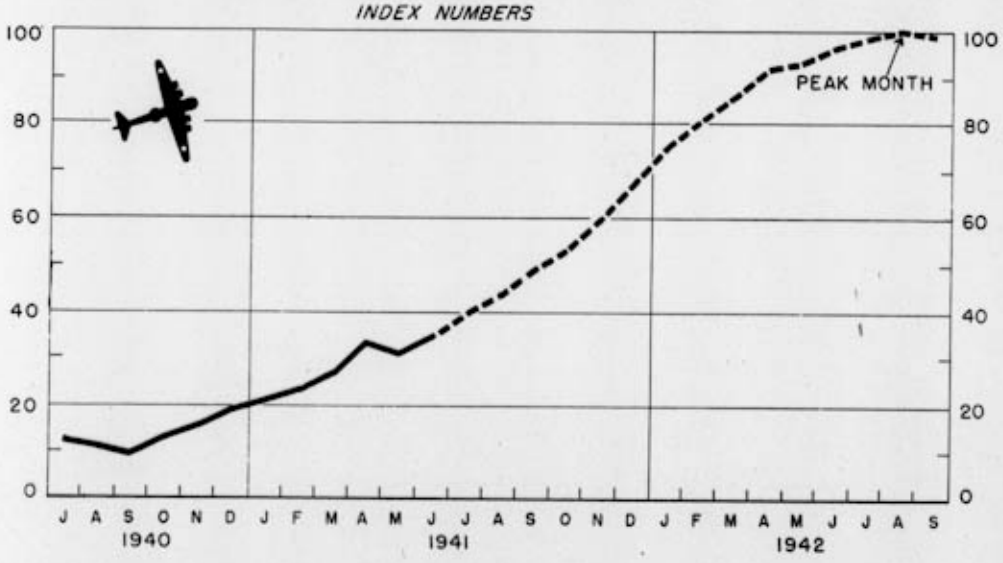
of British prepayments. Accordingly, indexes measuring the physical volume of deliveries of airplanes are presented in Charts 3 and 4. Chart 3 shows that, under programs now in effect, the peak rate of airplane production is scheduled to be reached in August 1942. The weighted monthly index of production rates compared with August 1942 as 100 was only 13 in July 1940, representing about 550 planes. As can be seen in Chart 3, the monthly rate of production has increased substantially, although not steadily, and during the last month of fiscal year 1941 slightly over 1,450 planes were delivered, a rate which is 35 percent of the anticipated peak rate. If OPM schedules are met, this rate should be almost doubled within six months.

CHART 2-AIRPLANES, ENGINES & ACCESSORIES
ENACTED DEFENSE PROGRAM*, CONTRACT AWARDS & CASH DISBURSEMENTS
JULY 1940 - JULY 1941



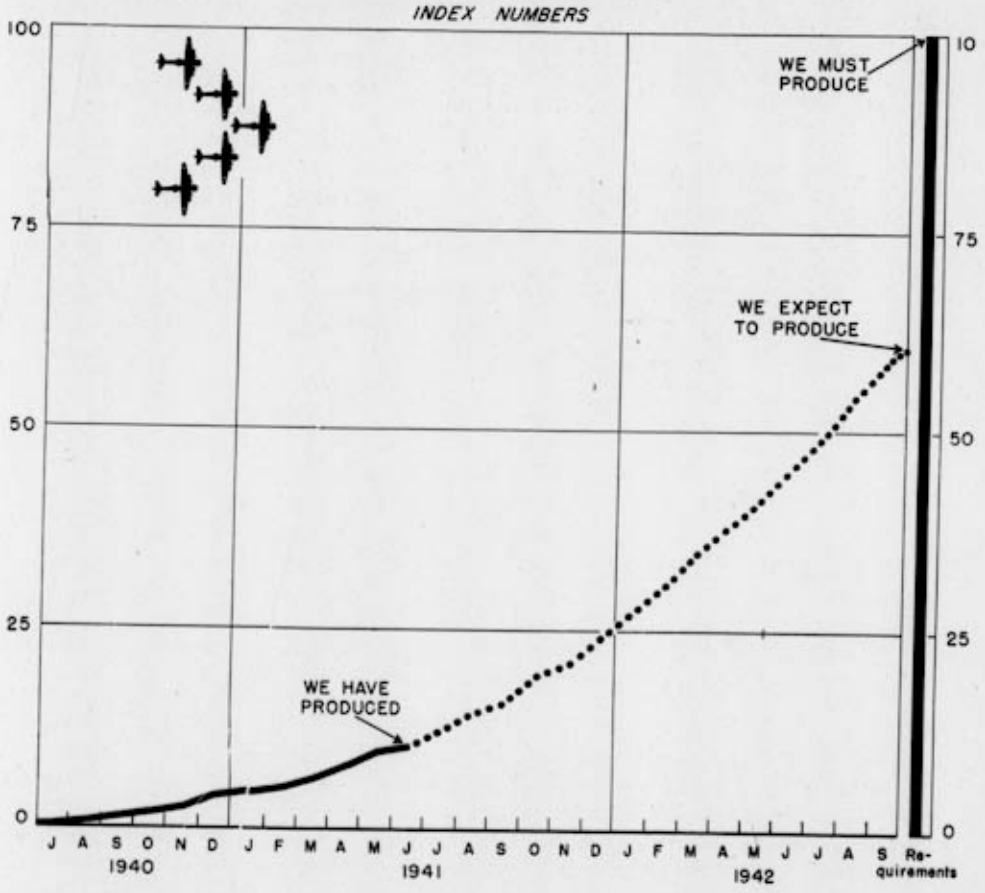
*United States and British Programs.

CHART 3-MILITARY AIRPLANES
MONTHLY PRODUCTION RATE



An index of cumulative production of military airplanes since the beginning of the defense program is shown in Chart 4. The base of 100 is the total number of planes to be produced under present programs for United States use and for export. At the end of December 1940, only about 4 percent of the total requirements had been produced. By the end of June almost 11 thousand planes had been produced bringing the weighted index to 11 percent. According to OPM schedules, over a quarter of the total airplanes now under procurement plans will have been delivered by the end of the present calendar year. These index figures relate to deliveries weighted by the relative importance of different types of planes, a heavy

CHART 4-MILITARY AIRPLANES
TOTAL PRODUCTION

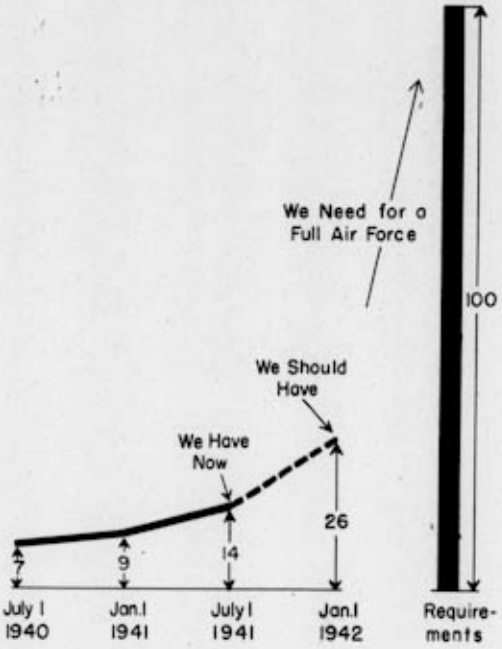


bomber, for example, affecting the index far more than a primary trainer.

The 4,500 airplanes which the United States forces possessed on July 1, 1940, represented, in terms of the weighted index, approximately 7 percent of the United States requirements, as indicated by existing programs. The July 1, 1941, inventory of slightly over 10,000 planes represented about 14 percent of these requirements. As an increasingly large share of production is retained in this country, American inventories will be rapidly increased and by the end of another six months the index should be almost double the present level at 26.

Chart 5 shows the inventory index for military airplanes.

CHART 5 - MILITARY AIRPLANES
U. S. INVENTORY INDEX



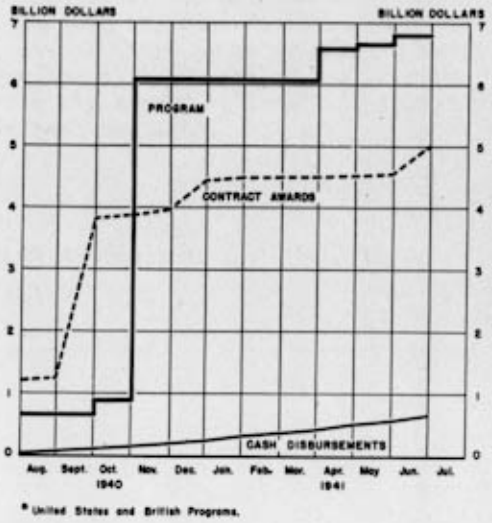
NAVAL POWER

The estimated cost of building a two-ocean Navy will be about $6½ billion, excluding armor and armament. Almost all of these funds have either been placed under direct contract or have been earmarked for expenditure. In addition, the armor and armament for these vessels will cost, according to present estimates, slightly over $2.8 billion.

When the two-ocean Navy is completed, the fleet will have been increased from the 384 major combat ships representing 1.3 million tons on July 1, 1940 to 692 ships, representing 3.5 million tons. In addition to these major fighting ships the Naval construction program will nearly treble the number of patrol craft and auxiliary vessels in the fleet.

The shipways which were available for construction of major combat ships were not being utilized fully in July 1940. The production rate index for these ships stood at only 18 representing about 12 thousand tons, compared with a peak of 100 expected in December 1942. As the work was speeded up and as more ways were made available, the index increased steadily and, as can be seen in Chart 7, reached 34 in June 1941. Expected increases in the number of shipways and the growing importance of prefabrication of large sections of the vessels should cause the amount of work being performed each month to increase rapidly, and in another six months work should be progressing at about 60 percent of the scheduled peak rate.

CHART 6 - NAVAL SHIPS AND PARTS
ENACTED DEFENSE PROGRAM*, CONTRACT AWARDS & CASH DISBURSEMENTS
JULY 1940 - JULY 1941



* United States and British Programs.

CHART 7 - COMBAT SHIPS
MONTHLY PRODUCTION RATE
INDEX NUMBERS

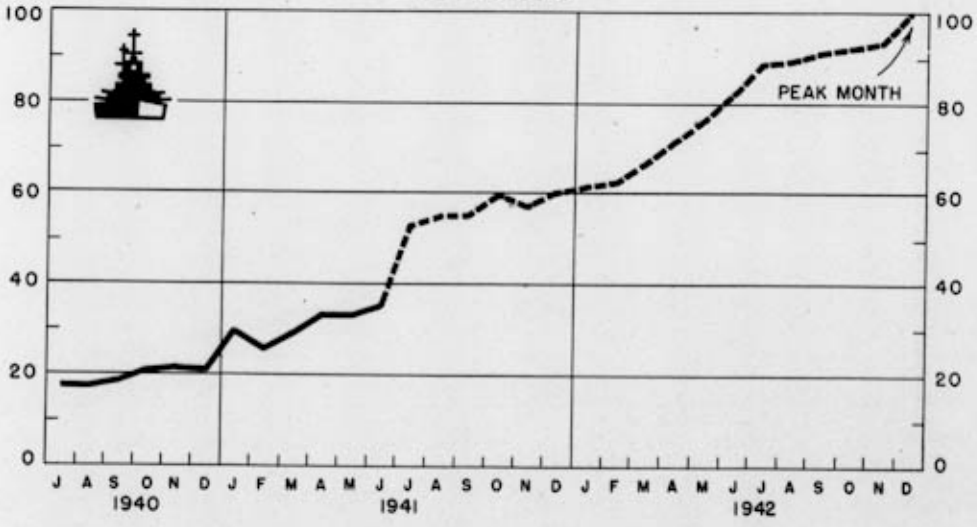
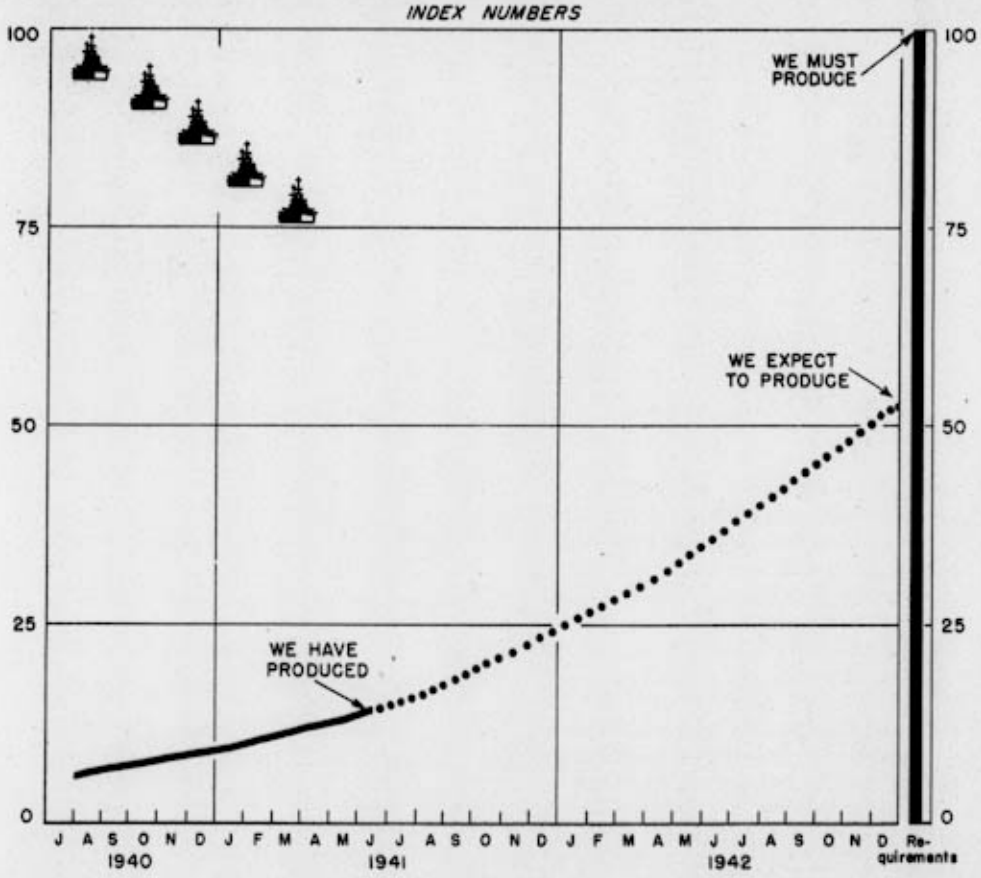


Chart 8 indicates the total amount of work which has been performed toward building the two-ocean fleet. At the present time, it is estimated that 14 percent of all the work has been finished, or the equivalent of 320 thousand tons, almost three times as much as had been done on ships then under construction at the start of the program on July 1, 1940. By the end of another six months at least one-fourth of the construction program will have been completed.

CHART 8 - COMBAT SHIPS TOTAL PRODUCTION



On July 1, 1940, we had on hand 1.32 million tons, about 38 percent of the total tonnage of major combat ships for the two-ocean Navy, as shown by Chart 9. Shortly after the start of the program, 27 destroyers were converted to auxiliaries, and 50 others were transferred to Great Britain in exchange for island bases. Delivery of new destroyers and submarines since last July has replaced 58 percent of the tonnage thus lost. The present tonnage of 1.28 million tons is, however, more modern. If the work completed on undelivered ships is added to the tonnage of ships in service the index of completion of the two-ocean Navy is 44 on July 1, 1941. By the end of another six months, the index, including work done on unfinished vessels, should reach 54.

CHART 9 - MAJOR COMBAT SHIPS
U. S. INVENTORY INDEX

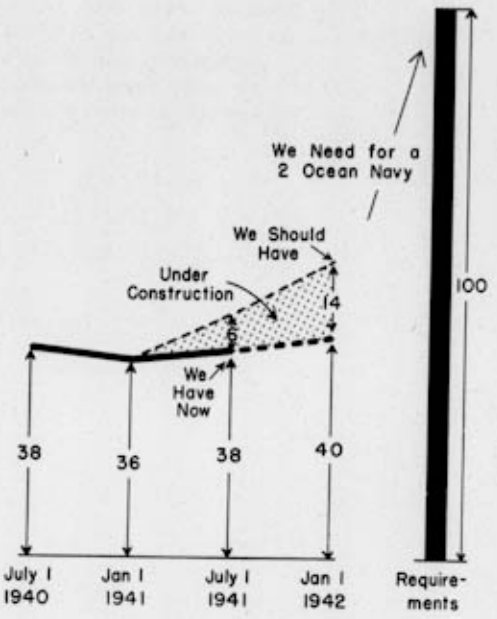
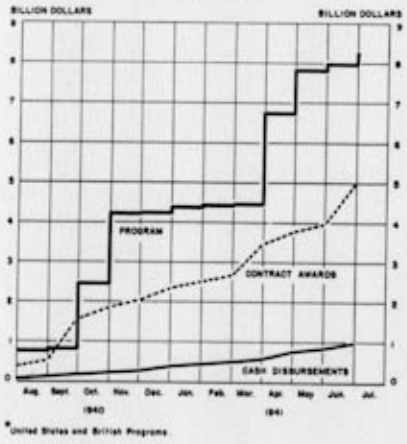


CHART 10-ORDNANCE SUPPLIES & EQUIPMENT
ENACTED DEFENSE PROGRAM*, CONTRACT AWARDS & CASH DISBURSEMENTS
JULY 1940-JULY 1941



*United States and British Programs

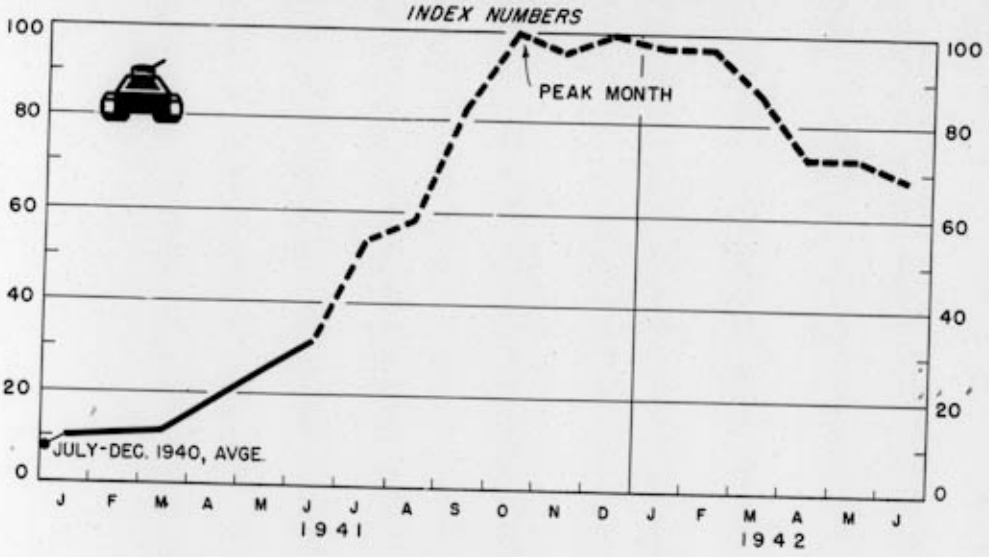
ORDNANCE

The total ordnance program, including Naval ordnance and combat vehicles, amounts to over $8 billion, of which $5 billion is for Army-type ordnance, the remainder for the purchase of Naval ordnance. At the present time approximately $3 billion of the $5 billion available for the purchase of Army-type ordnance has been placed under contract, as shown in Chart 10. A good portion of the remaining unobligated balance of about $2 billion is for the purchase of ammunition and for items for Defense Aid.

COMBAT VEHICLES

At the start of the defense effort the United States had almost no facilities for the production of combat vehicles. It was a fairly easy problem, however, to shift automobile and truck manufacturers to producing scout cars in quantity. With this production and a limited production of light tanks the United States was producing combat vehicles at about 8 percent of the scheduled peak rate for October 1941, as shown in Chart 11. New facilities were constructed and the

CHART II - COMBAT VEHICLES
MONTHLY PRODUCTION RATE



tempo of production increased rapidly. Medium tanks and personnel carriers are beginning to be turned out in considerable numbers although no heavy tanks have yet been completed. At the end of one full year, by June 1941, production was moving at 34 percent of the peak rate indicated by delivery schedules on existing orders which is expected to be reached in four to six months.

At the end of the first six months of effort, December 1940, we had produced less than 3 percent of the total production requirements

for combat vehicles indicated by existing programs. This index has now increased to between 9 and 10 percent of the combined United States and export requirements. Existing schedules given in Chart 12 show that early in 1942 well over half of present requirements will have been produced. In considering progress to date in the production of combat vehicles it should be recognized that the original designs for American tanks had to be modified in the light of experience in Europe. In addition, production of tanks has been retarded by the assignment of lower priority ratings than have been given to airplanes and ships.

CHART 12 - COMBAT VEHICLES TOTAL PRODUCTION

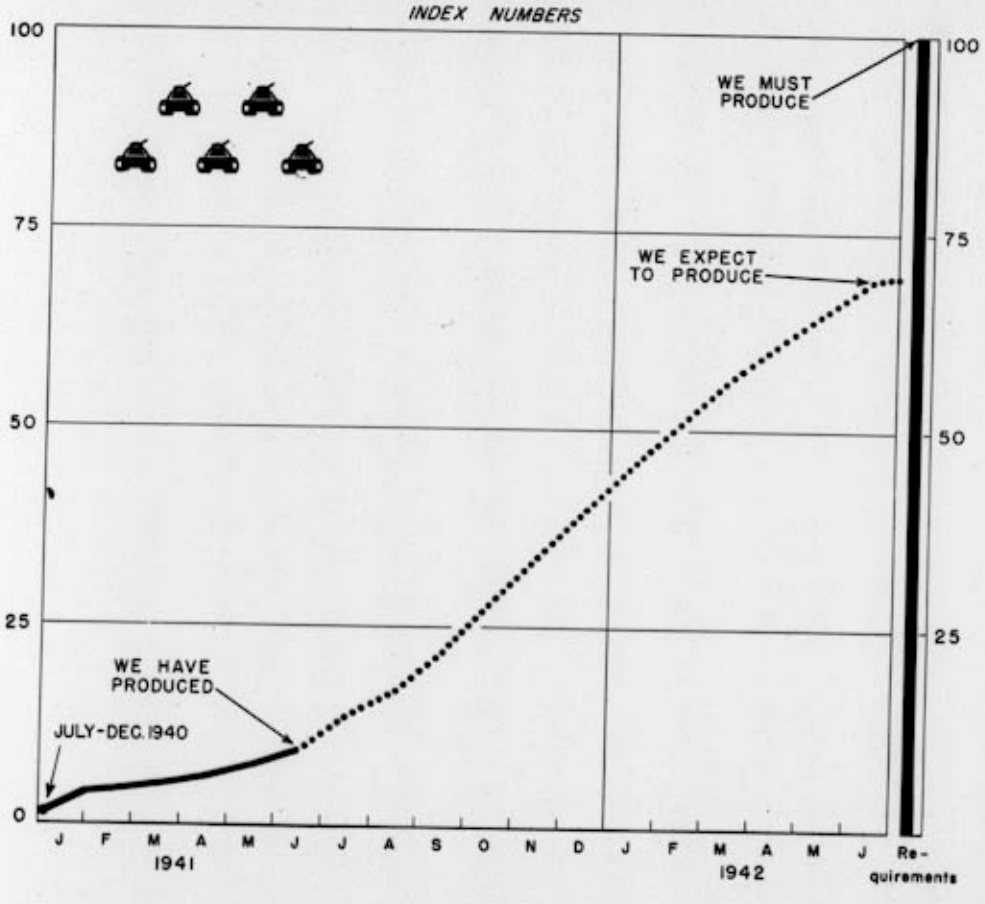
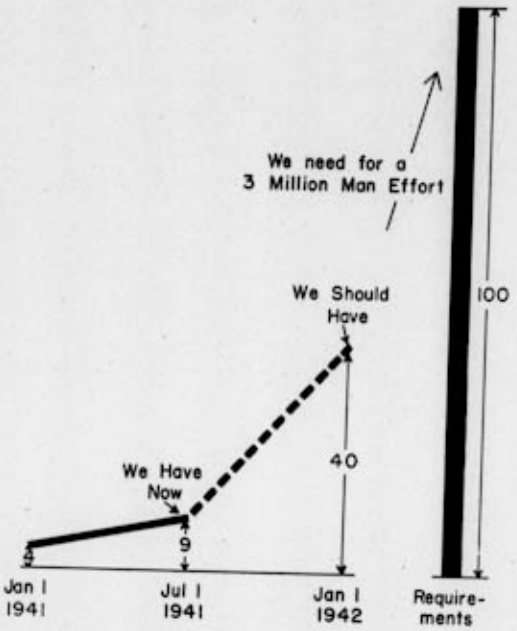


CHART 13- COMBAT VEHICLES
U. S. INVENTORY INDEX



As a result of the moderate extent of production to date the United States possesses less than 10 percent of the tactical requirements for these vehicles for a three-million-man effort.[a] However, now that the ground work has been laid, production should be rapid and within another six months it is indicated that inventories will be about 40 percent of these tactical requirements.

GUNS

Army-Type Guns

Chart 14 portrays the rate at which monthly production of Army-type guns has increased since the start of the program. During the first six months, production proceeded at a rate of 16 percent of the scheduled peak as indicated by schedules on existing orders, but it has increased rapidly so that by June 1941 we had gone above 38 percent of the peak rate. If present schedules are met, the peak rate will be reached in November 1941.

As shown in Chart 15, total production of guns for the United States forces and for the British and other anti-Axis powers amounted at the end of June 1941 to 16 percent of requirements under existing programs. This is three times as great as it was at the end of December. Another half-year must elapse before half of these requirements will be produced.

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[a] In the materiel requirements for a three-million-man effort, maintenance is included for a period which varies from one to twelve months, depending upon the type of equipment.

CHART 14-ARMY TYPE GUNS MONTHLY PRODUCTION RATE

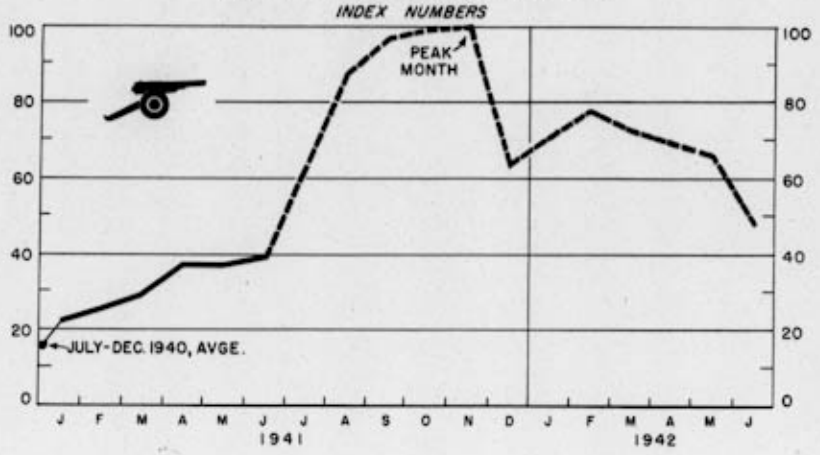


CHART 15 - ARMY TYPE GUNS TOTAL PRODUCTION

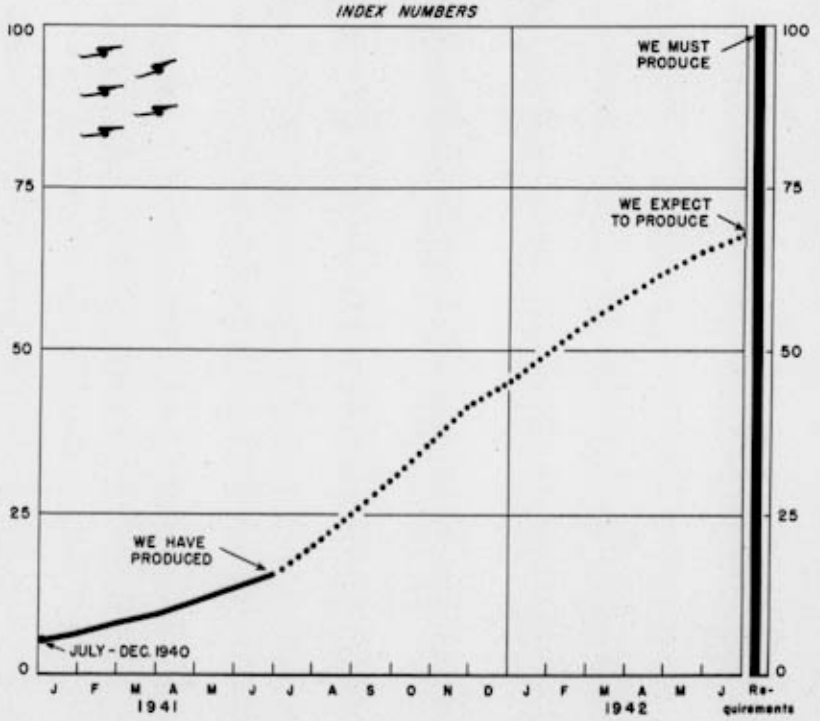
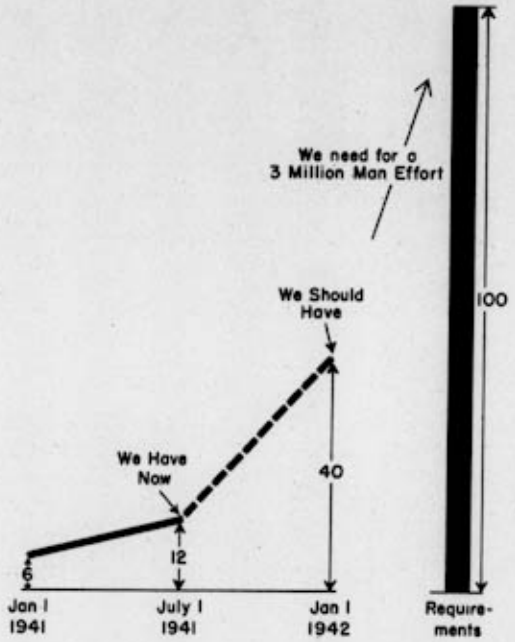


CHART 16 - ARMY TYPE GUNS
U. S. INVENTORY INDEX

A large share of the recent production has been exported and as a result American inventories have only increased during the past six months from 6 percent of the tactical requirements to 12 percent. Chart 16 indicates past and scheduled increases in the inventory of Army-type guns.



Field Artillery

The monthly rate of production of field artillery is scheduled to reach a peak in February 1942. At the present time production is about 15 percent of this peak rate but marked increases are scheduled to occur during the next few months. Most of these increases should occur in the production of the 105 mm howitzer, the new standard light field artillery weapon, and the new 155 mm gun. June production, however, does represent a marked increase over production during prior months, inasmuch as the average rate of production from July to December 1940 was only 4 percent of the peak rate.

As can be seen in Chart 18, total accumulated production of these guns to the present time is only about 6 percent of requirements facing United States manufacturers. Increases, however, are expected to be much more rapid in the future and before the middle of 1942 over half of production requirements should have been met.

CHART 17-FIELD ARTILLERY MONTHLY PRODUCTION RATE

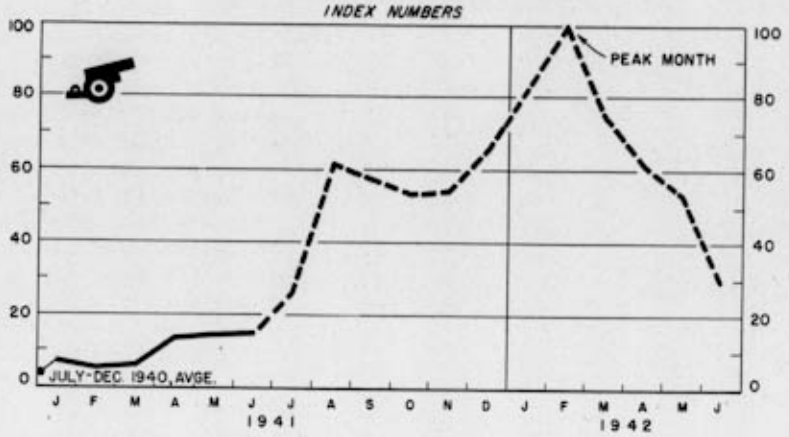
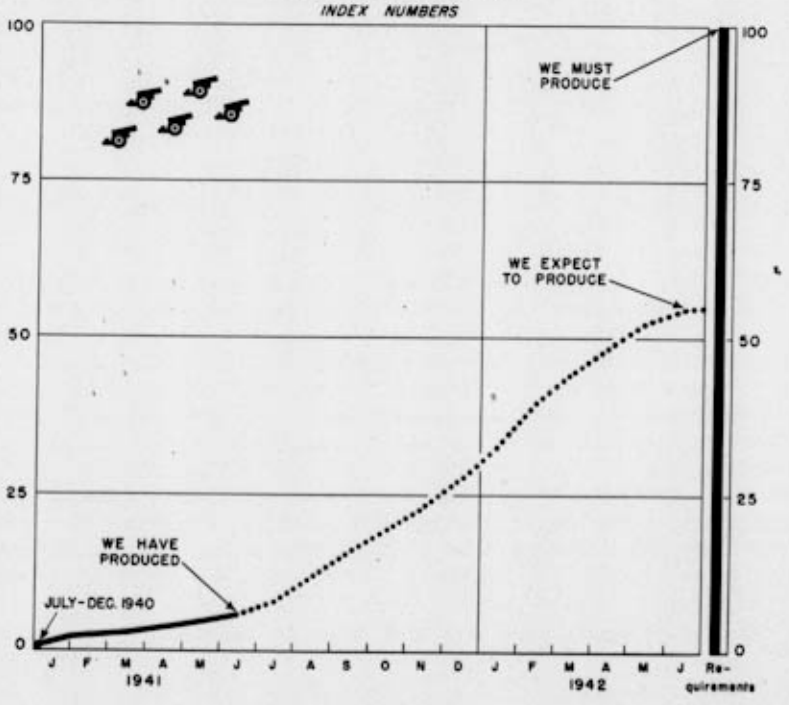
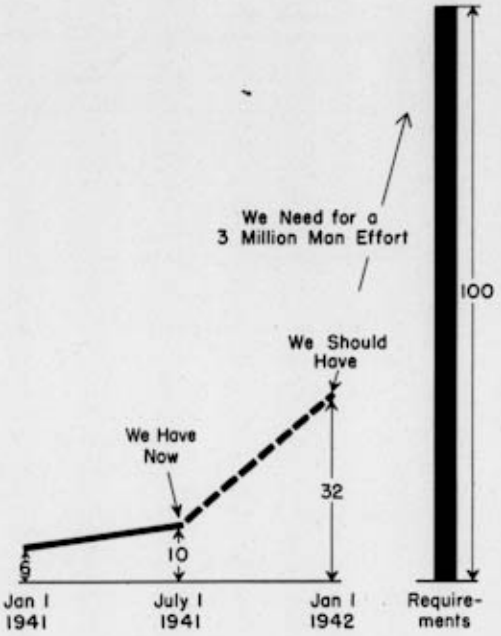


CHART 18 - FIELD ARTILLERY TOTAL PRODUCTION



At the end of the first six months of the defense effort the United States had produced little new artillery but had modernized enough of its World War I equipment to meet 6 percent of the tactical requirements of a three-million-man Army. Although further modernization has been performed during the past six months and although production of new weapons has begun, we still have only about 10 percent of the field artillery necessary for a three-million-man Army. Even six months from now we will have less than one-third of our tactical requirements. After that time production should be accelerated and, as shown in Chart 19, inventories will be rapidly expanded.

CHART 19 - FIELD ARTILLERY
U.S. INVENTORY INDEX



Antiaircraft Weapons

The development of fast, high-altitude airplanes and of armor plate for airplanes has made it necessary to develop new high-powered antiaircraft weapons with greater range and shell-burst area. The problems of producing mounts and fire control equipment for these new weapons have been difficult. Even at the end of a full year's effort we were producing antiaircraft guns at less than 40 percent of the peak rate scheduled to be reached a year from now. Most of the production to date has been of 37 mm. guns and .50 caliber machine guns for use against low flying aircraft, and of the 3" guns which are now "limited standard." Large scale production of the new 90 mm. gun which will be used as a standard weapon has just begun.

Chart 21 shows that we have produced only about 10 percent of the

CHART 20-ANTI-AIRCRAFT MONTHLY PRODUCTION RATE

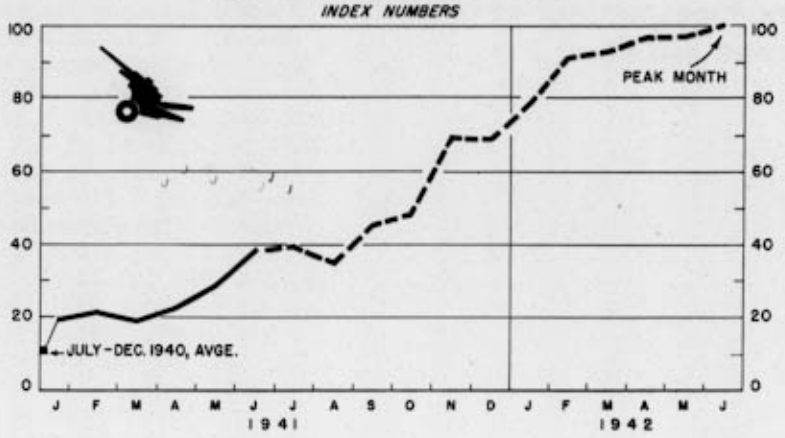
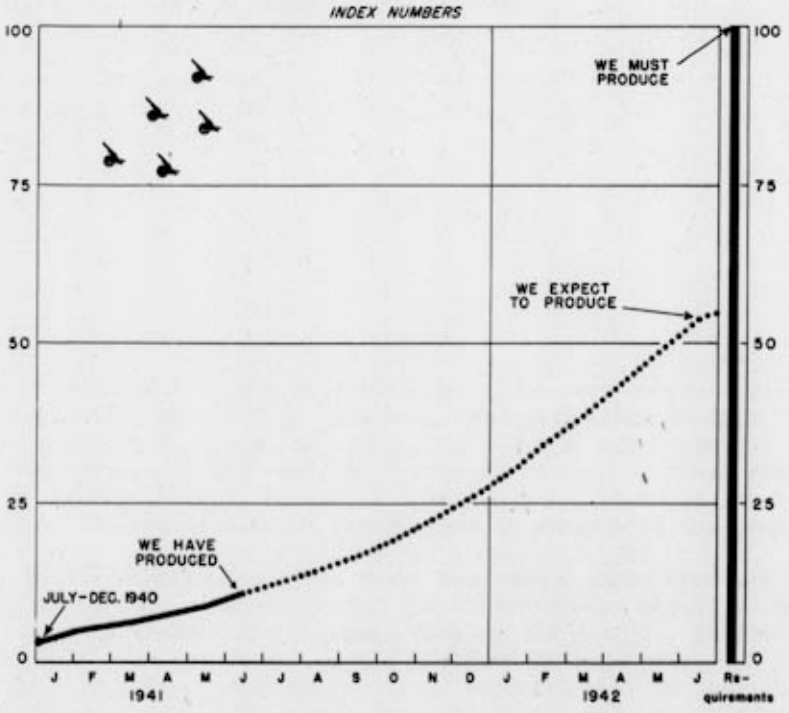
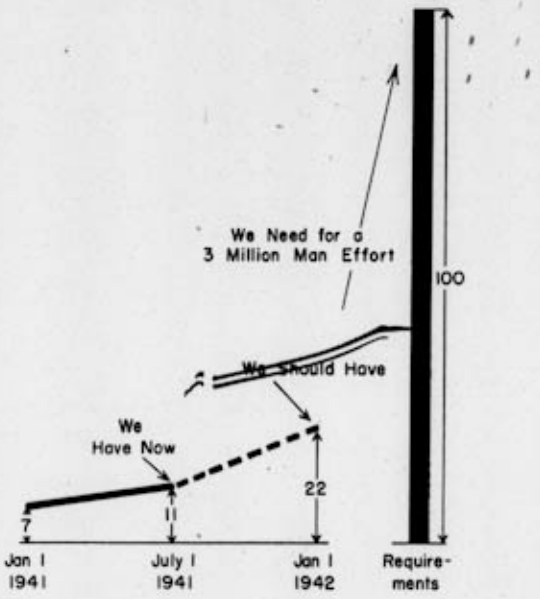


CHART 21 - ANTI-AIRCRAFT TOTAL PRODUCTION



antiaircraft guns which are now scheduled to be produced in this country. The rate of production should increase substantially during the next six months and it is expected that by January 1, 1942, one-fourth of the production program will have been completed. Inventories of antiaircraft guns, shown in Chart 22, have followed roughly the same pattern as total production since only a small part of production has been exported. The United States possessed enough antiaircraft weapons on January 1, 1941 to satisfy 7 percent of its tactical requirements. This increased to 11 percent by the first of July and should double to 22 percent by January 1, 1942. Six months from now we will still have less than one-fourth of our stated requirements for antiaircraft guns.

CHART 22-ANTI-AIRCRAFT WEAPONS
U. S. INVENTORY INDEX



Infantry-Supporting and Infantry Weapons

Production of infantry-supporting guns has been substantial due to their relative simplicity. The most important items in this category are Garand rifles, machine guns, mortars, and 37 mm guns for use in and against combat vehicles. Peak production of these weapons should be reached before the end of this year, and even now, as shown in Chart 23, we are working at better than 40 percent of the peak rate.

As can be seen in Chart 24, there has been a sharp increase in production over the past six months and this increase should continue at an even more rapid pace for the next five or six months. At the end of June 1941, over 22 percent of the combined United States and export requirements had been produced and it is expected that 50 percent of these requirements will have been produced by the fall of this year.

CHART 23 - INFANTRY - SUPPORTING WEAPONS MONTHLY PRODUCTION RATE

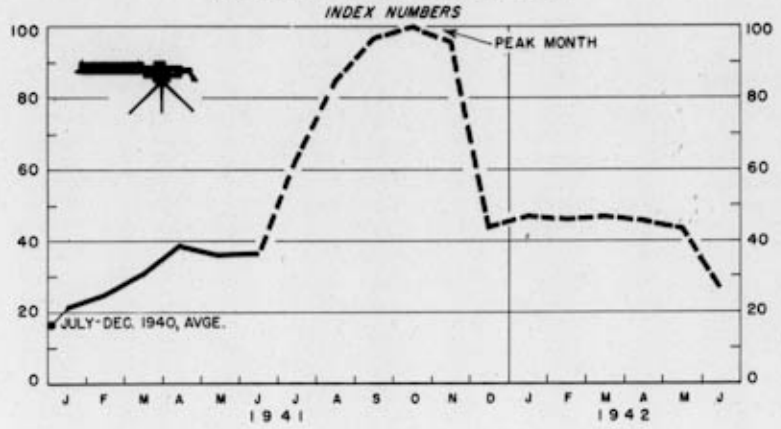


CHART 24 - INFANTRY-SUPPORTING WEAPONS TOTAL PRODUCTION

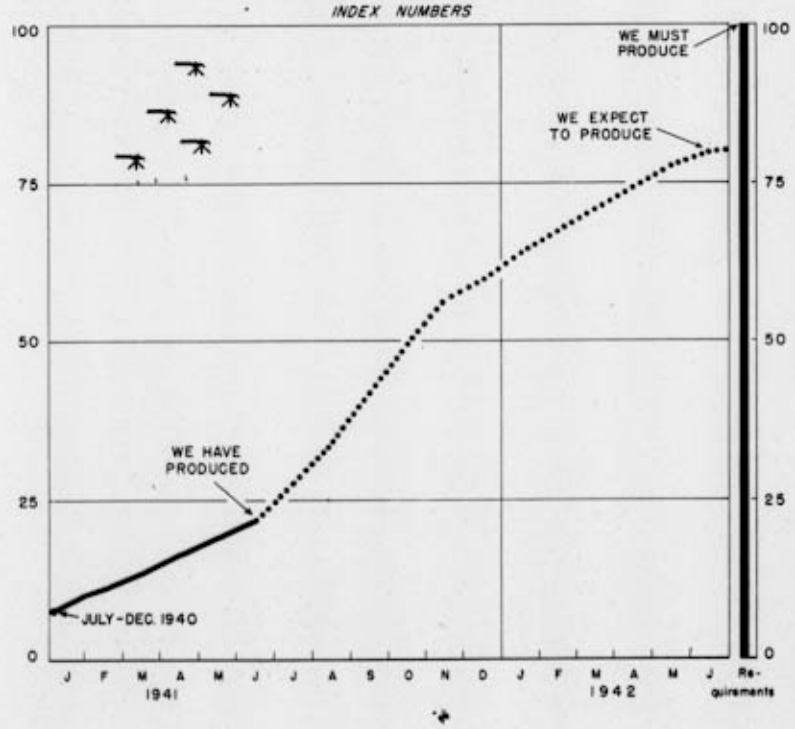
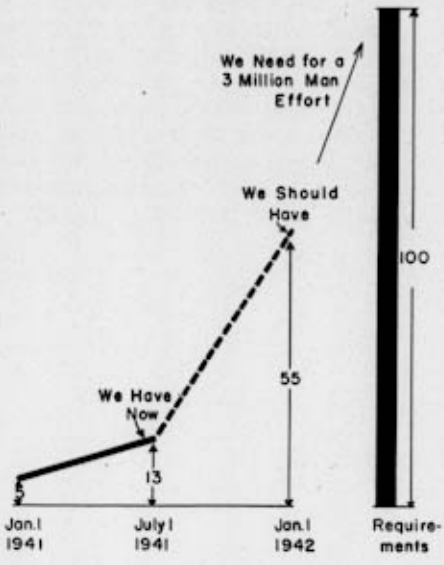


Chart 25 shows the rate at which United States inventories of these weapons have increased. For the six-month period, January 1 to July 1, 1941, inventories nearly trebled, rising from 5 percent to 13 percent of those required by a three-million-man Army and the Navy and Marine Corps. Within another six months they are scheduled to increase to 55 percent of our needs. The Army also has about a million Springfield rifles which are now being used for training purposes pending production of an adequate number of Garand rifles. Our stocks of infantry-supporting weapons have not increased as rapidly as our production would indicate, because a high proportion of our production of submachine guns and machine guns has been exported.

CHART 25-INFANTRY SUPPORTING WEAPONS
U.S. INVENTORY INDEX



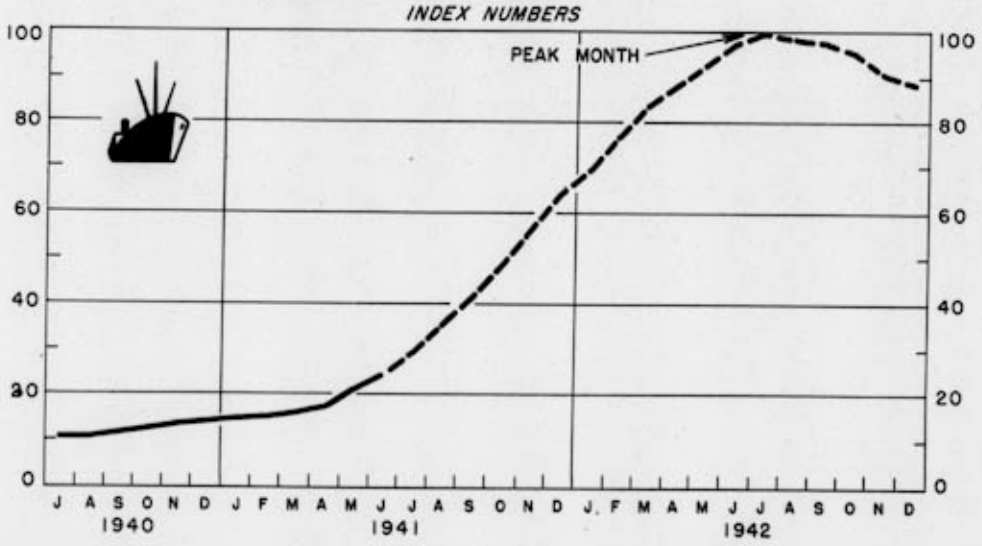
MERCHANT SHIPS

The merchant ship construction program facing United States yards calls for the building of approximately 1,350 ocean-going vessels, aggregating about 10 million tons. Almost 800 of these ships are to be of the emergency or "ugly duckling" type, the remainder being standard types. These figures include the 541 vessels for which the President has recently requested Congressional authorization.

During the first year of the defense effort, 620 thousand tons or about 6 percent of the vessels included in this program were delivered. Enough work was done on ships not yet delivered to raise the total amount of work done to 8 percent of the total program. The rate of delivery will advance during the remainder of this year, but the great bulk of the tonnage is scheduled to be constructed in 1942 and 1943.

The monthly construction rate index for merchant ships is presented in Chart 26. The index measures work done each month in relation to the peak month as 100. As can be seen in the chart, the monthly construction rate increased from 10 in July 1940 to 24 [a] in June 1941. The main factor in this rise in the monthly rate has been the large increase in the number of shipways available for constructing ocean-going tonnage. However, it will be another year before all the planned new shipways are constructed and before the peak rate can be reached. When the peak is reached, the construction rate should be equivalent to more than 450 thousand gross tons per month. Since the indexes of merchant ship construction are based upon work done rather than upon deliveries of completed vessels, the construction and delivery rate peaks do not coincide. Peak deliveries of more than two ships a day will not be reached until the first quarter

CHART 26-MERCHANT SHIPS
MONTHLY PRODUCTION RATE

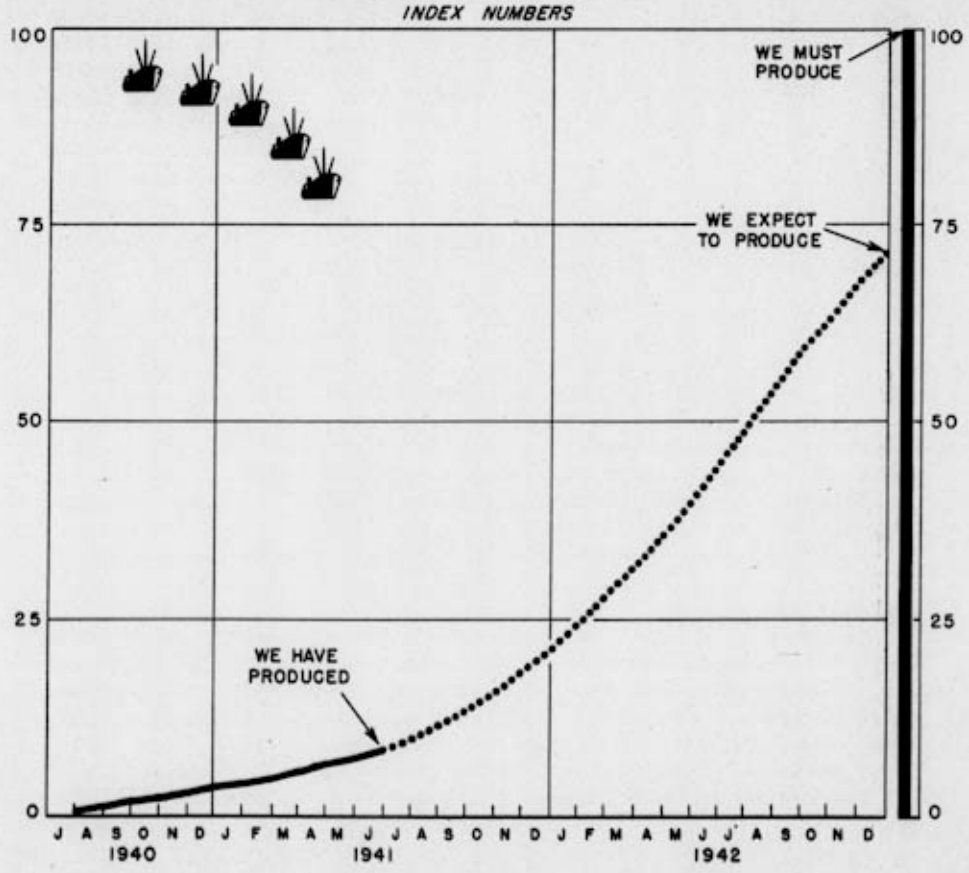


[a] These indexes of merchant ship construction are preliminary and are currently being revised. It is possible that the production rate index for the past few months exaggerates the improvement in actual production since the start of the program. However, the further improvement reflected in the future production rate index schedule is probably correct, according to present shipyard estimates.

of 1943. Scheduled work for July 1941 should raise the construction rate index to 29, approximately three times as high as it was a year ago.

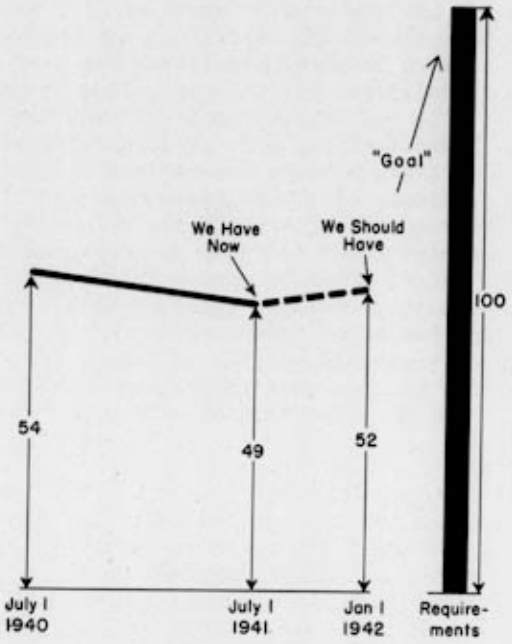
In Chart 27 there is presented an index measuring the total accumulated work done in constructing ocean-going merchant ships in the United States since July 1940. At the end of the first six months (December 1940) only 3 percent of the work required to build the projected 10 million tons of ships had been finished. By the end of June, this had increased to 8, and by next October should be 16.

CHART 27 - MERCHANT SHIPS
TOTAL PRODUCTION



If no transfers or sales are made of either the existing American merchant fleet or the tonnage scheduled to be constructed in the next two years, the United States merchant marine should amount to about 14 million tons by the end of 1943 or the middle of 1944. Chart 28 shows the relationship between tonnage on hand in the past and this goal. It should be kept in mind, however, that there are strong possibilities that a large share of existing and proposed tonnage will be sold or transferred to foreign registry and consequently the American registered tonnage is unlikely to reach the scheduled goal.

CHART 28 - MERCHANT SHIPS
U. S. INVENTORY INDEX



On July 1, 1940 it was estimated that the United States registered merchant marine consisted of 1,300 ships representing 7.6 million tons of ocean-going shipping. Vessels were sold or registry transferred to Great Britain, Panama, and other countries in order that they might be able to enter belligerent waters. Therefore, despite deliveries during the year, the American fleet had dropped to 1,179 ships representing 6.9 million tons on July 1, 1941.

Since the speed at which American yards can turn out ocean-going cargo vessels is one of the decisive factors in determining the final outcome of the present war, it should be noted that peak American construction of 450 thousand gross tons scheduled for July 1942 is slightly higher than British, allied, and neutral shipping losses which have averaged 425 thousand gross tons per month during the first half of 1941. Plans are currently being developed to speed up American production, and the peak rate may be reached prior to the date indicated by present schedules.

POSTS, DEPOTS, AND FORTIFICATIONS

As the Army and Navy expanded both in terms of manpower and equipment, it was necessary to expand the facilities for housing and training personnel. There have been made available funds of over $3.6 billion for the construction of posts, depots, and fortifications. The major share of this was used for the construction of barracks and hospitals for quartering the Army. The original cantonment program was planned to provide shelter and other facilities for an Army of 1.4 million men. This work moved at a rate considerably slower than the original schedules established by the Quartermaster Corps, and the final cost was twice as great as the original estimate. It is now virtually completed at a cost of about $1.5 billion. Further increases in quarters are being handled by relatively small periodic allocations to the Quartermaster Corps and the scale of the additional program will depend on further decisions which may be reached concerning the number of men in the Army and the time period over which any increases in the active duty strength of the Army may be scheduled.

In addition to the $1.5 billion cantonment program of the Quartermaster Corps other appropriations were made to provide housing for the families of enlisted men. Total allocations for these dwellings were 27,650 family dwelling units at the end of June 1941 when 24 thousand units had been placed under construction and 8,241 units had been completed. A small $12 million program for the construction of storage facilities and maintenance depots has been two-thirds completed at the end of the year.

Finally, the Quartermaster Corps has received about $67 million for construction of bases outside the limits of continental United States. This program is now about half finished and the remainder is scheduled to be completed at a rate of 15 percent during each of the next two quarters and 10 percent during the first two quarters of calendar year 1942.

In addition to the Army program for posts, depots, and cantonments, the Navy has a similar program totaling about $326 million. This program was half completed at the end of May 1941. The remainder of the program is scheduled to be completed by October 1942. It should be 85 percent complete by January 1942. The Navy also has a $260 million program for construction of bases outside continental United States which should be completed by January 1942. At the present time this program is about 60 percent complete.

The vast United States aviation program has necessitated a program for expansion of airports, particularly military airports. The total program for military airport construction amounts to $685 mil-

lion of which $467 million is for the construction and improvement of Army airports and $218 million for Navy airports. On July 1, 1941, this program was about 40 percent complete and by January 1, 1942, should be 90 percent complete. Completions to date have meant an increase in the number of airports from 78 on July 1, 1940, to 99 at the present time, plus improvements and better runways in all of the airports.

In addition to the strictly military program, the airport facilities of the country have been increased and improved through the Civil Aeronautics Administration and the Work Projects Administration programs. During the period July 1, 1940 to June 1, 1941, the number of class 2, 3, and 4 airports rose from 472 to 694 and the program contemplated for the next 12 months will increase this number to 962, class 4 airports being the best equipped. The classification of airports is based primarily on length of runways. The accompanying table shows the breakdown by class of airport and indicates the great improvement in the quality of existing airports which has been accomplished.

Number of Nonmilitary Airports

		Class			
	Total	1	2	3	4
Existing July 1, 1940	2,221	1,749	396	57	19
Existing June 1, 1941	2,250	1,556	531	118	45
Estimated June 1, 1942	2,386	1,424	438	407	117

The Civil Aeronautics Administration program for fiscal year 1941 was $31 million, of which $1,600 thousand had been expended by June 1; and the Work Projects Administration program represented $70 million of Federal funds. The program for fiscal year 1942 is for an additional $63 million for the C.A.A. and $134 million for the W.P.A.

In addition to the air bases in continental United States, work has been carried forward on 7 air stations for the Army outside continental United States and 25 air bases for the Navy. The list of bases is:

Army Air Stations

Ladd Field, Alaska
Elmendorf Field, Alaska
Wheeler Field, Hawaii
Hickam Field, Hawaii
Borinquen Field, Puerto Rico
Losey Field, Puerto Rico
St. Croix, V.I.

Naval Air Stations

Charlotte Amalie, V.I.	Guam
St. Thomas, V.I.	Kodiak, Alaska
Coco Solo, Canal Zone	Sitka, Alaska
Balboa, Canal Zone	Alaska, Alaska
Gatun, Canal Zone	*Antigua, B. West Indies
Guantanamo, Cuba	*Argentia, Newfoundland
San Juan, Puerto Rico	*Bermuda
Kaneohe Bay, Hawaii	*British Guiana
Pearl Harbor, Hawaii	*Jamaica
Oahu, Hawaii	*St. Lucia
Midway Island	*Trinidad
Tutuila, Samoa	*Bahamas
Wake Island	

*British bases secured in destroyer transfer.

Total funds allocated for the Air Corps program outside continental United States are $70 million and as of June 1, 1941, $30 million worth of work had been completed. The remainder is scheduled at a rate to bring the program to virtual completion by July 1942. The Navy program is $165 million. Approximately half of this had been completed by June 1, 1941, and the program should be 90 percent complete by January 1942. Of the Navy program for bases abroad, plans for the 8 naval air stations on the British Islands arranged through the trade for the 50 over-age destroyers, involve approximately $50 million.

Chapter 3

PRODUCTION AND PROCUREMENT PROBLEMS

The M-Day plans, which had been in preparation by the Army and Navy Munitions Board for a long period of time, made it possible for the program to get under way more rapidly than it could have done otherwise. When the program started last May, however, it proved to involve a large number of problems not adequately covered by the planning that had been done.

The M-Day plans of the Army and Navy Munitions Board never contemplated a situation in which the transition from peace to war would be gradual, involving an extended period of limited emergency, a situation in which the size of the program would be continually mounting, or a situation in which Defense Aid requirements, as well as our own military requirements, would need to be taken into account.

Because of the continual changes in technology much of the detailed economic planning for a defense emergency could not be done until the emergency was upon us. For many items of materiel, pilot models had still to be developed, tested, and adopted after May 1940. The planning of production, the tooling up, and the development of a producing organization had to wait upon adoption of these pilot models.

In addition to the problems of planning there were the large-scale problems of administration. Some indication of the magnitude of the administrative problem may be obtained from the increase in civilian personnel. The civilian employment of Government agencies concerned with defense has grown rapidly during the past year to take care of the administration and planning of the program. In July 1940 the total civilian employment of the War and Navy Departments (exclusive of the employees in arsenals, shipyards, manufacturing depots, and construction work) was 112,500. It has more than doubled and in April 1940 was 232,000. There were also 2,868 employees in the Office for Emergency Management. No total figure is available for the number employed in defense work in other Government agencies.

Large scale procurement of materiel did not start until early in September 1940. The attempt to make defense production an addition to the regular production for consumer demands delayed American producers in getting under way at a satisfactory pace. In spite of the fact that our economy as a whole was not operating at full capacity last summer, it was necessary, particularly in the production of aircraft, ships, and ordnance, to provide extensive new productive capacity.

The production of new facilities and the shift from one type of production to another was not speeded up as rapidly as now seems desirable, partly because defense contracts were not placed in sufficient quantities to provide business men with a motive drastically to revise their production plans and to extend defense production capacities.

Moreover, it was difficult for many to see how the defense program would touch every phase of the productive activity of our economy since the indirect impacts were not felt immediately, and that it would involve an unprecedented increase in employment and would place demands upon the supplies of most of our basic raw materials and upon our power and transportation facilities which they were not prepared to meet.

Some of the problems which have developed in connection with the defense program are discussed in the following sections.

DEFENSE INDUSTRIAL FACILITIES

Program

Roughly $7 billion was made available for plant expansion from the beginning of the defense program to June 1941. The Federal Government made available approximately $5.8 billion through appropriations and the operations of the RFC; and the British government has provided $149 million of capital assistance for new industrial facilities in connection with its purchases of war materials in this country. In addition to these public funds, almost $1 billion was made available through privately financed industrial facilities as indicated by approved and pending certificates of necessity under the five-year amortization plan.

About $3 billion of these funds have been definitely committed, either by financing or by construction contracts, with an almost equal amount still to be obligated. The Federal agencies engaged in financing defense industrial facilities had made definite commitments for 428 plants and plant expansions involving $2.6 billion. This total does not include such capital expansion as may have been part of the price of procurement under supply contracts. The obligated funds are shown below by financing agency.

PUBLICLY FINANCED INDUSTRIAL FACILITY PROGRAM
As of June 30, 1941

Financing Agency	(Million Dollars)
Total United States under Contract	2,572.9
War Department	950.5
Navy Department	774.0
Defense Plant Corp.	720.5
Reconstruction Finance Corp.	46.2
Maritime Commission	81.7
British	148.5

Facilities financed from public funds have been primarily for the production of finished war equipment and parts going directly into such equipment. There is now a trend towards Federal financing of earlier stages of production as the need for more materials is accentuated and private capital does not consider the expansion commercially sound. Our output of military equipment, except for ships, is almost completely dependent on the completion of these industrial facilities. For shipbuilding and aircraft assembly and aircraft parts, relatively extensive facilities existed for peacetime needs but these facilities were wholly inadequate for our present requirements.

The privately financed facilities under Certificates of Necessity providing for five-year amortization are also facilities essential to the defense program but to a much larger degree represent earlier stages of production.

By July 1, 1941 there had been received about 3,400 applications for certificates of necessity. The approved certificates for privately financed facilities number 1,603 with an estimated cost of $829 million. [a]

In addition to the approved applications, there were 1,359 applications upon which action was pending, most of which were for privately financed facilities. At least some and probably a large part of these pending applications represent facilities already under construction. The distribution of the value of defense industrial facilities by object to be produced and source of funds through June 30, 1941 is shown below.

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[a] Exclusive of facilities financed by RFC loans and facilities for pilot and mechanic training.

TABLE 6 - DISTRIBUTION OF VALUE OF DEFENSE INDUSTRIAL FACILITIES BY TYPE OF FACILITY AND SOURCE OF FUNDS THROUGH JUNE 30, 1941

(Amounts in Million Dollars)

	Source of Funds					
	Total		Public [a]		Private [b]	
	Amount	Percent	Amount	Percent of Total	Amount	Percent of Total
Total	3,550.2	100.0	2,721.4	76.7	828.8	23.3
Chemicals	450.6	12.7	396.3	11.2	54.3	1.5
Products of Petroleum & Coal	29.8	0.8	13.4	0.4	16.4	0.4
Iron and Steel Products	296.4	8.4	142.4	4.0	154.0	4.4
Ammunition, Shells, and Bombs	437.7	12.3	399.3	11.2	38.4	1.1
Guns	244.8	6.9	221.8	6.2	23.0	0.7
Aircraft	746.7	21.0	649.9	18.3	96.8	2.7
Ships & Ship Repair	519.5	14.6	506.6	14.3	12.9	0.3
Vehicles & Tanks	43.6	1.2	23.9	0.7	19.7	0.5
Nonferrous Metals	209.7	5.9	58.4	1.6	151.3	4.3
Machinery (except electrical)	188.0	5.3	80.8	2.3	107.2	3.0
Electrical Equipment	37.5	1.1	20.4	0.6	17.1	0.5
Miscellaneous Manufacturing	85.6	2.4	59.7	1.7	25.9	0.7
Nonmanufacturing	111.8	3.2	-	-	111.8	3.2
British-financed Facilities [c]	148.5	4.2	148.5	4.2	-	-

[a] Includes facilities estimated to cost more than $25 thousand and financed through direct obligations (Government and E.P.F. contracts) of the War and Navy Departments, Maritime Commission, and Defense Plant Corporation and Reconstruction Finance Corporation Loans.

[b] As reflected by Certificates of Necessity approved exclusive of facilities financed by R.F.C. loans ($30.0 million) and exclusive of privately financed pilot training facilities ($3.7 million).

[c] Breakdown by type of product not available.

The inter-relations between the production of finished products, the equipment and supply of basic materials necessary for such production, are complex. Until all the allocations are made for the facilities needed for end products and the production schedules are set for the amounts of end products needed, it is difficult to measure the size of the facilities problem. A subsequent section dealing with machine tools indicates something of the size of the problem faced by that industry, in attempting to produce the tools needed for facilities already ordered. Until the remainder of the Federally financed facilities are completed and contract schedules for their products are established, there will be difficulty in making specific arrangements for the needed machine tools, and additional capacity for parts and for the materials required.

Construction

Approximately one-fourth of the industrial facilities which had been put under contract under the defense program by May 1, 1941, were ready for initial operation by June. It is estimated that an additional half will be ready for initial operation during the next six months. For publicly financed facilities alone, about one-seventh were ready for initial operation by the end of the year with an additional two-thirds estimated to be ready for initial operation during the next six months. But these figures are misleading by themselves, since the values represent facilities working at full capacity but the dates show only that some operations in the plants were ready to start at that time.

An indication of the progress being made in the construction of facilities is available in the cash disbursements. The table below shows that cash disbursements for all Federally financed facilities equal 30 percent of the total under contract as of the end of June.

FEDERALLY FINANCED INDUSTRIAL FACILITIES

	Jan. 31	June 30
	(Million Dollars)	
Program	2,161	5,880
Contracts	1,513	2,767
Cash Disbursements	269	831

The production schedules of materiel shown in the preceding section of this report are based on the facilities already under contract, except for the airplanes which include the heavy bomber program. Scheduled increases for production of materiel, as shown by the indexes presented in the section on military equipment, will result primarily from the completion of these facilities.

Location.

At the beginning of the program, supply contracts were of necessity granted to established producers. A geographic distribution of supply contracts awarded, therefore, was at first entirely dependent upon the location of existing manufacturing establishments.

The accompanying maps of the location of new defense industrial facilities as of April 30, 1941, show that these new facilities have largely followed our previous industrial concentration. Factors affecting this concentration were skilled labor, transportation, water and power supply, and social service. This additional concentration of defense industries in already crowded areas, many of which are in vulnerable locations, has created serious problems even for the largest cities. Thus, defense facilities in the Baltimore area will create as many new jobs in industry in a period of two years as were created in the same area by boom industrial growth in the eight-year period 1921-1929. Locations have been chosen after balancing military and economic considerations with the tempering factor, the need for early production.

Equipment

Machinery, including machine tools and material-handling equipment, must be available as soon as construction on new facilities is sufficiently advanced to permit installation. To meet these requirements, an unprecedented production load has been placed on the machinery industry and especially the machine tool industry.

Machine tool deliveries in June 1940 were $31.7 million and in June 1941, $69.1 million, an increase of 118 percent. Deliveries for the year 1939 were $220 million and for the year 1940, they were $423 million. They are estimated to reach $800 million for the year 1941 and $1,000 million in 1942. To meet these estimates, the industry will require an average monthly output of $70.3 million for the last 6 months of 1941, and $83.3 million per month throughout 1942. The physical quantities involved will be less than these dollar estimates indicate as the price index of machine tools has shown a rising tendency. Since August 1939, the price index of machine tools has risen 18 percent, and since July 1940, it has risen 8 percent. The estimated monthly shipments are shown in the following chart.

In spite of the rapid expansion of the machine tool industry during the last twelve months, there is doubt whether this industry can meet the requirements of the defense program with the necessary speed.

CHART 29-DEFENSE INDUSTRIAL FACILITY EXPANSION BY INDUSTRIAL AREAS

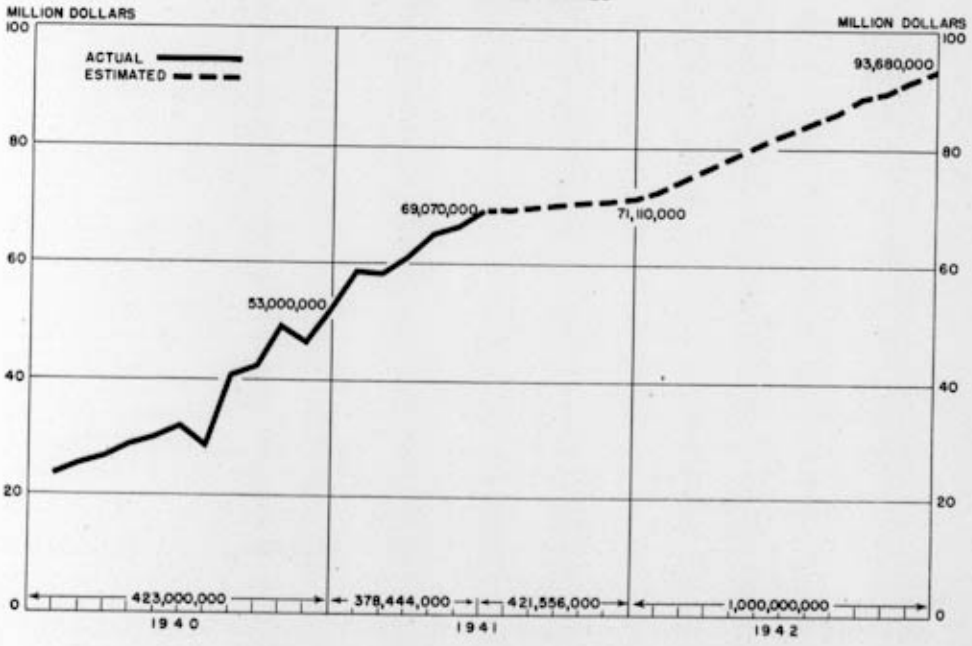
AS OF APRIL 30, 1941

Unfilled orders for machine tools as of June 30, 1941, were $529 million, approximately equal to the estimated capacity of the industry for seven and one-half months , enough to keep the industry busy until the middle of February, 1942. In addition to these defense requirements contracted for, the new facilities for the bomber program will require $300 million worth of machine tools, and other planned defense facilities an estimated additional $480 million tool investment, or a total of $780 million of additional machine tools required but not yet on order as of June 30, 1941.

If machine tool shipments meet present OPM estimates of shipments for the balance of 1941 and the year 1942, totaling $1,422 million, facility requirements now in sight cannot be met before December 1942. This assumes an even distribution of the production load in the machine tool industry, but facility requirements are much greater, in proportion to capacity, for some types of machine tools than for others. That is, it may take much longer than the average of 17 months to meet requirements for such critical machines as thread millers, gear-grinding machines, horizontal boring mills and jig borers as the following table shows.

MACHINE TOOL SHIPMENTS

ACTUAL AND ESTIMATED



The situation may be somewhat better than the above considerations would indicate if the fullest possible use is made of the so-called "captive plants."

An important contributing factor to the machine tool problem is the shortage of supply of skilled workers. Since this industry must work to very close tolerances, its requirements for skill and training are more exacting than in most industries using machine

TABLE 7 - CRITICAL MACHINE-TOOL REQUIREMENTS

	Deliveries June 1941	Estimated Average Monthly Deliveries 1941 [a]	Estimated Total Deliveries 1941 [a]	Total Unfilled Orders and Bomber Requirements [b]
	(Number of Units)			
Horizontal Boring Machines	75	109	1,306	1,683
Jig Boring Machines	64	109	1,309	1,516
Vertical Boring Machines	89	112	1,349	1,854
Deep Hole Drilling Machines	99	85	1,021	576
Radial Drills	264	252	3,027	3,111
Hobbing Machines	82	108	1,298	1,238
Gear Grinding Machines	36	52	629	1,352
Internal Grinding Machines	198	222	2,664	3,609
Thread Grinding Machines	77	86	1,028	886
Engine and Toolroom Lathes	618	702	8,425	9,232
Turret Lathes	845	1,072	12,863	12,832
Multi-Spindle Auto Bar Machines	259	268	3,217	3,651
Milling Machines	2,191	2,138	25,655	20,061
Thread Millers	85	68	815	1,218
Profiling	116	132	1,586	1,681

[a] Manufacturers' estimate.

[b] Does not include provision for $480 million worth of tools estimated for additional defense facilities (other than bombers) for which no breakdown is available.

tools. The tremendous expansion within the industry, plus the ever increasing competition for skilled machinists with other defense industries, has created a labor shortage. This has been a restraining influence on facility expansion.

Total employment in the machine tool plants increased about 60 percent from December 1939 to the first of May 1941. Man hours more than doubled during the same period, reaching a peak of 4.5 million weekly on May 1, 1941. This increase has been brought about by increased working hours and by increasing the use of second and third shifts. Employment in second and third shifts, however, is still a small part of total employment. Employees on the first shift were 73 percent of the total, those on the second were 22 percent, and the third only 5 percent of the total on May 1, 1941. The extensive training programs being undertaken by machine tool companies may help to correct this situation. Employment in the industry on May 1, 1941, was 87 thousand and is expected to increase to 100 thousand by the end of 1941. On May 1, 1941, these companies had 12,800 trainees which accounts for 14 percent of total employment in the industry.

The following table summarizes some significant labor facts:

TABLE 8 - EMPLOYMENT IN THE MACHINE TOOL INDUSTRY

Employees	
December 1939	55,000
May 1, 1941	87,000
Man Hours (Weekly)	
May 1, 1940	2,000,000
May 1, 1941	4,500,000
Average Weekly Hours as of May 1, 1941	
First Shift	54
Second Shift	54
Third Shift	36
Number of Men Working as of May 1, 1941	
First Shift	63,200
Second Shift	19,100
Third Shift	4,400
Trainees as of May 1, 1941	
Number	12,800
Percent of Total Employees	14

If new machines cannot be supplied fast enough to meet defense requirements the alternative is fuller use of existing equipment either through diverting plants having critical machine tools from nondefense to defense production or by transferring critical tools from nondefense to defense plants. Curtailed production of automobiles and electric refrigerators and the freezing of models is expected to divert many tools to the production of ordnance and airplanes. Similar future curtailments in the production of other industries that are large users of machine tools may also bring about further diversion of tools to defense industries and relieve the pressure on machine tool manufacturers.

Utilization

The volume of production depends not only upon the supply of industrial facilities but also on the degree of their utilization. Maximum utilization of the facilities already available has great immediate significance in the defense program, since it will be some time before the plants and equipment now under construction will come into production.

In general there are two methods of intensifying the use of facilities. One is the lengthening of working hours through overtime and the other is through multiple shifts. The progress made along these two lines will be discussed at some length in a later section. Only a brief summary of the final results of these two measures, which are employed to different degrees in different plants and industries, is given at this point.

There is wide variation among different industries and plants in the amount of time that facilities are in actual use. The situation in the aircraft industry as of May 1941 is summarized in the table below by means of a generalized index of plant utilization. This index is based on the assumption that the first shift represents the optimum relationship of workers to plant and equipment and is obtained by dividing the total productive man-hours for the week by the number of employees on the first shift.

None of the 42 airplane plants shown in the table averaged more than 99 hours a week although two plants, accounting for nearly one-fifth of the capacity of the group, showed operations of 95 to 99 hours. Eleven plants with nearly 50 percent of the capacity operated or had a plant utilization of between 75 and 100 hours a week. On the other hand, 15 plants with about five and one-half percent of the total capacity showed operations of 59 hours or less. The group with a plant utilization of 40 to 44 hours constituted eight plants with 2.8 percent of the total capacity.

The plants manufacturing airplane engines showed the most intensive plant utilization of the entire industry. One plant, with one-sixth of the total capacity in the engines group, operated at more than 125 hours per week out of a maximum total of 168 hours. The five major plants, accounting for nearly 80 percent of the total capacity

TABLE 9 - DISTRIBUTION OF PLANTS AND PRODUCTIVE CAPACITY IN THE AIRCRAFT INDUSTRY ACCORDING TO EXTENT OF PLANT UTILIZATION May 1941 [a]

Average Hours of Plant Utilization [b]	Airplanes		Engines		Propellers	
	Number of Plants	Percentage of Total Capacity	Number of Plants	Percentage of Total Capacity	Number of Plants	Percentage of Total Capacity
125 - 129	-	-	1	15.6	-	-
120 - 124	-	-	-	-	1	32.2
115 - 119	-	-	-	-	1	11.2
110 - 114	-	-	1	0.2	-	-
105 - 109	-	-	-	-	-	-
100 - 104	-	-	2	34.6	-	-
95 - 99	2	19.8	1	29.1	1	0.3
90 - 94	-	-	1	3.4	1	1.4
85 - 89	3	10.3	-	-	3	6.2
80 - 84	2	6.4	-	-	1	10.3
75 - 79	4	11.3	2	3.9	1	10.0
70 - 74	4	25.0	2	2.5	1	1.8
65 - 69	5	8.9	2	4.1	1	13.8
60 - 64	7	12.7	-	-	-	-
55 - 59	2	1.3	1	0.5	-	-
50 - 54	2	0.5	2	5.4	-	-
45 - 49	3	1.0	3	.7	2	11.3
40 - 44	8	2.8	-	-	-	-
35 - 39	-	-	-	-	1	1.4
30 - 34	-	-	-	-	-	-
25 - 29	-	-	-	-	1	.1
Total	42	100.0	18	100.0	15	100.0

[a] Based for the most part on data for week ended May 16, appearing in Materiel Division Consolidated Statistical Report for May 1941.

[b] Hours of plant utilization = $\frac{\text{actual man-hours for week}}{\text{number of workers on 1st shift}}$

This assumes that the number of workers in the first shift represents full use of facilities.

of the airplane engines industry, averaged more than 95 hours per week. None of the engine plants had a utilization of less than 48 hours per week.

Propeller plants stand between airplane and engine factories in degree of plant utilization. Two plants with more than 43 percent of the total capacity of the propeller group had a utilization of 115 to 125 hours per week. More than 40 percent of the total capacity of the group is concentrated at the rate of utilization of from 65 to 90 hours. Some 13 percent of the capacity listed by four plants had a utilization of less than 50 hours.

The foregoing figures may be compared with the one shift 40-hour week and the maximum of 168 hours in a 24-hour, seven day week. While the 168-hour week is not practically attainable, intensification of the use of existing facilities has great potentialities for speeding defense production. In the case of the aircraft industry, the most fully utilized plants operated at about 30 percent greater utilization than the average. The percentage difference is approximately the same for the groups of plants manufacturing planes as well as for those manufacturing engines and propellers. The output would obviously be substantially increased if all plants could at least be lifted to the points shown practicable for the best units.

The aircraft industry is not peculiar in this respect. There are even greater differences between the average utilization of all plants and the best plants in other industries engaged in defense production. The table below summarizes the condition for a list of selected industries important to defense. The figures are based on a survey of a total of 363 plants made by the Bureau of Labor Statistics for March 1941.

It will be seen that in the machine-tool accessories and electrical machinery and supplies industries, the plant showing the greatest degree of utilization covered in the survey was used twice as many hours as the average for all plants combined in that industry. The best plant in the machine-tool industry operated at the rate of 72 percent higher than the average; explosives 67 percent; and private shipyards 48 percent.

A glance at the first two columns of the table suggests that in some of the industries the performance of even the best plants might be improved. Hence, the latent possibilities for expansion of utilization and production lie beyond the best record achieved in the group. The best plant in the chemical industry was in full operation 73 hours a week (56 hours for the group as a whole). In machine-tool accessories there was at least one plant which operated 144 hours a week.

TABLE 10 - PLANT UTILIZATION IN ELEVEN INDUSTRIES IMPORTANT TO DEFENSE
Middle Week in March 1941 [a]

Industry	Number of Hours Per Unit of Capacity [b]		Ratio Best to Average
	Best Plant	Average All Plants in Sample	
Private Shipyards	89	60	1.48
Ammunition	95	77	1.23
Machine Tools	115	67	1.72
Machine-tool Accessories	144	68	2.12
Brass, Bronze, and Copper Products	106	75	1.41
Chemicals	73	56	1.30
Electrical Machinery and Supplies	122	59	2.10
Engines (other than aircraft)	90	69	1.30
Explosives	120	72	1.67
Firearms	75	57	1.32
Smelting and Refining Copper, Lead, and Zinc	81	60	1.35

[a] Based on survey of 363 plants made by the Bureau of Labor Statistics.

[b] Total "productive" man-hours divided by the number of "productive" workers on first shift. (One worker on first shift is taken as unit of capacity).

In Government navy yards (not shown in the table) the difference between the best and the average was less than 20 percent in recent months for which data are available. This is less of a spread than for any of the industries shown in the table as well as for the aircraft industry. The difference is much less than for private yards. The basic data for Government navy yards are not fully comparable to those for private yards and other industries. It appears, however, from such preliminary data as there are on hand, that both the best and average utilization in Government yards are lower than in several of the private industries shown in the table above.

RAW MATERIALS

The ability to provide sufficient raw materials to meet defense program requirements and essential civilian needs at the same time resolves itself into two principal parts. (a) The capacity of available facilities may be a limiting factor particularly in the case of synthetics and of the refining of some metals. (b) Where a substantial portion of our basic supply must come from abroad, we must reckon with the wartime difficulties of maintaining the flow of our imports. Below are discussed illustrative increases in our facilities and the stockpiles we have developed as insurance against the cutting off of imports.

Facility Expansions

It was apparent more than a year ago that we needed substantial expansion in airplane and ordnance facilities. But the extent to which available capacity would limit our ability to obtain basic raw materials in the amounts needed has become clear only in recent months. As of June 30, our facilities program, including British capital assistance and the five-year amortization plan amounted to approximately $7 billion. Less than one-half billion of this total was for raw material facilities. What has been done and what is in prospect in the way of added facilities in the case of four important defense materials is shown in the table below. Although further increases are needed, the additions shown for aluminum and magnesium are substantial.

	Capacity June 30, 1941	Increase in Capacity July 1, 1940 June 30, 1941	Increase in Capacity Expected July 1, 1941 June 30, 1942
Steel, million tons per year	87.6 [a]	2.6 [a]	3.7 [a]
Aluminum, million pounds per year	629.0	194.0	175.0 [b]
Magnesium, million pounds per year	37.0	25.0	41.0
Synthetic rubber, million pounds per year	.5	2.5	1.8

[a] Report to the President by Gano Dunn, May 22, 1941; figure in column 1 is for December 30, 1940; figure in column 2 is for calendar year 1940; figure in column 3 is for calendar year 1941. A part of the increase in 1940 represents renovation of obsolete and high cost facilities and resetting of furnaces.

[b] Plans for additional capacity of 600 million pounds are under consideration.

The synthetic rubber now being produced in the United States is a substitute for rubber only for specialized purposes. The RFC has recently announced plans for facilities to produce synthetic rubber of the Buna^{S}-type which is more suitable for general substitution. These facilities which are not yet under construction will have an annual capacity of about 19,000 long tons. It is planned that they will come into production during the latter part of 1942.

In the case of tin, the Metals Reserve Company has made arrangements for the construction of a tin smelter at Texas City, Texas, for refining annually about 50,000 tons of Bolivian tin ore or concentrates, or enough to smelter 18,000 tons of fine tin. The Metal Reserves Company has contracted for the purchase of this quantity of tin concentrates for a period of five years.

In the case of petroleum products, transportation facilities have come to be a limiting factor. This point is discussed below.

The Stockpile Program

Legislation for the accumulation of stockpiles of strategic materials was recommended by the Army-Navy Munitions Board in January 1939. The Strategic Materials Act (Public 117) was passed in June 1939, under which Congress provided for the appropriation of $100 million to be expended by the Treasury for building up stockpiles of strategic materials. Between June 1939 and May 1940 supplemental appropriations were made available for expending the reserves of defense materials.

In June 1940, the Congress amended the Reconstruction Finance Corporation Law (Public 664), and authorized the Corporation to create and finance companies to produce, obtain, and store defense supplies. Three important subsidiaries of the Reconstruction Finance Corporation, the Rubber Reserve Company, the Metals Reserve Company, and the Defense Supplies Corporation, have been set up for producing, acquiring, and carrying strategic and critical materials.

In June 1940, the ANMB recommended the accumulation of stockpiles of 13 strategic materials. In October the ACCND increased a number of the recommendations of the ANMB and added nine additional strategic and critical materials. The Office of Production Management in May 1941 again expanded the program. Through June 1941 the funds obligated for the whole stockpile program amounted to $980 million, of which $470 million were contractual obligations and about $180 million actually disbursed.

In addition to this direct stockpile program, the Government negotiated an agreement with the United Kingdom for the exchange of 600 thousand bales of cotton for approximately 85 thousand tons of

rubber. The rubber has become a part of the Governmental stockpile, but according to the agreement cannot be released to industry until the United States has consulted the British Government as to method of disposition. The same provision applies to the British disposition of American cotton.

Until about April 1941 the accumulation of stockpiles had largely been limited to the strategic materials as classified by the Army-Navy Munitions Board. As emergency conditions have changed, some formerly critical and essential materials have become of strategic importance, and less formal accumulations of reserves of these materials have been made. Recent legislation, June 10, 1941, (Public 108, 77th Congress) makes it possible for the Reconstruction Finance Corporation, through its subsidiaries, to purchase and sell to industry materials which have not been declared strategic or critical by the President. Purchases and sale of a number of such materials have taken place.

In a few instances where tight market situations have developed, such as in the case of tungsten and copper, a part of the reserves have been released to industry at prevailing prices. The stockpile of strategic materials accumulated under Public 117 is released by Executive Order after the President has found that an emergency exists, with regard to the individual materials. Those materials accumulated under Public 664 are released on the recommendation of the Office of Production Management by direction of the President. Firms having priorities in the manufacture of defense equipment have a preference in the purchase of stockpile materials. Not all the reserve materials, however, are immediately available to industry. For example, the agreement between the Metals Reserve Company and the International Tin Committee provides that part of the tin stockpile will not be available for distribution until after January 1, 1944.

Table 11 following shows the estimated imports of the principal strategic stockpile materials required for 1941, the recommended stockpiles, the quantities purchased and delivered during the first year's operation of the program.

This table shows striking contrasts between the quantities of individual stockpile materials purchased and delivered. The purchase of four materials--antimony, manganese, quinine, and tungsten--exceeded the recommended stockpile during the first year's operation. The deliveries of these items, however, were far below the purchases, except quinine which was the only item reaching 100 percent of the recommended stockpile.

TABLE 11 – IMPORTS AND STOCKPILES OF STRATEGIC MATERIALS

Stockpile Materials	Unit	Estimated Imports for Industry and Stockpile, 1941	Two-Year Recommended Stockpile	Purchased as of June 28, 1941	Delivered as of June 28, 1941
Antimony	S.T.	22,000	18,000	29,637	7,295
Chrome Ore	L.T.	1,120,000	1,300,000	646,808	172,909
Industrial Diamonds	Cts.	–	2,000,000	770,729	4,165
Manganese	L.T.	1,800,000	1,800,000	3,218,500	327,622
Manila Fiber [A]	S.T.	86,000	53,360	13,438	9,544
Mercury	Flasks	–	10,000	5,000	2,050
Mica	Lbs.	20,800,000	10,800,000	5,581,414	2,288,442
Quartz Crystals	Lbs.	141,120	702,000	99,270	52,469
Quinine	Av.Oz.	[B]	6,400,000	7,200,000	6,485,000
Rubber	L.T.	1,000,000	517,000	262,685	206,002
Tin	L.T.	260,000	159,400	100,420	42,285
Tungsten	S.T.	14,000	13,000	67,294	5,871

[A] Bales converted to pounds by applying 270 pounds per bale.

[B] Estimated imports of 5,419,000 pounds of cinchona bark, the raw material for quinine.

Table 12 shows the operations of the supplemental or revolving stockpiles.

Since the end of June 1941 some quantities of lead, bauxite, cork, and leather have been purchased by the subsidiaries of the Reconstruction Finance Corporation for the supplemental or revolving stockpile reserves. The stockpile program is in process of continual revision.

Requirements and Supplies

Despite the steps that have been taken, supplies of many materials will not be adequate to meet the combined military and unrestricted civilian requirements during the next year. In fact some materials, particularly aluminum, magnesium, and nickel now appear to be inadequate for direct and indirect military purposes. Should the military effort expand much beyond the contemplated program for the next twelve months, the shortages will become even more severe. Lack of transportation facilities and a shortage in electric power may cause greater deficits.

TABLE 12- SUPPLEMENTAL STOCKPILES OF STRATEGIC AND CRITICAL MATERIALS [a]
(End of June 1941)

Material	Unit	Purchased	Delivered	Released
Asbestos	S. T.	1,560	-	-
Cadmium	S. T.	67	67	-
Copper	S. T.	304,701	168,495	147,821
Diamond Dies	Number	6,000	4,076	1,466
Graphite	M. T.	4,028	411	-
Iridium	T. Oz.	765	-	-
Nitrate of Soda	S. T.	300,000	111,703	11,703
Optical Glass	Lbs.	11,400	5,547	-
Tin Ore	L. T.	290,045	2,635	-
Zinc Concentrates	L. T.	150,000	-	-
Zinc Ore	S. T.	86,000	-	-
Wool (Argentine) [b]	Bales	7,494	7,494	-

[a] Does not include 170,000 metric tons of aluminum scheduled for delivery from Canada during 1942, 1943, and 1944.

[b] 230,104 bales of a total of 840,000 bales of Australian wool delivered for storage in the United States.

Estimated requirements and supplies for the calendar years 1941 and 1942 are shown for 32 commodities important for defense on the accompanying charts. Total requirements are represented for each commodity by the distance between the two vertical black lines. The lower bar for each commodity shows the four main constituents of supply; stocks on January 1, estimates for primary production, secondary production, and imports.

Chart 31 shows the requirements and supply situation for 18 metals, including steel, ferro-alloys and nonferrous metals for 1941. The chart indicates that for eight of the metals estimated supplies are less than requirements for this year. The indicated shortages include aluminum, magnesium, nickel, copper, zinc and brass. In addition, during 1942 there are indicated shortages of lead, tungsten, and vanadium. In the case of antimony, chrome, cobalt, and tin, the adequacy of the supply depends upon the continuation of overseas imports in something like the present volume.

Almost the total consumption of tin comes from the Far East and the supply situation is threatened by Japanese movement southward. About half of the United States consumption of tungsten comes from China. The continued supply from this source is largely contingent upon the Burma Road remaining open. Although a comparatively large part of the vanadium consumed in the United States is imported, the principal source is in the Western Hemisphere. Practically the whole supply of nickel comes from Canada.

Steel, aluminum, and magnesium are outstanding examples of vital materials where a shortage arises from a lack of productive facilities within the country. Shortage in transportation facilities will cause many difficulties of supply, the most obvious of which at this time are in motor fuel and fuel oil. The magnitude of the deficiencies expected next year will be small for the country as a whole, but in certain sections of the country--especially on the East Coast--shortages are likely to be severe.

In normal times domestic producers supply all of our copper, lead, and zinc, but foreign supplies of ores or refined metals are necessary to meet defense requirements. Domestic refining capacity appears to be adequate for lead, but expansion is needed in copper and zinc refining facilities. Imports of copper and zinc (ore or metal) from the Western Hemisphere in amounts equal to those of the past year would still leave a substantial shortage, and such imports would have to increase to a great extent to relieve the expected deficiency. Continued imports of lead and lead ore from the Western Hemisphere would cover the deficiency from domestic mines but might prove inadequate if requirements for lead increased as a result of the substitution of this material for other materials which are already deficient. Al-

CHART 31 - 1941 SUPPLY AND REQUIREMENTS
STEEL, FERRO-ALLOYS, AND NON-FERROUS METALS

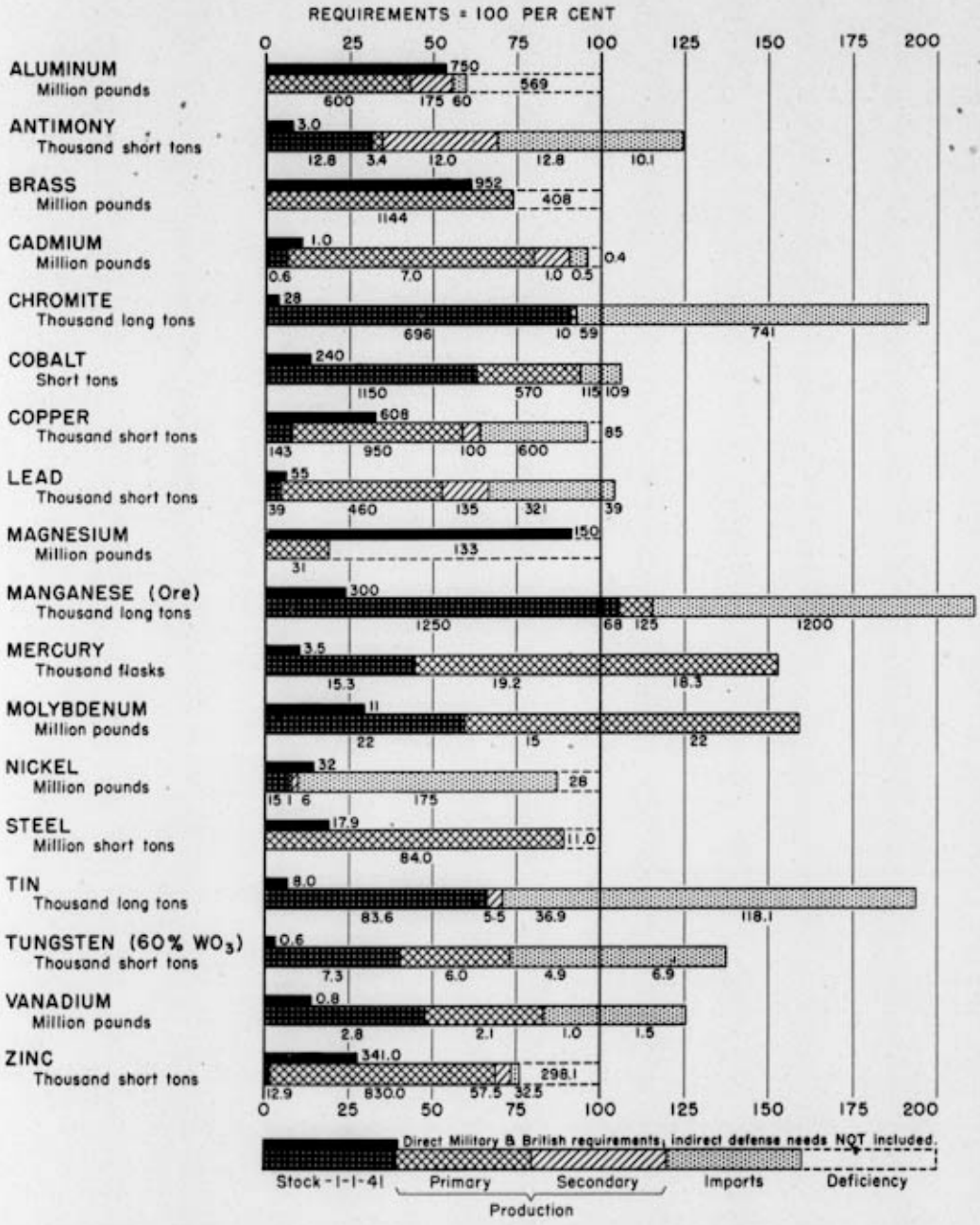
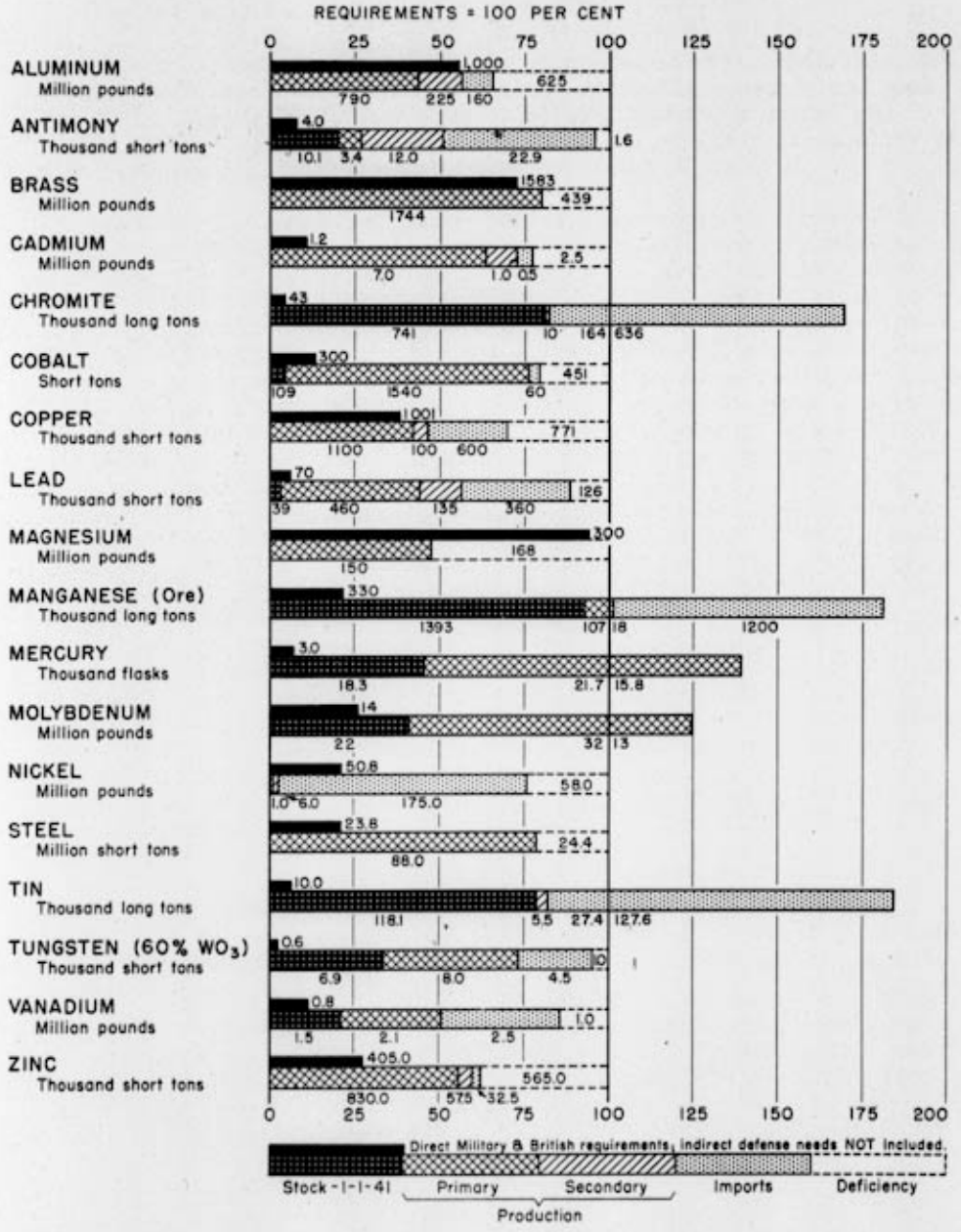


CHART 32 1942 SUPPLY AND REQUIREMENTS
STEEL, FERRO-ALLOYS, AND NON-FERROUS METALS



though the source of such imports appears reasonably secure, limited ocean shipping facilities threaten to restrict the flow of materials even from nearby sources. Inventories of all three metals have been drawn upon during the past year and offer little possibility of relieving the expected deficiencies.

Chart 33 indicates considerable shortages of other materials, including cork, graphite, kapok, neoprene (synthetic rubber), and wool for 1941. During 1942, shortages of potash, hides and skins, and manila fiber, are indicated. In addition, the adequacy of supplies of mica, rubber, and silk depend upon continuation of imports.

All the cork consumed in the United States must be imported in one form or another; with the threatened Axis invasion of Spain and Portugal, the principal sources of supply, the situation may become extremely critical. The supply of the critical grades of graphite comes largely from Madagascar, and imports have been negligible for the first five months of 1941. The United States rubber supply originates in the Dutch East Indies and British Malaya and requires a relatively large amount of shipping space. The supply of kapok also comes from the Dutch East Indies. Most of the silk consumed in the United States comes from Japan. [a] The United States supply of manila fiber (abaca) comes almost exclusively from the Philippines. There are some limited Western Hemisphere substitutes, such as sisal and henequen, in case of an interruption of supply. Strategic mica comes primarily from India, and the United States requirements in shipping tonnage are comparatively small, and should not present any great difficulty as long as the sea lanes remain open.

Domestic production of hides and wool is also inadequate, but even in normal times these products are supplied in large amounts from abroad. Countries of the Western Hemisphere could provide supplies of these materials in sufficient quantities to meet requirements not covered by domestic production, but again, a shortage of shipping facilities may make such imports difficult. The supplemental stockpile of wool being acquired under an agreement with Australia will help cover the deficiency in an emergency. [b]

[a] Priorities Director Stettinius issued an order July 26 freezing all stocks of raw silk, and limited the processing of thrown silk to levels set during the week ending July 26. This order does not prevent deliveries from ship to importers.

[b] Civilian requirements for these commodities represent unrestricted civilian demand assuming a $87 billion national income in 1941 and a $100 billion national income in 1942. Thus, the requirements of steel are estimated on the assumption that there will be no restriction in automobile output.

CHART 33 1941 SUPPLY AND REQUIREMENTS
ALL OTHER

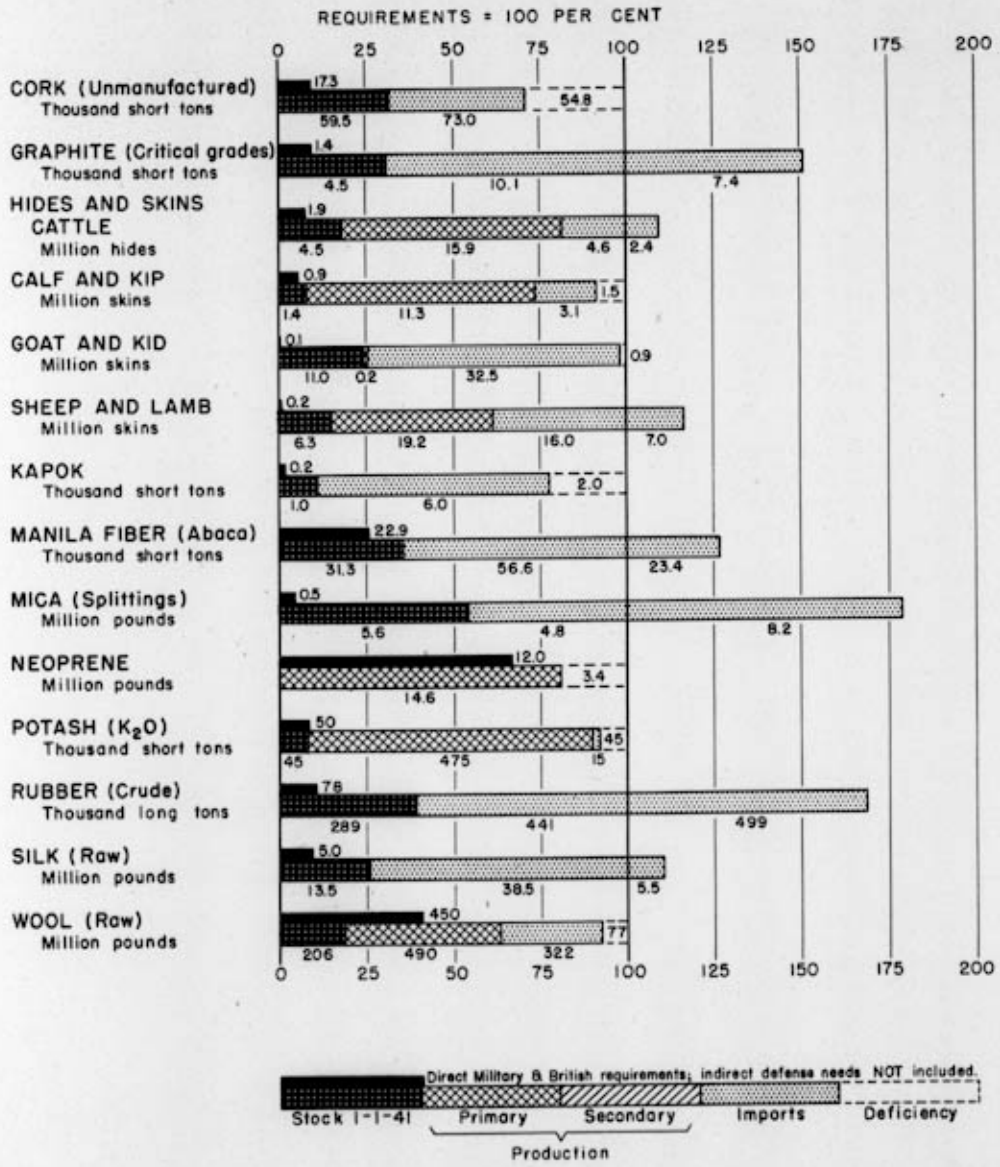
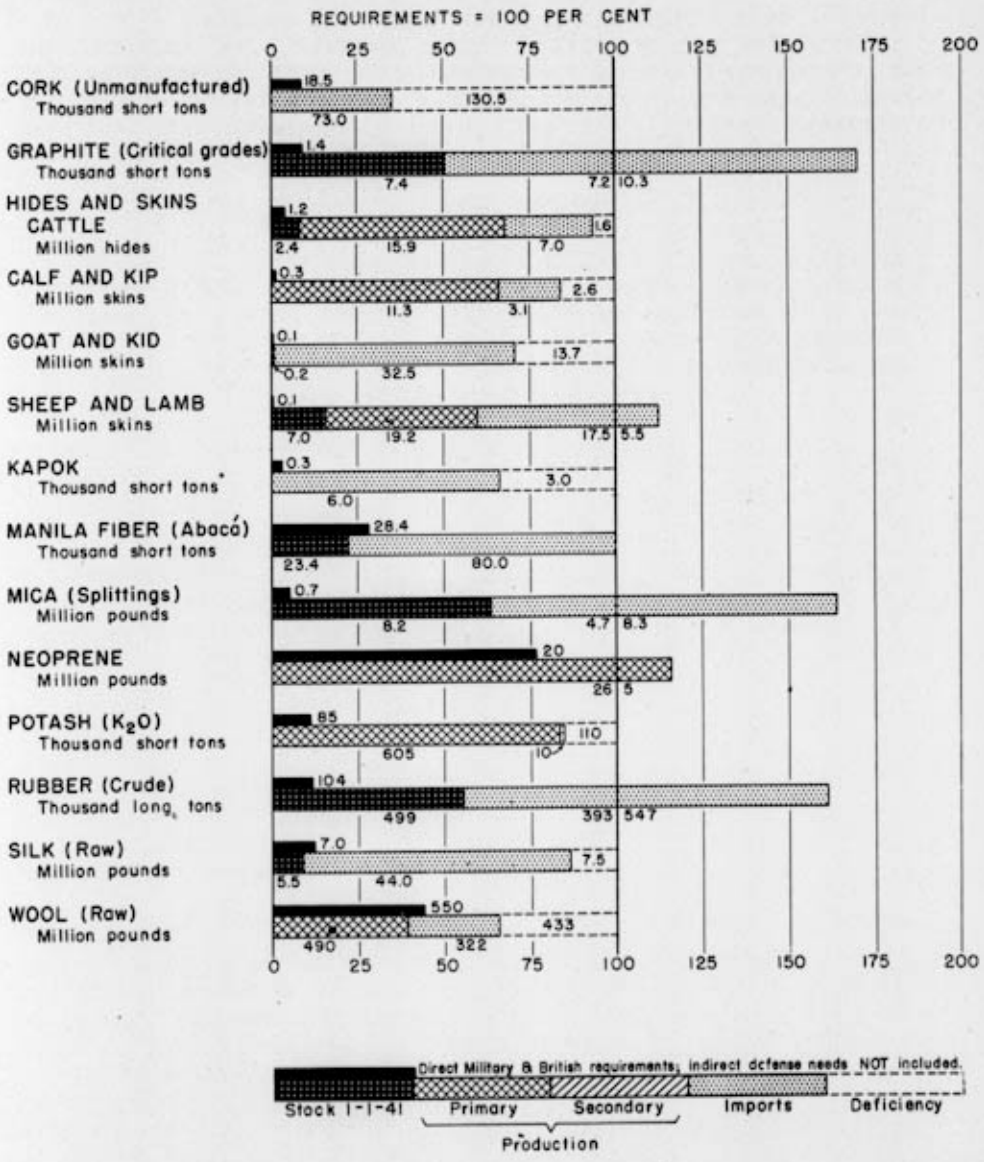


CHART 34 1942 SUPPLY AND REQUIREMENTS
ALL OTHER



LABOR

To make provision for the availability of labor of various skills in sufficient quantities is one of the most difficult of the defense production problems. During the first year of the defense effort total employment increased by nearly 3 million persons to an all-time high. With increased production activity requiring longer hours and more overtime, with increased costs of living to some extent offsetting higher earnings, with more congested working conditions, and with a more favorable market situation for labor, industrial disputes have been of increasing importance. The several problems relative to labor are discussed in the following sections.

Overall Expansion of Nonagricultural Employment

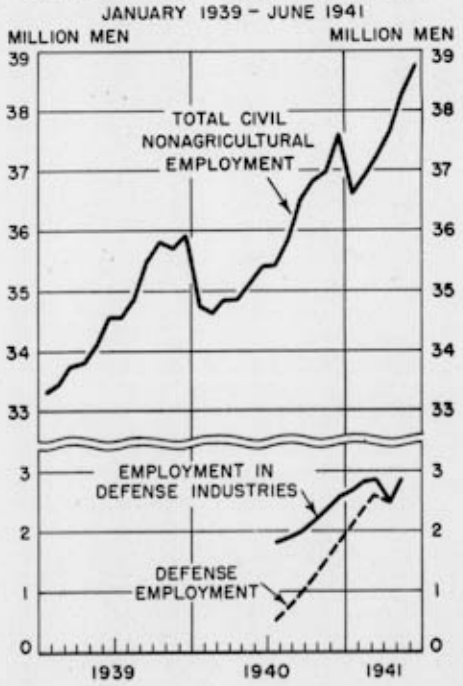
In May 1941 total nonagricultural employment stood at a record high of 38,278,000. While this figure represented a gain of three million in employment over May 1940, there are estimated to be some five million employables still seeking work. About 60 percent of the total increase in employment occurred in the nation's factories between May 1940 and May 1941.

Expansion of Employment in Defense Industries

Total employment in defense industries, as shown in Chart 35, increased to almost three million persons in May 1941.[a] The 18 private manufacturing industries included in this total were engaged to a larger extent in filling defense contracts in May 1941 than in July 1940. The increase in "defense employment" is probably more nearly as shown by the dotted line. For

CHART 35 - EMPLOYMENT

JANUARY 1939 - JUNE 1941



a This estimate of direct defense employment is made up of the following: (1) employment in 18 major defense industries, (2) employment on public construction handled by private contractors, and (3) employment in Federal Navy yards, arsenals, etc.

17 private manufacturing industries of key importance for defense, man-hours had increased by 61.5 percent during the period April 1940 to April 1941. The most pronounced increases occurred in those industries which, despite their growth over the past year, still are farthest short of the needs of total defense. For the same period ammunition increased the number employed by 159.1 percent and man-hours, 174.5 percent; aircraft gained 139.0 percent in numbers and 162.1 percent in man-hours; firearms, 101.9 percent in numbers and 128.0 percent in hours; and private shipbuilding, 92.7 percent in numbers and 113.7 percent in hours.

Changes in Average Hours Worked per Week per Wage Earner

The extent to which lengthening hours has increased effective industrial effort is indicated by translating overtime above 40 hours per week into the equivalent number of workers who would have been needed in the defense industries had no overtime been worked. In total, these 17 manufacturing industries, most of which have encountered shortages of skilled men, would have needed 200 thousand additional workers in April 1941 if the same number of man-hours of work had been obtained with an average of only 40 hours per week per worker. The aircraft industry substituted overtime for 22 thousand workers, or 13.3 percent of its total employees; shipbuilding for 11 thousand, or 6.8 percent; machine tools, 25 thousand, or 27.8 percent; foundry and machine shop products, 62 thousand, or 12.0 percent; brass, bronze, and copper products, 11 thousand, or 9.5 percent; and the electrical machinery industry, 36 thousand, or 10.3 percent.

Overtime has been employed most extensively for defense production in the machine tool industry. Chart 36 shows that since November 1939 average hours per week per wage earner have, except for August 1940, exceeded 47.0 hours and have remained above the 50-hour mark during the past six months. The aircraft industry also has engaged in extensive overtime operations and currently its average hours amount to 45.2 per week. With the exception of the continuous process industries, such as blast furnaces, steel works and rolling mills, and smelting and refining (copper, lead, and zinc), all of the defense manufacturing industries averaged well in excess of 40 hours per employee per week in May 1941. Average hours for all manufacturing amounted to 40.8 hours, an increase of 9.7 percent over May of the preceding year. The durable goods industries expanded hours to 42.5 per week, an increase of 11.5 percent during this interval, while hours in nondurable goods rose to 38.9, an increase of 7.1 percent.

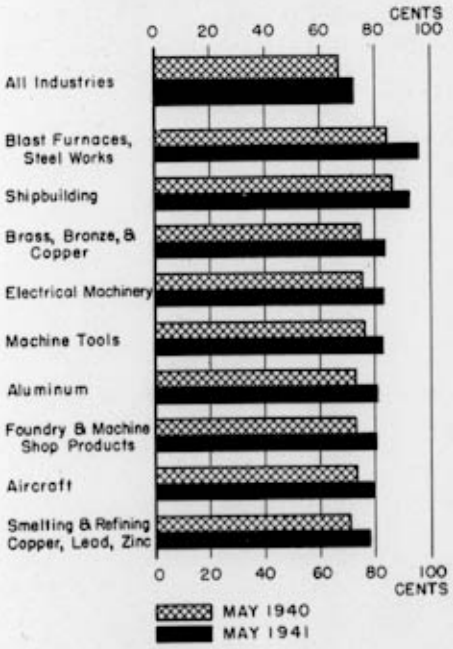
Changes in Hourly Earnings

Three factors have produced significant changes in overall hourly earnings in manufacturing industries since the inauguration of the national defense program: (1) payment of overtime wages; (2) rapidly expanding employment in the higher paid defense industries; and (3) increases in basic wage rates. A comparison of average hourly earnings per worker for all manufacturing and for nine major defense industries is shown in Chart 37. Average hourly earnings in all manufacturing reached 72.6 cents in May 1941, an increase of 8.5 percent since May 1940. The slow but steady increase from May 1940 through March 1941 was due primarily to the increase in employment in the higher paid defense industries and to increasing overtime with relatively little influence from increases in wage rates. Since March, however, the sharper rise has been the result of wage rate increases. Over this interval hourly earnings in durable goods industries (80.6 cents) rose 11.1 percent, while those for the nondurable goods group (64.1 cents) increased only 4.9 percent. All of the selected defense industries have maintained hourly earnings levels consistently above those for

CHART 36-AVERAGE WEEKLY HOURS PER WORKER MACHINE TOOL INDUSTRY

CHART 37 AVERAGE HOURLY EARNINGS ALL MFG. & 9 DEFENSE INDUSTRIES

MAY 1940 AND MAY 1941



all manufacturing. Hourly earnings in blast furnaces, steel works, and rolling mills advanced sharply in April 1941 as a result of increases in wage rates affecting 400 thousand workers. This industry's hourly earnings, 96.8 cents, now (May 1941) stand higher than those for any other listed defense industry. Shipbuilding currently stands second in the list with average hourly earnings of 92.6 cents, followed by brass, bronze, and copper products (83.4 cents).

The Trend of Multiple Shift Operations

The number of wage earners on the second and third shifts in 363 key defense plants surveyed by the Bureau of Labor Statistics increased by 2 percent between December 1940 and March 1941. Ten establishments stepped up operations to a three-shift basis during the period, bringing the number of three-shift plants to 214.

From December 1940 to March 1941 employment in the 363 plants expanded by 62,357, or 13.9 percent, to a total of 510,201 wage earners. Increased employment on the first shift amounted to 36,863, on the second to 17,950, and on the third shift to 7,544 workers.

While 214 of the 363 plants reported three-shift operations in March, the 37,724 employees on the third shift represent only 7.4 percent of the total wage earners employed by these establishments. The second shift engaged 102,211 employees, or 20 percent of the total.

The Week-end Shutdown

Operations in 587 plants surveyed by the Bureau of Labor Statistics in March 1941 dropped to about two-thirds of the weekday level on the Saturday of the surveyed week and to about 10 percent on Sunday as measured by the number of persons at work on those days.

Only a negligible number of defense establishments outside of the continuous process industries were using a "swing shift" to make 24-hour seven-day operation of plants possible while employees are required to work only five or six days per week.

Although 308 of the 587 plants were in operation on Sunday of the surveyed week, only 22 plants were employing as many as 70 percent of their workers on Sunday and these, in most cases, were continuous process plants.

Labor Turn-over in Manufacturing Industries

The influence of industrial expansion on the labor market has been reflected in a sharp increase in quit rates, a reduction in lay-off rates and a rise in accessions over the past year for manufacturing industry in general. The rate for voluntary separations (quits) has shown an irregular but sharp rise from 0.77 in May 1940 to 2.20 per 100 employees in May 1941 when it reached the highest point on record. That all new workers hired were not satisfactory was indicated by a higher discharge rate. This type of separation shows an increase from 0.13 in May to 0.19 in October 1940, and rose to an all-time high of 0.25 in April 1941. The importance of lay-offs as a factor in total separations has diminished. In May 1940 when total separations were reported at the rate of 3.78 for every 100 workers on the pay roll, 74 percent represented lay-offs. The percentage has decreased in April 1941 to 31 percent of the total. The sharp rise in the miscellaneous separation rate may be interpreted as representing principally workers leaving to enter the military service. The total separation rate has remained at a fairly constant level, ranging from a low of 3.00 in August 1940 to a high of 3.89 in April 1941. This figure fell slightly to 3.86 in May 1941.

The total accession rate in May was nearly twice as high as in the corresponding month of last year. The depletion of the backlog of experienced workers in manufacturing industries has become more apparent in recent months. In May 1940 new hires constituted 56 percent of the total accessions; in October 1940, 78 percent; and in May 1941 five of every six workers hired came under this category. The lack of trained workers was apparent to a greater extent in key defense industries than in all manufacturing combined. In the aircraft industry the ratio of rehires to new hires in May 1941 was 1 to 70; bronze and copper products, 1 to 14; and engines and turbines, 1 to 21.

Labor Disputes.

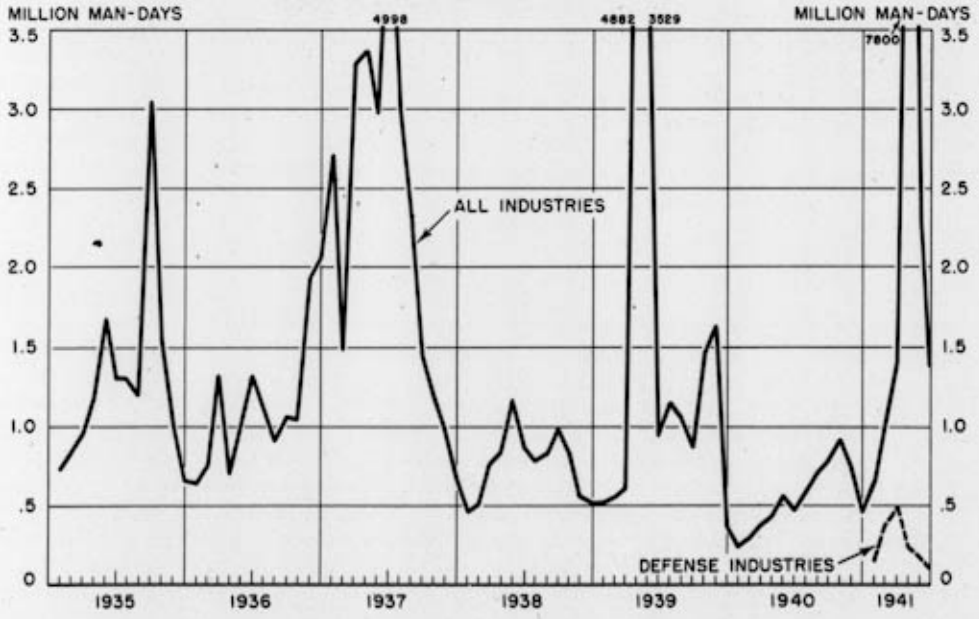
At the outset of the defense program the level of strike activity was unusually low. During the first half of 1940, the number of strikes (1,159) was three-quarters of the average number that had occurred during the first half of the preceding 5 years, 1935-39 (1,534). Even sharper was the contrast in the number of workers involved and the man-days of idleness during strikes. As compared with the average of 638,500 workers involved in strikes during the first half of the years 1935-39, only one-third as many (210,000) were in-

volved between January and June of 1940. Likewise, the man-days of idleness during strikes in the first half of 1940 ran less than one-third of the average level of the preceding 5 years (2,515,000 as compared with an average of 9,413,000).

Strike activity increased sharply from January to April 1941. While some increase was to be expected at this season of the year, the actual increases were much greater than seasonal. The figures for April (as graphically portrayed in Chart 38) were largely influenced by the general strike in the bituminous coal industry. In fact, this one stoppage accounted for about two-thirds of the workers and three-fourths of the man-days involved in the April strikes. Excluding the coal strike, however, the level of strike activity was still above the 5-year average, and it remained above the average in May after the coal strike was settled.

For the year June 1940 to May 1941 as a whole, the number of workers involved in strikes was 38 percent above the average for the corresponding months of the preceding 5 years, and the idleness during strikes was 11 percent above the corresponding average.

CHART 38 - MAN-DAYS IDLE IN ALL INDUSTRIES AND IN DEFENSE INDUSTRIES



In view of the sharp increase in the industrial pace in 1940-41, the strike figures of the year can be compared appropriately with strike records in other similar periods of accelerating activity.

The number of strikes during the first year of the defense program was 5 percent less than in the corresponding months of 1936-37 but 64 percent greater than in the same months of 1933-34. The number of workers involved in the strikes of 1940-41 was slightly below the number involved in 1936-37 (2 percent less) and in 1933-34 (5 percent less).

The man-days of idleness during the strikes of 1940-41 were 23 percent less than during the strikes of 1936-37 and 15 percent less than during the strikes of 1933-34.

During each of the months of 1940, idleness during strikes remained below two-tenths of one percent of the total man-days of available work. In April, 1941, the month of the coal strike, idleness during strikes amounted to 1-1/3 percent of the available working time. From April to May 1941 strike activity declined as a result of the eventual ending of the bituminous coal strike. However, the number of workers involved in May strikes (1.5 percent of all workers) and the number of days of idleness (0.39 percent of available working time) showed a higher rate of strike activity than in any previous month of the defense program except April. Chart 38 exhibits the downward trend since March, 1941, of man-days idle because of strikes in plants with important defense contracts. Man-days idle because of strikes showed a substantial decrease in June 1941, over April 1941, for these industries. The proportion of workers involved in strikes per year was higher continuously from 1916 through 1922 and during the years 1933, 1934, and 1937, than during the 12 months under review.

Measures instituted to avoid and diminish industrial unrest and labor disputes include greatly improved Government mediation machinery, as well as indirect methods such as maintaining price stability and efforts to facilitate collective bargaining and to establish minimum labor standards. The basic mediation agency of the Government has been the United States Conciliation Service of the Department of Labor. In addition, special defense mediation machinery, however, has been provided by the National Mediation Board and by the Labor Division of the Defense Commission and the Office of Production Management.

Labor Shortages.

In spite of the fact that there are still some 5 million unemployed, there have been nation-wide shortages of skilled workmen in particular occupations, and local labor markets in some sections of the country have exhausted all usable reserves.

The active files of the Public Employment Offices do not represent a complete count of job seekers, and they contain many applications of employed persons who are seeking better jobs. Nonetheless they are indicative. In April 1940 two of the five million registrants were skilled and semi-skilled, but less than 900,000 of these had had experience in manufacturing industries. The remainder would have to be trained for industrial jobs.

TABLE 13- NUMBER OF REGISTRANTS AT PUBLIC EMPLOYMENT OFFICES IN 394 SELECTED DEFENSE OCCUPATIONS (March 22, 1941)

Type of Occupation	Number
	(Thousand Registrants)
T o t a l	364.4
Miscellaneous Professional and Technical Occupations	12.2
Aircraft Manufacturing and Service Occupations	4.3
Automobile Service Occupations	22.7
Building Construction Occupations	168.4
Electrical Equipment Manufacturing Occupations	6.4
Instruments, Optical Goods, Watch and Clock Occupations	1.0
Metal Trades Occupations	107.5
Multi-Industry and Miscellaneous	51.3
Forging	6.7
Foundry	10.8
Heat Treating	0.8
Machine Shop	29.7
Sheet Metal	8.2
Ship and Boat Building and Boilermaking Occupations	6.7
Textile, Garment, and Related Occupations	23.8
Miscellaneous Occupations	11.4

Some idea of the country's remaining reserves of workers who are experienced in critical defense jobs can be had from a compilation of registrants in 394 selected defense occupations made by the Bureau of Employment Security as of March 22, 1941. Only 364,000 job seekers fall into the categories presented in Table 13. The inadequacy of this supply will be seen when it is compared with the estimated demand for labor which will be needed to keep the currently authorized program moving on projected schedules. Persons registered for aircraft manufacturing and service occupations could not take care of the necessary expansion of any one of the several major plants in a single month; those registered for shipbuilding are equally inadequate.

Training Workers for Defense

A large proportion of the skilled and semi-skilled workers who will be added to the defense labor force in the remaining months of this year and in 1942 and 1943 must be trained for their jobs. Vocational training programs now under way and projected into the future are endeavoring to train every capable worker who can be persuaded to equip himself or herself with a defense industry skill.

Under programs conducted by the United States Office of Education, "pre-employment" and "refresher" courses have had a combined, cumulative enrollment from July 1940 to June 30, 1941, of 392 thousand trainees. Supplementary courses attracted cumulative enrollment of 465 thousand for the same period. It is estimated that the enrollment in both pre-employment-refresher and supplementary courses for 1941-42 will be slightly more than double that of 1940-41. During the last half of 1940-41, emphasis was placed upon training for aviation services, machine shops, and, to as great extent as possible, upon training for ship and boat building.

A "training-within-industry" program under the sponsorship of the Office of Production Management has been developed to stimulate and coordinate the drive to give workmen who are on the job added skills that make possible their up-grading into key functions. The United States has been divided into 22 districts, with a training-within-industry office established in each under the supervision of a personnel expert borrowed from local industry. Each office commands the services of a labor leader and a representative of industrial management who act as advisors. The work is closely coordinated with that of the Federal Committee on Apprenticeship. More than 100 companies, with a total of 300 thousand employees have used the organization's service in setting up training programs.

Promotional activities include educational bulletins, articles in newspapers, trade and professional journals, and the sponsoring of meetings. Objectives include the augmenting of the country's

effective labor force by breaking down prejudices that have prevented the employment of Negroes, newly naturalized citizens, and women in industrial occupations.

Since June 1, 1940, a total of 50 thousand Federal Government employees are or have been in training -- 22 thousand in civilian positions under the War Department, including its manufacturing establishments, and 6 thousand trainees in other branches of the Federal services. Of these totals, some 8,500 workers are or have been training in regular apprenticeship courses.

The Apprenticeship Unit of the Division of Labor Standards through its field staff extends a variety of technical services to industry in connection with in-plant training of skilled workers. In May 1940 there were but 500 apprenticeship systems operating under the standards set up by the Federal Committee, whereas today there are over 1 thousand.

As of April 1941, the National Youth Administration had a total enrollment of 156 thousand young people in its "Work Shop Production Projects," where they were receiving training intended to fit them for industrial occupations, such as in the metal trades, aviation, radio, and drafting. The monthly rate at which enrollees have been graduated reached 41 thousand in April of this year.

The United States Office of Education, in cooperation with 139 certified engineering schools, inaugurated a program of higher-level technical training which was well under way by January 1941. This training is intended for qualified prospects having high school or college education. Degrees are not required. Many of the enrollees are engineers being given "refresher" courses. Others are already employed but seeking training in courses not ordinarily included in college curricula.

Authorized enrollment in Engineering Science and Management Defense Training, as the program is called, reached 140 thousand trainees by June 30, 1941. General, mechanical, and industrial engineering had 33 thousand, 27 thousand, and 24 thousand trainees respectively; aeronautical, civil, and electrical engineering, 12 thousand, 10 thousand, and 8 thousand, respectively; chemical 6 thousand trainees, and marine engineering and naval architecture 4 thousand persons.

1,409,000 More Men for Planes, Ships, Tanks and Guns

If we are to maintain production schedules for shipbuilding, aircraft, machine tools, ordnance and other items of essential materiel (on order as of the middle of May) at least 1,409,000 workers must be added to the forces working on defense production in these industries before the end of April 1942. That this is a substantial force to recruit is apparent when it is realized that these industries employed 2,331,000 in April 1941. Indeed a substantially larger number of new workers will be needed if account is taken of minor defense items and secondary employment in industries which must supply the raw materials for the implements of war.

Table 14 presents data indicating the impact of additional requirements with respect to these principal defense industries.

TABLE 14- ADDITIONAL LABOR REQUIREMENTS IN PRINCIPAL DEFENSE INDUSTRIES BY APRIL, 1942

Occupational Group	Total	Ship Building	Aircraft	Machine Tools & Ordnance	Other
	(Thousand Employees)				
All Groups	1,408.5	323.9	408.4	291.6	384.6
Professional and subprofessional	91.2	32.4	32.7	14.6	11.5
Skilled	550.8	155.5	147.0	113.7	134.6
Semi-skilled	539.0	71.2	167.4	119.6	180.8
Unskilled	227.5	64.8	61.3	43.7	57.7

Of the men who must be added to the forces already engaged in the production of these items, only 227 thousand will be unskilled workers; the remaining 1,181 thousand must be professionally trained, skilled or semi-skilled. The labor force for aircraft calls for a peak employment six or seven times predefense levels. It will have to be made up of tens of thousands of persons who today have not yet seen the interior of an airframe, engine or propeller plant. The shipyards ten months hence will be fitting plates, caulking, and riveting with a quarter of a million men who never before have been engaged in the building of fighting craft.

These added workmen must find their way into the defense plants and shipyards of New England (127 thousand), of the Middle Atlantic States (362 thousand), of the East North Central States (320 thousand), of the North Pacific (57 thousand) and the South Pacific (142 thousand). There must be 56 thousand draftsmen, 35 thousand engineers, 65 thousand foremen, 37 thousand grinder operators, 156 thousand machinists, 36 thousand sheet metal workers, 27 thousand tool and die makers, 9 thousand barrel riflers and straighteners, and so on down the list of skilled men -- men who do not exist in the ranks of the unemployed. The distribution of these additional requirements by skills for regions is given in Table 15. For all gradations of skill the Middle Atlantic and East North Central States will bear the brunt of the additional requirements. (See Table 15)

This demand for 1,409 thousand additional workers will not absorb all our unemployed. But there will be shortages of various types of skilled labor. It is not easy to show statistically how far such shortages may cause defense bottlenecks. Various expedients may be employed: up-grading of workers; in-training as an aid to up-grading; a more minute "division of labor"; other process changes designed to adapt the process to the available supply of labor; longer hours; the use of older workers. The extent to which labor shortages can be avoided depends in large part on the ingenuity of management.

TABLE 15 - DEFENSE LABOR REQUIREMENTS IN PRINCIPAL GEOGRAPHICAL REGIONS *

Occupational Group	Total U. S.	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	North Pacific	South Pacific
	(Thousand Employees)										
TOTAL	1,408.6	126.8	361.7	319.8	127.9	130.2	64.5	65.3	12.7	57.4	142.3
Professional & Sub Professional	91.2	8.5	19.7	18.8	7.3	9.7	3.3	5.4	0.6	5.3	12.6
Skilled	550.8	52.2	138.6	118.9	46.9	54.1	24.4	26.1	4.9	25.4	59.3
Semi-skilled	539.1	44.5	145.9	133.7	54.5	43.9	26.7	23.0	5.2	16.0	45.7
Unskilled	227.5	21.6	57.5	48.4	19.2	22.5	10.1	10.8	2.0	10.7	24.7

* Preliminary estimates, Bureau of Labor Statistics, May 20, 1941.

INDUSTRIAL DEFENSE HOUSING

The great expansion in employment in defense industries will not only exhaust the resident labor supply in many localities, but will increasingly require migration of a large number of workers into these communities. This migration is already taking place in many localities and as defense production is speeded up with its relatively great geographical concentration, the exhaustion of resident labor supply will more and more require moving laborers into the necessary communities.

Detailed field studies of 102 areas, prepared largely by the Bureau of Employment Security, indicate that defense industries in those communities expect to add nearly 1,300 thousand workers to their pay rolls during 1941 on the basis of contracts at the time of the survey. It is estimated that about 30 percent, almost 400 thousand, will need to be imported from communities outside of a practicable commuting area.

On the assumption that total employment in defense centers will have increased by two and one-half million between December 1940 and June 1942, a total of 750 thousand defense workers must move their residence to the defense centers. About half of these migrants will be married and have families.

TABLE 16 - DEMAND AND SUPPLY FACTORS FOR HOUSING IN SELECTED DEFENSE AREAS

Area	Estimated Increase in Employment	Estimated Number of Workers Required from Outside Defense Area	Period Covered by Labor Estimates (12 Mo. Ended)
Los Angeles, Calif.	114,000	53,000	March 1, 1942
Detroit, Mich.	105,000	56,000	Jan. 1, 1942
Philadelphia, Pa.	51,000	26,000	Jan. 1, 1942
San Francisco, Calif.	33,830	11,000	March 1, 1942
Dallas-Ft. Worth, Texas	27,000	17,000	Dec. 31, 1942 a
Seattle, Wash.	22,000	9,000	Jan. 1, 1942
Dayton, Ohio	15,120	7,500	Jan. 1, 1942
Bridgeport, Conn.	12,500	4,000	Jan. 1, 1942
Hartford, Conn.	12,000	3,600	Jan. 1, 1942
Canton-Alliance, Ohio	11,400	3,600	Feb. 1, 1942
Total for 10 Areas	403,850	190,700	
Total 92 Other Defense Areas	894,800	200,700	
GRAND TOTAL 102 Selected Defense Areas	1,298,650	391,400	

a 18 months.

Note: This does not include employment increases subsequent to the Bureau of Employment Security surveys, notably those in the Detroit area.

In addition to the large scale migration resulting from increased defense production in these communities, additional housing demand will be created through the natural forces of population growth, smaller families, and undoubling of families from improved income; thus, only a portion of the existing supply of vacant houses and of the supply of houses coming on the market through new private construction are available to meet the requirements of the new defense workers.

The census of housing showed for April 1940, before the initiation of the defense program, that 4.7 percent of all dwelling units in the 140 metropolitan areas in the United States were vacant. Since the date of the housing census, vacancies have fallen sharply in the industrial cities most directly affected by the defense program. In 71 urban areas, which were affected by defense orders, the vacancy rate was already low in the spring of 1940 and fell from 2.8 percent to 2.1 percent in the early months of 1941—before the full anticipated increase in employment was effective.

The declining level of vacancies was accompanied by some increase in the level of residential rents although this increase has been relatively small to date over the country as a whole. The small number of cities most directly affected, however, are distinct exceptions. In some localities, mainly the smaller places, very large rent increases have occurred.

TABLE 17 - RESIDENTIAL VACANCY IN 71 DEFENSE INDUSTRIAL CITIES OR AREAS

Percent of All Family Dwelling Units That Were Vacant	Number of Cities or Areas with Indicated Vacancy	
	Apr. 1940	Dec. 1940-May 1941
Under 1.0	3	1
1.0 - 1.4	5	20
1.5 - 1.9	7	13
2.0 - 2.4	16	12
2.5 - 2.9	8	9
3.0 - 3.9	13	7
4.0 - 4.9	5	6
5.0 and over	14	3
TOTAL	71	71

New residential construction during the first year of the defense program has been proceding at a more rapid rate than at any time since 1928.

During fiscal year 1941, privately financed residential construction totaled 508 thousand units in nonfarm areas compared to 426 thousand in fiscal year 1940, according to preliminary figures from the Bureau of Labor Statistics. Exact data are not available as to how much of this construction occurred in defense areas and much of it was in higher price ranges than defense workers could afford, but insofar as it occurred in defense areas the general housing situation was benefitted.

About 400 thousand dwelling units, including the publicly financed units, were constructed in defense areas.

Direct public construction of defense housing has been undertaken in defense areas where the housing need is purely temporary, where the families requiring housing cannot afford to live in new private construction, and to some extent in areas where private enterprise cannot produce the needed volume of housing in a sufficiently short time.

As of the end of June 1941, out of the public funds made available especially for defense housing, allocations had been made for 59 thousand dwelling units for industrial workers and 37,500 units were under construction with 6,600 units completed. In addition to these permanent units, allocations have been made for 4,100 trailers of which 1,200 are completed and 8,900 units for single persons of which 3,100 have been completed.

In addition to housing for industrial workers, public defense housing has been provided for married enlisted men and civilian employees of the Army and Navy. Altogether 38,300 units have been allocated for these families and 10,900 units completed by the end of June.

The full impact of the defense program upon the housing situation cannot yet be seen in detail since half of the industrial facilities to be added under the defense program have not been planned or located and a considerable portion of the defense orders are yet to be placed.

For the fiscal year 1942 it is estimated by the Defense Housing Coordinator that the requirements for additional family dwelling units in defense areas will total 525 thousand family dwelling units of which approximately 125 thousand will need to be supplied from public funds.

TRANSPORTATION AND POWER

The defense program has placed a larger and growing burden on our basic utilities, and especially on our transportation and electric power facilities. Since the latter part of 1940, limited overseas shipping capacity was a restrictive factor on defense aid to Britain. Want of overseas shipping facilities during fiscal 1942 may aggravate our raw material problems. Railroad and pipeline facilities will probably not be adequate to meet both military and civilian requirements, and an electric power shortage is in prospect next December.

Overseas Shipping

By far the most crucial phase of the transportation situation today is that of overseas shipping. Total merchant tonnage of vessels available to Britain, the United States, and other countries, not including tonnage under Axis control, is probably between 25 and 30 million tons. As of June 30, 1941, 6.9 million tons were under United States registry.

A satisfactory current requirements estimate is not available, but there is a substantial current shortage. During the nine months ended June 30, 1941, vessels clearing American ports averaged 3.7 million tons per month as compared to 4.0 million tons during the third quarter of 1940. Last winter the tonnage of vessels passing through the Panama Canal was substantially below that of the preceding year. For May 1941, the margin was only slightly below that for May 1940.

This situation has been met in part by diversions of shipping from coastwise routes and other improvements in routing, and in part by an informal system of shipping priorities. Our overseas dry-cargo exports during June 1941, is estimated at about 28 percent less than the average during the three months, July - September 1940.

Our merchant ship construction program was described above in Chapter 2. It is estimated that total replacements of merchant tonnage available to Great Britain, United States, and other non-Axis nations will not equal current shipping losses until early in 1942. Meanwhile, our production of munitions and defense equipment and materials is scheduled to increase rapidly during the coming months. This will involve an increased demand for overseas shipping. The merchant vessel shortage is destined to become more acute before it can get better.

Railroads

The strategic importance of our railroad transportation system to the defense program was demonstrated in 1917 when the railroad congestion threatened to tie up our entire economy. A major factor at that time was the use--or rather mis-use of freight cars as a sub-

stitute for warehouses.

Many changes have taken place in our transportation system since World War I. Among them are the development of competing types of carriers, particularly automotive vehicles, and a great improvement in the allocation and routing of freight cars through the Car Service Division of the American Association of Railroads.

Nonetheless, various parts of our railroad system which required attention in 1917-18 may need attention again--the capacity of coastal terminals for trans-shipment to water carriers, the capacity of freight classification yards, aggregate locomotive tractor effort, freight car capacity.

The problem of freight car capacity is discussed here. Table 18 outlines the freight car situation on July 1, 1941, for Class One railroads and the changes in that situation during the preceding year.

The 1,661 thousand cars on July 1, 1941, represented a net increase of 1 percent during the fiscal year 1941. However, serviceable cars increased nearly 6 percent, for there was a substantial decline in bad order equipment.

The number of freight cars on order on July 1, 1941, was substantially larger than total installations during the preceding year. It was about five times what it had been 12 months earlier. Box cars and open top (gondola and hopper) cars together make up about 95 percent all Class 1 freight cars. New orders will add especially to the supply

TABLE 18 - FREIGHT CARS CLASS 1 RAILROADS, FISCAL YEAR 1941

	Box Cars	Gondolas	All Freight Cars
		(Thousand Cars)	
On hand July 1, 1940	701.7	785.4	1,644.9
Serviceable			1,492.2
Bad Order			152.7
Installations F. Y. 1941	35.8	25.9	65.1
Retirements F. Y. 1941	26.7	14.3	49.1
On hand July 1, 1941	710.8	797.0	1,660.9
Serviceable			1,575.6
Bad Order			85.3
On order July 1, 1941	59.8	28.0	92.6

of box cars. The test of the adequacy of our freight car supply will come next fall during the traffic peak. By October 1 we may have an increase of 10 to 15 thousand in our stock of serviceable cars, making a total of 1,585,000 to 1,590,000.

It is estimated that during the fall traffic peak, carloadings will run at the rate of 970 thousand per week, and that a total of some 1,590 thousand freight cars will be needed. This requirement estimate assumes a minimum idle surplus of 60 thousand cars and a utilization ratio of 10 cars newly loaded for 16.4 active cars. This would involve equalling the previously best recorded ratio, (10 carloadings to 16.4 active cars) in the fall of 1939. Clearly a tight situation is in prospect.

Oil Transportation

The diversion of 50 tankers for the British shuttle service, the gradual transfer of tankers to foreign registry, the requisition by the Navy of 12 new tankers have combined to create a shortage of facilities for transporting petroleum to the East Coast. In Table 19 will be found estimated consumption of refined petroleum

TABLE 19 - PETROLEUM PRODUCTS: EAST COAST REQUIREMENTS
FISCAL YEARS 1941 AND 1942

(Millions of Barrels)

	East Coast	
	Fiscal 1941 [a]	Fiscal 1942
Total	518	562
Motor Fuel	222	237
Fuel Oil	238	263
Other Products	58	62

[a] American Petroleum Fact Finding Report of May 13, 1941.

products in fiscal 1941 compared to the estimated requirements in fiscal 1942 for the East Coast States if no curtailment other than new car production is anticipated. It is estimated that this area will consume 562 million barrels of petroleum products.

In past years, 96 percent of these products were brought into the area by water in tankers principally.

The supply situation may be briefly summarized as follows:

TABLE 20 - SUPPLY OF PETROLEUM PRODUCTS, EAST COAST
FISCAL YEAR 1942

(Millions of Barrels)

Can be imported via water	427
Can be imported via rail	65
Can be imported via pipeline [a]	28
Total new supply	520
Stocks on hand, July 1, 1941	59
Total Supply	579

[a] Includes Pennsylvania crude

If total new supply reaches 520 million bbls., as estimated, there will be a deficit of 42 million bbls. The deficit is nearly as large as total stocks on July 1, 1941. The transportation bottleneck is likely to involve an especially severe shortage in the case of fuel oil.

It is possible that transport facilities will be unable to carry 520 million bbls. The rail transport estimate assumes that the 19,000 surplus tank cars reported by the American Association of Railroads are all in good condition and operate continuously beginning August 1, 1941. On the other hand, the new tankers now under construction have not been included. If made available to Gulf East Coast shipping, they would permit the carrying of 36 million barrels in fiscal 1942. It is doubtful whether these tankers will be placed in this service. Indeed, there is a possibility of still further diversion of tankers to the British shuttle service.

Increases in pipeline capacity which will come into operation during fiscal 1942 have been included, such as Southeastern pipeline, Plantation, etc., but variously contemplated lines from Texas or Oklahoma to the East Coast have not been included. They cannot be completed in time to help materially during fiscal year 1942.

The substitution of rail for water transportation will increase costs. According to recent estimates, the cost of transporting crude oil by rail to New York is $2.37 per barrel as compared with 67.5 cents by pipeline and with 53 cents by tanker.

Electric Power

In 1917-1918 electrification of American industry had not gone far enough to make electric power a central defense problem, although serious local difficulties were developing at the time of the Armistice. Today the provision of adequate electric power is of crucial importance to defense.

Total United States generating capacity has grown steadily in recent years. Total dependable capacity on December 31 for the last two years and estimated capacity as of the end of 1941 are as follows:

	Million KW
1939	30.5
1940	34.0
1941	37.2

Compared with the estimated dependable capacity at the end of 1941 of 37.2 million kw, the estimated power requirements are 33.9 million kw. The excess of capacity over requirements, 3.3 million kw, is about 1 million kw less than the capacity estimated to be needed as minimum reserves. Proportionately, the infringement upon reserves is more serious in certain sections of the country, particularly in the eastern areas. For the calendar year 1942, despite substantial increases in capacity, preliminary forecasts of power requirements indicate infringement upon reserves more serious than at the end of 1941 and sufficient to threaten temporary power shortages over large portions of the country.

At the present time detailed plans are being developed for assuring an adequate defense power supply during this critical period. In addition to installing additional generating capacity

up to the limit of manufacturers' ability to furnish equipment, extensive transmission interconnections are under way and planned which will enable load requirements to be spread more uniformly over the available generating capacity and will permit pooling of reserve capacity and hence lessen the service hazards from using reserve capacity for regular operation. Additional power generating facilities are being planned at locations suitable for defense and where the facilities will be valuable assets in the future economy of each section of the country.

PROCUREMENT PROCEDURES

The defense program placed a sudden and heavy load upon the procurement system of the United States. Normally, the task of procurement is twofold: (1) to obtain goods and services when and as required by the Government; and (2) to obtain these goods and services at the lowest price possible and to ensure that the price is still high enough to give the seller adequate incentive fully to meet his obligations under the contract. This price, however, should not be so low as to be unfair to the seller or to cause him to be unfair in his contracts with others. In normal times and for nondefense agencies there is less pressure for haste and hence more attention may be given to obtaining the lowest feasible price. Under the exigencies of the present emergency where speed is essential there is always the danger present that disorderly buying may become prevalent.

In this connection, a comparison of the experience under the defense program during the past year with conditions during the first nine months following our entry into World War I reveals an outstanding contrast. The former period was marked by extremely disorderly buying, whereas, buying during the past year has on the whole been much more orderly.

During World War I, there were numerous instances in which contracting officers representing different units, the Army, the Navy, our Allies, or even contracting officers in the same department of our Government, bid against each other for a supply which was inadequate to meet the total war demand. There were many instances, too, in which one branch of the service was short and another held an unnecessarily large inventory.

If the record of defense efforts during the past nine months has from time to time been marred by disorderliness in buying, nonetheless, by comparison with the first nine months of our participation in World War I, buying in the more recent period has been fairly orderly. There have been important developments in the forward planning of procurement, in the careful timing and placing of contracts, and in the coordination of buying by different contracting officers.

Three steps in the direction of forward procurement may be singled out for mention here: one of these is the development of a billion dollar stockpile program. Under this we are accumulating stocks of strategic and critical materials, materials for which demand is greatly increased by the defense program or for which war conditions threaten a serious curtailment of supply. It is thus a form of price insurance. [a]

A second step in the direction of forward procurement planning involves the better timing and placing of purchases of finished goods, goods for which there are both defense requirements and civilian uses. This type of forward planning is illustrated by a supplemental appropriation for the War Department for 1941 amounting to $175 million,[b] for the accumulation of inventories of clothing and other quartermaster items to make possible the timing and placing of purchases so as to obtain the most favorable market conditions. Under this fund, invitations to bid were issued for 900,000 overcoats; 400,000 mackinaws, a million and a half serge coats, and more than two million and a half pairs of wool trousers for production during the slack season.

A less spectacular but perhaps more significant step has been the development during a period in which markets have not been very tight, of a reserve group of contractors who are familiar with Government purchasing practices and to whom the Government can look for additional supplies. Various devices have been used to develop this reserve group of contractors. Bid invitations have called for bids F.O.B. mill. Bid invitations of the split-bid type have been issued. The setting of a maximum [c] contract per bidder spreads the work among a number of contractors. Variations in specifications have been permitted different contractors. The requirement to use domestic materials has in some instances been relaxed, and outright persuasion has been resorted to. The development of a reserve group of contractors does not, in general, mean lower prices. It is rather a form of price insurance. A further factor which has contributed to the greater orderliness in buying has been up until recently, the easier market conditions prevailing. In a vital sense, the test of procurement methods still lies ahead.

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[a] The stockpile program is discussed in greater detail earlier in the chapter.

[b] Approved February 14, 1941.

[c] A minimum is commonly set also.

A second contrast between procurement methods during World War I and during the past year has to do with the type of seller from whom the Government buys. During the recent experience the prime contractor has, as a rule, been a producer rather than a middleman. The marked shift from indirect buying to direct buying which has taken place is associated partly, no doubt, with the changes in the structure of the distributive system. It is associated partly too with changes in the relative importance of the various types of articles to be purchased.

Types of Contracts.

Present procurement methods share with those employed during World War I an extensive resort to negotiated contracts. These contrast with the types of contracts in vogue before July 1940. In October 1941, the NDAC announced a general procurement policy. The NDAC policy emphasized a variety of objectives, among which accurate conformity of the required commodity or service to specifications and speed of procurement received special emphasis. After recognizing that the advantages of the several methods of drawing contracts vary with the circumstances, this announcement made it clear that where negotiation better served the defense objectives than open competitive bidding, negotiation should be employed.

Recourse to negotiated contracts may be in effect required by circumstances under certain conditions. Thus if the number of sellers is very small or uniform quotations exist, competitive bidding may be highly undesirable in that the price may be much higher than if the contract were negotiated.

A second major condition which makes negotiated contracts desirable is to be found in cases where the article purchased embodies a military secret. It is clear that the production of such articles must be confined to a very small number of producers and that, once military information has been entrusted to a manufacturer, other manufacturers not similarly in the Government's confidence cannot compete with this manufacturer on an even basis.

A third condition which makes negotiation desirable is to be found in connection with the demand for various ordnance, chemical warfare, and other items for which total demand over a long period of years has been practically zero. When defense preparedness demand is introduced into such a situation through "educational" orders, a particular manufacturer must clearly be singled out to be educated, and the terms under which he operates subsequently clearly call for negotiation.

When Government demand for an article is so large as to represent a substantial fraction of industrial capacity, or, in some instances,

as to equal or exceed that capacity, the possibilities for open competitive bidding are somewhat limited. A part of the Government's requirement may be met through open competitive bidding, provided all the Government's requirements do not become known too early in the process. But, as capacity is approached, resort to negotiated contracts becomes essential. A special aspect of this case arises when the Government has given capital assistance to one or more suppliers.

Thus far, negotiated contracts have been most characteristic in fields of the defense program which illustrate these four cases, viz: the plane program, the ship-construction program, the ordnance program, and the purchase of real estate.

Competitive bidding has been used for such items as clothing, shoes, blankets, and other equipment readily produced by ordinary facilities.

The distribution of the Army defense contracts by major types, as of March 1, 1941, is shown in the accompanying table.[a]

Type of Contract	Percent of Value of All Contract Awards[a]
Open competitive bidding—lump sum or fixed price	31
Negotiated--lump sum	35
Negotiated--cost plus fixed fee	34

a Does not include project orders which it is estimated account for 14 percent of the value of all production on order.

As of March 1, 1941, 66 percent of the value of all Army contract awards represented negotiated contracts.

The proportion of contracts let according to these types is very different for the Navy. The following were reported as of June for the hulls and machinery of combat vessels:

Type of Contract	Percent of Value of All Contract Awards[a]
Negotiated--adjusted price (escalator)	75
Negotiated--cost plus fixed fee	24
Negotiated--lump sum	1

a Project orders are not included. Competitive bidding is used extensively for procurement of other types of equipment.

It has usually been assumed that the most favorable prices are obtained for the Government through the use of open competitive bidding. There has been considerable evidence of bidder collusion in the last several years which has defeated the alleged advantage of this type of contract.

On the other hand, negotiated contracts, as well as open competitive bidding and open-market purchases, ordinarily involve competition among sellers, when this is feasible. Thus, an Army purchase of an article, for the manufacture of which several facilities have been allocated, may be made only after conference with all of the allocated facilities. Open competitive bidding is neither the only possible competitive device for Government procurement, nor a procurement device that is certain to avoid monopolistic price.

Open competitive bidding and contract negotiation are thus not sharply opposed alternatives. Negotiation is also frequently found in connection with contracts fixed by competitive bidding. Thus negotiation may be needed to insure a friendly bidder. Moreover, whenever in connection with a contract it becomes necessary, subsequent to the award, to make a change in specifications, the change is necessarily a subject of contract negotiation.

In the case of split bidding, all bids below a price considered reasonable may be accepted, and the balance of the required quantity may be negotiated for. Or, where a long list of items is included in a single bid invitation, some items may be negotiated for. Or price differentials for extras may be fixed after negotiation but before inviting bids. The possibility of recourse to negotiation in whole or in part makes competitive bidding work better.

Planning by the Army prior to the emergency had led to the allocation of many industrial facilities for the production of specialized defense requirements. Although plans were not laid for a program of the magnitude of the one authorized, and hence the allocated facilities were not sufficiently large to meet the requirements, the prompt making of part of the contracts, especially for ordnance items, was aided by these allocations. It has been reported that the "Ordnance Department" has placed 85 percent of its orders for small arms, artillery, and ammunition components with industrial concerns already familiar with its problems.

Price Differentiation

Present emergency procurement methods are distinguished by the far greater use of price differentiation than in World War I. Partly as a means of justification of emergency prices higher than those prevailing in the preemergency period, a practice developed during

World War I has become somewhat general — the practice under which certain special cost elements are more or less separated from the price proper. Thus, special provisions have been made for the financing of necessary plants and equipment in fields where it is unlikely that there will be a continuing demand for the products of such plants and equipment beyond the duration of the emergency. The five-year amortization provision is open not only to prime contractors but also to all other producers at other stages of production. Costs incident to great speed (such as overtime pay, special bonuses for prompt performance, etc.) have similarly been more or less distinguished from what may be called the price proper in various contracts. Another segregation of cost elements from the price proper is found in provision for termination of the contract when the Government so elects and for a fair and just settlement in the event of such termination. The net effect of all of these is to expand the use of price differentiation in contracts.

PREFERENCE RATINGS AND PRIORITY ALLOCATIONS

Under normal circumstances, military requirements do not impose any strain upon the ability of industry to produce and deliver the requirements as provided for in the contracts. Such production can be handled without any large-scale displacement of orders for civilian purposes. But the urgency and continual expansion of the defense program make undesirable any reliance upon normal procedures to insure the deliveries as scheduled. More direct control is needed. This is furnished by the System of Priorities.

Deliveries may be held up for at least two reasons: (1) prior dates of deliveries scheduled by civilian and/or other military contracts, and (2) shortages of materials and equipment. Accordingly, two major types of control are needed to insure that production of the defense requirements is completed on time: (1) time control, i.e., control designed to prevent any delay in delivery because of the prior existence of civilian and/or less urgent military contracts. This type may be necessary even where the supplies are adequate both for defense and nondefense requirements. Where, however, the supplies of particular commodities are insufficient to meet all requirements, then, in order to insure that the military requirement shall be met, even if at the expense of nondefense demand, a further control is necessary; (2) quantity control, i.e., control over the allocation of available supplies to various uses.

Corresponding to these two types of control are the two major techniques used in the Priorities System. These two techniques are: (1) the preference rating, and (2) control of supply. Each of these techniques has a number of variants. The preference rating is in the main granted to an individual order and its purpose is to provide for the delivery on the contract as scheduled even if this involves displacing contracts with earlier delivery dates but with lower or no preference ratings. The allocation of supply is set up in order to insure that available supplies of specific commodities shall be used first for defense purposes and then if at all, for nondefense purposes.

The system of priorities began in June 1940 as a system solely of preference ratings, but as the size of the program expanded, shortages of raw materials, tools, etc., began to loom up and consequently in February 1941 the allocation of raw materials was undertaken, first with a few commodities and then on a wider basis.

The Preference Rating

1. The Priorities Committee of the Army and Navy Munitions Board. On June 28, 1940, Public 671, "An Act to Expedite National Defense" was enacted. Section 2-A of this Act provided that all Naval contracts and orders and all Army contracts and orders, shall, at the discretion of the President, take priority over all deliveries for private account or for export. It is to be noted that compulsion could, under this section, be used only with respect to Army and Navy contracts.

The Priorities Committee of the Army and Navy Munitions Board, which had been appointed in June 1940 was assigned the task of organizing the system of granting preference ratings to Army and Navy contracts. In the furtherance of this task an "Automatic Directive" was promulgated August 12, 1940. The directive classified military objectives in order of their importance and urgency. The classifications ranged from AA, A-1, A-c.....A-10, and similarly for B and other letters if required.[a]

On the basis of this directive, procurement officers in the field could "automatically" apply preference ratings and extensions thereof to all contracts for items on a list known as the Priorities Critical List. This list of some 200 items had been prepared by the Army and Navy Munitions Board a little earlier and was restricted to primary military items. This list at first was not published. At the same time, preference ratings could be extended from the prime contract to related subcontracts by the purchasing officers in the field.

In late August or early September this system of priorities was put into use. There is very little information available on the extent to which the system was used by the Army and Navy for the period from September 1940 to the middle of February 1941. The best estimates indicate that preference ratings were extended to more than

[a] The significance of each rating is shown in Table A in the Appendix.

50,000 industrial contracts in this initial period. The system encountered difficulty in that most of the preference ratings given were A-1. As a result of this piling up of ratings in the A-1 classification, it was found necessary on November 28, 1940, to break down the A-1 classification into the following subclassifications:

A-1-a, A-1-b, ... A-1-j [h]

Beginning with the week ending February 22, statistics are available showing the number of preference ratings issued by weeks and the ratings assigned to each one. As seen from Appendix Table C, from February 22 to the week ending June 28, 1941, 289,166 preference ratings were issued by the Army and Navy Procurement Officers. Of these, 80 percent were concentrated in the three groups, A-1-b, A-1-c, and A-1-d. This heavy concentration in these subgroups would make it appear doubtful whether the system is really functioning well. When too many orders are marked "rush" the results are the same as when orders are not marked "rush" at all.

2. Administrator of Priorities and the Priorities Board. On October 21, 1940, a Priorities Board and an Administrator of Priorities were established by the Council of National Defense and authorized by the President under authority of Section 2-A of the Act of June 28, 1940. The Board's function was to lay down regulations with regard to priorities, subject to the approval of the President. The Administrator was to enforce these regulations.

The Office of the Administrator of Priorities operated in a limited field. Since Army and Navy defense orders for items on the Priorities Critical List could have preference ratings automatically applied to them by the procurement officers in the field, the problems that would arise in connection with the granting of priorities would be those that concerned items not on the Critical List or agencies other than the Army and the Navy. The Office of the Administrator of Priorities consequently received applications from industrial concerns and all branches of the Government other than the military for preference ratings. A separate application for a preference rating was required for each purchase order on which the applicant wished a rating. On October 23, 1940, a Commercial Aircraft Priority Committee was appointed by the Priorities Board to handle the problems within that field, and on October 30, a Machine Tool Priority Committee was appointed to handle the problems in the machine-tool field.

[h] See Table B in Appendix for the significance of these subclassifications.

Thus, the Priorities Board supplemented the functions of the Priorities Committee of the Army and Navy Munitions Board which continued to grant automatic ratings on contracts for the Army and Navy for items on the critical list.

3. The Division of Priorities. On January 7, 1941, the Office of Production Management was established and with it was established a Director of Priorities. In addition, there was also set up a Board of Priorities to serve as an advisory body. On February 17, 1941, a working arrangement between the Priorities Committees of the Army and Navy Munitions Board and the Priorities Division of the Office of Production Management was published. The principal points were the following:

(1) Army and Navy Munitions Board to determine priority ratings on all items on "Critical List." Expansion of this list to be agreed upon by both.

(2) Army and Navy Munitions Board to extend priority ratings down to first subcontractor.

(3) Allocation of raw materials to be within jurisdiction of the Priorities Division of the Office of Production Management.

(4) All certificates granting preference ratings to bear the signature of Director of the Priorities Division.

On March 17 the first Administrative Order of the Director of Priorities issued provided formal authorization for the handling of priorities for items on the Priorities Critical List by the Army and Navy Munitions Board for specified classes of contracts, and validated previous priorities orders and actions.

The major changes in this formal set-up over the previous one were as follows: (1) The Priorities Critical List was published for the first time and was to be revised and published on a monthly basis. (2) The Priorities Critical List was expanded to include commodities subject to allocation orders. The Priorities Critical List as of June 1, 1941, contained over 300 items. (3) In case of conflict between the allocation orders and preference ratings granted to individual contracts, the allocation orders were to take precedence. (4) The Army and Navy Munitions Board was again given jurisdiction

over all extensions beyond the first subcontract.[a] (5) The Army and Navy Munitions Board was to assign preference ratings on a nonmandatory basis to the price contracts of certain foreign governments and for subcontracts.

The individual Contract Preference Rating System is now as follows:

> The Army and Navy Munitions Board may issue ratings "automatically" for items on the Critical List.[b]
>
> The various classes of contracts handled by the Army and Navy Munitions Board on an automatic basis are: (1) Army and Navy contracts; (2) contracts of various Government agencies such as Maritime Commission, Coast Guard, Coast and Geodetic Survey, Panama Canal, and National Advisory Committee on Aeronautics; and (3) contracts for foreign governments such as Great Britain and Canada, which are deemed to be necessary to the defense of the United States as determined by the President.

The Priorities Division issues individual preference ratings after special application has been made and approved. It determines preference ratings for those items, including civilian items and military items, which do not appear on the Priorities Critical List. Such preference ratings cannot be extended automatically. Such extensions are treated as new applications.

[a] Previous to establishment of the Priorities Division of Office of Production Management, the Army and Navy Munitions Board had extended priority ratings below the first subcontract, but it was felt that not sufficient care had been exercised in granting such extensions. Hence, the attempt was made to control further extensions by depriving them of their automatic character. The attempt did not succeed because it was difficult to control the field officers.

[b] Prior to May 1, 1941, the items on the Critical List were deemed to include fabricated parts and accessories which were "designed to meet military specifications, and as designed are not commercially useful for civilian purposes." As of May 1, 1941, the limitation as to the military character of parts and accessories was dropped.

Up until May 31, 1941, mandatory power existed only for Army and Navy contracts, otherwise the system operated on a voluntary basis. An amendment on that date to the Act of July 28, 1940, extended the mandatory feature to contracts for governments whose defense the President deems vital to the defense of the United States and to contracts or orders, including subcontracts and subholders, which the President deems necessary or appropriate to promote the defense of the United States.

Appendix Table D shows the number and distribution of the individual preference ratings issued by both the Administrator and the Director of Priorities. Up to January 1, 1940, 550 certificates had been issued. From January 1, 1941, to June 28, 1941, 9,233 certificates had been issued. The concentration in the high ratings is not as great as in the case of the Army and Navy Munitions Board ratings. As compared with the 80 percent concentration in the a-1-b--A-1-d levels, the Priorities Division has issued 54 percent in the same groupings. The smaller concentration in these classes is due to the fact that the Priorities Division is far more concerned with borderline cases between defense and nondefense.

4. Limited Blanket Ratings. To simplify and speed up the granting of preference ratings other techniques are used where firms are engaged primarily in defense production. These are the limited blanket ratings provided for by the so-called P-orders, which include as a special case, the Defense Supplies Rating Plan. In addition, there was an earlier type called the Blanket Rating, not now used, and the project letter which has only recently been discarded.

a. The P-Orders. P-orders are issued only to industries in which the firms are engaged principally in defense work and which are having trouble in obtaining certain well defined materials. P-orders are permissive in character in that they make available to firms in a particular industry under fulfillment of certain conditions, a blanket rating applied to a specified list of materials for defense contracts. As of July 1, 1941, twelve P-orders have been issued and include the following: crane builders, machine-tool makers, airframe producers, aeroengine and propeller manufacturers, firms producing any commodities which may be used for defense purposes for sale "off-the-shelf," merchant shipbuilding, and freight car construction.[a] As of June 28, 1941, 358 preference ratings have been granted under these P-orders. There have been complaints that the blanket order has been used indiscriminately by the firms coming under it; also that it is being used for items not specified, such as aspirin, books, etc.

[a] Appendix Table E shows the P-orders, the effective dates, the coverage, and the controls set-up.

b. Defense Supplies Rating Plan. This plan is a procedure whereby a firm can establish the proportion of its business devoted directly or indirectly to national defense work. After the proportion of defense work is established, and if it is substantial, a certificate is granted carrying an A-10 rating to apply to the defense proportion of the producer's purchase orders. Anyone may apply but, in general, certificates are restricted to concerns manufacturing small items for off-the-shelf distribution, which are important to the defense program. They are granted for three months periods. As of June 30, 1941, the applications of 65 firms had been approved, 25 more were in process, forms had been distributed to 900 firms; 10 thousand to 15 thousand firms, it is estimated, are potentially eligible.[a]

Control of Supply

As long as individual preference ratings were applied to contracts representing only part of the available supply and capacity of an industry, the chief problem was to make certain that the deliveries would be made as scheduled. Under such conditions there could be two parts of the supply, "priority supply," and "free supply." The free supply could then be disposed of at the will of the supplier. But as the volume of defense contracts grew, a further problem developed, viz., shortages in the available supply, so that both defense and nondefense requirements could not be simultaneously met. But the system of preference ratings was not fool-proof in making certain that defense requirements would be met first. It takes time before the extensions reach the lowest layers of subcontracts and consequently nondefense contracts could thus have first claim upon the limited supply. In addition, many contracts, although for defense purposes, could not trace a direct connection with defense orders. Moreover, there was no control of the remaining supply left after priority claims had been met. And when this supply was too small, the fact that priority claims had been met at any moment did not mean that all known defense requirements had been satisfied, in any case where requirements had not been fully translated into defense contracts.

The first steps taken in the direction of control of supply were in late January and February and were not very stringent. The controls were informal in character, being requests rather than orders. The first items affected were machine tools, alumimum, and magnesium.

[a] The method of granting ratings through project letters is no longer used but has been used in the case of certain important defense projects, plant construction etc. As of June 28, 1941, 57 preference ratings had been granted under the project letters.

1. Allocation of Supply: The M and E-Orders. Beginning in March, formal controls were set up. The most far-reaching type of control used at first was the mandatory priority letter, which was later superseded by the M and E types of General Preference Order. (The initials denote Material and Equipment respectively) There had been only one E order as of July 1, 1941, E-1, which directs that no machine tool may be delivered unless the contract for the machine tool carries a preference rating. Each M-order establishes control over the distribution of the raw materials named in the order. This control varies from a detailed allocation of the total supply, as in the case of neoprene, to the establishment of a minimum preference rating for all defense contracts for such raw materials. Each order provides that defense contracts must be filled first if necessary and that other contracts will be filled, if at all, in accordance with a standard set forth in each order. In effect, ratings equal to or better than the minimum rating specified in the order are assigned for all defense contracts and lower ratings are assigned to all other contracts. In some cases, a system of quantity allocation is also established.

As of July 1, 1941, there have been 14 M-orders issued, while an additional one in preparation had not yet been issued.[a] The commodities affected are given below:

Commodity	Order Number	Date Effective
Aluminum	M-1	3/21/41
Magnesium	M-2	3/24/41
Tungsten	M-3	3/26/41
Neoprene	M-4	3/28/41
Nickel Bearing Steel	M-5	4/10/41
Nickel	M-6	5/15/41
Borax and Boric Acid	M-7	6/ 9/41
Cork	M-8	5/31/41
Copper	M-9	5/29/41
Polyvinyl Chloride	M-10	6/ 9/41
Zinc	M-11	7/ 1/41
Tung Oil	M-12	Not Issued
Synthetic Rubber	M-13	6/ 9/41
Tungsten in High Speed Steel	M-14	6/11/41
Rubber	M-15	7/ 1/41

In addition there are two milder forms of control: General Metals Order Number 1 and the General Steel Preference Delivery Order.

[a] See Appendix Table F for details.

2. Control of Inventories.

General Metals Order Number 1, issued on May 1, 1941, provided for a mild inventory control over sixteen (now fourteen) metals and classes of metals. It provides that, in general, shipments of the metals affected may not be made to customers in amounts which would increase the customers' inventories to unnecessary levels. The sixteen are:

1. Antimony
2. Cadmium
3. Chromium [a]
4. Cobalt
5. Copper[b]
6. Ferro-Alloys, All Types
7. Iridium
8. Iron and Steel Products, including rolled, drawn forgings, castings, and pig iron.
9. Lead
10. Manganese or Spiegeleisen
11. Mercury
12. Molybdenum
13. Nonferrous Alloys, all types
14. Tin
15. Vanadium
16. Also, secondary materials, or scrap, containing any of the metals listed herein or any metals otherwise subject to an allocation order of the Director of Priorities, prepared for sale in order to recover the metal content thereof.

3. Control of Deliveries.

General Steel Preference Delivery Order in effect on May 29, 1941, directs all producers to give preference to defense orders and asks that any customer who feels he is subject to unreasonable delay or whose order is refused by a producer file with the Priorities Division a form setting forth the facts concerning this delay. The Priorities Division will then take action to bring about the delivery of the material, if it is needed for defense.

The Appendix Table G shows the total number of commodities subject to some form of supply control by the Priorities Division.

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[a] Made subject on July 7, 1941 to allocation order M-18.

[b] Made subject on May 29, 1941 to allocation order M-9.

Civilian Allocation

The existence of shortages creates a twofold task: (1) safeguarding the prior claims of the defense program to available supplies of materials; (2) the allocation of residual supplies available for civilian consumption after defense requirements have been met. Safeguarding the claims of the defense program is mainly a function of the Division of Priorities of OPM. The allocation of supplies available for civilian use is a function of the Office of Price Administration and Civilian Supply, created on April 11, 1941. This Office has four major responsibilities: (1) To control prices to avoid profiteering and unwarranted price rises; (2) to facilitate an adequate supply of materials for civilian use; (3) to distribute materials for civilian use among various industries, firms and users; (4) to protect consumer interests.

Scarce materials are allocated between different uses after consideration of: (1) the extent to which curtailment of the output of any industry or firm will dislocate production and cause unemployment; (2) the effect of curtailment on the satisfaction of consumer needs; and (3) the effect of curtailment on the relative positions of firms in each industry.

Three devices are used for civilian allocation. Firstly, programs are formulated for the distribution among industries of the total supply of a scarce material available for civilian use. As of July 1, 1941, eight civilian allocation programs had been issued. They concerned the following commodities:

Date Issued	Commodity
5/31/41	Copper
6/ 5/41	Cork
	Pig-Iron, Ferro-Alloys, Steel Ingots and Castings, and all carbon and alloy steel products
6/ 9/41	Borax and Boric Acid
6/10/41	Material and Equipment necessary for construction and repair of freight cars
6/22/41	Rubber and rubber products
7/ 1/41	Materials used for maintenance and repair in 26 selected industries
7/ 1/41	Materials used for maintenance and repair in canning industry

These programs issued by OPACS contain only a general statement of the purpose of the allocation. Preference ratings for civilian use are assigned by OPM after consultation with OPACS. Usually, but not always, civilian uses are granted preference on a B level. Some civilian allocation programs recommend that selected uses of materials be granted a priority. For instance, repair parts to facilitate the maintenance of durable goods in the hands of users have been recommended for the highest civilian preference rating.

Impacts of Priorities

After a year's evolution and adaptation to new conditions which arose as the defense program grew, particularly in the last three months, the system of priorities has developed a complex structure. On the one hand, it assigns degrees of urgency to individual contracts or producers by means of preference ratings; on the other hand, it allocates the raw materials to various uses in accordance with their relative importance. Because of the very newness of this complex structure of priorities, it is difficult to assess its impact upon the economic system.

Certain problems, however, are beginning to emerge:

(1) The problem of enforcement. This problem in large part has arisen out of misunderstanding and in part out of an attempt to get around the rules and regulations of the Priorities System. To meet this problem, a Compliance Section was set up recently (July 7, 1941).

(2) The problem of restricting civilian consumption. Defense output has in the last year been an addition to the total volume of output, not a substitution for certain categories of output. The shortage of raw materials, machine tools, etc., will no longer permit this situation to continue. The coming year will see large shifts of resources from the production of nondefense to defense output. Consumers will be compelled to take large cuts in certain types of consumption. How this can be done most equitably is the problem confronting the Civilian Allocation Section of the Office of Price Administration and Civilian Supply.

(3) The problem of shifting labor. As materials become less available to nondefense production, labor may become displaced. This displacement will result in a temporary period of unemployment. To shorten this period of unemployment, steps are needed to shift labor with the least possible delay from nondefense production to defense production. The problem is most acute at present in the aluminum ware industry where it is reported that at least 20 percent of the workers are unemployed, 3 thousand out of 15 thousand. In other industries, automobiles, electric refrigerators, etc., the problem is potential.

This problem of labor displacement is particularly significant for the distributive trades. As the quantity of goods available for consumption is restricted, the vast distributive system will become affected; salesmen, advertisers, installment business, gasoline station attendants, etc.

(4) The problem of prices. The use of larger and larger amounts of commodities for defense purposes without parallel in-

creases in the total supplies creates an upward pressure on prices. Since consumer incomes are also rising, added pressure is created for price rises.

These are problems which now confront the American people. They are the inevitable result of the transfer of production from a non-defense to a defense basis. They should not, however, be productive of much hurt and suffering if integrated plans are developed to handle them. If solutions are dalayed, these present-day questions may turn into future major crises.

Chapter 4

INTERNATIONAL ASPECTS

The measures taken to control the flow of goods and funds from and into the United States are an integral part of our defense program. They include steps taken to strengthen friendly countries economically. They also include policies which make access to our resources difficult if not impossible for unfriendly countries.

Six major steps taken thus far are the following:

(1) British purchases.
(2) Defense Aid. (Lend-Lease)
(3) Export Control.
(4) Freezing of funds of countries regarded as unfriendly or as under the control of unfriendly countries.
(5) Defense Credits.
(6) Program of Commercial and Cultural Relations with Latin America.

In addition to these there is the stockpile program discussed above in Chapter III.[a]

BRITISH PURCHASES

Both France and the British Empire made extensive purchases of war material in the United States, the French on a larger initial scale than the British. No exact information is available on the extent and disposition of French purchases. It does not appear, however, that large deliveries were made to France under these orders. When France fell, the great bulk of unfilled orders were taken over by the British.

British Empire countries have placed orders in the United States through the facilities, or with the knowledge, of the British Purchasing Missions, totaling over $3.7 billion, inclusive of approximately $146 million direct capital aid to United States manufacturers. Under this program of purchases, over $2 billion had been disbursed as of June 30, 1941.

a Since June 30, 1941, the policy of preclusive buying of defense materials by the United States to prevent their shipment to the Axis Powers, and preclusive selling of products in Latin America which might otherwise come from Axis countries, have become a definite part of the economic defense program.

The major classes of commodities purchased by the British are:

(1) Aircraft Products
(2) Ordnance, including explosives, ammunition, arms, and tanks
(3) Iron and Steel Products
(4) Machine Tools
(5) Merchant Ships

Such orders have, when necessary, been given a priority status. Under these they may have the same urgency as orders placed by the Army and Navy. Preference ratings have been extended to British orders since December, 1940.

Aircraft Products. The British have ordered about $1.7 billion of airplanes, engines, and aircraft accessories. This amount includes not only the equipment originally ordered by the British, but also those orders, placed by the French and other nations, which were subsequently taken over by the British. Between 60 and 75 percent of the equipment ordered will be delivered by the end of the calendar year, and the entire order will be completed by the middle of 1942. The British also have options to purchase additional engines and accessories, but it is likely that these options will be absorbed in the Defense Aid program.

Ordnance.

A. Guns. The British have ordered about $240 million worth of guns. Most of these are small arms or infantry-supporting weapons such as machine guns, submachine guns, 20 mm cannon, and 37 mm tank guns. Facilities for the production of machine guns, originally financed by the British, have been purchased by the Defense Plant Corporation and the supply contracts are being absorbed in the Defense Aid program. Peak production of most of the equipment should be reached within the next few months.

B. Ammunition. Orders for ammunition for the British amount to about $222 million, including shells for small arms, 2 pound shells, and 75 mm and 6 inch shells. Production of these items is fairly good, and the present program should be completed some time during the latter part of 1942.

C. Tanks. About $190 million worth of combat vehicles have been ordered. Deliveries of equipment under these orders were scheduled to begin in July 1941 and the program should be completed late in 1942 or early in 1943.

D. Explosives. About $58 million worth of smokeless powder

and TNT has been ordered and about a quarter of this order has already been completed. The TNT order should be completed within six months and the smokeless powder order within a year.

Iron and Steel Products. The British have ordered about $340 million worth of iron and steel ingots and semi-fabricated or fabricated steel, of which about $300 million have been delivered.

Machine Tools. The British have also ordered over $310 million worth of machine tools, a large part of which has been delivered.

Merchant Vessels. Orders for merchant vessels represent about $160 million (60 cargo vessels). None of these vessels will be complete before the end of this year but all 60 should be finished by the end of 1942. Great Britain has also provided about $8 million to finance facilities for the production of these vessels.

Barter Transfers. The most dramatic barter transaction was the exchange of 50 overage United States destroyers for 99 year leases for naval and air bases on eight islands under British rule.

Economic aid has also been given in the form of barter deals. One of the best-known of these transactions is the cotton-rubber exchange agreement between the United States and the United Kingdom on June 23, 1939. In this agreement the United States agreed to supply the British with 600 thousand bales of cotton in exchange for a quantity of rubber equivalent in terms of value. The purpose of this transaction was to build up stocks in the event of war, and hence, these quantities were not to be sold through regular commercial channels.

Barter will relieve the pressure on financial resources as long as items are available on both sides to barter. It cannot, however, provide the resources on a sufficiently large scale for purposes of war. Lacking financial resources, some other form of aid is necessary. During the year under review the United States extended this aid through the Lend-Lease and First Defense Aid Acts.

DEFENSE AID (Lend-Lease)

Defense Aid represents by far the largest external form of defense effort thus far undertaken. The purchases made by the British in the previous period had put an enormous strain upon their ability to continue to purchase. This was true, also, of the other countries seeking aid. In response to this critical situation, the Lend-Lease program was begun. It is a scheme to avoid the bottleneck of finance and to deal with the democratic countries in terms of their ability to produce and use goods, not their ability to provide financing.

By the Lend-Lease Act of March 11, 1941, the President was empowered to transfer not more than $1.3 billion of equipment from stocks or from material provided for in prior appropriations, and a program of Defense Aid was also authorized.

The Defense Aid Supplemental Appropriation Act, March 27, 1941, made available $7 billion for the carrying out of the purposes of the Lend-Lease Act. The President may, under this act, reimburse the various agencies for transfers under Lend-Lease but he is not required to do so. Under the two Acts the potential maximum of Defense Aid is therefore $8.3 billion.

Under the Defense Aid Act, funds were appropriated for eight major objects, with the provision that an amount not to exceed 20 percent may be transferred by the President from one category to any other category, but that no appropriation may be increased by more than 30 percent. Prior to July 1, 1941, one such transfer had been made, as indicated in the accompanying table. Funds are also appropriated for two other categories to cover miscellaneous services and expense and administrative expenses.

Presidential Allocations.

To June 30th, the President had allocated $5,176 million of Defense Aid funds to various Federal departments and agencies to which he has assigned the task of providing aid, i.e., 74 percent of the 7 billion dollar total had been so allocated. In four of the categories of a more urgent character, over 90 percent of the appropriation had been allocated. In a fifth important category, facilities and equipment, only 45 percent of the appropriation had been allocated. In the case of Agricultural and Industrial Commodities, most of which are purchased as needed, and after they are produced, 29.4 percent of the original appropriation had been allocated. The per-

TABLE 21 - DEFENSE AID APPROPRIATIONS

Category	Appropriations (as in Act)	Appropriations (After Transfers) between Categories)*
	(Million Dollars)	
(1) Ordnance, Ordnance Stores	1,343	1,343
(2) Aircraft & Aeronautical Material	2,054	2,054
(3) Tanks & other Motor Vehicles	362	362
(4) Vessels & other Watercraft	629	729
(5) Misc. Military Equipment	260	260
(6) Facilities & Equipment	752	752
(7) Agricultural & Industrial Commodities	1,350	1,250
(8) Testing, Repairing, Etc.	200	200
(9) Misc. Services and Expenses	40	40
(10) Administrative Expenses	10	10
TOTAL	7,000	7,000

* Status as of July 1, 1941. During the week ending July 9, several subsequent transfers were effected, as follows:

Increases		Decreases	
Ordnance & Ordnance Stores	$130,000,000	Facilities and Equipment	$132,600,000
Tanks & Other Motor Vehicles	108,600,000	Agriculture & Ind. Commodities	170,000,000
Vessels and Other Watercraft	54,000,000	Testing, Repairing, etc.	40,000,000
Misc. Military Equipment	50,000,000		
Total	$342,600,000		$342,600,000

centages of appropriations allocated, by category, were as follows on June 30, 1941:

	Percent Allocated on June 30, 1941	
Ordnance and Ordnance Stores	91.9	
Aircraft and Aeronautical Material	98.4	
Tanks and Other Vehicles	93.9	
Vessels and Other Watercraft	88.6	(102.7) 1
Misc. Military Equipment	41.2	
Facilities and Equipment	45.1	
Agricultural and Industrial Commodities	31.8	(29.4) 1
Testing, Repairing etc	37.8	
Misc. Services and Expenses	33.0	
Administrative Expenses	43.7	
Total	74.0	

1 The figure in parentheses represents the percentage of the original appropriation; the first figure is the percentage of the appropriation after the transfer indicated in Table 21.

Data on obligations incurred, by object and by procuring agency, are available, but the Division of Defense Aid has not approved their inclusion in this review.

Transfers

On May 31, 1941, title to defense articles amounting to a little over $75 million had been transferred under the Lend-Lease Act, of which $64.5 million were under appropriations made prior to March 11, 1941, and the balance under the Defense Aid Supplemental Appropriation Act. While the destination has not been revealed, it may be presumed that the principal destination was Great Britain. During the month of June, it is understood that greatly increased quantities of defense articles have been transferred, but exact data are not available. Deliveries up to May 31 by agencies were as follows:

Department or Agency	Total (Millions)
War	$35.4
Navy	7.1
Maritime Commission	10.5
Treasury	14.2
Agriculture	8.0
Total	$75.2

Deliveries to May 31 classified by chief objects were as follows:

Objects	Total (Millions)
Ammunition for small arms & artillery, explosives, etc.	$ 9.8
Ordnance: arms and miscellaneous	20.6
Aircraft	4.0
Vehicles	3.4
Watercraft, etc.	26.2
Signal & Chemical Equip., etc.	1.8
Agricultural Products	8.0
All other	1.4
Total	$75.2

EXPORT CONTROL

The present system of export licensing went into effect after the passage of the Export Control Act, ("An Act to expedite the strengthening of the National Defense"), July 2, 1940. Under this Act, the President, through Executive and Military orders, set up an Administrator for Export Control and a Control Procedure. The Procedure provides that the Secretary of State shall issue or deny export licenses after a specific directive from the Administrator of Export Control. The Administrator of Export Control has set up an Interdepartmental Committee consisting of representatives of the several departments and agencies especially interested in the control of exports to advise him on policy under the Act.

Before the passage of the Export Control Act, the exportation of "arms, ammunition and implements of war" was subject to licensing under the Neutrality Act, administered by the Department of State. The primary purpose of this export restriction was to limit international traffic in arms. For the first six months of 1940 these items constituted about 7.5 percent of the total exports from the United States.

Shortly after the passage of the Export Control Act, 40 additional categories of products, needed for national defense, were placed under the licensing system. The system was gradually extended until by December 1940 almost 25 percent of the total exports were subject to control. As of the end of May 1941, 44 percent of our May exports were subject to the licensing system.

The following table shows the exports for May 1941 by commodity groups and the respective percentages subject to licensing:

	Millions of Dollars May 1941	Percentage Subject to Licensing [a]
TOTAL EXPORTS	$ 384.6	44
Commodity Groups		
Animal & Animal Products, edible	9.7	11
Animal & Animal Products, inedible	3.4	11
Vegetable Food Products & Beverages	16.1	23
Vegetable Products, inedible (Except Fiber & Wood)	17.4	4
Textile Fibers & Mfgs.	21.0	6
Wood & Paper	12.3	8
Nonmetallic Minerals	40.0	36
Metals & Mfgs. (Except Mach. & Vehicles)	56.5	78
Machinery & Vehicles	155.4	50
Chemicals & Related Products	22.8	35
Miscellaneous	30.0	51

[a] Under licenses in force at the end of the month. By the Presidential Proclamation of July 17, 1941, none of the items heretofore under licensing may be exported to or for the account of the persons whose names appear on the "Proclaimed List of Certain Blocked Nationals," except by special licenses. Also Schedule Z has been issued by the Administrator of Export Control placing hundreds of additional items under licensing as far as the "Proclaimed List of Certain Blocked Nationals" are concerned.

The export licensing system, initiated primarily as a neutrality measure, then extended to conserve defense materials, has been further modified to harmonize with the policy of aiding democracies and strengthening hemisphere defense. Though there is no exact statistical measure of the aid to democracies, or victims of aggression, through the direction of exports under the licensing system, the following table, giving exports to major destinations for the first five months of 1941 in comparison with the corresponding period of 1940

shows changes which reflect in large measure effects of export control. However, the indicated 75 percent decrease in the exports to the "all other" countries (including France, Belgium, the Netherlands, and other Continental European countries) reflects not the effects of export control, but rather the British blockade, and a shortage in shipping facilities.

TABLE 22 - TOTAL EXPORTS BY PRINCIPAL DESTINATIONS

Destination	First 5 Months		Percent Increase or Decrease 1941 over 1940
	1940	1941	
	(Million Dollars)		
United Kingdom	280.9	520.2	+ 85
Canada	249.7	345.3	+ 38
Other Principal British Empire Countries and Egypt	124.0	233.6	+ 88
Portugal and Spain	25.5	12.8	- 50
Greece	6.6	12.2	+ 85
Latin America	341.8	355.6	+ 4
China	39.5	41.5	+ 5
Russia	36.1	21.8	- 40
Japan	91.8	47.8	- 48
Netherland Indies	19.8	39.4	+ 99
All Other	498.9	125.8	- 75
TOTAL	1,714.6	1,756.0	+ 2

The export under license of important products such as airplanes, arms, ammunition, and metal working machinery, accounts for the substantial gains in total exports to the United Kingdom, Canada, and other British Empire countries, for the first five months of 1941 over the similar period of 1940. This is particularly significant when the increase in trade with the British Empire countries is contrasted with

the decided declines to other countries, particularly Japan. Exports of many defense materials would almost certainly have been much larger to countries other than the British Empire and Western Hemisphere countries without the licensing system. The Administrator of Export Control reports that during the first six months of the operation of the system, applications for licenses for about $150 million worth of materials were rejected.

The following table shows 3 categories of export products. Category A represents increased licensed exports of essential defense materials being supplied to victims of aggression. Category B represents decreased licensed exports which are needed for national defense, and which have been restricted or entirely shut off to Axis Powers. Category C represents exports of raw materials and food exports not substantially restricted by licensing which have declined because of the blockade of the continent, the lack of shipping facilities, and other causes. The 15 commodities in the 3 categories represent about one-third of the total exports during the first five months of the respective periods.

TABLE 23 - U. S. EXPORTS BY TYPES OF COMMODITY

Commodity	First 5 Months	
	1940	1941
	(Million Dollars)	
A. Increases in Licensed Exports		
Steel ingots, billets, etc.	39.2	64.9
Steel mill manufactures	49.6	63.9
Metal working machinery	89.9	104.8
Airplanes	74.9	162.0
Firearms and ammunition	5.8	63.0
B. Decreases in Licensed Exports		
Iron and steel scrap	19.8	7.0
Tin plate and tagger's tin	27.1	10.1
Copper (ingots, plates)	45.6	12.2
Motor fuel and gasoline	31.5	19.7
Aluminum manufactures	10.2	1.7
C. Decreases in Non-Licensed Exports		
Cotton, unmanufactured	163.9	21.5
Tobacco, unmanufactured	23.7	18.6
Canned fruit	8.0	.5
Crude petroleum	27.5	15.9
Corn	10.6	2.0

In May 1941 Export Control was extended to exports from the Philippine Islands and territories, dependencies, and possessions of the United States, by a Joint Congressional Resolution.

Recently, also, instead of the individual licenses, customarily used at the outset, general and unlimited licenses have been issued for exports to British Empire and Western Hemisphere countries. Furthermore, authority to determine the "forms, conversions, or derivatives of items" of basic items placed under control by Presidential Proclamations has been delegated to the Administrator of Export Control.

DEFENSE CREDITS

The Export-Import Bank of Washington was organized in 1934, with funds furnished by the Reconstruction Finance Corporation, to facilitate foreign trade. Because of the trade difficulties with which various Latin American countries were faced after the outbreak of the European war in September 1939, the operations of the Bank have been directed primarily toward the improvement of Western Hemisphere trade as a hemisphere defense measure.

In September 1940 Congress, by an amendment to the RFC Act, increased the lending power of the Bank by $500 million bringing the total up to $700 million. The expressed purpose of the additional funds was "to assist in the development of the resources, the stabilization of the economies, and the orderly marketing of the products of the countries of the Western Hemisphere." With the exception of China and Finland, the new activities of the Bank have, since its increased lending power, been concerned with Latin American trade. A large part of the Latin American loans have been made for the purchase of United States industrial and agricultural products. The risks assumed by the United States Government through these Export-Import Bank loans are comparatively small. The net cost which can be charged to defense when the loans mature should be negligible..

The operations of the Bank from June 1940 to June 1941 were as follows:

	Status June 1940	Status June 1941	Increase
	(Million Dollars)		
Total Loan Commitments to Date	437[a]	730[b]	293
Total Disbursed to Date	160	267	107
Total Repaid to Date	62	100	38
Outstanding	99	167	68

[a] Includes $119 million authorization cancelled and expired.

[b] Includes $185 million authorization cancelled and expired.

The loans of the Export-Import Bank to foreign countries represent an outward capital movement but these loans have been a relatively small offset to a strong inward capital movement in recent years. The balance of payments showed a net inward capital flow of $1,403 million into the United States in 1940 as compared with only $85 million disbursed by the Bank.

In accordance with the expressed purpose of the $500 million additional capital provided for the Bank in September 1940, the operations have largely applied to Latin American countries although the disbursements to China have exceeded those to any other single country.

The operations of the Export-Import Bank with Latin American countries from June 1940 to June 1941 have been as follows:

	Status June 1940	Status June 1941	Increase
	(Million Dollars)		
Total Loan Commitments to Date	174	365	191
Total Disbursed to Date	63	102	39
Total Repaid to Date	40	56	16
Outstanding	22	46	24

The largest part of the disbursement to Latin American countries for the past year took place during the months of January to June 1941 and the full effects of the operation have not become fully apparent. A large part of the loan commitments have been made for the purchase of United States products. For example, Brazil is purchasing equipment in the United States for building up her steel industry. In addition, through credits from the Bank, Brazil has been able to release blocked obligations due United States investors. A temporary expansion of exports would ordinarily be expected following such credits, but due to the unusually heavy demands for defense materials, the imports from Latin America have exceeded exports during January to June 1941, reversing the trade position since 1938. The operations of the Export-Import Bank have created (or conserved) exchange for the purchase of needed products by Latin American and other countries which have been confronted with exchange difficulties.

The activities of the Export-Import Bank have been comparatively large and effective in the commercial relations with China. Loans to China constitute the largest single item in the balance of payments between the United States and China. Loans to China during 1940 were greater than either exports to, or imports from that country.

Following is a summary of the Bank's operations with China from June 1940 to June 1941:

	Status June 1940	Status June 1941	Increase
	(Million Dollars)		
Total Loan Commitments to Date	63	139	76
Total Disbursed to Date	38	98	60
Total Repaid to Date	9	21	12
Outstanding	29	77	48

The operations of the Bank in relation to China have made it possible for the United States to obtain from that country needed defense materials, such as tungsten and tin, which secure the loans.

The activities of the Export-Import Bank, together with the stabilization fund of the Treasury, constitute the principal Governmental means of furnishing financial aid to foreign countries. [a] During the past year the Treasury has committed itself to furnish financial aid to the extent of $50 million to Argentina and $50 million to China. The legislature of Argentina has not yet accepted the $50 million proffered to it.

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[a] The recently reported arrangements for a loan of $425 million to the British by the Reconstruction Finance Corporation under the Act of June 10, 1941,(Public 108, 77th Congress) will be independent of the Export-Import Bank and of the Treasury Department.

FROZEN FUNDS

An important step in cutting off or restricting access to the economic resources of the United States is the policy of freezing the funds of unfriendly countries and of their nationals and business enterprises wherever they may be located. Since it is impossible to use such blocked funds except under license, it becomes difficult for the nationals of the blocked countries (to whom general licenses have not been granted for this purpose) to purchase goods in the United States, or to pay for purchases in other countries with American funds, or to carry on propaganda work with such funds.

The countries whose funds are now [a] subject to the control of the United States Government and the dates on which their funds were put under control are as follows:

Date	Country
April 8, 1940	Norway
	Denmark
May 10, 1940	The Netherlands
	Belgium
	Luxembourg
June 17, 1940	France (including Monaco)
July 10, 1940	Latvia
	Estonia
	Lithuania
October 9, 1940	Rumania
March 4, 1941	Bulgaria
March 13, 1941	Hungary
March 24, 1941	Yugoslavia
April 28, 1941	Greece
June 14, 1941	Albania
	Andorra
	Austria
	Czechoslovakia
	Danzig
	Finland
	Germany
	Italy
	Liechtenstein
	Poland
	Portugal
	San Marino
	Spain
	Sweden
	Switzerland
	Union of Soviet Socialist Republics

[a] On July 26, 1941, the funds of the governments and nationals of China and Japan were also frozen.

Prior to June 14, 1941, the funds held in the United States by nationals of 14 countries, amounting to approximately $4,587 million, had been frozen. The greater part of these funds was held by the governments and nationals of the Netherlands and France.

On June 14, 1941, the funds of 13 additional countries were blocked. General licenses permitting the use of these funds were granted to six countries, the principal ones concerned being Switzerland and Sweden. Seven other countries were not granted general licenses and their funds remain effectively blocked except where they are permitted to be used for particular purposes under limited general or special licenses. Funds held by the governments and nationals of the countries blocked on June 14, 1941, to whom general licenses were not granted, amounted to $196 million, nearly all representing the funds of Germany and Italy.

The accompanying table shows funds held by blocked countries, and by countries to which general licenses have been granted.

COMMERCIAL AND CULTURAL RELATIONS BETWEEN THE AMERICAN REPUBLICS

Under an Executive Order, August 1940, the Office of Coordinator of Commercial and Cultural Relations between the American Republics was created. The principal function of the Coordinator is to correlate the activities of public and private agencies interested in inter-American relations. In this work, emphasis is placed on a policy of strengthening hemisphere solidarity as a part of national defense, as well as a long-range program of cooperation. The work of the Coordinator may be classified under the following four broad categories: financial and commercial development, cultural relations, communications, and social and civic welfare.

One of the most important functions under the category of financial and commercial development has been the Coordinator's activities in stimulating various agencies of the Government to increase imports of essential defense materials from Latin America. The Coordinator's study of representation in Latin America of United States business firms and the program which has been carried out in cooperation with the Departments of State and Commerce to replace anti-American representatives has been an important function of the Office. This operation laid the groundwork for the "Proclaimed List of Blocked Nationals" in the preparation of which the Coordinator's Office now participates. Another phase of this activity has been the program for developing inter-American trade, and stimulating industrial development in Latin America.

An outstanding activity under the cultural relations phase of the program has been to stimulate the teaching of Spanish, Portuguese, and

TABLE 24 - CONTINENTAL EUROPEAN ASSETS IN THE UNITED STATES

	Long Term	Short Term	Total [1]
	(Million Dollars)		
A. Countries blocked up to June 14, 1941			
Norway	62	110	175
Denmark	32	57	92
Netherlands	819	794	1,619
Belgium	258	494	760
Luxembourg	17	31	48
France	475	1,047	1,593
Latvia	-	12	12
Estonia	1	9	10
Lithuania	-	6	6
Rumania	5	48	53
Bulgaria	1	1	2
Hungary	16	8	24
Yugoslavia	2	69	71
Greece	21	101	122
Total	1,709	2,787	4,587
B. Countries blocked on June 14, 1941			
Germany	99	6	105
Italy	56	14	70
Austria	9	-	9
Czechoslovakia	5	-	5
Danzig	-	-	-
Poland	2	5	7
Albania	-	-	-
Total	171	25	196
C. Countries to which general licenses are available under the Order of June 14, 1941			
Switzerland	715	769	1,484
Sweden	51	465	516
Spain	21	9	30
Portugal	2	155	157
U.S.S.R.	-	39	39
Finland	1	16	17
Total	790	1,453	2,243
Grand Total	2,670	4,265	7,026

[1] The total column includes some assets not sufficiently clearly identified to be classified as long term or short term.

other Latin American subjects in the schools and colleges of the United States. Closely related to this has been the inauguration of a program for the exchange of students, artists, writers, and professors between the United States and Latin American countries.

Possibly the most significant project under communications has been the inauguration of an extensive program of both short and long wave broadcasts to Latin American countries. These broadcasts are sponsored by commercial firms of the United States. The exchange of films of all sorts is another activity in this category.

In the field of social and civic welfare the Office of the Coordinator has embarked upon a program of cooperation with various Latin American countries. As a result, directors and representatives of some 17 schools of social work of 11 Latin American countries have come to the United States to study the development of inter-American collaboration in the field of social welfare.

The above are only a few of the phases of the wide activities of the Office of the Coordinator.

Chapter 5

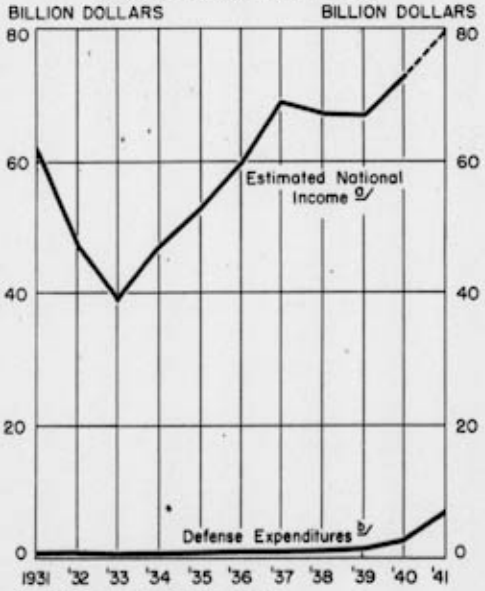
ECONOMIC AND SOCIAL IMPACTS

The magnitude of the defense program and the speed with which it has grown have had important repercussions upon our economy. A number of these repercussions and illustrations of the attendant problems are treated briefly below under several heads, as follows: national income and production, fiscal problems, prices and civilian supplies, and migration and social problems.

NATIONAL INCOME AND PRODUCTION

The defense expenditures of the United States in the decade preceding the present conflict amounted to 1.5 percent of the national income. Even in the twelve months preceding the initiation of our defense program, after the magnitude of the hostilities abroad became evident and its significance to the safety of the United States became clear, the total outlays for defense in the United States were only about $1.6 billion or 2.2 percent of the national income. The relation between national income and defense expenditure is shown in the chart to the right.

CHART 39 U.S. DEFENSE EXPENDITURES AND NATIONAL INCOME
FISCAL YEARS 1931 - 1941



a/U.S. Department of Commerce
b/U.S. Treasury and O.P.M.

In the light of this record, the undertaking of a program which grew to $50 billion in the subsequent year was a phenomenal step. It is true that all of the funds made available during the first year were not to be spent during that period. But the actual outlays for the year were greater than they had been in any peace-time year in the history of the country. Defense expenditures [a] in 1940-41 constituted nearly nine percent of the total national income. Toward the end of the year, mounting defense disbursements

[a] Not including payments on British contracts.

absorbed nearly 15 percent of the national income.

The unspent balance of the funds made available in the first year, to which additional appropriations have since been added, will be spent as rapidly as the productive capacity of the country is mobilized toward the execution of the program. It is to be expected that in the next few months the monthly rate of disbursements will rise rapidly.

There are two principal means of expanding defense production and expenditures. One is the expansion of total national production through bringing into employment unused or partially used resources and the other is the diversion of productive effort from the regular nondefense activities of the Nation.

When the defense program was initiated there was a considerable amount of idle plant and equipment and there were millions of unemployed workers. Total production, including services of all kinds, (or national income), was at the rate of less than $75 billion a year, while the estimates of total productive capacity ran around $100 billion. Hence, if the unused productive capacity could be fully and efficiently used for defense purposes, defense production could perhaps be as much as $25 billion a year without diminishing the supply of goods for civilian consumption which obtained immediately before the start of the Program.

The specialized nature of defense production, however, makes such a mobilization of resources difficult at best and impossible without a substantial lapse of time. To overcome shortages, it was necessary to incorporate into the program extensive additions of specialized industrial facilities (see chapter 3). Most of these will not be in production until 1942. In order to make use of the unemployed labor, a program of training for the specialized jobs called for under the defense set-up was necessary. This too will require time before it becomes fully effective. Although national income is less than 90 percent of our theoretical capacity to produce, shortages of raw materials, particularly metals, have developed and stand in the way of a rapid expansion of total production. As a result, diversion from normal uses is increasingly necessary along with expansion.

Two types of diversion from nondefense to defense activities should be recognized. <u>One</u> is the shift of resources from the production of finished goods. This means an immediate curtailment of the volume of such goods. We are already facing this problem. The <u>other</u> is a shift from the production of capital replacements. Though event-

ually the failure to replace plant and equipment used in production will result in the curtailment of the output of the finished products, the diminution in output need not occur immediately. We have not yet faced restriction of capital replacements, but may face this problem shortly.

To speed the defense program it may be necessary to postpone the making of replacements and concentrate on the output of necessary finished products. From this standpoint, reference to the so-called "gross national product" is perhaps more significant than to national income. The gross national product is the total volume of goods produced without deducting an allowance for depreciation. The value of the product represented by depreciation in 1940 was approximately $9 billion out of a total gross product of $85 billion, while in the present year the depreciation will be about $10 billion. To the extent that retirements and replacements of depreciated equipment may be postponed, the productive resources involved in such replacements may be shifted to defense production.

Thus there is a dual relation between defense expenditures on the one hand and national income and gross national product on the other. On the one hand defense expenditures tend to stimulate an expansion of the total product while on the other they merely displace ordinary production, and may lead to a decreased capacity to produce.

It is therefore difficult to determine precisely what defense disbursements are going to be in relation to the national income. It can be presumed, however, that as long as there is still expansible capacity, the expenditures for defense will tend to increase the total national output and hence will not impinge upon the normal civilian consumption to the full extent of the expansion in defense production. As the slack is taken up, however, the defense effort may increasingly have to be accomplished at the expense of the nondefense portion of the economy. As may be noted in the chart, the increase in national income in the first year of the program was substantially larger than the added Federal expenditures for defense purposes. As a result, the total consumption of the people was larger than in the previous year. Owing to the reemployment of large numbers of workers and to the increases in earnings the population as a whole was better off than before.

The increase in economic activities induced by the defense effort during the first twelve months has benefited nearly all classes of the population. Agricultural income, as shown in the chart below, was consistently higher in fiscal year 1941 than in fiscal year 1940. The increase was particularly noticeable in the last quarter of the period, and it appears likely that this upward trend will be accelerated as the program develops. So far the rise in farmers' incomes has

not been off-set to any material extent by the increased prices of the goods bought by farmers. Agricultural wages, however, have risen, and to the extent that such wages enter into costs the increase in net farm income tends to be less than the increase in farm cash income.

The increase in agricultural wages is paralleled by a marked shortage of farm labor which is especially noticeable in the agricultural regions near the industrial areas of the country. This shortage is due to a draining-off of farm labor by the expansion of industrial production and to an intensification of the demand for farm products, such as dairy and poultry products and vegetables, resulting from the influx of population and the expansion of incomes.

Industrial wage earners have benefited in two ways. There has been an increase in employment not only in defense industries but in consumer goods industries. As a result there has been an increase both in the number of wage-income recipients and in the number of hours per week per employee. There has also been an increase in average hourly earnings of workers, resulting partly from more overtime work and partly from increased wage rates. As will be seen in the table below, average nonagricultural employment outside the military establishment rose by more than two million during the period July 1940 through May 1941. Manufacturing employment alone increased by more than 1,170 thousand.

Hourly wage rates in factories increased 5 percent from an average of 65 cents in the preceding year. The result of increased hourly earnings and fuller employment is apparent in the increases in weekly earnings as well as in the increases in total wages and salaries paid.

CHART 40 - U.S. CASH FARM INCOME

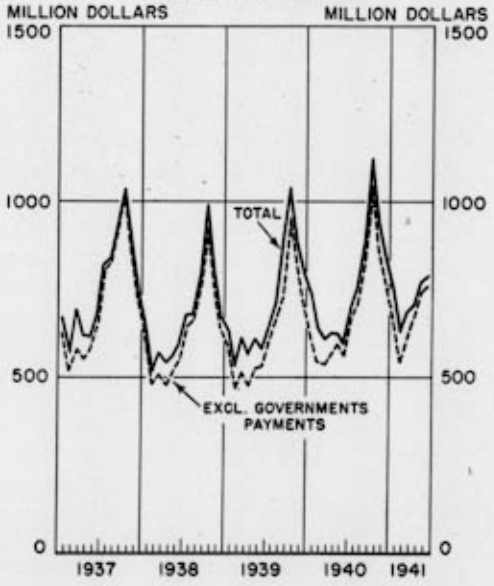


TABLE 25 - EMPLOYMENT AND WAGES

	F. Y. 1940 July 1939- May 1940 Inclusive	F. Y. 1941 July 1940- May 1941 Inclusive	Percentage Increase
Average Total Civilian Non-Agricultural Employment (in thousands of persons) [a]	34,888	36,916	5.8
Average Total Manufacturing Employment (in thousands of wage earners) [a]	9,606	10,779	12.2
Average Weekly Earnings in Factories (in dollars) [a]	$25.23	$27.73	9.9
Average Hourly Earnings in Factories	$ .65	$ .69	5.0
Average Hours Per Week in Factories [a]	38.3	39.8	3.9
Total Wages and Salaries (in millions of dollars) [b]	$43,220	$48,733	12.8

a U. S. Bureau of Labor Statistics.
b Income payments estimated by the U. S. Department of Commerce.

The above comparisons are between two years. On a monthly basis the rise is somewhat sharper. And it is sharper still in those industries most closely related to defense, as the following table shows.

TABLE 26 - HOURS AND EARNINGS ALL MANUFACTURING AND NINE MAJOR DEFENSE INDUSTRIES [a]

	June 1940	May 1941	Percent Increase
All Manufacturing Industries			
Average Weekly Hours Per Worker	37.5	40.8	8.8
Average Weekly Earnings Per Worker (Dollars)	25.8	30.7	19.0
Average Hourly Earnings Per Worker (Cents)	67.2	72.6	8.0
	May 1940	**May 1941**	**Percent Increase**
Nine Major Defense Industries			
Average Weekly Hours Per Worker	38.7	43.7	12.2
Average Weekly Earnings Per Worker (Dollars)	30.28	37.81	24.9
Average Hourly Earnings Per Worker (Cents)	78.33	86.64	10.6

[a] U. S. Bureau of Labor Statistics. The nine major defense industries include blast furnaces, steel works, and rolling mills; foundry and machine shop products; electrical machinery; smelting and refining, copper, lead, and zinc; brass, bronze and copper products; aluminum manufactures; machine tools; aircraft; and shipbuilding.

The rise in the cost of living during the first 12 months of the program was about 3 percent; hence, the income gain of the wage earning groups was real. To what extent it will be possible to keep these gains with a further intensification of the defense effort, it is impossible to indicate at this time. A spiraling of prices and wage rates might not only hamper the defense program but might also cause the real incomes of the working population to deteriorate.

During the 12 months under consideration, there has also been an improvement in the profits of large industrial corporations, as is shown in the following table. The figures for the latest quarter are not available, but it can be seen that during the nine months following the initiation of the defense program, profits of a sample of 168 industrial corporations were 10 percent higher than in the corresponding months immediately preceding. It may be noted that industrial profits were approximately at the same level as they were in 1937.

TABLE 27 - PROFITS OF 168 LARGE INDUSTRIAL CORPORATIONS [a]
Before and After Initiation of Defense Program

	Fiscal Year 1937	Fiscal Year 1940	Fiscal Year 1941	Percentage Increase FY 1941 over FY 1940
	(Million Dollars)			
Quarter Ending September		$141	$185	21
Quarter Ending December		296	289	-2
Quarter Ending March		247	280	13
Quarterly Average	$255	228 [b]	251 [b]	10

[a] Data are for 168 industrial corporations as reported by the Federal Reserve Bank of New York.

[b] Average for three quarters.

TABLE 28 - QUARTERLY PROFITS OF 499 INDUSTRIAL CORPORATIONS [a]

Type Of Industry	Number Of Companies	First Quarter 1941 (Million Dollars)	First Quarter 1940 (Million Dollars)	Percentage Increase
Aircraft	5	8.9	4.8	85
Steel	39	97.1	46.4	109
Nonferrous Metals	33	18.1	14.5	25
Electrical & Industrial Machinery	34	29.8	23.5	27
Lumber & Building	29	13.6	7.4	84
Autos & Accessories	42	86.8	67.7	28
Miscellaneous Durable Goods	94	34.5	22.7	52
Total Durable Goods	276	288.8	186.4	55
Other Industrials	223	155.6	146.2	6
Total	499	444.4	332.6	34

[a] Data supplied by the Federal Reserve Board

The increase in profits has on the whole been greater in the durable goods industries than in other industries. Among the durable goods industries, which have profited most, are several groups closely associated with defense, as the preceding table shows.

FISCAL PROBLEMS

Of the total funds made available by Congress for the defense program by the end of June 1941, $8.6 billion were in contract authorizations for which no cash had been appropriated and $34.6 billion were in cash appropriations. In addition to these funds, there are the defense commitments of the Reconstruction Finance Corporation in the amount of $2.8 billion and British orders of $3.7 billion, making a grand total, as of June 30, 1941, of $49.7 billion.

The defense payments from the general fund of the Treasury during the first year of the program amounted to over $6.0 billion while $333 million were disbursed from funds supplied by the Reconstruction Finance Corporation.

TREASURY OPERATIONS [a]

Fiscal Year 1940 and 1941

	Fiscal Year 1940	Fiscal Year 1941	Change from Fiscal Year 1940 to Fiscal Year 1941
	(Billion Dollars)		
Nondefense disbursements	$ 7.9	$ 7.2 [b]	$ - 0.7
Defense disbursements	1.6	6.2 [b]	+ 4.6
Total disbursements	9.5	13.4	+ 3.9
Total receipts	5.9	8.3	+ 2.4
Deficit [c]	3.6	5.1	+ 1.5

[a] Exclusive of debt retirements but including social security receipts and expenditures.

[b] These figures are not comparable with those given in Table 4 in Chapter 1. The total shown in that table is on a checks issued basis and includes payments from Reconstruction Finance Corporation funds as well as minor items from other agencies not separated by the Treasury.

[c] This does not correspond to change in gross public debt because of exclusion of certain items such as increments on gold and changes in general fund balance.

The problems faced by the Treasury during the past 12 months of raising the necessary cash to meet maturing defense obligations were not particularly difficult ones. They are summarized in the preceding table.

While defense payments in fiscal year 1941 increased by $4.4 billion over 1940, nondefense expenditures fell off about $700 million. Previous taxing and borrowing operations of the Treasury were of such magnitude as to permit its being able to finance its expenditures without great difficulty. As will be noted from the summary of the operations of the Treasury, it was necessary to raise $3.9 billion more than had been raised in 1940 to meet the increase in total expenditures. Of the additional $3.9 billion, $2.4 billion was met from an increase in revenue collections and only $1.5 billion from public borrowing.

The task of the Treasury in the present fiscal year will be considerably more difficult. The unused balance of defense cash appropriations passed by Congress in the past fiscal year amounted to nearly $29 billion at the end of June. Theoretically, the Treasury could be called upon to pay checks to this full amount and in addition to the amount of such other defense funds as may be appropriated for the current year. Actually, of course, no such demands will be made since, in general, defense goods and services must be produced or delivered before payments are made. Such production even by the most optimistic estimates will fall short of this total amount.

It is tentatively estimated that about $17 billion of checks for defense purposes will be paid out of the General Fund of the Treasury during the fiscal year 1942. When an estimated $7.4 billion of nondefense disbursements during the current fiscal year are added, we get an impressive picture of the immediate fiscal problems of the Federal Government. The heavy defense expenditures follow a decade of steady increase in a public debt which reached a gross figure of nearly $49 billion by the end of June 1941. If nondefense expenditures are kept down to $7.4 billion and defense expenditures amount to $17 billion in Treasury payments, the total funds required by the Treasury this year will be $24.4 billion or $11.0 billion more than in the last fiscal year.

How will such a sum be raised? The total tax revenue in the past fiscal year was $8.3 billion. In the present year the tax yield on existing schedules is expected to be about 22 percent higher, which will bring the total tax revenues to about $10.1 billion. Another

$2.5 billion may be raised this fiscal year by the pending tax bill which is intended to yield $3.5 billion during the calendar year 1942. At this rate, total tax revenue will be $12.6 billion--over 50 percent greater than in 1941 and more than twice as great as in 1940. Impressive as these receipts are, they still leave a deficit of $11.8 billion which must be raised through Treasury borrowing. The situation is summarized in the table below.

TABLE 29 - FEDERAL FISCAL SITUATION, FISCAL YEARS 1940, 1941 and 1942 [a]

	1940	1941	1942 [b]
		(Billion Dollars)	
Increase in Federal Gross Debt Exclusive of Reconstruction Finance Corporation	$2.5	$6.0	$11.8
Including Reconstruction Finance Corporation	2.8	6.6	13.4
Defense Disbursements, General Fund and Reconstruction Finance Corporation	1.6	6.4	18.5
Total Disbursements, General Fund and Reconstruction Finance Corporation Defense Disbursements	9.5	13.8	26.0
Total Federal Taxes and Other Revenue Receipts	5.9	8.3	12.6
Ratio of Revenue Receipts to Disbursements	.62	.60	.49

[a] Figures include Social Security receipts and payments.
[b] These estimates are highly tentative.

Since the industrial facilities and stockpile programs financed through the Reconstruction Finance Corporation will involve additional cash payments of perhaps $1.5 billion to $2.0 billion, the total Federal borrowings for the fiscal year may amount to more than $13.4 billion. Any fortunate circumstances which increase defense production beyond the estimates underlying these calculations will further add to the fiscal problem.

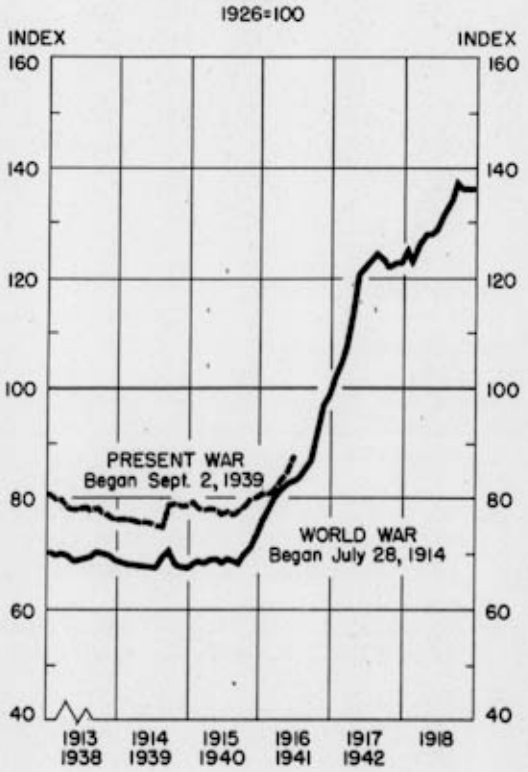
The question whether such a fiscal program can be followed without inflation should be considered in connection with the developments discussed in the following section.

PRICES AND CIVILIAN SUPPLIES

During the first year of the Defense Program there was but a moderate increase in the general price level. In June 1940 prices were still below the averages reached in 1937. Between June 1940 and June 1941 wholesale prices as a whole rose less than 13 percent according to the Bureau of Labor Statistics Index, while the Bureau of Labor Statistics Index of the cost of living rose only 3 percent.

The relative stability in the price level shown for the first twelve months of the program was due in large measure to the fact that the availability of a large volume of unemployed labor and unused capacity permitted an expansion of both defense production and civilian production without undue pressure upon the industrial resources of the country. As the slack is taken up by the expansion of defense production and by the increased demand for consumer goods resulting from the expansion of incomes, inflationary pressures are bound to evolve. A comparison to World War I is instructive. (See the accompanying chart). In World War I prices had been comparatively stable for many months before the accumulation of pressures sent prices out of bounds.

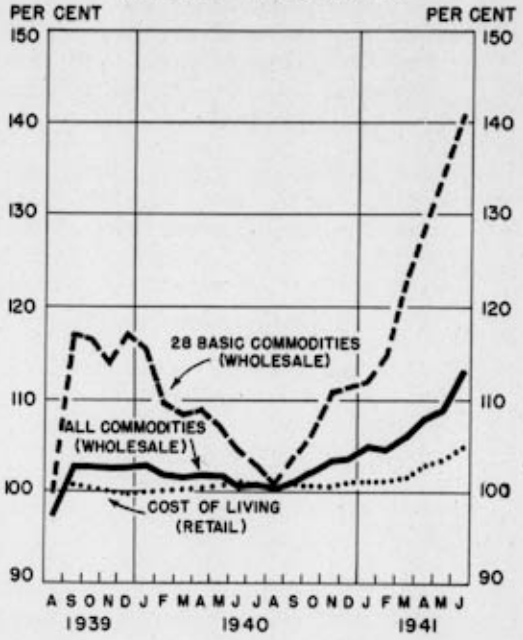
CHART 41- WHOLESALE PRICES
ALL COMMODITIES



Already there are indications that pressures now at work are reaching a critical stage. Though on the average the rise in prices has so far remained within a relatively small range, some prices have already reached disturbing heights. The accompanying chart shows the movement of prices as revealed by three indices, namely composites of all wholesale prices, wholesale prices of 28 basic commodities, and the cost of living. In the twelve months under consideration, the average for 28 basic commodities covered by the Bureau of Labor Statistics and shown in the chart rose about 37 percent. Adding the rise scored by the prices of these commodities between the beginning of hositilities in Europe and the beginning of our defense program, the total increase was nearly 50 percent.

CHART 42-PRICE MOVEMENTS IN THE U.S.

JULY, 1938 - JUNE, 1939 = 100



As already stated, the index of the cost of living showed only a very moderate increase - 3 percent - during the first year of the program. To the extent that wholesale prices anticipate changes in retail prices it appears that a further rise in the cost of living is already on the way. The retail prices of food included in the cost of living index - which increased more than those of other components of the index - rose about 5 percent in the twelve months ending June 1941. During the same period, however, the wholesale prices of foods had risen 18 percent. Likewise, while the retail prices of clothing entering the cost of living index rose only about one percent, the wholesale prices of textiles moved up more than 16 percent.

To offset the pressures tending toward inflationary price rises, controls over prices have been instituted by the Office of

Price Administration and Civilian Supply. Seven general types of price control actions have been employed:

1. Requests. Requests have been made either to a particular producer, or to the various producers in an industry. The requests have been either (a) to refrain from raising prices until a conference is had with the Administrator, (b) to maintain prices at their existing levels, or (c) to lower prices either generally or to specified figures.

2. Warnings. Warnings have been issued either to individual producers, named or described by conduct, or to the industry generally. The warnings usually have stated that if compliance with the Administrator's requests is not forthcoming or if there is failure to reduce prices or to check a price rise, more drastic action will be taken.

3. Informal Agreements. Informal agreements have been entered into by the Administrator with individual producers but never with an industry as a whole. The agreements have related to existing or future prices or to conferences with the Administrator before making price changes. Informal agreements have also been reached with commodity exchanges with respect to margin requirements on outside contracts and on sales of futures.

4. Public Announcements. Public announcements have been made by the Administrator to the effect that existing prices are unnecessarily high or that no price rise in the immediate or near future is in view. These announcements were designed to prevent hoarding and accumulation of inventories in anticipation of price rises and/or to deflate a market characterized by abnormally high prices due in part to lack of adequate information concerning supply and demand conditions.

5. Advising Postponement of Government Purchases. Government agencies, particularly the Division of Purchases of the Office of Production Management, have been advised to postpone purchases of materials at a time when large Government orders would cause a temporary strain on supplies and hence on prices. Such advice has been given only when the materials were not immediately needed by the Government agency. Close collaboration with the Division of Purchases has made Government purchasing power a factor for price stability.

6. Price Schedules. Price schedules have established the maximum prices at which specified products can thereafter be purchased or sold. To date there has been no legislation

providing sanctions for sales in violation of the ceiling prices. But the Administrator has relied on something more than mere voluntary cooperation, for he has admonished that: "The powers of the Government to compel the delivery to the Government of materials at the established maximum prices, to condemn or requisition properties, to issue priorities and to use other powers to carry out the defense program will be exerted to the utmost against any person whom we find to be disregarding these ceiling prices."

7. Measures To Increase Supply. In conjunction with other defense agencies measures have been taken to increase supply: stimulation of imports, use of export controls, encouragement of full capacity operations, and promoting additions to productive capacity.

The main emphasis in enforcement of the price ceilings has been in the direction of keeping a careful watch on the price situation and on alleged violations, utilizing field investigators and representatives, and, as stated above, relying on the powers of persuasion and potential publicity. Enforcement is implemented by the provisions in a number of the price ceiling schedules, requiring reports, varying in completeness with the commodity involved, on prices and sales of the commodity.

These methods have had considerable effectiveness. In a number of instances the ceiling price schedule has served as a standard to which the industry in general will adhere. Where investigation on the Administrator's initiative or upon complaint has revealed offers or sales constituting violations of price schedules, it has frequently been possible to secure adjustments conforming the prices to the ceiling.

But there has recently been indication of "bootlegging", and in substantial quantities, especially with respect to the scrap metal price schedules. Also, there have been refusals to comply with the requests of the Administrator to restore prices or to avoid price increases, notably in the case of automobiles.

A complete record of the actions taken by the Office of Price Administration and Civilian Supply (and prior to April 11, 1941, by the National Defense Advisory Commission) has not been compiled. Many of the informal conferences and communications either have not been recorded or their record has not as yet been made available.

However, a list of the commodities which have been affected by one or several of the preceding actions and which were deemed of sufficient significance to be publicized by an official press release is:

1. Paper, paper pulp, waste paper, and paper board.
2. Lumber.
3. Lead.
4. Zinc, zinc scrap, and secondary zinc.
5. Aluminum (scrap and secondary).
6. Copper and brass.
7. Steel, scrap iron and pig iron.
8. Wool.
9. Iridium.
10. Second-hand machine tools.
11. Quicksilver.
12. Hides.
13. Rents.
14. Coffee.
15. Bituminous coal.
16. Nickel scrap and nickel alloy scrap.
17. Cadmium.
18. Farm implements.
19. Combed cotton yarn.
20. New machine tools.
21. Cocoa beans.
22. Pepper.
23. Ammonium sulphate.
24. Plywood.
25. Automobiles.
26. Bread.
27. Petroleum products (gas and oil).
28. Rubber.
29. High tungsten content steel scrap.
30. Furniture.
31. Household refrigerators.
32. Railroad car wheels.

In addition to the anticipated rises in retail prices it is possible that as a by-product of the Defense Program there will be deterioration in the quality of goods purchased by consumers. So far, deterioration is perceptible in a number of lines, but there is little evidence that it has been general.

Neither has there been any appreciable set-back to the flow of consumer goods. On the contrary, sales of durable consumers' goods such as automobiles, refrigerators, vacuum cleaners, and furniture increased rather sharply, indicating increased purchasing power plus the fear that supplies would be short and quality lower next year. Retail sales of new passenger automobiles increased by 22 percent in the year ending May 1941 as compared with the previous year. Sales of vacuum cleaners, electric refrigerators and washers showed increases of 16, 40 and 23 percent, respectively, as compared with the eleven months of the preceding year.

Supplies of a number of nondurable goods, however, became scarcer during the year 1940-1941 than they had been previously. The principal reasons for such changes were shipping difficulties arising

out of war conditions and increased purchases by defense agencies. Included in the list of goods so affected are fats and oils, hides, cordage, starches, and certain spices. Rubber was an outstanding exception; during 1940-1941 both imports of crude rubber and civilian consumption of tires were at record levels.

There was still relatively little interference with consumer supply on account of recognized shortages of certain strategic materials. Even in the widely publicized case of aluminum cooking utensils, there is no evidence to indicate that shortages existed at the retail level before the end of the year. Large stocks of the primary metal had been accumulated by manufacturers and indications are that many large retail outlets had stocked up on utensils.

TABLE 30 - RETAIL SALES OF DURABLE CONSUMERS' GOODS

	July 1939-May 1940 Inclusive	July 1940-May 1941 Inclusive	Percent Increase
Passenger Automobiles (Thousands)	3,026	3,674	22
Electric Refrigerators (Thousands)	2,081	2,924	40
Vacuum Cleaners-Hand and Floor (Thousands)	1,515	1,756	16
Washers (Thousands)	1,365	1,675	23

Source: Survey of Current Business, Annual Review Number, 1940, 1941, and June 1941 Issues.

MIGRATION AND SOCIAL PROBLEMS

The great expansion of employment in defense industries has required and will continue to require the migration of large numbers of workers. As noted in Chapter 3 it is indicated that between December 1940 and June 1942, 750,000 defense workers will be drawn into defense centers from other parts of the country. About one-half of these inmigrants will be married and require dwelling units, the remainder, single persons, will require rooms or nonhousekeeping accomodations. Moreover housing requirements in these areas are increasing because of population growth, undoubling of families as incomes increase, migration of other than defense workers, and the improved economic status of large groups of the population.

The supply of new houses and other facilities has not kept pace with this increase in demand. Vacancies are dropping and rents are rising. Among the problems attendant upon the defense effort are (1) the danger that substandard housing and slums may develop; (2) the lack of educational facilities for children; and (3) the lack of social facilities. To avoid such problems, integrated policies of residential development are necessary along with the allocation of defense contracts. Social problems have been created also as a result of the expansion of the armed forces, and pre-defense social problems have been brought into clearer perspective.

One of the significant factors in the all-out national defense program is its recognition that civilian, as well as military, health and morale are essential to national self-protection.

The need for an aggressive attack upon malnutrition has been emphasized by the findings with respect to young men subject to military service. Out of a million men given physical examinations under the Selective Service system, a total of 380,000 have been found unfit for general military service by present standards. It is estimated that perhaps one-third of these rejections were due directly or indirectly to nutritional deficiencies. In terms of men, the Army today has thus been deprived of 150,000 who should have been able to serve as soldiers. This is fifteen percent of the total number physically examined by the Selective Service system.

As the defense program developed, it became evident that recreation and leisure-time activities were an important problem. Within less than a year, a million and a half young men were in the armed services; huge new military posts were being built and old line posts were being rapidly expanded. The same thing was happening in industry -- millions of new workers were manning the production lines of national defense; established factories were doubling their personnel; new factories were being built.

For recreation and welfare within their posts, the Army and Navy have overall organizations under a full-time, competent staff, and have established the principle that morale is a function of command. Gradually, this vigorous interest in leisure-time activities is being implemented by facilities and leadership on the posts. These services fill a very real need, but not the whole need.

The leisure-time problem for both men in uniform and defense workers has been the more acute because most of the new military posts and many of the new industrial plants are located at a dis-

tance from the larger cities where there are relatively adequate community recreation facilities. The small country towns and villages, that have found themselves neighbors to defense activity, have increased in size by four or five times almost overnight. Such towns inevitably face a shortage of every community resource and service. This shortage has been particularly acute in facilities for recreation and leisure-time activities. Many of these communities had little or no past experience or existing equipment for public recreation. Some had little conception of what they could and should do to provide recreational activities; and even those who recognized their obligations and opportunities on this phase of defense often were unable to meet the demands made upon them.

One step toward nationwide cooperation was taken when six national religious and welfare organizations, including those concerned with Army and Navy recreation in 1917 and after, came together to form the United Service Organizations for National Defense. Its members are the YMCA, the YWCA, the National Catholic Community Service, the Jewish Welfare Board, the Salvation Army, and the National Travelers Aid Society. The U.S.O. operates within the general framework set up by the Federal Coordinator of Health, Welfare and Related Defense activities [a] a major part of its job being to help fill the local gaps in leisure-time opportunities for men in the armed forces, and for men and women in defense industry.

A further step forward dealing with these problems is the Community Facilities Act, recently passed by Congress. This Act authorizes the use of $150,000,000 in Federal funds for community facilities to be used in hard-pressed defense areas for community recreaton centers, as well as schools, hospitals, and sanitation facilities.

[a] In November 1940, the Federal Security Administrator was named Coordinator of Health, Welfare and Related Defense Activities.

APPENDIX

TABLES A - H

TABLE A - CLASSIFICATION OF PRIORITY RATINGS BY OBJECTIVES

Rating	Army Objective	Navy Objective
AA	Reserved for items of immediate urgency (for emergencies).	Reserved for items of immediate urgency (for emergencies).
A-1	Equipment for authorized units of Regular Army and National Guard. Completion of aircraft program set for October 1, 1941, and construction of air bases.	Maintenance of ships and aircraft. Completion and equipment of ships being acquired. Equipment for Marine Corps of 38,500 men. Expansion of air force to 8,918 planes.
A-2	Equipment and construction for first 1,000,000 men of selective service army.	Items essential to the completion of all ships under construction.
A-3	Construction of seacoast and overseas defenses.	Items essential to expansion and equipment of augmented naval shore establishment.
A-4	Completion of aircraft program to full objective by April 1, 1942	Completion of naval aviation to total strength authorized.
A-5	Critical items for completion of equipment and for maintenance for 4 months, and construction, for 2,000,000 men.	Items essential to future construction, recommissioning, or conversion of ships for naval use.
A-6	Essential items for completion of equipment and for maintenance for 4 months for 2,000,000 men.	Equipment for naval expansion in wartime.
A-7	Facilities to provide production capacity to the Army of 18,000 airplanes a year. Facilities to provide critical items of equipment for combat force of 2,000,000 men.	Expansion of capacity and creation of new capacity for wartime production of ships, aircraft and equipment.
A-8	Incorporation in existing essential Army installations and facilities of passive features to reduce damage of enemy action.	Incorporation in existing essential naval shore facilities of passive features to reduce damage of enemy action.
A-9	Facilities for expansion of Army behond 2,000,000 men.	
A-10	Educational orders. Additional reserves of critical and essential items.	Assembly of reserve material for general naval use.

TABLE B - CLASSIFICATION OF ITEMS GIVEN A-1 PREFERENCE RATING

Rating	Items
A-1-a	Machine tool and gage builders' supplies and facilities.
A-1-b	Bombsights. Small arms ammunition. Aircraft machine guns. Requirements for existing ships and aircraft. Replacement of 1,221 existing aircraft.
	Conversion of vessels to naval use. Items for Fleet Marine Force and Defense Battalions. Plant equipment for producing vessels listed under A-1-c. Harbor defense items. Panama Canal defense projects.
A-1-c	Aircraft engines, propellers, armor, instruments, armament, ammunition, and radio apparatus. Construction of authorized destroyers, light cruisers, submarines, subchasers, motor torpedo boats, Coast Guard Vessels, tenders and repair ships for same.
	Tankers being constructed and naval vessels scheduled for completion in 1941, one aircraft carrier and one battleship scheduled for completion in 1942.
A-1-d	Aircraft accessories and equipment, except as in A-1-c. Airframes. Aircraft machine guns and pyrotechnic pistols. Surgical instruments and hospital equipment. 12 nonrigid airships. Items essential to expansion of Marine Corps to a strength of 38,500 men.
A-1-e	Equipment, supplies and plant facilities for optical industry. Maintenance and expansion of existing facilities for repair, overhaul, and operation of aircraft and aircraft armament. Equipment for flying personnel. Aircraft bombs and pyrotechnics.
A-1-f	Anti-aircraft equipment. All anti-aircraft and 60 mm mortar material, including ammunition. Fleet operating all base facilities. Anti-aircraft and underwater protection for U. S. merchant vessels.
A-1-g	Construction of new air fields, air bases and air stations. Combat vehicles, accessories and equipment. Anti-tank guns and ammunition.
A-1-h	Mobile artillery and all accessory equipment, including ammunition.
A-1-i	Infantry and Cavalry weapons, ammunition, and individual and organizational equipment not specified above.
A-1-j	All remaining items which can be classified as A-1.

TABLE C - INDIVIDUAL PREFERENCE RATING CERTIFICATES ISSUED BY ANMB BY RATINGS AS OF JUNE 28, 1941

Rating	Number	Percent of Total
AA	674	0.2
A-1	269	0.1
A-1-a	8,385	2.9
A-1-b	83,157	28.8
A-1-c	78,790	27.2
A-1-d	71,399	24.7
A-1-e	5,356	1.9
A-1-f	6,738	2.3
A-1-g	6,510	2.3
A-1-h	3,637	1.3
A-1-i	7,145	2.5
A-1-j	1,876	0.6
		94.8
A-2	6,398	2.2
A-3	81	-
A-4	295	0.1
A-5-A-10	628	0.2
		2.5
B-1	3	-
B-2	1	-
B-3		-
B-4-B-10	1	
Multiple Ratings	6,908	2.4
Not Rated	915	0.3
GRAND TOTAL	289,166	100.0

TABLE D – NUMBER AND KIND OF PREFERENCE RATING CERTIFICATES ISSUED BY PRIORITIES DIVISION, OPM
As of June 28, 1941

Rating	Domestic	Foreign	Army–Navy Special	VQ–Series	Issued by Telegram	Total	Per Cent of Total
AA	11	1	1	0	0	13	0.1
A-1-A	241	5	0	45	4	295	3.0
A-1-B	424	824	0	22	0	1,270	13.0
A-1-C	2,870	15	0	7	0	2,892	29.6
A-1-D	814	74	0	224	0	1,112	11.4
A-1-E	159	11	0	74	0	244	2.5
A-1-F	129	16	8	0	0	153	1.6
A-1-G	506	106	36	0	0	648	6.6
A-1-H	66	8	0	0	0	74	0.8
A-1-I	173	0	1	1	0	175	1.8
A-1-J	286	0	58	14	0	358	3.7
A-2	735	21	0	1	1	758	7.7
A-3	163	0	0	0	0	163	1.7
A-4	10	0	0	8	0	18	0.2
A-5	41	5	0	0	0	46	0.5
A-6	2	0	0	0	0	2	–
A-7	5	0	0	0	0	5	0.1
A-8	1	0	0	0	0	1	–
A-9	3	0	0	0	0	3	–
A-10	287	25	0	1	0	313	3.2
BB	6	0	0	1	0	7	0.1
B	14	0	0	0	0	14	0.1
B-1	535	6	0	0	0	541	5.5
B-2	445	2	0	2	0	449	4.6
B-3	99	0	0	1	0	100	1.0
B-4	89	0	0	0	0	89	0.9
B-5	10	0	0	0	0	10	0.1
B-6	4	0	0	0	0	4	–
B-7	4	0	0	0	0	4	–
B-8	22	0	0	0	0	22	0.2
TOTAL	8,154	1,119	104	401	5	9,783	100.0
Per Cent of Total	83.3	11.4	1.1	4.1	0.1	100.0	

TABLE E - PRODUCERS ASSIGNED LIMITED BLANKET RATINGS ON P - ORDERS
As of July 1, 1941

Order Number	Date Effective	Coverage	Preference Rating for Defense Orders	Controls
P-1	3/12/41	Crane Builders	A-1-c	Specified list of materials.
P-2	3/28/41	Machine-tool Producers	A-1-a	List of specified materials.
P-3	4/29/41	Airframe Producers	A-1-d	Rating applies only to items on the current priorities critical list and to cutting and other tools and equipment except machine tools.
P-4	4/29/41	Producers of Airplane Engines and Propellers	A-1-e	Rating applies only to items on the current priorities critical list and to cutting and other tools and equipment except machine tools.
P-5	5/26/41	Crane Builders	A-1-a	Specified list of materials. Make deliveries of products or parts as decided.
P-6	5/16/41	Producers for "off-the-shelf" orders	A-10	Limited to scarce materials for defense orders. Quantity required is certified by Division of priorities.
P-7	6/12/41	Merchant Shipbuilding	A-1-a	Limited to items on current priorities critical list and to tools other than machine tools.
P-8	6/18/41	Freight-car Construction	A-3	Limited to items on the current critical list and cutting and other tools except machine tools.
P-9-a, b, c	6/26/41	Producers of Airframes, Aeroengines, and Propellers	A-1-b for Heavy Bombers	Limited to items on current priorities critical list and to perishable tools and equipment other than machine tools.
P-9-d, e, f	6/30/41	Producers of Gun Turrets, Gun Sights, Bomb Sights, Gunfire Controls, and Turbo Superchargers		
P-10	6/19/41	Merchant Shipbuilder (Teitjen and Lang Drydock Company)	AA	Limited to items on current priorities critical list and to perishable tools and equipment other than machine tools.
P-11	7/1/41	Producers of Metal Working Equipment	Not Specified	Specified list of materials.
P-12	6/26/41	Aluminum Scrap Smelters	A-10	Quantities not to be greater than requirements for effective operation of each producer's plant.

TABLE F - COMMODITIES SUBJECT TO ALLOCATION OF SUPPLY BY M - ORDERS a
As of July 1, 1941

Order Number	Commodity	Effective Date	Minimum Rating for Defense Contracts b	Provisions
M-1	Aluminum	3/21/41	A-10	Preference ratings may be given to non-defense contracts but deliveries cannot be made on such contracts except on instructions of OPM.
M-1-a		3/21/41		Nondefense uses given preference ratings on B-level and percentage allocations made thereto based on the average of previous consumption. Excessive increases in inventories forbidden.
M-1-b		4/11/41		Covers low grade aluminum, relaxing percentage allocation in which B-group deliveries may be made.
M-1-c		6/10/41		Prohibits deliveries of aluminum scrap for purposes of melting or processing except with preference rating of A-10 or higher, or specific authorization by Director of Priorities.
M-2	Magnesium	3/24/41	A-10	Nondefense contracts may be filled only by assignment of preference ratings, or on special order.
M-3	Tungsten	3/26/41	A-10	Nondefense deliveries to be made only on basis of preference ratings or of specific order.
M-3-a				Assigns B-1 preference rating to contracts for products which are used for defense contracts directly or indirectly. Urges use of substitutes for nondefense purposes.
M-4	Neoprene	3/28/41		No contracts to be filled except in accordance with such direction to be given in supplemental orders. Series of supplemental orders issued governing disposition of monthly output. Reserve of 6 per cent of monthly output provided for.
M-5	Nickel Bearing Steel	4/10/41	A-10	No nondefense deliveries to be made except on basis of ratings and on instruction of Director of Priorities.
M-5-a		4/10/41		Allocation based on percentage of previous consumption and present supplies.
M-5-b		6/17/41		Maximum allowable amount of primary nickel to be used in melting of nickel bearing stainless steel shall not exceed 40 per cent of the nickel content except with permission of the Director of Priorities. Balance of nickel content shall be made up from nickel bearing scrap.
M-6	Nickel	5/15/41	A-10	Specific allocations of metal to be made each month. No deliveries to be made to any one without sworn statement of his requirements and any such information as the Director of Priorities may require.
M-7	Borax and Boric Acid	6/ 7/41	A-8	Definition of defense contracts restricted to Army or Navy contracts. Deliveries to be used in manufacture of borosilicate glass are given preference rating A-9.
M-8	Cork	5/31/41		No suppliers shall until June 12, 1941, process cork in excess of 50 per cent of his average daily rate for the month of April 1941. On and after June 12, 1941, each supplier is directed to set aside entire stock as reserve for future allocation by the Director of Priorities.

TABLE F - COMMODITIES SUBJECT TO ALLOCATION OF SUPPLY BY M - ORDERS (CONT'D)
As of July 1, 1941

Order Number	Commodity	Effective Date	Minimum Rating for Defense Contracts [b]	Provisions
M-9	Copper	5/29/41	A-10	Deliveries on nondefense contracts without preference ratings may be made after compliance with preference ratings assigned to defense contracts. During each calendar month each refiner shall set aside a quantity equal to 20 per cent (or any other amount specified) of total April production for future allocation by the Director of Priorities. Commencing June 1, 1941, all copper owned by the Metals Reserve Company will be allocated by PD. New contracts for refining of copper on toll basis can be made only with the permission of the Director of Priorities.
M-10	Polyvinyl Chloride	6/9/41		No producer shall deliver or process any polyvinyl chloride without specific permission of the Director of Priorities. Monthly instructions regarding shipments to be issued.
M-11	Zinc	7/1/41	A-10	Deliveries may be made on nondefense contracts after compliance with the preference ratings assigned to defense contracts. During each successive month each producer shall set aside a quantity of zinc for allocation which will be determined from time to time. Except as limited by issuance of preference ratings, balance of production shall be made so that each customer shall receive an equal percentage of the producer's commitments to him but no shipment to be made if it increases inventories excessively.
M-12	Tung Oil	Not Issued		
M-13	Synthetic Rubber	6/9/41		No producer shall on or after July 1, 1941, deliver or process synthetic rubber except as ordered in monthly instruction. Takes over the control of Neoprene and other types of synthetic rubber.
M-14	Tungsten in High Speed Steel	6/11/41		Customers shall not place and producers shall not accept contracts for Class B high speed steel if Class A high speed steel will reasonably fulfill customers' requirements. In no event may a customer place or a producer accept contracts for Class B steel which will exceed in the aggregate by weight the quantity of Class A steel ordered by such customer from the same producer during the same quarter. Allocation to be made first to defense contracts, the other contracts necessary to defense, and then to civilian contracts on basis of program issued by DPACS
M-15	Rubber (crude)	6-20-41		Requires producers to limit total monthly consumption to an amount not to exceed the following percentage of their average monthly consumption during the period April 1, 1940 to March 31, 1941: July 99 per cent August 94 per cent September 89 per cent October 84 per cent November 82 per cent December 80 per cent Beginning July 1, 1941, all rubber released by the Rubber Reserve Company will be allocated by the Director of Priorities. No processor shall accept rubber for inventory in excess of his requirements. By M-15-a, 6/27/41, no producer required to reduce his consumption durily July 1941 by more than 20 per cent of his consumption during June 1941.

[a] All M-orders require the keeping of proper records and the furnishing of information as stipulated.
[b] Defense Orders are generally defined as (1) Army and Navy Contracts, (2) Contracts for Great Britain; (3) Contracts for any other government whose defense the President deems vital to the defense of the United States.

TABLE G – COMMODITIES AND EQUIPMENT SUBJECT TO CONTROL BY PRIORITIES DIVISION
As of July 1, 1941

Item	Type of Control	Order Number	Date Effective
Aluminum	Allocation	M – 1	3/21/41
Antimony	Inventory	General Metals #1	5/1/41
Borax and Boric Acid	Allocation	M – 7	6/9/41
Cadmium	Inventory	General Metals #1	5/1/41
Chromium	Inventory	General Metals #1	5/1/41
Cobalt	Inventory	General Metals #1	5/1/41
Copper	Allocation	M – 9	5/29/41
Cork	Allocation	M – 8	5/31/41
Ferro-alloys, all types	Inventory	General Metals #1	5/1/41
Iridium	Inventory	General Metals #1	5/1/41
Iron and Steel Products (including rolled, drawn, forgings, castings, and pig iron)	Inventory and Delivery	General Metals #1 and General Steel Preference Delivery Order	5/1/41 5/29/41
Lead	Inventory	General Metals #1	5/1/41
Machine Tools	Allocation	E – 1	3/28/41
Magnesium	Allocation	M – 2	3/24/41
Manganese or Spiegeleisen	Inventory	General Metals #1	5/1/41
Mercury	Inventory	General Metals #1	5/1/41
Molybdenum	Inventory	General Metals #1	5/1/41
Nickel	Allocation	M – 6	5/15/41
Nickel-bearing Steel	Allocation	M – 5	4/10/41
Nonferrous Alloys, all types	Inventory	General Metals #1	5/1/41
Polyvinyl Chloride	Allocation	M – 10	6/9/41
Rubber (crude)	Allocation	M – 15	7/1/41
Secondary Materials or Scrap, containing any metal subject to Priorities Order	Inventory	General Metals #1	5/1/41
Synthetic Rubber	Allocation	M – 13	6/9/41
Tin	Inventory	General Metals #1	5/1/41
Tungsten	Allocation	M – 3	3/26/41
Tungsten in High Speed Steel	Allocation	M – 14	6/11/41
Vanadium	Inventory	General Metals #1	5/1/41
Zinc	Allocation	M – 11	7/1/41

TABLE H - EQUIPMENT SUBJECT TO ALLOCATION

Object	Order Number	Date Effective	Minimum Rating for Defense Orders	Provisions
Machine Tools	E - 1	3/28/41	A - 10	No deliveries to be made except after release by the Director of Priorities pursuant to assignment of preference ratings or otherwise. Records to be kept and information furnished.

The President 1

DEFENSE PROGRESS

NUMBER 50

AUGUST 1, 1941

PART B - ANNUAL SERIES

OFFICE OF PRODUCTION MANAGEMENT - BUREAU OF RESEARCH & STATISTICS
Stacy May, Chief

DEFENSE PROGRESS SERIES

	1940							1941						
	July[1]	August	September	October	November	December	6 month total	January	February	March	April	May	June	12 month total
TOTAL UNITED STATES DEFENSE PROGRAM *														
UNITED STATES ARMED FORCES (Thousands, officers and enlisted men)														
Army	289	36	112	81	63	38	619	75	242	207	123	88	95	1,449
Navy and Marine Corps	196	10	10	13	18	11	258	14	7	14	8	10	16	327
Total active strength	485	46	122	94	81	49	877	89	249	221	131	98	111	1,776
FINANCIAL PROGRAM														
ADDITIONS TO FUNDS AVAILABLE (Million dollars)														
Monthly total	6,686	171	6,615	9,264	307	569	23,672	488	653	10,062	4,822	2,725	R 7,366	R 49,728
Ex British orders	5,404	0	6,184	8,727	-3	108	20,420	254	568	9,962	4,755	2,711	R 7,389	R 46,059
NEW CONTRACT AWARDS														
Monthly total	3,358	433	5,472	1,940	1,140	1,906	14,249	1,482	664	1,885	1,738	1,587	5,303	26,910
Ex British orders	2,076	262	5,041	1,403	828	1,445	11,055	1,247	579	1,785	1,671	1,573	5,327	23,239
Plus pay, sub., travel, etc	3,434	517	5,552	2,035	1,243	2,016	14,797	1,608	814	2,044	1,921	1,789	5,524	28,499
MONTHLY CASH DISBURSEMENTS														
Ex pay, sub., travel, etc.	518	351	387	415	477	564	2,712	790	701	850	837	797	R 864	R 27,527
Ex British orders, pay, sub., travel, etc.	101	152	189	237	302	379	1,359	611	572	695	735	708	R 779	R 5,461
Monthly total	594	435	468	511	581	677	3,266	916	852	1,011	1,022	1,001	R 1,087	R 29,131

* Data are as of the close of the month or week nearest available date.
R Preliminary data. X Revised data. n.a. Data not available.
For additional footnotes see page 12.

(Continued on Next Page)

DEFENSE PROGRESS SERIES (Continued)

	1940							1941						
	July-R	August	September	October	November	December	6 month total	January	February	March	April	May	June	12 month total
OBJECTS														
AIRPLANES, ENGINES, ETC.							(Million dollars) *							
Additional funds available	1,634	29	2,201	397	183	169	4,613	84	31	2,204	1,553	8	3,235	11,728
New contract awards	889	-57	984	690	463	374	3,343	511	60	158	103	483	2,171	6,829
Monthly cash disbursements	150	100	95	96	93	101	636	219	108	177	98	93	R 111	R 1,442
NAVAL SHIPS & PARTS														
Additional funds available	668	0	229	5,174	0	0	6,071	0	0	522	60	143	0	6,796
New contract awards	1,207	13	2,596	57	90	475	4,428	48	14	0	27	21	452	5,000
Monthly cash disbursements	30	32	44	40	63	46	255	62	53	65	88	64	R 72	R 660
ORDNANCE (Incl. Naval Ord.)														
Additional funds available	793	20	1,651	1,758	67	71	4,359	70	43	2,252	1,056	159	286	8,225
New contract awards	367	139	1,007	334	175	281	2,303	186	143	803	289	266	988	4,978
Monthly cash disbursements	62	49	63	54	60	75	362	70	58	98	134	117	R 142	R 981
OTHER MUNITIONS														
Additional funds available	375	0	284	206	1	6	872	1	3	274	336	44	568	2,098
New contract awards	46	74	97	131	33	58	439	103	24	14	31	56	286	953
Monthly cash disbursements	16	23	14	18	19	32	122	34	34	46	53	48	R 52	R 390
TOTAL MUNITIONS														
Additional funds available	3,469	49	4,365	7,535	251	246	15,915	155	77	5,252	3,005	354	4,089	28,847
New contract awards	2,509	169	4,684	1,212	761	1,188	10,523	848	241	975	450	826	3,897	17,760
Monthly cash disbursements	258	203	216	208	235	254	1,374	386	253	387	374	322	R 377	R 3,472

* Data are as of the close of the month or week nearest available date.
R Preliminary data. R Revised data. n.a. Data not available.
For additional footnotes see page 12.

(Continued on Next Page)

DEFENSE PROGRESS SERIES (Continued)

	1940							1941						
	July	August	September	October	November	December	6 month total	January	February	March	April	May	June	12 month total
MERCHANT SHIPS								(Million dollars) *						
Additional funds available	144	1	3	10	2	100	260	7	380	633	179	0	100	1,560
New contract awards	29	1	3	10	3	100	146	7	2	4	809	0	494	1,462
Monthly cash disbursements	39	22	19	18	20	16	134	17	15	20	19	25	P 28	P 259
INDUSTRIAL FACIL.-CONS., EQUIP.,& REAL ESTATE														
Additional funds available	558	25	735	322	-4	120	1,756	173	60	1,377	948	1,068	499	5,880
New contract awards	110	30	269	360	109	274	1,152	361	155	234	80	402	377	2,761
Monthly cash disbursements	52	26	28	29	26	40	201	68	79	87	116	154	P 150	b P 831
INDUSTRIAL FACIL.—CONSTRUCTION ONLY														
Additional funds available	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	P 830	P 50	P 200	P 133	14	111	269	1,607
New value in place	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	124	52	76	52	63	10	198	575
POSTS, DEPOTS, & FORTIFICATIONS														
Additional funds available	712	0	688	98	0	0	1,498	0	0	932	446	261	522	3,659
New contract awards	230	54	86	158	112	74	714	88	85	530	248	214	333	2,212
Monthly cash disbursements	8	33	30	58	88	128	346	175	231	190	181	174	P 171	P 1,469
HOUSING														
Additional funds available	32	0	100	150	0	0	282	0	0	5	0	155	0	442
New contract awards ‡	0	0	10	35	31	29	105	26	23	20	54	24	23	275
Monthly cash disbursements	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
STOCKPILE PROGRAM														
Additional funds available	60	0	338	102	0	3	503	85	-3	170	39	160	P 26	P 980
New contract awards	52	63	45	23	20	45	248	28	93	19	13	57	12	470
Monthly cash disbursements	2	4	11	11	9	14	50	15	12	26	32	15	P 29	P 179

* Data are as of the close of the month or week nearest available date.
P Preliminary data. ‡ Revised data. n.a. Data not available.
For additional footnotes see page 12.

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DEFENSE PROGRESS SERIES (Continued)

	1940							1941						
	July[R]	August	September	October	November	December	6 month total	January	February	March	April	May	June	12 month total
OTHER EQUIPMENT & SUPPLIES							(Million dollars) *							
Additional funds available	591	96	324	359	50	96	1,516	63	174	1,386	54	190	249	3,632
New contract awards	428	116	149	256	106	191	1,246	106	48	113	38	57	141	1,749
Monthly cash disbursements	160	62	83	90	98	113	606	129	111	141	114	107	P 109	P 1,317
PAY														
Monthly total														
Additional funds avail.	638	0	0	409	0	0	1,047	0	0	48	34	454	1,225	2,808
Monthly cash disb.	61	65	66	74	80	88	434	97	109	122	134	147	P 157	P 1,200
Army														
Additional funds avail.	349	0	0	380	0	0	729	0	0	0	0	0	1,225	1,954
Monthly cash disb.	34	36	36	42	46	50	245	58	68	79	90	100	P 109	P 750
Navy														
Additional funds avail.	283	0	0	2	0	0	285	0	0	48	0	417	0	750
Monthly cash disb.	26	27	28	29	30	32	171	34	35	37	38	39	P 40	P 395
SUBSISTENCE, TRAVEL, MISC.														
Additional funds available	482	0	62	279	8	4	835	5	-35	259	117	83	P 656	P 1,920
Monthly cash disbursements	16	20	15	22	24	24	120	30	42	39	51	58	P 65	P 404
VALUE OF FACIL. ON APPLIC. FOR CERT. OF NECESSITY [2]														
Total monthly									1,021	14	78	158	153	1,424
Approved, private funds									236	392	74	72	55	829
Approved, public funds [3]									110	78	6	5	2	201
Pending each month									674	218	213	291	387	
DEFENSE HOUSING [4]							(Number of dwelling units) *							
Monthly fund allocations	1,460	5,925	27,309	4,250	6,795	572	46,311	7,772	20,613	5,487	16,103	9,767	4,245	110,298
New construction contracts	624	1,162	2,997	10,469	5,399	7,876	28,527	6,264	5,349	8,276	17,008	6,810	6,486	78,820
Constr. completed in month	0	0	0	0	0	605	605	709	1,201	2,909	4,180	4,810	7,354	21,768

* Data are as of the close of the month or week nearest available date.
P Preliminary data. R Revised data. n.a. Data not available.
For additional footnotes see page 12.

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DEFENSE PROGRESS SERIES (Continued)

	1940							1941						
	July[R]	August	September	October	November	December	6 month total	January	February	March	April	May	June	12 month total
PRIORITY CERTIFICATES & EXTENSIONS							(Number)*							
No. issued monthly				It is estimated that 50,000 certificates and extensions, not included in the total, were granted between October 1940 and February 1941.						R 75,709	67,428	74,145	81,667	298,949
AGENCIES														
U. S. MILITARY							(Million dollars)*							
ARMY														
Additional funds avail.	2,617	0	4,383	1,377	0	0	8,377	0	175	687	3,896	0	7,211	20,346
New contracts+pay, sub., travel, etc.	584	170	1,878	1,008	637	639	4,916	1,062	339	786	467	1,133	1,289	9,992
Monthly cash disb.	78	97	94	149	184	270	873	472	463	505	506	512	R 536	R 3,868
NAVY														
Additional funds avail.	2,083	0	1,107	6,797	0	0	9,986	0	0	2,109	296	1,133	0	13,524
New contracts+pay, sub., travel, etc.	1,514	107	2,939	387	226	693	5,866	168	204	1,023	420	500	1,735	9,916
Monthly cash disb.	87	115	142	140	173	168	825	206	192	254	296	250	R 299	R 2,322
TOTAL														
Additional funds avail.	4,700	0	5,490	8,174	0	0	18,363	0	175	2,796	4,192	1,133	7,211	33,870
New contracts+pay, sub., travel, etc.	2,098	277	4,817	1,395	863	1,332	10,782	1,230	543	1,809	887	1,633	3,024	19,908
Monthly cash disb.	165	212	236	289	357	438	1,698	678	655	759	802	762	R 835	R 6,190

* Data are as of the close of the month or week nearest available date.
R Preliminary data.
For additional footnotes see page 12.
Ⓡ Revised data.
n.a. Data not available.

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DEFENSE PROGRESS SERIES (Continued)

	1940							1941						
	July*	August	September	October	November	December	6 month total	January	February	March	April	May	June	12 month total
DEFENSE AID (Lend-Lease)								(Million dollars)*						
Additional funds available										7,000	0	0	0	7,000
New allocations Ī											3,736	541	900	5,177
New contracts												n.r.	n.r.	n.r.
Monthly cash disbursements												7	R 19	R 26
MARITIME COMMISSION														
Additional funds available	154	0	0	0	0	0	154	0	415	0	180	0	0	749
New contracts	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	810	0	0	810
Monthly cash disbursements	8	13	11	12	14	12	70	13	9	15	14	16	R 19	R 156
RFC AND SUBSIDIARIES														
Additional funds available	0	0	594	212	-2	108	912	254	14	161	185	1,241	R 27	R 2,794
New commitments	0	55	287	61	27	182	612	103	142	98	84	91	12	1,142
Monthly cash disbursements	1	3	9	14	12	13	52	20	23	49	61	67	R 61	R 333
BRITISH ORDERS														
Additional funds available	1,282	171	431	537	309	461	3,192	234	85	100	67	14	-23	3,669
New contracts	1,282	171	431	537	309	461	3,192	234	85	100	67	14	-23	3,669
Monthly cash disbursements	417	199	199	179	176	187	1,357	179	130	157	104	91	R 87	R2,081
OTHER AGENCIES														
Additional funds available	550	0	100	341	0	0	991	0	-36	5	198	337	151	1,646
New contracts	54	14	18	43	41	41	211	40	44	37	73	49	48	502
Monthly cash disbursements	3	7	13	16	22	26	88	26	35	32	42	58	R 64	R 345

* Date are as of the close of the month or week nearest available date.
R Preliminary data.
For additional footnotes see page 12.
Ī Revised data.

n.a. Not available.
n.r. Data not released.

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DEFENSE PROGRESS SERIES (Continued)

	1940							1941						
	July	August	September	October	November	December	6 Month Average	January	February	March	April	May	June	12 Month Average
DEFENSE EQUIPMENT INDEXES *														
PRODUCTION RATE INDEXES	(Indexes, production in scheduled peak month=100)													
Military airplanes	13.0	11.8	10.0	13.3	16.0	19.6	13.9	21.7	23.7	27.0	33.9	31.4	Ξ 34.9	21.4
Combat vehicles	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	7.9	10.1	11.1	11.9	18.1	25.2	Ξ 31.8	12.9
Combat vessels	17.7	17.2	18.6	20.7	21.7	21.1	19.5	28.9	26.0	28.9	33.8	33.5	Ξ 34.4	25.2
Army-type guns, total	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	15.5	22.0	24.6	28.4	37.1	36.4	Ξ 38.7	23.4
Field artillery	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3.7	7.1	5.7	6.3	13.8	14.3	Ξ 15.0	7.1
Antiaircraft guns	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10.8	19.7	21.4	19.1	22.6	28.1	Ξ 38.1	17.8
Infantry-supporting guns	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16.4	21.6	25.0	30.3	38.5	36.0	Ξ 36.2	23.8
Merchant ships	P 10.3	P 10.5	P 11.4	P 12.4	P 13.3	P 13.8	P 11.9	P 14.4	P 14.8	P 15.9	P 17.7	P 20.3	P 24.0	P 14.9
TOTAL PRODUCTION INDEXES	(Indexes, cumul. since July 1940, program requirements=100)													
Military airplanes	0.5	1.0	1.5	2.0	2.7	3.5		4.4	5.4	6.5	7.9	9.2	Ξ 10.7	
Combat vehicles	n.a.	n.a.	n.a.	n.a.	n.a.	2.8		3.4	4.1	4.8	5.8	7.3	Ξ 9.2	
Combat vessels	5.8	6.3	6.9	7.5	8.1	8.7		9.5	10.3	11.1	12.1	13.1	Ξ 14.1	
Army-type guns, total	n.a.	n.a.	n.a.	n.a.	n.a.	5.3		6.6	8.0	9.6	11.7	13.8	Ξ 16.0	
Field artillery	n.a.	n.a.	n.a.	n.a.	n.a.	1.5		2.0	2.4	2.8	3.7	4.7	Ξ 5.7	
Antiaircraft guns	n.a.	n.a.	n.a.	n.a.	n.a.	3.2		4.2	5.2	5.2	7.3	8.7	Ξ 10.6	
Infantry-supporting guns	n.a.	n.a.	n.a.	n.a.	n.a.	7.6		9.2	11.1	13.5	16.4	19.2	Ξ 22.0	
Merchant ships	P 0.5	P 1.0	P 1.5	P 2.1	P 2.7	P 3.3		P 4.0	P 4.7	P 5.4	P 6.3	P 7.2	P 8.3	
U. S. INVENTORIES	(Indexes as of 1st of month, U. S. requirements=100)													
Military airplanes	7.0	n.a.	n.a.	n.a.	n.a.	n.a.		8.6	n.a.	n.a.	n.a.	n.a.	12.6	
Combat vehicles	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		4.4	n.a.	n.a.	n.a.	n.a.	8.0	
Combat vessels, delivered	37.7	n.a.	n.a.	n.a.	n.a.	n.a.		36.0	n.a.	n.a.	n.a.	n.a.	36.4	
Army-type guns, total	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		5.7	n.a.	n.a.	n.a.	n.a.	10.4	
Field artillery	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		6.4	n.a.	n.a.	n.a.	n.a.	9.2	
Antiaircraft guns	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		6.9	n.a.	n.a.	n.a.	n.a.	8.5	
Infantry-supporting guns	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		4.6	n.a.	n.a.	n.a.	n.a.	12.0	
Merchant ships	P 54.1	n.a.	n.a.	n.a.	n.a.	n.a.		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	

* Data are as of the close of the month or week nearest available date.
P Preliminary data.
Ξ Revised data.
n.a. Data not available.
For additional footnotes see page 12.
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DEFENSE PROGRESS SERIES (Continued)

	1941						1942					
	July	August	September	October	November	December	January	February	March	April	May	June
DEFENSE EQUIPMENT INDEXES *												
SCHEDULED PRODUCTION RATE INDEXES	(Indexes, production in scheduled peak month=100)											
Military airplanes	40.0	43.6	48.7	53.7	60.0	67.8	75.9	80.8	85.8	91.5	92.9	96.3
Combat vehicles	54.0	58.6	83.1	100.0	95.7	99.6	97.0	97.0	87.2	73.3	73.3	69.0
Combat vessels	52.6	54.5	55.3	59.9	57.4	60.0	61.5	61.9	66.0	71.0	76.6	82.1
Army-type guns, total	62.1	86.5	96.6	98.8	100.0	62.9	92.4	77.5	72.2	68.4	65.0	47.5
Field artillery	26.3	61.8	57.6	53.2	54.9	65.2	82.5	100.0	74.2	61.0	53.3	29.9
Antiaircraft guns	39.4	34.9	45.6	48.5	69.0	68.7	78.3	91.3	93.2	96.6	96.6	100.0
Infantry-supporting guns	62.9	84.6	96.4	100.0	95.8	43.9	46.9	46.0	46.9	45.4	43.4	27.2
Merchant ships	29.0	35.6	41.0	47.8	55.5	62.9	69.4	76.4	83.0	88.0	92.8	97.8
SCHEDULED TOTAL PRODUCTION INDEXES	(Indexes, cumul. since July 1940, program requirements=100)											
Military airplanes	12.4	14.3	16.3	18.5	21.0	23.9	27.0	30.4	34.0	37.8	41.7	45.7
Combat vehicles	13.5	16.9	21.9	27.8	33.5	39.4	45.2	50.9	56.1	60.5	64.8	68.9
Combat vessels	15.3	16.8	18.4	20.2	21.8	23.6	25.4	27.2	29.0	31.1	33.3	35.7
Army-type guns, total	20.2	25.1	30.6	36.3	42.0	45.6	49.6	54.1	58.2	62.1	65.8	68.5
Field artillery	7.7	11.9	15.7	19.3	23.0	27.4	32.9	39.6	44.6	48.7	52.3	54.3
Antiaircraft guns	12.6	14.3	16.6	19.0	22.4	25.8	29.7	34.3	38.9	43.7	48.5	53.4
Infantry-supporting guns	27.8	34.3	41.7	49.4	56.7	59.7	63.7	67.2	70.8	74.3	77.6	79.7
Merchant ships	9.7	11.3	13.2	15.5	18.0	21.0	24.2	27.7	31.6	35.7	40.0	44.5

	1942						1943					
SCHEDULED PRODUCTION RATE INDEXES (Continued)	(Indexes, production in scheduled peak month=100)											
Military airplanes	98.5	100.0	99.1									
Combat vessels	88.6	89.1	91.0	91.7	93.0	100.0						
Merchant ships	100.0	98.7	97.6	95.2	91.3	88.0	85.8	89.3	81.9			
SCHEDULED TOTAL PRODUCTION INDEXES (Continued)	(Indexes, cumul. since July 1940, program requirements=100)											
Military airplanes	49.8	54.0	58.1									
Combat vessels	38.3	40.8	43.5	46.1	48.8	51.7						
Merchant ships	49.2	53.8	58.3	62.8	67.0	71.1	75.1	79.2	83.0			

* Data are as of the close of the month or week or nearest available date. P Preliminary data. R Revised data. n.a. Data not available.

For additional footnotes see page 12.

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DEFENSE PROGRESS SERIES (Continued)

	1940						1941							
	July [a]	August	September	October	November	December	January	February	March	April	May	June	12 month total	Total Program
STOCKPILE *														
ANTIMONY (short tons) - Purchases	0	6,250	0	0	0	0	3,306	19,535	239	0	0	307	[c] 29,637	1,800
Deliveries	0	0	0	0	0	2,351	0	3,900	[d] -1	489	250	306	[c] 7,295	
CHROME ORE (thous. long tons) - Purchases	95	46	0	20	122	100	[d] -1	54	95	9	115	[d] -9	647	1,300
Deliveries	27	6	0	2	23	22	24	2	4	23	18	22	173	
INDUS. DIAMONDS (thous. carats) - Purchases											768	3	771	2,000
Deliveries											4	0	4	
MANGANESE (thous. long tons) - Purchases	225	764	475	162	461	163	150	3	314	67	400	35	[c] 3,219	1,800
Deliveries	65	15	2	10	16	5	43	26	60	47	29	10	328	
MANILA FIBER (bales) - Purchases	25,590	0	0	6,800	11,200	7,906	8,000	8,000	8,000	8,000	8,000	8,050	99,546	395,257
Deliveries	23,490	0	0	2,100	0	7,006	6,750	3,550	4,650	350	7,806	14,995	70,696	
MERCURY (flasks) - Purchases	0	0	5,000	750	0	0	[d] -750	0	0	0	0	0	5,000	10,000
Deliveries	0	0	0	0	0	550	500	0	500	0	500	0	2,050	
MICA (thous. lbs.) - Purchases	0	0	0	0	547	0	642	2,554	302	2,205	[b] -1,056	387	5,581	10,800
Deliveries	0	0	0	0	0	0	238	234	0	587	522	708	2,288	
QUARTZ CRYSTALS (lbs.) - Purchases	19,700	0	0	0	84,470	0	0	0	[b] -4,900	0	0	0	99,270	702,000
Deliveries	13,224	1,797	1,362	1,912	1,300	881	7,989	5,057	10,694	635	4,134	3,484	52,469	
QUININE SULPHATE (thous.advp.oz.) - Purchases	723	3,000	0	3,500	0	0	0	0	[i] -23	0	0	0	[c] 7,200	6,400
Deliveries	723	0	0	100	300	0	1,400	900	877	800	300	1,085	[c] 6,485	
RUBBER (long tons) - Purchases	55,878	39,667	31,442	23,924	10,402	5,773	20,035	13,146	11,732	25,932	3,212	21,542	262,685	517,000
Deliveries	32,437	9,304	10,946	2,565	30,417	19,610	29,186	17,230	5,719	21,478	6,452	20,658	206,002	
TIN (long tons) - Purchases	10,348	2,136	14,606	0	2,095	5,905	29,330	36,000	0	0	0	0	100,420	159,400
Deliveries	5,861	1,318	3,981	1,080	4,075	4,490	6,055	2,960	4,010	4,015	2,215	2,225	42,285	
TUNGSTEN (short tons) - Purchases	782	6,695	1,667	0	2,083	1,500	0	18,583	0	0	20,634	1,850	[c] 67,294	13,000
Deliveries	809	0	6,067	33	9	9	[i] -280	10	[k] -832	22	911	887	5,871	
ESTIMATED TOTAL COST (Thousand dollars)														
Purchases							[g] 288,218	80,524	18,668	16,065	51,811	14,580	469,866	
Purchases without excess							[g] 250,276	51,701	9,530	12,942	4,673	9,630	338,752	
Deliveries							[g] 110,385	13,817	9,097	17,260	8,869	13,941	173,369	

* Data are as of the close of the month or week nearest available date.

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For additional footnotes see page 12

DEFENSE PROGRESS SERIES (Continued)

	1940						1941					
	July	August	September	October	November	December	January	February	March	April	May	June
ECONOMIC ACTIVITY RELATED TO DEFENSE *												
FED. RES. BD. PRODUCTION INDEXES	(Indexes 1935-39=100)											
Total industrial production	121	121	125	129	E 133	E 139	140	141	143	140	E 150	P 156
Durable manufactures	132	135	146	150	154	165	170	172	170	167	E 176	P 188
Nondurable manufactures	112	112	112	116	120	124	122	123	127	131	E 136	P 137
Minerals	120	113	116	113	118	119	118	118	125	101	E 127	P 132
BUR. FOR. & DOM. COM. MFGS. ORDERS, SHIPMENTS, INVENTORIES	(Indexes)											
New orders, total (1/39-100)	127	130	164	172	171	172	176	189	194	196	E 207	P 236
Shipments, total (1/39-100)	117	124	145	146	148	152	148	159	165	172	E 180	P 190
Total inventories (12/31/38-100)	109.2	110.9	112.2	114.4	116.5	119.3	120.8	121.1	122.1	123.6	E 126.3	P 128.3
Durable inventories (12/31/38-100)	111.9	115.4	118.4	121.2	124.1	127.9	129.7	130.7	131.8	134.1	E 137.4	P 139.3
Nondurable inventories (12/31/38-100)	106.4	106.0	105.5	107.1	108.5	110.1	111.2	110.8	111.8	112.2	E 114.4	P 116.6
BLS PRICE INDEXES	(Indexes)											
Strategic materials (8/39-100)	123.6	122.7	123.2	125.3	126.5	125.4	126.1	127.6	132.1	136.5	138.7	138.5
Critical materials (8/39-100)	107.5	106.6	107.8	110.1	110.0	110.6	111.7	111.4	112.0	112.5	113.5	114.8
Basic commodities (8/39-100)	108.5	106.4	109.3	112.1	116.6	117.6	120.5	121.3	129.6	136.6	142.5	146.3
Machine tools (8/39-100)	108.7	108.9	109.4	109.3	109.8	112.6	114.6	115.1	115.1	116.4	117.3	117.7
All commodities (1926-100)	77.7	77.4	78.0	78.7	79.6	80.0	80.8	80.6	81.5	83.2	84.9	87.1
BLS COST OF LIVING INDEX[B] (1935-39=100)	P 100.3	P 100.0	100.4	100.2	100.1	100.7	100.8	100.8	101.2	102.2	102.9	104.6
NATIONAL INCOME	(Billion dollars, annual rate)											
Total income payments	75.2	76.3	77.2	78.0	78.5	80.1	81.7	82.8	83.3	83.8	86.0	88.0
FEDERAL DEBT	(Billion dollars, end of month)											
Net public debt [H]	41.5	41.4	41.6	42.2	42.4	44.1	43.8	44.4	44.4	44.8	45.8	46.3

* Data are as of the close of the month or week nearest available date.
P Preliminary data.
E Revised data.
n.a. Data not available
For additional footnotes see page 12.
(Continued on Next Page)

DEFENSE PROGRESS SERIES (Continued)

	1940						1941					
	July	August	September	October	November	December	January	February	March	April	May	June
TRANSPORTATION AND POWER						(Weekly average)						
Freight carloadings (thousands)	707	930	784	817	945	680	684	706	954	698	832	909
Unloadings for export (dly.av.cars) R	1,502	1,656	1,597	1,409	1,318	1,329	1,352	1,371	1,392	1,514	1,479	1,441
Freight-car surplus (thousands)	133	104	75	88	96	129	110	87	71	190	72	71
Box cars	57	51	33	27	33	45	43	32	26	31	34	34
Coal cars	47	30	24	45	42	57	42	31	23	139	16	17
Electric power prod. (mil.kw.hrs.)	2,731	2,810	2,796	2,948	2,978	3,038	3,080	3,073	2,957	3,006	3,054	R 3,115
LABOR DISPUTES												
PLANTS WITH IMPORTANT DEFENSE CONTRACTS						(Monthly figures)						
Number strikes in progress	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	13	16	27	19	16	11
Workers involved (thousands)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	26	40	54	30	29	28
Man-days idle (thousands)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	146	378	494	238	182	103
ALL INDUSTRIES 2												
Number strikes in progress	390	394	394	419	373	277	330	369	461	524	725	R 670
Workers involved (thousands)	83	90	108	107	102	62	109	125	176	561	415	R 216
Man-days idle (thousands)	586	706	780	915	740	458	665	1,128	1,543	7,056	2,250	R 1,375
EMPLOYMENT R						(Thousand workers)						
Total civil nonagricultural 2	35,454	35,902	36,528	36,867	36,986	37,608	36,621	36,928	37,227	37,626	38,278	R 38,790
WPA employment 3	1,659	1,708	1,689	1,768	1,786	1,855	1,894	1,893	1,764	1,607	1,479	1,423
Defense 2												
Private, 18 major industries	1,660	1,719	1,773	1,839	1,901	1,972	2,036	2,108	2,173	2,259	2,332	R 2,400
Priv. contractors, pub. constr.	13	14	48	120	290	423	448	531	490	470	362	
Public	155	159	172	187	201	201	203	213	218	218	220	
Total direct defense	1,828	1,892	1,993	2,146	2,392	2,597	2,687	2,853	2,880	2,947	2,914	
Deep-sea merchant vessels 4	51	52	51	51	48	49	49	49	51	51	52	51
UNEMPLOYMENT (NICB estimate)						(Monthly total)						
Number of unemployed	8,566	7,643	6,742	6,453	7,066	6,687	7,367	7,039	6,117	5,412	3,962	

* Data are as of the close of the month or week nearest available date.
R Preliminary data. X Revised data. n.a. Data not available

(For Footnotes see Next Page)

FOOTNOTES

1 Data furnished by the Office of the Defense Housing Coordinator.

2 Data furnished by the Bureau of Labor Statistics.

3 Data furnished by the Works Progress Administration.

4 Data furnished by the Maritime Commission.

a July data are cumulative totals for the period ending July 31. They include appropriations made prior to July for fiscal year 1941 and orders and disbursements in this country, since December 1939, by the British Purchasing Mission and the Ministry of Shipping.

b This total is less than the sum of the monthly figures by $24 million, which represents a payment to the British Purchasing Mission by the Defense Plant Corporation.

c The February data are cumulative and include all certificates of necessity granted prior to March 1, 1941.

d Facilities financed through the Reconstruction Finance Corporation, Emergency Plant Facilities, and Government Supply Contracts. The entire cost of these facilities is included in Industrial Facilities - Cons., Equip., & Real Estate above.

e The March figure is a cumulative total of all recorded OPM priority certificates and extensions issued between November 6, 1940 and March 29, 1941, and all recorded ANMB certificates and extensions issued between February 17, 1941 and March 29, 1941.

f The January data are cumulative figures.

g Allocations of funds to purchasing agencies or departments.

h Reflects cancellation of contracts to this amount.

i Stocks to this amount released.

j Reduction due to correction of previous report.

k Reflects rejection of stock already delivered.

l Reflects recalculation of ore content of previously delivered stock.

m Data are as of the 15th of the month.

n Gross public debt minus balance in the general fund.

o Weekly figures are made up from three and four day averages of daily car unloadings for export at Atlantic and Gulf Ports; monthly figures are weighted averages of all the three and four day reporting intervals within the month. Unloadings of grain and coal are not included because these data are not available.

p All data, save those for WPA employment, are as of the 15th of the month or pay period nearest the 15th. WPA employment is as of the second Thursday of the month.

q This is in excess of the recommended program.

For Technical Notes see following pages.

TECHNICAL NOTES

United States Armed Forces includes regulars, all retired and reserve men and officers on active duty, National Guardsmen in Federal service, and Selective Service trainees.

Additions to Funds Available includes estimated cost of tonnage authorizations.

New Contract Awards includes some letters of intent.

Airplanes, Engines, Etc. includes Army, Navy, U. S. Coast Guard, Defense Aid, and British programs, for airplanes, engines, parts, and accessories.

Naval Ships and Parts includes the U. S. Navy and Coast Guard programs for the construction and maintenance of naval ships and parts.

Ordnance includes Army, Navy, Defense Aid, and British programs for ordnance, including naval armor, combat vehicles, and fire control apparatus.

Other Munitions includes the Army Chemical Warfare Service, activities of the Corps of Engineers, except construction, the Signal Corps, Quartermaster Corps transportation equipment, Army educational orders, and National Guard supplies; Navy Bureau of Navigation, Naval Supply Account and Marine Corps activities exclusive of pay; Defense Aid miscellaneous military equipment; and British orders for chemicals, motor vehicles, and animals.

Merchant Ships includes the regular and emergency programs of the Maritime Commission; Defense Aid vessels, and other watercraft, and British orders for ship and marine equipment.

Industrial Facilities—Cons., Equip., & Real Estate includes the Tennessee Valley nitrate plants and power facilities; the Bonneville power facilities; and new facilities financed with funds of the Army, the Navy, the Reconstruction Finance Corporation and its subsidiaries, the Emergency Fund for the President, Defense Aid, and the Maritime Commission. This program is an incomplete measure of the volume of new defense industrial facilities since it does not include privately financed expansion.

Posts, Depots, & Fortifications includes land for and construction on Army posts, depots, and other nonindustrial structures, repair of arsenals, and Seacoast Defense; construction and maintenance of Navy bases, stations, yards, and docks; U. S. Coast Guard shore facilities; the Panama Canal; defense construction by the Public Building Administration; airport construction; and nonindustrial construction by the Army and Navy financed through the President's Fund.

Housing includes defense housing under the Federal Works Agency, the USHA, Defense Homes, and the President's Housing Fund.

Stockpile Program includes the stockpile programs of the Reconstruction Finance Corporation and subsidiaries and the Treasury.

Other Equipment and Supplies includes other equipment and supplies for the Army Medical Corps, miscellaneous equipment, clothing, equipage, and regular supplies for the Quartermaster Corps, and maintenance and operation of the Army Air Corps; other equipment and supplies for the Navy Bureau of Medicine, clothing, supplies, fuel and transportation for the Navy, and maintenance and operation of naval ships and aircraft; purchases of agricultural and other commodities; and British orders for agricultural commodities and other non-materiel items.

Pay includes military and executive pay roll of the Army and organized reserves; the Navy, Naval Reserves, and Marine Corps; Selective Service; U. S. Coast Guard; and civilian national defense agencies.

Subsistence, Travel, Misc. includes Army subsistence, travel, and incidential expenditures of the Quartermaster Corps, miscellaneous services and schools, nonindustrial expenditures, the Citizens' Military Training Camps, and the U. S. Military Academy; Navy subsistence and travel, miscellaneous items, and naval training stations; RFC working capital loans; the pilot training program; Federal Security Agency defense activities; President's Emergency Fund for the Army and Navy not elsewhere classified; miscellaneous expenditures of the Coast Guard; defense expenditures of the Department of Justice; the National Advisory Committee in Aeronautics; Defense Aid testing, services, repairs, and administrative expenses; and administrative expenses of the British Purchasing Mission.

Navy Program and Total U. S. Military Program include the estimated cost of tonnage authorizations.

(Continued on following page.)

TECHNICAL NOTES (Continued)

Maritime Commission includes the regular and emergency shipbuilding programs of the Maritime Commission.

RFC & Subsidiaries includes the Reconstruction Finance Corporation, the Defense Plant Corporation, Defense Supplies Corporation, Metals Reserve Company, and Rubber Reserve Company.

Other Agencies includes defense activities of the Coast Guard, Tennessee Valley Authority, Bonneville Dam, Panama Canal, Public Buildings Administration, Federal Works Agency, United States Housing Authority, Defense Homes, the Treasury, Federal Security Agency, Department of Justice, Selective Service, Office of Emergency Management, National Advisory Committee for Aeronautics, and the various President's Defense Funds.

Private, 18 major defense industries includes abrasives; aero engines; aircraft; aluminum manufactures; ammunition; blast furnaces; steel works, and rolling mills, brass, bronze, and copper products; electrical machinery, apparatus, and supplies, explosives; firearms; foundry and machine shop products; instruments; machine tools; machine-tool accessories; optical goods; screw machine products; shipbuilding; smelting and refining--copper, lead, and zinc.

Priv. contractors, pub. constr. includes all defense construction (except ships) by private contractors for the Army, Navy, and other Federal agencies.

Public defense employment includes civilian employment in War Department manufacturing arsenals, on ship construction and repair in Navy Yards, and on War and Navy force account construction.