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## AMERICAN EXPERIENCE IN ECONOMIC MOBILIZATION TO WORLD WAR II

30 August 1951

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Colonel Barnes: Gentlemen, today we are going to have a look at what we have actually done about economic mobilization in the past. Dr. Hunter has broken down this lecture into two parts. The story today will bring you up to World War II and tomorrow he will complete it by covering the period of that war. As you listen to this American experience in economic mobilization, you should match your opinion of what you think we should have done against what we actually did. In other words try to analyze our experience as to what lessons can be derived, lessons that ought not to be repeated. One other thought that you ought to carry away from these two lectures on our experience is the realization of a very important point which Dr. Hunter tried to express and did so very successfully yesterday; that is, the overriding need in wartime of a centrally planned and controlled economy. Dr. Hunter.

DR. HUNTER: Yesterday morning I discussed with you the nature and problems of economic mobilization in our own day. This morning I want to review with you some of the economic problems of warfare as we faced them in two earlier wars. Then I shall conclude with a brief account of our economic mobilization planning activities between the First and Second World Wars--planning, as it was then called, for industrial mobilization. To cover so much ground in one period is giving you what is known as full treatment, but perhaps you can bear up under it. Then tomorrow, as Colonel Barnes indicated, I will try to give you an over-all view of how we mobilized the American economy in the recent war.

The conduct of warfare, as I pointed out yesterday, has varied, and often widely, from one age to another; but in every age warfare has its economic base and the conduct of war is confined within the limitations of that economic base. It is obvious, for example, that a backward agricultural economy such as is found in most countries of the Middle East and Asia, an economy in which most of the people are living close to the margin of subsistence, if not on the actual edge of starvation, cannot support warfare on the scale and with the intensity that an advanced industrial economy can.

As I emphasized yesterday, the war-making capacity of a nation depends on the ability of its economic system to provide the forces, the equipment, and the supplies essential for the conduct of military operations. It depends above all on the ability of the economy

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to produce a surplus of goods beyond the bedrock requirements of the civilian population and of the war-supporting economic activities. The larger this surplus, the greater the scale of military operations that can be supported.

I have prepared a chart which helps illustrate this close relationship between national wealth and war-making capacity in American history, and I have called it "The Rising Cost of Waging War." Three basic trends are shown on this chart, relating to population, national wealth, and war costs or expenditures. We have rather extraordinary increases within all three fields. In population we have moved from around 2.5 million at the time of the Revolutionary War to 132 million at the beginning of World War II. In the field of national wealth the figures here are very rough estimates, especially for the earlier years. We have moved up from about three-fourths of a billion dollars--a rough estimate for the Revolutionary War period--to, in round numbers, an estimated 400 billion dollars at the time of the beginning of the recent war. In the first column, the total cost of war rises from 125 million dollars in the Revolutionary War to the colossal figure of 350 billion dollars, in round numbers, in the last war. (See Chart, page 3.)

To see these figures of wealth and war expenditures in correct perspective, it is necessary to allow for the increase in population; so, in the third column and the fifth column from the left I have introduced the per capita figures for the costs of war and for wealth. On the one hand we find an extraordinary increase in the per capita cost of war, from around \$50 in the Revolutionary War to nearly \$2,650 in the recent war, with much the greatest upward movement between World War I and World War II. On the other hand, we see in the last column on the right the great growth in per capita wealth, up from less than \$300 in the time of the Revolution to roughly \$3,000 in the recent war. This great growth in per capita wealth shows how it was possible to wage war on the scale which marked World Wars I and II.

But note one more thing before leaving this chart; namely, how much more rapidly war costs have risen than the supporting national wealth since the First World War. I think those figures help to explain why our economic mobilization had to be carried much further and operated much more tightly in the Second World War than the First World War. I leave to your imagination what will be required in a third World War.

This close relationship between military power and economic development is beautifully illustrated in the case of our own Civil War, an affair which south of the Pentagon is customarily

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THE RISING COST OF WAGING WAR

	Total Cost of War (In Millions)	Size of Population	Per Capita Expenditures	Total National Wealth (In Millions)	Per Capita Wealth
Revolutionary War	\$ 125	2,500,000	\$ 50	\$ 750	\$ 270
Civil War (North)	3,300	24,000,000	140	15,000	625
World War I	35,000	100,000,000	350	250,000	2,500
World War II	350,000	132,000,000	2,650	400,000	3,000

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referred to as the War between the States. The Civil War was a struggle, not only between the Confederacy and the North--considered as different governments--it was a struggle between the economic and social systems of the belligerent sections. It was a struggle between the economies of these two sections which differed in important respects.

If we go back to the period of the late 18th century, say the years which followed independence, we find surprisingly little difference between the Northern States and the Southern States with respect to either size of population or total wealth and, so far as the bulk of the population in each section was concerned, surprisingly little difference in the general character of their economic life, their mode of making a living. However, in the 75 years between the Revolution and the Civil War, the American economy underwent very important changes. The population of the United States, for example, increased about ten times, an increase which is probably without parallel in recorded history. The wealth of the Nation increased in much greater proportion--approximately twenty times. Most important of all, and largely responsible for this great increase in wealth was the rapid advance beyond the rather simple agricultural economy of the 1780's and 1790's. The character of this economy advance can be summed up in a single word--industrialization; that is, the extension of the methods and the techniques of the industrial revolution in England to the United States.

During the 75 years between the two wars, for example, the iron, coal, and metal working industries underwent a very great expansion and, for the first time, these industries assumed a fundamental role in our economic system. Steam power in this period was introduced in a very large way and it brought about, among other things, a revolution in transportation through the rapid extension of the railroads and of inland steam navigation. The new transportation facilities and service greatly accelerated a shift from the largely self-sufficient agricultural economy of the 18th century to an industrial economy with a growing measure of economic specialization.

Favored by steam power and improvements in metal working techniques, mechanization spread steadily through manufacturing industry. Machine methods replaced hand methods. Even agricultural operations began to feel the direct impact of mechanization as a result of the introduction of reaping machinery in the 1850's. Important beginnings were developed in mass production in this same period. Finally, along with all these changes and influenced by them, there was a steady shift from the small shop to the large factory, from the small partnership to the corporation.

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The significance of these developments for war is obvious enough. The productive efficiency of the economic system was greatly increased. The economic surplus available for military purposes, you will hear it referred to as the economic war potential, likewise underwent a very substantial increase.

This in turn made possible the support of military operations on a far larger scale, in proportion to the population, than in the Revolutionary War.

While the Nation as a whole had greatly increased its economic potential--productive capacity--it was divided very unequally between the two belligerents, between the two sections. The North, since the Revolutionary War, had moved far ahead of the South in population and in wealth, in transportation facilities and service, in shipping and foreign trade and, above all, in industrial facilities and capacity of all kinds. Even in agriculture the South lagged behind. In 1860 the hay product of the North exceeded in value all the leading Southern staples combined--cotton, tobacco, rice, and sugar.

Because of this economic superiority, the North was able to raise and support its large armies and navies without great difficulty. In the first year of the war there was a great deal of confusion and disorder. For in the North, as in the South, they began the war quite without plans and preparations. But, thereafter, the equipping and supplying of the Federal Armed Forces was just a large-scale procurement job, with all the difficulties of that job; but it didn't go beyond that. In the North, the normal peacetime economic life went on pretty much as usual. Industrial and agricultural expansion, which had been so rapid the generation before the Civil War, went on with little check during the war. Throughout the war there were few scarcities of any importance and little hardship among civilians. There was no economic or even industrial mobilization, in the proper sense of the term, in the North. There was almost nothing of the central planning and directing which marks the true war economy. No controls were established over resources, production, prices, and labor--except for the draft. The Government was authorized in 1862 to take over the railroad and telegraph systems but, except in the war zone, it did not do so.

The position of the Confederacy was very different and far more difficult. The Southern economy centered in the production of a few staple crops--tobacco, cotton, sugar, and rice--chiefly for foreign markets. The loss of these foreign markets was a very serious blow for the South, cut off, as the foreign markets were,

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by the northern naval blockade. The South was dependent for manufactured goods of all but the simplest kinds upon imports from the North and from England, and both these sources of supplies were cut off, along with the outlets for its staple products, which had been so vital a source of income. The South had almost no heavy industry and was deficient even in such items as textiles, clothing, shoes, and leather goods. At the outset of the war the South had no munitions plants. Not only were its transport facilities far inferior to those of the North but, for lack of replacements of rails, rolling stock, and locomotives, its railroads steadily deteriorated during the course of the war.

The result was that the Confederacy found it increasingly difficult to move and supply its armies in the field and to concentrate in the areas of military operations the supplies drawn from all parts of the Confederacy.

The supply problems of the Confederacy were not primarily in the field of munitions; its military position was never seriously threatened by a lack of small arms, powder, and shot. Shortages in field artillery and munitions did at times definitely handicap the Confederate armies. It was fortunate, especially for the South, that the reliance of both sides during the war was on hand weapons of a simple, not to say, antiquated construction; for, if the weapons in the war had been of a more complicated kind, the industrial North would have had the South at an even greater disadvantage. The really serious problems of war production and supply centered in such commonplace items as clothing, shoes, harness, rails, locomotives, rolling stock, and the like. Two of the most serious shortages, surprisingly enough, which gave the South the most difficulty, were the shortages of horses and salt; and the most critical shortage of all, perhaps, was not in material but in manpower.

I think it was obvious that the outcome of the Civil War was not determined solely by economic considerations but, to the extent that it was, one thing seems clear--because of its limited resources, the South could only expect to win if it used those resources with maximum effectiveness. The Confederacy in fact found itself in a situation which really called for an economy directed and controlled by the central government. In order to overcome its economic weaknesses, a mobilization of its resources was essential, but there were numerous and very serious obstacles to such a mobilization. There was no experience in this country or elsewhere to provide guidance in such a mobilization of economic resources. Moreover, the Confederacy not only did not have the strong centralized administration required to make such

a mobilization effective, it had to improvise its central government at the outset and it made rough going of the whole wartime job. Also, Southern leaders were opposed to a strong central government on principle. That was a major reason for their secession from the Union--they did not like a strong central government. And throughout the war there was interminable bickering between the State Governments and the Confederate government.

In spite of the difficulties, the Confederate government did take some measures to mobilize its economic resources in support of the military effort. It was done under pressure of urgent necessity. It was not a matter of conscious planning. It was not a matter of a deliberate consideration of all that was involved. These measures, taken collectively, represent the beginning of a controlled and directed war economy. They included, principally, the establishment and operation by the Confederate government of plants for the manufacture of a variety of supplies in the South: clothing, shoes, small arms, artillery, salt, powder, transportation equipment, and so on. It included the setting up of certain controls over transportation, chiefly the railroads. The Confederate government also established certain limited controls over manpower and materials, operating chiefly through the draft and draft exemptions and through transportation priorities of a very crude kind. They also exercised pretty close control over foreign trade, including government operation of blockade runners. There were even controls over agriculture, chiefly restrictions on cotton and tobacco planting, which the planters persisted in continuing to produce, although of no use whatever in the war effort, but rather a hindrance upon it.

In terms of the things that the Confederate government tried to do, the record is rather impressive; but in this effort to mobilize economic resources the southern people had only a very limited success. They failed and at last the Southern economy almost literally broke down. The Confederacy lost the war not so much on the battlefields as on the economic and administrative fronts.

The experience of the Confederacy is interesting because the South in an important respect was closer to total war than anything we have experienced in this country in either of two World Wars. For example, substantially the entire white male population of military age, not exempted by law, was enrolled in the army, amounting to an equivalent of three years' service from over a million men out of a total white population of 5.5 million. So far as the civilian population was concerned, nothing in the two World Wars in this country can compare with the hardships and privation suffered in the Confederacy. In fact, when you view the great

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differences in the material resources of the belligerents in this war, the ability of the South to continue the war so long was remarkable.

Between the collapse of the Confederacy and the outbreak of the First World War in 1914, a period of 50 years, a great deal took place in this country. These developments were largely a continuation of the economic developments which got under way in the first half of the century. Population expanded many times; industrialization advanced rapidly; there were great advances in mechanization in all branches of economic life; new materials, such as steel, petroleum, and rubber, came to play an important role; the chemical industries rose to a position of industrial prominence; new sources of power such as the electric motor and the internal combustion engine came into wide use.

The economic results of this widespread industrialization were very great. The total national wealth of the United States as noted earlier, increased three or four times as rapidly as the population. The surplus income beyond the bedrock requirements of the civilian population and available for the support of warfare showed an even greater increase.

Another equally significant result of the great advances in productive efficiency and in technology was the new types of weapons and other military equipment which these developments made possible. These new weapons in turn provided the basis for a new kind of warfare. The key to this new warfare can be summed up in two phases-- the mechanization of combat and the industrialization of supply.

As I pointed out earlier, we had made a beginning in the industrialization of supply in the Civil War. But with minor exceptions, actual combat in the Civil War, as in the Revolution, had been mainly a hand operation employing hand weapons. By the time of the First World War, combat itself had become mechanized to an important degree as the result of the development and introduction of important new weapons: the breech-loading rifle using the metallic cartridge; the machine gun; the rapid fire field gun; and similar advances in mechanization in naval weapons, above all, the evolution of the warship from sail to steam, and the introduction of the submarine. Combat was mechanized further by the introduction of the airplane and the tank, both made possible by the internal combustion engine; and the motor truck and automobile in turn advanced the mechanization in transport and supply right up into the combat areas.

So, by 1914, the ground had been prepared for warfare on a scale and with an intensity that were unprecedented. Huge conscript armies of millions of men were mobilized and put in the field. The early attempts of Germany to force a quick decision were defeated, and there followed the long stalemate of trench warfare on fronts hundreds of

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miles long. The large numbers engaged, the long sustained actions, and the high rate of fire produced enormous expenditures of ammunition and other supplies. For example, in the preliminary bombardment in 1917 in the third battle of Ypres, 2,300 guns on a fifteen-mile front expended over 100,000 tons of shells. The average weekly expenditure of shells by the British in France rose from 2,000 tons at the end of 1915 to over 100,000 tons at the end of the war. Naval warfare was much less intensive, but submarines took a very heavy toll of shipping and supplies.

The scale of the supply problem resulting from these conditions exceeded by far anything that had been anticipated by any of the belligerent powers. The struggle soon settled down into an endurance contest in which the outcome, it became clear, would depend largely on the ability of the belligerents to meet the very heavy drain on their productive resources. The main burden of the war of attrition fell upon the industries supplying the munitions requirements of the armed forces, but before long scarcities of food, raw materials, general industrial capacity, and manpower appeared. Supply crises in one form or another developed within all the belligerent powers and threatened the success of military operations.

Under the compulsion of these conditions, the governments found themselves compelled to take extraordinary measures, and they established direct controls over their economies at critical points: control over scarce materials in order to channel them into war production; control over foodstuffs through rationing; control over prices, profits, and credit; control over transport facilities, manpower, and so on.

These controls were established only gradually and in a piecemeal fashion, as the pressure of events compelled the governments to act. Collectively, they changed radically the operation of the economic systems of the belligerent powers. In this fashion, the war economy was then born.

When the United States entered the war, in April 1917, the position of the Allies was critical. They were approaching the limits of their resources in materials, manpower, and productive capacity and they were approaching their limits also in credit for purchases abroad. We brought to the Allies the greatest industrial capacity of any nation in the world, but it was capacity geared almost entirely to the production of civilian type goods for civilian needs. The first and most critical problem we faced was that of converting this industrial power into military power, and we had to do it fast. However, with all our productive skill and with the best will in the world, under the pressure of the urgent war situation,

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from 12 to 20 months were required to get into production on the more critical items such as artillery, planes, and machine guns. And there was much reluctance on the part of many manufacturers to convert to war production.

A second major problem appeared at an early stage, just as it appeared in the European countries--scarcities in basic metals, lumber, foodstuffs, fuels, and heavy chemicals; productive capacity could be increased only slowly; our priorities systems had to be devised and operated to channel scarce materials where they were most needed.

A third major problem was a transportation bottleneck which retarded both industrial and military aspects of the war effort. On top of a great increase in domestic transport requirements, resulting from great expansion of production, was added the huge job of transporting an army of two million men to Europe and of keeping them supplied there. This, plus heavy shipments of Allied supplies, minus heavy toll taken on ships by submarine warfare, required our building up merchant tonnage on a large scale. This called for an enormous expansion of shipbuilding facilities. Rail transport broke down under the load of wartime demands, and this resulted in the Federal Government taking over the operation of the railroads for the duration.

Other major problems centered in the labor and price fields, neither of these proved nearly so difficult, however, as in the Second World War. Price inflation presented the more serious of the two problems. This problem was not simply one of price stability to minimize disturbances to business operations; it was also one of keeping down the cost of war and of keeping up public morale.

Finally, there was the problem of over-all coordination of the war production effort.

All these problems and many lesser ones were, of course, not separate and distinct problems. They were all interrelated and interdependent. No one could be solved simply by itself. Moreover, the many different production programs had to be kept in balance with each other. There must not be too much ammunition and not enough guns to use it. Unless we had the necessary shipping to get the supplies to Europe, what was the use of manufacturing the supplies? Somebody had to sit on top and direct the many phases of the economic mobilization effort, for, without such over-all coordination, the whole war effort might bog down.

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This brings me to the organizational and administrative aspects of our industrial mobilization, which I will treat only very briefly. When we entered the war, the military authorities and a few civilians had some general idea, at least, of the immense job which had to be done, as the result of their observation of developments in the European war. But we were almost completely lacking in plans for doing the job. We had little conception, for example, either of our requirements for everything from end items to raw materials, or of our industrial capacity and output to meet those requirements. There was little general awareness of the need for central direction and control of war production. We had to develop the elaborate system of war agencies to direct the various phases of the mobilization effort; but we did this reluctantly, slowly, and by a series of improvisations and make-shifts. In fact, by the time the organizational machinery for the direction of the war production effort was fairly complete, the war was practically over.

Much of the most important of these war agencies was the War Industries Board, set up in July 1917, to replace an advisory commission established some months earlier. The effectiveness of the War Industries Board, however, was limited by the lack of any real authority over production until March 1918. The passage of the Overman Act at this time gave priority and other powers to the President, and he delegated much of this power to the Chairman of the War Industries Board, Bernard Baruch. Under Baruch as Chairman, the War Industries Board served as a kind of industrial general staff for the direction and coordination of efforts on the economic front of the war. It was built up into a wartime organization of substantial size--for that day; it seems very small indeed, compared with the War Production Board in the recent war. It had functional divisions set up to deal with such matters as requirements, priorities, price fixing, and so on. Other important divisions were concerned with raw materials and finished products. The main attention of the Board was given to such urgent matters as the conversion and expansion of industrial facilities; the opening up of new sources of critical raw materials; the development and operation of a priorities system for the distribution of scarce materials where most urgently needed for the war effort. Much attention also was given to the conservation of scarce materials, labor, and price control.

The War Industries Board was simply the most important of a score of war agencies set up to deal with problems of production, distribution, and control in a variety of fields. There was a Fuel Administration, and a Food Administration, a Railroad Administration, and a Shipping Board; and still others to deal with labor, foreign trade, communications, and so on. Through the priorities power delegated to it by the President, the War Industries Board was able to ride herd over a lot.

In this mobilization we moved very slowly. We had been at war nearly a year before our industrial mobilization began to make real headway. It wasn't until 13 months after we entered the war that the War Industries Board was given the priority power essential for its effective operation. There was a strong public resistance to the wartime controls. For example: The automobile industry succeeded in opposing all the efforts of the War Industries Board to restrict automobile production until the spring of 1918, a year after we had entered the war. Then agreement was reached to reduce production to 30 percent of capacity and to end production at the close of 1918; by which time the war was over. One of the largest of the automobile manufacturers, in fact, refused to go along with the industry in this matter until he was finally brought around by the threat of commandeering his coal supply and denying him the use of any railroad cars.

As you all will recall, the story did have a happy ending--we did win the war and the mobilization of our economy was in many respects a very great achievement. With only a small head start from Allied orders, we built up a war production system of tremendous capacity. We supplied our Allies with great quantities of food, raw materials, and manufactures. We recruited, trained, equipped, and transported to France an army of over two million men. We moved from an economy without controls to one which in many respects was highly regimented.

But against this array of achievements must be balanced serious shortcomings. The failure early to establish central direction and controls in war procurement and production resulted in great delays and in great losses in manpower and materials. Another serious weakness was failure to restrict sharply nonessential production in order to force industrial conversion to war production. The mistakes and delays in determination of military requirements and the setting of production goals too high at the beginning resulted in a disproportionate share of labor and materials being absorbed simply in tooling up for production. As a result of the delays, war production was just getting into high gear when the war came to an end. Major items of materiel--airplanes, shells, and artillery--were supplied to the American Expeditionary Force chiefly by our Allies. And, finally, the Federal Government gave literally almost no thought to plans for industrial demobilization and reconversion. The result was, we ended up the war in as much confusion as we began it.

This brings me to the last part of my talk this morning--planning for industrial mobilization between World War I and World War II. In the years immediately following the First

World War, a good deal of attention was given by the services and by Congress to a review of our wartime experience. That attention centered on the weaknesses and shortcomings of the military establishment as revealed by the war and in the shortcomings of our economic effort. The results of this review were embodied in the National Defense Act of 1920.

Among the various lessons which we learned from our experience in World War I, two are of particular importance to us here. One obviously was the demonstration of the central or basic role of industrial mobilization in modern war; and the second was the importance, indeed the necessity of peacetime planning, for the eventuality of war--not only the preparation of strategic war plans but, of scarcely less importance, planning for the industrial support of military operations. You see, a dictatorship may keep military forces in being on such a scale that planning loses some of its importance; but in a democracy, especially under American conditions, accustomed as we have been to maintaining the armed forces on a nominal scale in peacetime, chiefly an army, planning for rapid expansion of these forces in wartime assumes a very great importance.

Formal military planning in this country dates from the act of 1903 which established the General Staff and gave it responsibility for formulating war plans. The Defense Act of 1920 went a step further. It recognized the importance of the industrial foundations of warfare and made specific provision for planning in this field. Within the War Department it created the Office of the Assistant Secretary, and it specifically charged the Assistant Secretary of War with two major duties: the supervision of military procurement within the War Department and, to quote the act "... with the assurance of adequate provision for the mobilization of materiel and industrial organizations essential to wartime needs ...."

This rather awkwardly, not to say obscurely, worded clause provided the basis for 20 years of what was called industrial mobilization planning--planning not simply for the War Department alone but for the military establishment as a whole, and for the entire Nation. The War Department was given the entire responsibility for planning in this particular area.

Within four years of the passage of the Defense Act of 1920, three agencies had been established to carry on these activities. In 1921 the Planning Branch in the Office of the Assistant Secretary of War was established. This branch carried the main load of the planning work in the military establishment during the next 20 years. It was never a large outfit; most of the time it operated with only 25 or 30 officers. Next, in 1922, the Army and Navy

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Munitions Board was set up by the Assistant Secretaries of the War and Navy Departments, as the result of recognition of the need for coordinating the procurement planning between the two services. The Army and Navy Munitions Board played a rather slight role, however, for the first 10 years. It was not until the early thirties that it stepped actively into the picture. From then on to the outbreak of war it played a very active role in the planning effort.

In 1924 the Assistant Secretary of War established the Industrial College to train Army, Navy, and Marine officers in the problems of procurement planning and industrial mobilization. From 1924 to the close of school, following Pearl Harbor, nearly 1,200 officers graduated from the Army Industrial College, nearly three-fourths from the Army and the remainder divided equally between the Air Corps on one hand, and the Navy and Marine Corps on the other. Of the Army officers, about four-fifths came from the technical and supply services. The Army Industrial College worked closely with the officers in the Planning Branch, who aided in instruction, and the students in the college worked on problems of interest to the Planning Branch.

During the twenties and the thirties industrial mobilization planning was carried on actively, and it broke down into two broad categories which I will describe very briefly: procurement planning on the one hand and, on the other, planning for the so-called over-all aspects of industrial mobilization. The first procurement planning related to the specific responsibilities of the armed services for procurement of their equipment and supplies, whereas the second related to the measures of industrial mobilization necessary to insure that the procurement efforts would be met by the economy in the event of war.

In the field of procurement planning, the Planning Branch in the Office of the Assistant Secretary of War merely laid down general policies and then reviewed, analyzed, and coordinated the detailed planning work which was carried on chiefly by the supply services in the Army and by the supply bureaus of the Navy. The detailed procurement planning broke down into planning activities concerned, for example, with the computation of requirements for the principal items of military supplies, with the determination of industrial sources of supply and the making of plant surveys to determine what plants would be most suitable for the production of different types of essential military items in the event of an emergency.

Much attention was given to the allocation of these industrial facilities which had been surveyed--allocation as between Army and Navy, in order to prevent competition for the use of such facilities in the event an emergency should arise. Competition had caused no end of trouble during the First World War.

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In support of what might be called the operational side of procurement planning, that concerned with the ultimate placing of supply contracts, numerous studies were made of such problems as the supply of raw materials where shortages were probable; studies of manpower, fuel, transportation, power, war trade and finance, contract forms and procedures, construction, and so on. That pretty well covered the field.

All these foregoing studies related primarily to the procurement responsibilities and the meeting of the procurement responsibilities of the armed forces in the event of war.

The second phase of planning had to do with the broader aspects, what might be called the civilian aspects, of mobilizing the economy for war. In other words mobilizing the economic resources of military procurement in the manner I discussed in yesterday's lecture and this morning, and it had to deal not only with controls it established, but with organizational arrangements to exercise this direction and control over the economy.

This second phase was the phase of planning which received the chief publicity and aroused most interest among the general public. The general public was greatly and directly affected by any plans for mobilizing the economy. The end products of this planning for industrial mobilization were the Industrial Mobilization Plans. The first of these was made public during the hearings before the War Policies Commission back in 1930 or 1931 when Douglas MacArthur was Chief of Staff. There were three formal revisions of this first plan, issued as government documents in 1933, 1936, and 1939. The 1939 revision was the last made before World War II. These plans did two principal things: They indicated and described the various types of economic controls which were believed essential for making industrial mobilization effective in supporting procurement and supply operations. In the second place they outlined the organizational arrangements to be provided for administering these controls and for performing various other economic war functions necessary to carry out the mobilization of our productive resources. In the main the plan proposed that these controls and functions would be administered not by the regular old-line civilian agencies but by special emergency civilian agencies set up when the emergency came and to be abolished at the end of the emergency.

The story of industrial mobilization planning, the detailed story of the Industrial Mobilization Plans, and of what was done with these plans when the emergency came in the Second World War is a long and a rather complex story. There won't be time to make more than a very few remarks this morning about it; but for those who are interested I will simply refer you to the ICAF monograph "Economic Mobilization Planning and National Security--R128."

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When the emergency came, neither the detailed procurement plans of the supply services nor the over-all Industrial Mobilization Plans were put into effect. Specifically, the Industrial Mobilization Plan in its last revised form, that of 1939, was virtually ignored in our actual mobilization. The reasons for this I will discuss very briefly tomorrow. The facilities allocation system, in many respects the heart of the procurement plans of the supply services, broke down also when the emergency came. It was never made effective except in a very limited degree.

Despite the failure to place in operation the formal results of nearly 20 years of planning, it would be a mistake to feel that the planning effort was largely wasted. For one thing, as a result of the publicity given industrial mobilization by the planning authorities, and of some publicity that was not given by them but was received as a result of sensational newspaper and periodical articles, there was at least some general awareness among the general public at the outset of the war as to what would be involved on the economic side if we got into war, some general notion of the nature and problems of industrial mobilization and its role in warfare.

Also, it is important to keep in mind that within the armed services, as a result of the activities of the planning agencies--the Planning Branch, the Army and Navy Munitions Board, the Army Industrial College--at the upper levels of the military establishment and in the supply services at the lower levels, there was a rather general awareness of the conditions and problems of industrial mobilization and of the load which the armed services and the Nation would have to carry when war came. And when war did come, the armed services knew a great deal about what the score was; they knew a great deal about what the problems were, and they were in a position to move for these things they felt were necessary.

COLONEL BARNES: I just wanted to clear up one point in regard to this discussion period. The fact that the monitor is apt to announce that the speaker is ready for your questions is not to imply it is a period only to clarify by questions something the speaker said. We look on this as a very fruitful period of discussion, where somebody disagrees with the speaker and makes observations and comments with a view to bringing up his experience on something in the area. Any discussion that you think will be of interest to your class, anything that will stimulate the discussion period is what we are after, comments, observations, questions for clarification, and so on. Louie is ready for the discussion period.

QUESTION: During the course of the development of the plans and policies in the period between World War I and World War II, was an attempt made to give a practical field test to the plans and policies--

that is, was an organization developed in order to really test their workability?

DR. HUNTER: I believe nothing along that line was done. Of course, many of these planning activities by the procurement planning agencies took on something of the character of preparatory measures, such as establishing the industrial surveys, the plant surveys that were made. I forget the total figure but somewhere around 12 or 15 thousand plant surveys were made to determine whether specific plants would have value for the production of specific types or categories of military items. They went beyond that in two respects; Educational orders were introduced--I think the first Act of Congress, the first appropriation act providing funds for educational orders was passed in 1939--and made possible the giving of orders to manufacturers for specific military items regarded as presenting unusual production problems. The manufacturer taking an educational order would simply set up the equipment and machinery and run production on a pilot basis for a time until he discovered just what the bugs in production were, what the problems were, and so on--a very small-scale production.

In addition to that, provision was made for production studies, in which manufacturers did not actually set up the plant or equipment for the manufacture of the item; but, short of doing that, they investigated and, so far as possible, resolved the various production problems involved in making a particular item. I think that is the closest they got to trying out the phases of some of their preparatory planning.

QUESTION: In the chart, you used, were the values as given in terms of dollars suggested on the basis of the change in value of the dollar over a period of years?

DR. HUNTER: No, those figures are the figures as of the period. I didn't attempt to make the adjustment to the changing dollar value. For one thing, the figures of national wealth are very rough estimates. They should not be taken as anything more than that. Figures on the total cost of the war are somewhat more reliable and they are roughly comparable, for the reason that there was a substantial degree of inflation in each of our major wars.

COLONEL BARNES: Louie, will you explain the close concept of national income, national wealth, to show the relative equivalents, so the two figures won't be misunderstood? We didn't have our country wiped out by the cost of war.

DR. HUNTER: Keep in mind this is per capita expenditures through the entire period of the war, not annual per capita expenditures in the Revolutionary War. That is something that can be kept in mind. This \$50 per capita figure was spread over a period of about seven years. It was spread over approximately four years in each of the later wars--the Civil War and World Wars I and II. If we take into consideration the defense period, when our expenditure was really very heavy, World War II lasted over a period of pretty close to six years. The national wealth is comprised in large part of the productive resources of the Nation--the farms, factories, mines, mills, and so on. It is a major source of the national income, and, except for depleted mineral resources was not materially, if at all, impaired by the war.

COLONEL BARNES: Both the per capita wealth and national income for three or four years would at least exceed substantially the \$2,650, so there is physical evidence of our not being wiped out in this country of all our fixed public and private property, which that might imply on short consideration. That is explained.

QUESTION: Referring to that same chart, do the figures on the total cost of World War II reflect the additional cost of lend-lease?

DR. HUNTER: That figure of 350 billion dollars includes lend-lease aid to allies. It is the total over-all cost of the war in round figures.

QUESTION: Would you say that the primary reason for the nonuse of all the planning done by the planning branches of the Army, the Navy, and the Munitions Board was due to the lack of a complete and adequate plan, primarily because they brought in civilian industrialists to head up the industrial mobilization and they preferred to rely on their own industrial experience?

DR. HUNTER: That's a very interesting point. I would like to save for tomorrow discussion on just why the Industrial Mobilization Plan, as a whole, that is, was not put into effect. You may have in mind chiefly the procurement side of the planning of the armed services. The supply branches were faced with a very difficult situation because the war did not go according to their procurement plans any more than it went according to the over-all industrial mobilization plans. In so far as the procurement plans were concerned the central feature, which was the allocation of industrial facilities to the different services, was contingent upon the use of negotiations in the letting of contracts. In other words, if you allocated plant A to the Army and plant B to the Navy for the production of specific items and then let contracts for these items on the basis of the highest bid--the highest bidder might be plant X, Y, or Z--your allocation would be

completely upset. At the outset of the war, the services did not have authority to let contracts except to the highest bidder and when Congress, around July 1940, did pass a law permitting placement of contracts on the basis of negotiation under certain conditions, the procurement branches were very reluctant to make use of it--very little use was made of it for a year or so. Now I come around specifically to the point of your question. During intermission General Holman was pointing out the important role in the war procurement and production which was played by a number of the military graduates of the Army Industrial College, the very essential role that they played in some of the key war agencies, even outside the military departments, and what they brought to their work in industrial mobilization, on the procurement side. They brought this experience, these ideas, this understanding, this knowledge of what was needed and desirable, which they had obtained from their study of industrial mobilization at the Industrial College. A second point: The War Department, specifically the Assistant Secretary of War, responsible for industrial mobilization planning, did quite a publicity job for this planning. It was in many business and industrial circles that there was the greatest acquaintance with the Industrial Mobilization Plan and what was involved in industrial mobilization planning. The general public was beginning to learn of industrial mobilization planning from sensational articles, or semisensational articles, that appeared in various periodicals and newspapers, telling them: "See the Government plans for you, you, and you on M Day. Every action you take is planned." These articles give a picture of every one of us taking his assigned niche on the home front when the war came. In business and industrial circles they had a greater familiarity with the job to be done, but when the businessmen and industrialists came to Washington to staff the civilian war agencies, especially the production agencies, naturally they operated according to their past experience, their own ideas, and so on. How much they were influenced, to what extent, you might say, they had been indoctrinated and had taken over the ideas of the Industrial Mobilization Plan and planning, to what extent they operated in terms of those ideas, I don't know, but probably they had only taken over some of the more general ideas. When it came to detailed operations, I presume they were guided chiefly by all their experience in the business and industrial world.

QUESTION: Why did the Industrial Mobilization Plan of 1939 provide that mobilization plans be implemented through emergency civilian agencies rather than through the old-line agencies? I ask the question because Novick in his book on wartime production controls comments on that one point. He states that emergency

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agencies hurriedly thrown together cannot do a job. I notice also in these semi-emergency days the Government again has begun to set up emergency agencies which presumably will be abolished after the emergency subsides. I know some of the pros and cons on it. I would like to hear your explanation of it.

DR. HUNTER: There are two basic reasons, as I see it. On the one hand there was a very genuine feeling that the old-line agencies were not equipped to do the job, and that they are not given to moving quickly; that they are too engrossed in routine duties to rise to the requirements of an emergency. The second consideration was the fear that if you gave power to an old-line agency you would never in the world get that power away when the emergency came to an end. Therefore it was important to set up emergency agencies whose authority would not extend beyond the end of the war and staff them with businessmen who will be eager to get back to their own shops. You would solve the problem in that way. This fear of the growth of bureaucratic power was accentuated in conservative circles by the awareness that the regular executive agencies were headed up by New Dealers and, God knows, they didn't want the New Deal to get a permanent foothold--it was permanent enough as it was. There was a strong feeling: Don't let the war be taken over by the New Deal!

COLONEL BARNES: There was another consideration, too, Louie; that was, Franklin Delano Roosevelt--his ideas were the ones in mind.

QUESTION: I noticed in the lecture you stated the rail system had broken down through the First World War, and it was necessary for the Government to take over the railroads. I was wondering if you could comment on the reasons for it. I am interested in whether it could not be solved by leaving the private operation and by the use of other Government controls--whether it was absolutely essential for the Government to take over the operation itself.

DR. HUNTER: I am glad you raised that point. What happened in respect to the railroads in World War I is a very controversial issue, because it involves the whole question of private enterprise as against public ownership. It is therefore difficult to get an impartial, non-controversial treatment of that phase of economic mobilization in the First World War. All those who are opposed to anything resembling government operation of the railroads have naturally been inclined to be very critical of the action taken in World War I--often taking the position that either it was not necessary or it was very badly handled. I think the best way to get that whole story is to go to the volume written--at least one important side of it--by Mr. Hines who was the administrator of the railroads in the First World War. The difficulty was partly inherent in the competitive operation of

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our railroad systems and in the difficulties of adapting our transportation system, chiefly the railroads, to meet the urgent necessities, the urgent requirements of the war. For example, under the competitive operation of our railroads, as it was at that time and substantially is today, there was a great deal of duplication of facilities and of services of railroad lines themselves, of terminal facilities, rolling stock, and so on. That duplication in peacetime is part and parcel of the operation of the competitive system. When the war came and the requirements of the mobilization load upon transportation rose, increasing immensely, the waste and inefficiency attending duplication of facilities and services could not be permitted. This was only part of the problem. The load imposed on the railroads by the war was not only so much larger but so very different in its distribution that drastic changes were required to handle the load. The railroads failed adequately to anticipate and prepare for the needs of the war situation so the Government stepped in.

QUESTION: In view of the fact of the problem we have already had with the railroads and the decline in the railroad dividends, isn't it all the more probable we will have to take over the railroads again, because the trucking industry has absorbed so much of our transportation? I assume in mobilization we are going to find we have a greater problem involving transportation in the country, are we not? Defense should regulate that and distribute the type of transportation each carrier should have. I don't know whether it has died on its feet or is on the books somewhere. Can you enlighten me?

DR. HUNTER: I am sorry; I am not familiar with the details of the situation.

COLONEL BARNES: That seems to be all we have time for. Thank you from all of us, Louie.

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