SURVEY AND ALLOCATION OF FACILITIES
29 January 1946.

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GENERAL ARMSTRONG:

Gentlemen, we are going to hear Colonel Hare, who has a distinguished record in the Army since the First World War. I will not go into the details of all his activities except to tell you that for five years he was on the staff of the Assistant Secretary of War and Chief of the Facilities Division of the Army and Navy Munitions Board. He had a great deal to do with the system of allocation, which is of tremendous importance, and which we must examine in this course with considerable care. Colonel Hare has just returned from the Philippines, where as a General Staff officer he was in charge of all the depot operations in the Southwest Pacific Theater. Gentlemen, Colonel Hare.

COLONEL HARE:

General Armstrong, members of the faculty, and gentlemen of the Army Industrial College. There is no phase of industrial mobilization that is more susceptible to critical analysis than that which has to do with the plans drawn up in time of peace for placing orders in time of war. In the Office of the Under Secretary and the Army and Navy Munitions Board, we, with the Navy, formed an Allocations Division. This division had charge of the peacetime survey of industry, the earmarking of the best manufacturers, and the making of definite plans with them for swift production of the things that would be needed by the Armed Forces.

It has been extremely interesting to me in World War II to have served on both ends of the supply line, to have been in on the early thinking on what probably would go to industry in the way of war orders, what probably their production would be, what probably their problems would be, and then to see the materials move from our blueprint stage through the manufacturing plants to the troop on the firing line. I had a pretty good, close, first-hand opportunity to see the Industrial Mobilization Plan function in all of its details.

Lack of industrial plans in World War I.--To me, as I look back over the last war, the early planning that was done by the Technical Services, Industrial College, Munitions Board and the Office of the Under Secretary of War was of enormous value to the Nation, and is responsible, in no little degree, for the victory that was achieved by our arms. In those days we had little to go on, because the mobilization of industry for the First World War had not been preplanned. We could not point out to a student in the Industrial College in 1924 that, "This is the way we planned it and this is the way it actually was accomplished."

It is true that the Industrial College, when it was organized five years after World War I, did manage to collect and document a mass of valuable evidence on the supply experience of that conflict.

These data were used by both the General Staff and the industrial planners in charting a course that they hoped would avoid the pitfalls that nearly lead to industrial chaos in 1917.

But there had not been that intimate shoulder to shoulder daily contact between the Army and the Navy and the men in the factories who would have to produce the guns, the planes, the tanks, the food, the communications, the medicines, the chemicals, the machinery, the uniforms and equipment that characterized the industrial planning for World War II.

Tribute to procurement planners.--The Under Secretary of War paid high tribute to these early planners when he said in his report on the munitions experience of the last war: 1/

> "We ought not to forget the debt the Nation owed to the farsighted officers who worked on procurement planning in the Office of the Assistant Secretary of War and in the Supply Arms and Services during the years of peace. Their efforts attracted little attention, except now and then when they were misunderstood and criticised. ****** It is to their credit that they, as well as the tactical command of the Army, resisted the temptation to believe that war could be waged cheaply and insisted upon planning for an all-out effort. In spite of many handicaps - apathy, inadequate funds, insufficiant personnel - the planners achieved important results."

The General Staff had in a way gone into the industrial requirements of World War I. But nobody had really sharpened their pencils and gotten down to the real fundamentals of the impact of war on industry and the problems ahead in raw materials, machine tools, financing, labor, priorities and all those factors which must be considered in shifting from a peace basis. We wanted the answers to these questions and began sending our officers to Harvard University's Graduate School of Business and other centers of industrial education. We wanted these experienced military men to be well versed in economics and to know how to talk to manufacturers and understand the complicated language of business. We knew we could not get busy industrialists to study the military needs and to spend enough time working with us to insure that our plans were practical and abreast of the times. The results were more than successful.

Dividing up the capacity.--One of the first problems we tackled in preplanning World War II was to regulate the initial rush of the procuring agencies to the factories which had been such a demoralizing factor in the first days of World War I. We wanted to avoid having the Air Corps, the Signal Corps, the Quartermaster Corps, the Ordnance Department, the Navy, the Bureau of Ships, the Department of Commerce,

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1/ Munitions for the Army: A Five Year Report on the Procurement of Munitions by the War Department under the Direction of The Under Secretary of War.

and all the other buyers of the Government meeting together on the front steps of some big manufacturer, waiting for the doors to be opened, and then rushing in and elbowing their way to the front counter and saying, "For God's sake, take my order first."

So we set up a system of allocations. We surveyed industry. We went into the plants with people who knew what they were seeing, and we devised factory plans and flow charts and those things which showed convincingly what each plant could produce, and what is probably more important, the calibre of the management.

In each approved plant we allocated space, machine hours and other factors in production to specific war tasks; and we got an agreement between the Army, the Navy, and the other competing agencies as to who would come first, who would eat at the first table, at each particular facility. Then, to keep accurate track of the capacity we had developed, we had the plants accept tentative schedules of production.

The first Educational Orders.--When the war clouds began to gather in Europe, we knew very well what our problems in procurement would be. We went to industry with educational orders. There were lots of items that we could not even describe clearly to the man we had selected to make them. We would ask: "Do you have the equipment and the know-how? Could you get the raw material? Can you handle this kind of item on such-and-such a production basis?" He would say, "I do not know." He had never even heard of that kind of thing.

For instance, Sperry said he had never seen a bomb sight. Neither had I. Neither had a lot of other people because it was a very secret item. So we went ahead and got enough money from Congress to get some educational orders for industry. I do not want to go too much into that phase of industrial planning as it is a big subject in itself, but it had a most direct bearing on allocations and I am going to give you just a brief background. We placed educational orders for many strictly military items so that the plants would tool up, get material, make a pilot model, and then take the blueprints and the production flow data and lock them up in the safe. Such an educated plant was then all set for the mass production orders that would come if we went to war.

Sixty thousand plants alerted.--Those factory plans were recorded diligently and accurately in the Facilities Division of the Army and Navy Munitions Board. There was a file of allocated facilities and allocated capacities. Something like sixty thousand plants had been forewarned, so to speak, of the tasks that would confront them in the event of war. Their capacities had been appraised and they had been charted for a definite production on a certain time schedule.

No other country in the world went that far in its early planning. Germany was very much interested in it, and at one time had sent people over here to study it. Whether or not they put it into effect in all its details I do not know. But, anyhow, in those first days of war the

allocated facilities system was a godsend to the War Department and to the Navy. I will give you a few little human interest highlights.

One of the last industries to come into the fold, so to speak, and say, "We will forget about profits; push aside our customers and our competitive position; we are going to work for the Government; we are going to make munitions," was the automobile industry. Representatives of that industry always seemed to have some reason why they would not cut off on automobiles and start making gun carriages and those things that they were scheduled to produce for war. It was like the fellow who puts a little piece of bread on his plate and then a little gravy, and then finds he has too much bread and puts on a little more gravy, too much, and never comes out even. They stalled around a long time to use up the parts they had. It was quite a problem trying to make the automobile industry come into the war production picture. Some of the plants did it very promptly, but by and large the industry seemed a little reluctant.

A "Show-down" with the auto makers.--So one day Mr. Patterson said, "Mr. Knudsen and all the heads of the big automotive plants are coming to Washington for a meeting with Donald Nelson and we are going to have a showdown on why the automobile industry does not get more actively into war production. The first thing they are going to ask is 'Well, what do you want us to make?' We must be prepared to answer that question". This meeting was going to be on Monday morning, at nine o'clock, in the Department of Commerce building. To compile the voluminous data on requirements was quite a job. The auto makers had a right to know what we wanted them to convert to and how many of this and how many of that we wanted produced. Nobody knew the exact figures. There was only one Saturday afternoon and one Sunday to compile the information. So we went to the Facilities Division of the Army and Navy Munitions Board. There I think we had ten typists. We sat there all Saturday afternoon, all Saturday night, all day Sunday, and well into the morning of Monday morning, dictating what the order would be for the automobile industry if it would take the job. At nine o'clock Monday morning there was on Mr. Patterson's desk a mimeographed list of those things, by plants, that the Army and the Navy wanted from the automobile industry and knew from its plant surveys it could make.

Mr. Knudsen took that list to the meeting and said, "All right, here are gun mounts; here are this and that problem item; who can make this?" Hands would be raised out through the audience. Mr. Knudsen, being a practical man, said, "How do you know you can make this?" The bidder would say, "I have already made one." He had had an educational order. Those were days when we felt pretty good in the Under Secretary of War's Office and the Army and Navy Munitions Board, because we could actually see that the things we had done had been of real service both to the Armed Forces and to industry.

Plant surveys point the way.--It was of great value to the Army and Navy during those hectic days after Pearl Harbor to have a central place of record where up-to-the-minute data were immediately available

on plant surveys which showed not only what industry was producing but what was more important, what it could produce in the shortest time. This was the Facilities Division of the Army and Navy Munitions Board. How complete our records were I do not know. They could not have been too complete. But they were complete enough. They showed the type of thing we wanted. It was that kind of advance preparation that gave Army Ordnance, for example, the ability to intelligently jump the gun, and bring in vital production six months ahead of schedule.

It was a wonderful thing to sit back and watch the orders go to those preselected plants. In the Facilities Division we carded each big contract on what we called "Form 100," which showed the name of the facility, normal products, equipment, management and the commercial rating. We wanted strong management. These records showed what percentage of each plant could best be devoted to each kind of production.

We planners naturally expected those preselected plants to get the business for which they had worked so hard with us to prepare themselves. We wanted those strong managements to be on the first team because they knew the plays. But what happened? With the releasing of millions of dollars by Congress there came pressure for the "little business man" which could not be ignored. The little shop owner wanted to get war orders.

Finding jobs for the little shops.--It was not a very proper thing for the War Department to say, "We don't want these big prime contracts to go to the little shops; we want the big plants that have the facilities right now to start mass production. These big plants will need the little shops to help them as subcontractors, but let's let the strong resourceful managements be the prime contractors." That is exactly how the procuring agencies felt about it.

A Small Business Association was set up as part of the War Production Board. Mr. Floyd Odlum, a very fine gentleman and a successful industrialist, was named by the President to head it. I was fortunate enough to be named as the Army liaison. Admiral Fisher had the same job in the Navy.

We worked very closely together and went to great lengths to see that the big manufacturers "farmed out" to the little shops a fair percentage of the contracts awarded them. Both the Army and the Navy set up offices called Contract Distribution Divisions that screened all large contracts for their respective Secretaries and wrote into the agreements a fixed percentage of the work that would be subcontracted.

There was need for showing Congress that the little business man was not being overlooked. The procuring agencies set up sample rooms in all the procurement districts. We said, "Come in, you little business men, and see the samples of the thing we want to fight this war."

The little men complained: "No. Those big fellows are hogging all the orders. We cannot get to those sample rooms. They are too

far away from us. We do not have the money and the transportation so we cannot get to your offices to find out what you want that we can make in our shops."

Putting the sample rooms on wheels.--I suggested to Mr. Odlum that we take the samples to the little business men. "Let us get three trains from the Pullman Company. Let us fix them up. Let us send one north, one south, and one west. Let us stop at the crossroads. Let us put our sample rooms on wheels and prove to anyone that the little business man can get to the samples."

We were able to do that because our field surveys had shown where the little business men were located. We got those Pullman cars, and we pulled all the berths out of them to get the maximum space. We borrowed display artists from the National Cash Register Company, to fix them up so they would look pretty. We got the publicity advance agents for Ringling Brothers Circus to go ahead and prepare the public for the train arrivals. We made pictures of the exhibits that all the supply services of the Army and Navy had built into the cars assigned them. No circus sparkled brighter or had a better billing.

We had the Chambers of Commerce distribute free tickets to these Defense Train Exhibits to all manufacturers in their areas so that no potential producers would be overlooked. The newspaper publicity that resulted was most valuable to the war effort. When the trains arrived in each town, there were the little business men all lined up to see those things that the fighting men needed that they could make. There also were the officers from each procuring service who knew all about those items and who wrote down the names of the interested manufacturers for later contact by the proper procurement district. The district surveying officers then visited the plants and while a big percentage of them did not accept direct orders, it prevented criticism and showed that the War Department was placing its business on a fair basis and putting everybody it could into the war.

The little business man later became very important, because he learned that he was not suited for the big contracts but that his most profitable field was as a subcontractor. To help him, we made it one of the requirements for getting a prime contract that a certain percentage of the job must be subcontracted to the small plants. We knew what could be subcontracted. We knew what kind of subcontractors could best serve the big manufacturers because such information had come out in our survey of industry.

Manufacturers check their plans.--There was no part of the Under Secretary's operation that was more critically analyzed than the facilities record. The Facilities War Room in the old Munitions Building was a mecca for visitors for years before Pearl Harbor. Many manufacturers came to look over the plans for their facilities and to be sure the information on their tool equipment, floor space, etc., was kept up to date.

I remember one time that Mr. Knudsen of General Motors Corporation called up and said, "We are going to have our production executives in Washington on Monday for a meeting. We would like to look over the war load that you propose for our facilities." Well, that was the kind of thing we liked. When Mr. Knudsen and his party came in and sat down at the table, we had on one very large sheet of paper every General Motors plant, its capacity, its manpower, and the things it was scheduled to make in terms of finished war items. That made quite a hit with the automotive people. When they finally came into the picture as a part of the Army production line, they gave very serious consideration and time to the plan that had been devised by the Industrial College and the Munitions Board for their initial production.

The advantages of an early start.--It was interesting when the war clouds began to gather to see the reaction to this industrial mobilization plan. Many people will tell you that when we went into the war we did not use the same plan that we had been working on. They said, "You brought in a new team and put business men in charge and put uniforms on them; you started from scratch." We did bring in the business men and we would have preferred to have these experts all along if they had been available. But we very definitely did not start from scratch. A review of the record will show that the first war orders went largely to the allocated plants that we had selected long before Pearl Harbor, and that many important items of production rolled off the production line months ahead of schedule simply because of the years of procurement planning that predated this war.

As fast as the actual production orders were issued under any type of contract, the Facilities Division noted them on the war planning card, so that at any time it could point out: "Here is what Chevrolet's orders are to date, and here are the other items Chevrolet can still make according to the early surveys. Here is what percentage of the Chevrolet plant is actually at this moment engaged in war production. And, what is important, here is the free capacity." No other agency in Washington could talk like that. Many an important war order was directed to a plant in the early days of the war on the basis of the free capacity shown by the facilities record of the Army and Navy Munitions Board.

Allocated plants free to bid.--We did not find it necessary at any time during the war to harmfully restrict the free use of any plant because of the allocation system. Of course, there were some plants capable of making high precision products that we encouraged to not bid on some of the first war orders for simple products because of their having been earmarked for production of problem items later on. In every case that I knew of these special manufacturers and the procuring services cooperated to the utmost. The special plants cheerfully passed up opportunities to get early large contracts and waited until the procuring agency with which it had been planning was ready.

Some people thought we should have invoked the allocation system at the very beginning of the war and held the plants strictly to the production that had been planned for them. We had always felt that this

would not be necessary. We said that the allocation system was designed to point the way to the plants best suited to produce the items that the War and Navy Departments needed and that when this had been done, the procuring agencies would find it to their advantage to follow this pattern if it was a good one.

We believed that under any system of buying, whether competitive bid or direct negotiation, the allocated plants would get the orders because they knew the most about the items desired and they would be the most courageous in offering to do the job. It is interesting to note in this connection that the first war orders actually did go to the allocated manufacturers and this explains why the production records in the first months after Pearl Harbor were so far ahead of the time schedules.

One of our most perplexing early problems was to insure that no capacity of a plant needed for war orders was held out selfishly by the manufacturer to take care of the less essential needs of his civilian customers. In some highly competitive fields many manufacturers felt they would lose their regular customers to their competitors if they converted all of their resources to munitions work. We tried to take care of this situation by seeing to it that the competitors also devoted their full capacity to war orders. This was a difficult undertaking because in the early days there was more uneducated capacity available than was required. This was later taken care of by the rationing of raw materials making war orders essential to keeping plants alive.

Summary.--In closing, I would like to briefly summarize some of the accomplishments of procurement planning and the allocation system as I have observed it. It will be up to you, gentlemen, to correctly appraise the World War II experience in this regard and to finally give your views on whether or not we should pattern our planning for future wars along the same general lines:.

1. Procurement planning and the survey of industry forewarned and prepared America's great industrial machine for the war job it was called upon to perform.

2. It acquainted the procurement agencies of the Army and Navy with limitations that existed in the plants and made it possible for them to plan their requirements to best fit what industry could produce.

3. It permitted exact and desirable prearrangement by the procuring agency and by the plant, for production of the problem items of munitions. Each allocated plant was familiar with the task it would be expected to perform and made preparations to meet it, thus facilitating early production.

4. It encouraged an orderly distribution of the war load, especially initial production. Without such a system this load might have been thrown haphazardly upon the country in an intensive and confused purchasing campaign when time was vital.

5. It reduced undesirable competition, especially for the output of a single plant.

6. It made possible calm decisions and adjustments before the war which otherwise would have to be made hurriedly on or shortly after M-day. That was of tremendous importance to both industry and the Armed Forces.

7. It fostered a spirit of comradeship between the military and industry and a recognition and understanding of common problems greater than existed in any previous national emergency.

8. It prepared the way for the largest, fastest and smoothest mobilization of the total industrial might of a nation the world has ever known.

Are there any questions?

GENERAL ARMSTRONG:

Gentlemen, the points that Colonel Hare has made are very important. Certain people object to the word "levels", but I do not know any better way to express it--that there are two levels at least in this industrial mobilization. There is the level from the War Department down into industry, and there is the level, if you want to call it that, from the War Department and the Navy Department up to the superagencies or the controlling agencies.

Nobody can deny that the industrial mobilization plan of the Ordnance Department, which I know something about, was carried out, because what Ray Hare has just told us was what I did in Chicago, where I examined personally twelve hundred plants from 1939 to 1940. When the order came in September 1940, I went to work with those plants that I knew, that were allocated to the Ordnance Department. So allocation does work.

The point that we must study here is to what extent should allocations be a practice in the postwar industrial mobilization plan. You will have to examine it and see whether it is all advantageous, as I think it is, or whether there are any good and sufficient reasons why it should not be adopted and carried on in the future.

But I would like to take advantage of the time we have left to see if anyone wants to put any questions to Colonel Hare who has told you so effectively what he saw from both ends of the business.

A STUDENT:

I would like to ask Colonel Hare if there were any industries which were forced to get into war production because of lack of materials for civilian production. I am thinking of the washing machine industry.

COLONEL HARE:

Yes, there was a very definite development of distressed areas in the early war period. When we began to divert the flow of raw materials from the normal channels to the manufacturers of war items, some plants were left absolutely without any materials with which to operate and the workers who had been dependent upon them for their livelihood suffered. The washing machine industry was an example. There was rather a long period before the washing machine industry got into war production. There was a sudden cut-off of materials for that industry and the situation became quite acute before it was relieved. Manufacturers of women's clothing, before the WACs and WAVEs came in, was another example.

One of the biggest jobs the Quartermaster Corps had was to buy mosquito bars. The first requirement was for four million. Making mosquito nets is a decadent industry. We do not use mosquito bars now because we have screens on our houses. The time when every dry goods store had a bolt of mosquito netting on its shelf passed out with the four poster bed. So we looked around for some modern product that required the same kind of machinery, and we found that it was ladies underwear--the lingerie manufacturers. So the first big war order for mosquito bars went to Her Majesty's Underwear Company in New Jersey. This brought another nonessential industry into the war production picture.

CAPTAIN HENNING:

You did have allocation of machine tool plants, some to the Navy and some to the Army, and some plants were divided between the Army and the Navy.

COLONEL HARE:

Yes.

CAPTAIN HENNING:

When we started tooling for war, those people that needed plant equipment had to go out and get it. In other words, they did not allocate them on the standpoint of output of war items for the Navy and the Army. I think that consideration should be kept in mind the next time.

COLONEL HARE:

Yes. I think that is very important. In some instances we went into the machine tool industry and allocated plants to make other high precision munitions items for which the national capacity was small. We later found that we needed them for their normal products--machine tools and had to switch back. It proved better to leave the capacity of the machine tool industry open for the people who needed machine tools.

A STUDENT:

When did the automobile people came to Washington for this conference?

CAPTAIN HENNING:

It was somewhere around 1940. It is all on record here.

A STUDENT:

Keeping in mind that a lot of rather complicated machinery is necessary for high precision tools, jigs and fixtures--if a certain extent of production is to be guaranteed, how did that effect those educational orders?

COLONEL HARE:

Of course, we realized that educational orders would call for a lot of expensive special tools and fixtures to start with. That was one of the main purposes of an educational order--to develop the special equipment needed to produce the tricky war items. When the tooling was decided upon, we bought the tools and the Government retained ownership of them.

A STUDENT:

These educational orders were quite different from ordinary orders. They were intended for these people to gain practice.

COLONEL HARE:

Many Ordnance items had never been made outside of a government arsenal. We had to fit these items into commercial plants and not only did the plant learn a lot by the process, but the military people learned a lot too. Industry showed us how to simplify the items and make them susceptible to mass production.

GENERAL ARMSTRONG:

I want to interrupt just a moment to speak from first-hand experience of the advantage to the Army of educational orders, because it was not only industry that was being educated. It was the Army as well.

Now, I am speaking quite feelingly about this because I had in my district in Chicago one educational order for the production of shell forgings on the upsetter machinery. That is a process which had been used at Frankford Arsenal which the Army had developed, but had never been used by industry for forgings of that type. I want to tell you that it took us at least as long to educate the Ordnance Department as it took to educate the facility involved.

That is a most important point because the Ordnance Department sat back here in an office and had no conception of the difficulties of

actual production of upsetter forgings. They insisted on certain tolerance that were absolutely impossible to produce commercially.

That is what we were trying to do. We were trying to develop a commercial process and not some laboratory production method. That is why it is so undependable when we come to the problems of war when we need the most production. I just want to say that both the Army and the Navy need to be educated right along with the manufacturer on educational orders.

A STUDENT:

We can see the value of the allocation system and educational orders. What would happen to industry had the planned load continued upon them all during the period of the competitive bidding stage and other orders went through these various plants without reference to the allocations system? That was in turn followed by the fact that the allocations system then followed the order. When the order was placed, you had to get an allocation. That to my mind was purely keeping a record. Whether you actually got the allocation or not, as long as they had the record and they had the orders, it was all right. I dropped out of the picture then, and I wondered how long that allocation system was kept up and whether it was of any value to actually give allocations later, as long as we kept a record of where the orders went.

COLONEL HARE:

Once the war purchasing program began, there was no effort to confine the procuring services to their allocated facilities or the plants to their previously accepted schedules of production although the various procuring agencies did respect each other's early plans. The allocation system had done its job. Actual contracts replaced the theoretical loads that had been placed to develop the capacity during the planning period.

As it actually turned out, the low bidders were in most cases the plar that had in the past been allocated to do the job. As I have said, they ha the courage to bid the lowest. There were millions of dollars in these fir war orders and many manufacturers were afraid of the huge quantities involv But the allocated plants were the ones that knew what was wanted and how tc deal with the services courageously.

GENERAL ARMSTRONG:

I think that in concluding this expert presentation, I would like to s this about the situation. We had, of course, in September 1940 started our industrial mobilization. We did not start it after Pearl Harbor. Do not forget in examining the history of World War II that we started industrial mobilization September 1940. What we, and I think probably everybody else did, was to use chiefly the allocated plants for which we had far greater capacity than we had orders. So we invited the allocated plants to bid on those orders.

Colonel Hare, I want to thank you for your very valuable contribution to our record here. I know how much the class appreciates it, just as I do. Thank you very much.

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(23 July 1946--200.)S