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ORDNANCE PROCUREMENT ON M-DAY

by

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ORDNANCE PROCUREMENT ON M-DAY

An announced by Colonel Jordan, the subject I will discuss is "Ordnance Procurement on M-day", or what would the Ordnance Department do to put our plans into effect? How would the Department expand? How do we expect to keep the period of confusion to a minimum?

Your studies in this course will bring to your attention the absolute necessity of making proper plans for munitions procurement in the relative tranquility of peace instead of having to make the plans as well as to perform the procurement under the stress of actual war, as was done during previous wars. Therefore, I propose to pass over the phase of peace-time planning and talk about the transition of American industry from production of the things of peace to those of war.

It is not an easy thing to be certain that we are thoroughly prepared. Difficulties by the hundreds — generally the unexpected — are bound to arise on M-day. How to meet each and every situation with the minimum of delay is the question.

I have heard that the Japanese have a doctrine that no questions should be raised or explanation asked after the order of mobilization. That doctrine is ideal, but not possible unless a nation is thoroughly prepared.

We would be glad to find a policy in relation to preparedness that is automatic and fool-proof. I wish I could believe such a policy could be invented. If we are to succeed in initiating and carrying through a program, we must not begin by flattering ourselves that it can be accomplished by the simple and easy device of passing a statute or two. We must never fall into the comfortable delusion that when we have passed some laws we shall have made ourselves secure. Our policies and program will require continual action that is vigilant, resourceful and resolute. We must be ready to jump in many different directions with changing conditions.

We also must realize that planning is not the actual solution of the problem. Our plans are merely thought out lines of action. The circumstances may call for any quantities of our standard products and in any combination. Our plans must be elastic enough to permit of rapid production in any case. There is no magic solution.

The responsibility of procurement of ordnance in peace-time offers no particular difficulty. The needs of the Army are such that they can be easily met by production at the government manufacturing arsenals, supplemented by purchases from commercial organizations.

CHART I Our present producing facilities are:

Rock Island Arsenal, Rock Island, Illinois, where we design and have limited production of artillery material and tanks;

Picatinny Arsenal, Dover, N.J., is the Ordnance Department's experimental and research powder and explosive laboratory. Here are developed our powders, high explosives, metal components, loading technique, and pyrotechnics. It produces propellant powder and loads ammunition;

Watervliet Arsenal, near Albany, N. Y., manufactures light and heavy guns and their accessories;

Watertown Arsenal, adjacent to Boston, Mass., produces seacoast and railway gun carriages, railway and anti-aircraft mounts. It operates a metallurgical laboratory for use by the entire Department;

Springfield Armory, Springfield, Mass., is our small arms design and producing center;

Frankford Arsenal, near Philadelphia, Pa., has the most diversified work of any arsenal. Its products include fire control instruments, metal components of ammunition, and small arms ammunition of all types.

Our existing manufacturing arsenals have an important place in the scheme of industrial preparedness. In time of peace we look to them to assist in the development of new designs and the improvement of existing materiel.

We depend upon them for production, at least to a sufficient extent to uncover production difficulties, standardize methods of manufacture, and determine costs. It is through these means that the art of manufacture of ordnance is kept alive. They serve as centers for the training of personnel to assist in the inauguration of mass production.

In the early months of war, arsenals will be an important source of manufacture of such urgently required materiel as they are capable of producing without material expansion of facilities. To permit our arsenals to undertake a large increase in production facilities immediately after the outbreak of war would seriously interfere with these vital functions.

Though we are referring specifically to procurement in this talk, I must remind you of the storage, issue and maintenance problem of the Ordnance Department. The stocks of materiel in storage represent our reserves of supplies available for the equipment and supply of troops during the early period of an emergency before new production becomes available. The prevention of deterioration of this material, even under the most careful and efficient storage conditions, and its rapid issue to troops, present serious problems. Later, there are the repairs required which cannot be performed by the field and are turned in to an Ordnance establishment where suitable facilities are available.

In peace, the work of the Ordnance Department is carried on by some 320 officers, 2,400 soldiers and from 6,000 to 11,000 civilian employees, depending on the amount of work on hand. Operated by the Ordnance Department are the six manufacturing arsenals already mentioned, 13 storage depots, 1 proving ground, and the 14 Ordnance Districts. Personnel and technical information is also furnished for supply and maintenance work at military posts.

CHART 2. A cursory examination of our activities can be portrayed by a brief examination of annual appropriations. The chart shows graphically in millions of dollars, Ordnance Department appropriations for fiscal years 1910 to 1938. It is to be noted that our appropriations ran ten to twelve millions of dollars a year prior to the World War, and the appropriations were in about the same

amount for several years after the war. Beginning with the fiscal year 1936, there has been a considerable increase so that this year the Ordnance Department is spending approximately \$23,000,000 of its own appropriation and several millions of dollars apportioned by other branches and departments.

During war years, appropriations naturally were increased tremendously - amounting to three billion, one hundred million during the fiscal year 1918, and four billion, two hundred million in the fiscal year 1919.

Just one word about current Ordnance appropriations. The increased amounts in recent years have been principally for the procurement of modern equipment for the existing Army, and particularly for mechanization, anti-aircraft, and seacoast defenses, and for augmentation of the war reserve of ammunition, aircraft bombs, and so forth.

Our war reserve shortage of equipment and ammunition on the new Protective Mobilization Plan is approximately \$350,000,000. This is based on a force of 750,000 men, all to be available for the Theatre of Operations by 91-M plus the requirements for special defense projects. This is about one-half of the cost of the shortage under the 1933 Mobilization Plan.

This is a large figure, but, as a people, we still spend annually for cigars and cigarettes three times as much as is appropriated annually for operation of the entire War Department.

Broadly speaking, the most important and also the most difficult responsibility of the Ordnance Department is the war-time procurement of Ordnance materiel in the time and in the quantities required. How we are organized and what actions become necessary at the outbreak of hostilities is the issue under discussion.

We can visualize a picture of M-day. Telegrams to the fourteen district headquarters will in turn initiate telegrams to thousands of manufacturing plants. Many plants will know exactly what they are to produce and when deliveries are to be expected. They will review drawings and specifications will analyze their plans in this new production and will proceed to negotiate contracts in the districts.

Even so, take my word for it, you will be astonished to witness improvisation, last minute efforts at coordination, and the crying need to do many things which should have been done before mobilization.

As the machine starts to roll, will there be a complete and prompt determination of requirements, of design and priority? Plan as well as we may, we still probably will be forced to improvise, for war least of any activity conforms to fixed rules.

Immediately, estimates of the funds required must be submitted. The Ordnance Department will be in a position to submit these estimates at once. While we cannot predict what Congress may do, I believe that it is reasonable to assume that if it votes for a declaration of war it will not long delay the action necessary to provide the funds required for its successful prosecution. In any event, pending the passage of the appropriation act, remaining balances under current appropriations could and would be used to inaugurate the most urgent steps necessary to get the program under way promptly.

In this connection, it is to be noted that the requirements of funds for the operations of the Department for the first two years under the 1933 Mobilization Plan are approximately six billion dollars.

In general, initiation of procurement will be secured by the following actions:

- a. Orders to mobilize;
- b. Directive from the General Staff giving the approximate size of the force to be mobilized;
- c. A recomputation of requirements;
- d. Check and completion of drawings and specifications under revision;
- e. Appropriations of the necessary funds and their allotment to procuring agencies;
- f. Appointment of District Chiefs as Contracting Officers and Inspectors of Ordnance;
- g. Instructions to Districts stating the procurement program is in effect;
- h. Negotiation of contracts;
- i. Distribution of drawings and specifications to contractors;

j. Aid to contractors in securing the necessary machine tools, raw materials, labor, power and transportation;

k. Decision of superagencies as to priorities.

Actually it will not be as simple and automatic in operation as it sounds. The small nucleus of personnel in the peace establishments will be working under tremendous pressure getting the procurement program under way, while at the same time building up the organization by bringing in the additional personnel needed for the very great expansion involved.

Before the procurement program can be initiated, the Ordnance Department must know the approximate size of the military force which the War Department contemplates mobilizing and putting into the field. To initiate procurement on the basis of 3,000,000 men, when a force of one-half to two-thirds of that size will be organized, of course is not logical. The devotion of time, energy, and money to the expansion or development of facilities for the production of supplies greatly in excess of actual requirements, will result in delays in the production of supplies actually needed during the early months and will be a waste of time and money.

Based on the approximate size of the force to be mobilized, procurement requirements will have to be recomputed in approximate terms. This will be sufficient to inaugurate procurement and minor adjustments can be made later. In fact, it has to be realized that any plan adopted initially will have to be changed frequently as the war progresses, resulting in changed requirements for supplies. We can only hope that these changes will not be too great or too frequent.

It must be realized that once having committed ourselves to a procurement program on a certain basis, it is not possible to suddenly step-up the production rate. Material increases in the rate of production will require time. A decision arrived at in the sixth month to mobilize twelve more divisions cannot be made effective immediately.

There is also the problem of drawings and specifications. Progress is constantly bringing out changes

and developments that tend to render current designs obsolete. New developments give rise to new standardizations. We attempt to keep our drawings fairly up to date in peace time, but some of them may require revision on the day of mobilization. These revisions will have to be accomplished quickly prior to procurement.

As an example of the magnitude of the work of preparing drawings, thirteen hundred drawings are required in detailing the anti-aircraft director M3, approximately twenty-three hundred drawings are required to manufacture the tank, less its armament and its equipment, and eighteen hundred and fifty drawings are required to manufacture the 3-inch anti-aircraft guns and accessories.

Simultaneously, the procurement districts will be notified of the size of the contemplated procurement program and directed to proceed with procurement. Each district will immediately organize on a war footing, and begin at once the negotiation of contracts with the manufacturers with which it has schedules of production for the procurement of supplies required by the contemplated military effort.

Fundamental for the effective mobilization of industry is the decentralization of procurement into fourteen districts into which the United States has been divided for this purpose. I believe this decentralization of operation will be our salvation in war.

The underlying purposes of the district organization are to keep the work of the Department from bogging down because of too great volume in one office and to leave the handling of local problems in the locality. It is not an easy step from peace to war. It is not easy to convert industry from its normal peace-time products to the munitions of war. It is not easy to secure these munitions in the time required. It is not an easy task to spend six billion dollars wisely.

It is for this reason we must rely on "Captains of Industry" as our district leaders. Men who can bring us a wealth of business experience, men of sturdy business acumen and of unfailing loyalty. Many such have accepted service in the district organization as Chiefs of the Districts, Assistant Chiefs, and members of Advisory Boards, while others are commissioned in the Reserve Corps.

CHART 3. The following chart shows you a typical organization of a District Office. Based on this typical chart, each District has an organization varying slightly to agree with local conditions. You will note the two main divisions under the District Chief; namely, General Office and Manufacturing Services. The General Office Division contains the usual Administration, Fiscal, Personnel, Property and Traffic Divisions. The Manufacturing Service is in effect a misnomer - it should probably be called "Procurement" Service. This latter Service is divided into Divisions, based on the type of material allotted to the District. This chart parallels the organization of the Ordnance Office.

At this point let me correct an erroneous impression rather prevalent today; namely, that the districts supervise and direct manufacturing operations at the contractor's plant. This is grossly in error. Primarily, the districts negotiate contracts, perform inspection, accept and make payment for the goods delivered.

Districts will assist manufacturers in obtaining production and will keep the Chief of Ordnance advised as to the status of production. However, the responsibility for production will rest with the contractor, and the district will not supervise, control or interfere in this manner except within the terms of the contracts. In other words, we do not tell the manufacturer how he has to produce the product. We will guide and aid him - we will help him in his difficulties - we will give him the drawings and specifications, and his job is to produce the item in accordance with these drawings and specifications.

Insofar as possible, the fixed price contract will be used, although it is recognized that this form will not be applicable in many cases, and provision has been made for the use of an adjusted compensation form of contract where necessary.

The fixed price form for the purchase of supplies and construction is to be used where procurement may be on competition or negotiation. The greatest advantage of the fixed price contract is that it is the customary method of doing business. Other forms may seem sound theoretically, but they do not always work out so well as they might in practice.

However, there will be many cases where a contractor will not be in a position to bid a fixed price or be able to take a fixed price that is satisfactory to the government. The article may be an item of ordnance that has never been manufactured in quantity. The contractor may be more anxious to protect himself from loss than to make large profits. For these and similar situations there has been developed the adjusted compensation contract - a cost plus contract designed to limit profits and guard the manufacturer against loss. I will not go into the details of this contract as I believe this is a subject for later study in your course.

A word about war profits and price fixing: the fixing of price levels is a major element in eliminating excess profits, but it is not the only element. Price fixing alone cannot accomplish the desired result. It must be supplemented by reasonable and effective procedure in letting contracts, and probably by excess profits taxes.

During a war, the enlarged requirements for war materials make it necessary to use the product of the high-cost producer. It, therefore, becomes necessary to set prices, if they are set, at a level which will make it possible for each producer to turn out his part of the nation's requirements without loss to himself.

In the preparation of munitions, after the specifications have been decided upon, quantity determined, and contracts made, there is a period of time during which material and machinery must be assembled, or redistributed. Jigs, tools and gages must be manufactured and during this period to the inexperienced nothing seems to be happening, no finished article appears.

I think the average man not familiar with manufacturing operations finds it hard to understand why it takes so long to get into large production of munitions after war is declared. He reads in the papers that Henry Ford turns out, say, 8,000 automobiles a day, and other companies also turn out large numbers per day. The automobile is a fairly complicated looking machine and he wonders why we cannot telephone to Mr. Ford today and have him begin turning out gun carriages at, say, 8,000 a day, in perhaps a week or so from receipt of the order. The answer is that Mr. Ford was not able to get into production of 8,000 automobiles a day until he had spent over a year preparing his factory for that production, and that it would take him even longer to prepare his factory for the production

of gun carriages, because it was not originally designed for that purpose.

Factory buildings with metal working and cutting machinery are only the foundation of modern manufacture. We must have much more than this for economical and rapid production - the factory must be "tooled up". It takes engineering skill and expert knowledge to design the new tools and appliances needed, to make the necessary alterations, and to relocate the old and new machinery for effective production of ordnance materiel.

If the demand for guns and ammunition were as great and continuous as the demand for automobiles, American industry given time would meet the demand.

To give some idea of the extensive job, consider converting a company manufacturing "sporting rifles", or a company manufacturing "calculating machines", to manufacturing semi-automatic rifles or machine guns.

Each part must have just the right shape and just the right dimensions within small tolerances to permit it to work properly with adjacent parts. Unless the parts are constructed with the required accuracy, the weapon will not function properly.

The difficulty of whittling all of these parts out of a steel bar or rod, even with the aid of modern machinery, and the difficulty of laying out fine measurements individually are so great that the cost of one or a few rifles made by hand is very great.

Most of the parts, before going to a machine shop, must be cast or else worked, hot or cold, under presses or hammers. In this forming of the metal, punches, dies or rolls are used, and these generally have to be special for every part. It takes engineering skill, and an expert knowledge to design these appliances, and frequently experimental work must be done before the most satisfactory appliances are determined.

When the forgings have been made, they must be machined to the greatest exactness, frequently to the one-thousandth of an inch. It would be slow and costly to measure off and mark all of these forgings and machine them

or to determine the dimensions by use of measuring instruments or gages during the process of machining. To avoid this expense, we use aids to manufacture called "jigs" and "fixtures", which are appliances for guiding the cutting tools of the machines or holding the work on the machine so that each surface, when finished, is of correct dimensions and correctly located within allowable tolerances.

Even when jigs and fixtures are used, constant examination must be made to see that the parts are of proper dimensions. To facilitate this checking, we use measuring devices called "gages", and to prevent errors due to wear of gages we check the gages by the use of accurate measuring instruments. There are some standard commercial gages, but the great majority of gages for any job are special for that job.

In the Springfield Rifle, Model 1903, there are 93 different parts to the rifle, requiring 103 different dies, 463 different jigs and fixtures, 506 different special cutting tools, 1320 different working gages, and 1339 different inspection gages.

Strange as it may seem, many manufacturers of metal products do not have many of the machine tools necessary to produce ordnance. Production of commercial products is often performed on special machines designed for the job only. As a result, most of the contractors to whom we have allocated ordnance products will have to install many additional machine tools before they can proceed at full speed.

It has been estimated that the present Ordnance requirements for machine tools approximate \$183,000,000. The chart shows a few of our largest requirements:

CHART 4.

Internal & External Grinders, cylindrical ...	3,306
Engine Lathes .....	10,600
Automatic Lathes .....	3,270
Turret Lathes .....	6,070
Milling Machines .....	6,500
Forming and Stamping Presses .....	3,200
Hydraulic Presses & Bulldozers .....	1,900

CHART 5. According to the American Machinist Survey of 1935, there are approximately 210,000 lathes of all types installed in plants in the United States. I am representing

this number of installed lathes on a bar chart and have noted thereon in cross-hatched red the approximate number of lathes on hand at our six Arsenals. It is to be noted that the number of lathes at Arsenals represents less than two per cent of the total on hand in the country. The existing shortage of lathes for our war production is represented by the extension of the bar to the right.

Of course, it must be our constant endeavor to use more and more of the existing lathes and thus decrease our requirements.

And now a word about the geographical distribution of the load. Our existing Arsenals are capable of producing about 5% of our requirements in a maximum effort. Private industry must produce the remainder.

In this country the locations of commercial manufacturing plants have been dictated by peace time economic considerations. These industrial areas may or may not be strategically safe, but we must accept the situation as it exists. The industrial effort involved in a major war is so great that, broadly speaking, all available suitable industrial capacity must bear its share of the burden.

CHART VI. The following chart shows the distribution of the Ordnance war load. The figures in squares on this chart show by War Department Zone the percentage of the total war load for Ordnance, in terms of money value, apportioned to each Zone. The figures in circles indicate the proportion of industrial products produced in each Zone, in per cent of the total value of such products in the United States in the year 1929. As is to be expected, there is general agreement between the two percentages. In other words, the Ordnance war load is distributed in approximately the same proportions as the peace-time productive capacity of the nation. It does show, however, that the war load for the Chicago Zone (No. 2) is proportionally greater than for the others. Note that more than one-third of the Ordnance load is in Zone 1, comprising New England, New York, New Jersey and Eastern Pennsylvania.

When we break down the Ordnance war procurement into classes of items we find that the northeastern section of the United States has a far greater importance to our war program than the above figures indicate.

Ninety per cent. of the inspection gages to be produced will come from Zone 1, and more than 80% from New England, for the simple reason that the industry is now concentrated there.

Aside from the capacity of Rock Island Arsenal, the only plants now capable of producing small arms are located in New England and Upper New York State. This is an undesirable situation from the standpoint of strategical location, and the question of having existing small arms companies take over commercial plants or build new ones in the middle west is now being studied. The prospects of success in obtaining early production in such plants is highly problematical. Based on World War experience, the best that can be expected is about one year.

In the same way, 35% of the early production of small arms ammunition comes from the Hartford District. In this case, new facilities must be provided as well as the expansion of existing facilities. Plans now in preparation contemplate that all expansion will take place west of the Appalachian Mountains.

Looking at the load problem on the basis of money value of present day apportionments to districts, we find the following:

CHART 7.

Boston .....	\$132,000,000.	Hartford .....	\$355,000,000
New York.....	137,000,000	Rochester .....	268,000,000
Philadelphia ..	1,200,000,000	Pittsburgh .....	428,000,000
Baltimore.....	122,000,000	Cleveland .....	209,000,000
Cincinnati .....	260,000,000	Birmingham .....	196,000,000
Detroit .....	364,000,000	Chicago.....	640,000,000
St. Louis .....	410,000,000	San Francisco..	7,000,000

At the present time we are making many readjustments. The load in Philadelphia and the New England Districts will be reduced insofar as possible, and transferred to the mid-west. We also intend to place a number of bomb, pyrotechnic and explosive apportionments on the west coast.

A recent study of the propellants for the Army, Navy and Marine Corps shows a two-year requirement of 427,000 tons, approximately 1,000 tons greater than the powder manufactured during the World War period. The present

available yearly capacity in the United States today is approximately 5,100 tons. The present stock of propellants on hand is approximately 22,500 tons. The big deficit must come from new facilities. The most optimistic estimates indicate that maximum production cannot be secured before M plus 12 months.

I also want to say a few words about loading plants. These plants take the metal components of shell, bombs and fuzes and fill them with their high explosive charges. They also put up powder charges and assemble the ammunition into complete rounds ready for issue to the service. This work is non-commercial.

In view of the fact that practically nothing similar to the operations at loading plants is conducted in civil life, and due to the strict laws and regulations in all states and localities applicable to the handling of explosives, it is considered advisable that these plants be supervised directly by the Ordnance Office in Washington.

CHART VIII. The loading plants that will be operated are enumerated on the chart.

First, we have our existing plant, Picatinny Arsenal. We do not plan for any large expansion of the facilities at Picatinny. Its principal functions will be (a) to completely utilize the existing facilities on a two-shift basis and to produce the maximum possible without new construction; and (b) to train personnel for our other loading plants.

Second, we have five renovation plants currently renovating ammunition. These plants will be converted to loading plants. No major expansion of these plants is contemplated, and their primary function will be to supplement the production of Picatinny Arsenal as quickly as possible. These five plants are shown on the chart — Delaware (New Jersey), Curtis Bay (Maryland), Nansemond (Virginia), Charleston (South Carolina), and Savanna (Illinois).

Third, there are to be placed into being large production plants built on government-owned land, using existing buildings insofar as possible. These units are called First Phase Loading Plants, and will be located

at Tobyhanna (Pennsylvania), Delaware (New Jersey), Curtis Bay (Maryland), Nansemond (Virginia), Erie (Ohio), and Edgewood (Maryland). These plants are designated on the chart by the solid dark blue circle.

Fourth, the Second Phase Loading Plants, designated in solid red, are the new loading plants which will be located on the land that will be leased or purchased. The plans for these plants take into consideration both the strategic and production situations that may exist, and their erection is contemplated at:

Rauschs', Pa., in the Philadelphia District;  
 Saunders Station, Pa., in the Pittsburgh District;  
 Bridgeport and Carpenter, Alabama, in the  
 Birmingham District;  
 King's Mills, Ohio; Wurtland and Louisville,  
 Kentucky; and Nashville, Tenn., in the  
 Cincinnati District;  
 Two plants in the Cleveland District, one in Chicago  
 and one in St. Louis District - the tentative  
 locations of which have not been selected.

It is intended that these loading plants be of medium size, employing approximately 3,000 people, and that they be located within reasonable automobile distance of a dependable source of labor. During the World War we built very large loading plants including villages for housing personnel. Today, with the universal ownership of automobiles by labor, the construction of villages will not be necessary. As a result we can have plants of moderate size, thus decreasing the hazard, and have more plants, thus distributing the risk.

CHART IX. This next chart shows in general terms the production that we can reasonably anticipate from these loading plants. It is to be noted that the production for the first three months is very small, and at the beginning of the third month production increases gradually until the sixth month. This is the effect of the First Phase Plants. The Second Phase Plants are not expected to start until the eighth month, and will not reach maximum production before the twelfth month.

The converted renovated plants and the First Phase Plants will be government-operated, similar to any

other Ordnance establishment. We expect to contract with commercial firms for the construction and operation of the Second Phase Plants. The Ordnance Office will control the flow of metal components and explosives to these plants and will inspect their products.

I believe the loading of artillery ammunition and bombs is one of our most difficult and important problems of war-time production. The loading plants are really assembly plants, handling components made by many different manufacturers and assembling them into complete rounds. At each, there is the ever present risk inseparable from the handling of explosives.

In conclusion, I may say that the peace-time planning which we have carried on for the last eighteen years has had results. The drawings and specifications of our products are in better condition than ever before in peace time. War production has been apportioned to Districts and in large part to plants. Plans have been drawn up for the production of many classes of articles. The extent of the demand for equipment and supplies by manufacturers have been anticipated. There has been considerable instruction of Reserve Officers and others in the production of Ordnance material. I believe our efforts at planning will save us, say three months, on the average, in arriving at production. Additional time may be saved, or time may be lost, during the transition period depending upon how things are handled during that time.

Industry will be with us during this transition period, as it was during the last war, with this difference: This time, each plant will know immediately what to do, whereas, in the last war, it was weeks or months before some firms knew definitely what their jobs were to be.

Failure of supply in an emergency, if it occurs at all, is most likely to happen in the transition period. The success or failure of the operations of the Ordnance Department will be determined largely by its efficiency during this most important period.

DISCUSSION FOLLOWING MAJOR GENERAL TSCHAPPAT'S LECTURE

Colonel Jordan: Gentlemen, the Chief will answer any questions you may desire to ask.

Q. I would like to ask one question. We have heard that you have discontinued the Baltimore District and established an office near Wilmington somewhere. What is the reason for that, sir?

A. Well, it was not intended to discontinue the Baltimore office permanently. This is a temporary measure, principally brought about by the desire to concentrate on planning for powder. We have found it better to use the personnel jointly for that purpose in the Philadelphia District for the time being. It was not intended to permanently abandon the Baltimore District.

Q. General, is that requirement curve on loading for the 1933 or the new protective mobilization plan?

A. It is based on the 1933 plan.

Q. Will there be some gain in the protective mobilization plan?

A. We have no accurate figures on that yet.

Q. It would seem they could cut that hump down considerably up to M-3.

Q. Does the Ordnance Department place educational orders with proposed ordnance manufacturers?

A. We do place orders on the outside, but they are not educational orders in the technical meaning of that term. The term "educational orders" has gotten to mean orders placed with firms that have accepted schedules of wartime production without regard to advertising. Of course we would need legal authority to do that. We have had no legal authority and have placed no educational orders.

Q. General, if this is permissible, I would like a little enlightenment on one topic. By trying to break down and decentralize procurement of ordnance and letting industry know something about the needs of the armed forces, it seems to me that there is a danger that eventually foreign governments will be in possession of all of our plans for tanks or planes, or whatever it may be. The thing I would like to know, if it is permissible is how we can let industry know what the needs of the armed forces are and at the same time keep the knowledge from foreign governments of what we plan to get?

A. I think industry has cooperated very well on those things. When we ask them to keep plans confidential they make every effort to do that. They cooperate. Of course it is only the engineers or the men high up in a firm who would know all the plans of any piece of ordnance, like a tank, for instance. Generally they would not be known to many of the employees of the firm. They would know only the parts they work on. It is impossible to keep such things secret forever, but I think we can depend upon manufacturers to keep that kind of information confidential for a time at least.

Q. General, from the standpoint of organization of your procurement districts, would you state, please, the reasons that they are organized for peace time purchases? The reason for my question is there has been stated from the platform, I think my notes show at least twice, the fact that the Army uses one system of peace time purchasing and will use another system in war. Now it isn't true, I don't believe, in all cases. I notice the Signal Corps concentrates their procurement districts and their peace time purchases under the same officers. The Air Corps does not, I think, and, as I understand it, the Ordnance does not. I would like to get some idea of why these different conditions exist, why the Ordnance happens to keep theirs separate.

A. Well, the basic reason is because of the large war time expansion and the desire and necessity of decentralizing the procurement of equipment of the kind that we have to buy which frequently involves the construction of new plants and certainly the rearrangement of plants. We want to throw that into industry and have it operated by men who are thoroughly familiar with industry in that district.

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Now we don't do that in peace time because we have our arsenals, where we manufacture a good part of the peace time equipment. Naturally, therefore, the arsenals are the peace time centers for procurement. However, we are decentralized in peace time too. We do all our procurement at arsenals, practically none of it from the ordnance office in Washington. So we are decentralized both ways but to different points. The arsenals will continue in war time too, but their purchases will be limited to those necessary for their own manufacture. We anticipate no difficulty in passing from one system to the other.

Q. General, what cooperation is there between the Ordnance Department of the Army and that of the Navy in procurement planning?

A. We are always in touch on designs where the designs have the same purpose in view. We supply the Navy with a good many things in both peace and war, small arms and small arms ammunition, machine guns and machine gun ammunition etc. and we also get things from the Navy. We are pretty well together on designs where the materiel is such that it can be used by either service.

Colonel Best: General, the Marine Corps, as you know, is now buying some small tanks from the Harrington company and those are in production now. Does the Ordnance Department intend to use tanks of that type or an entirely different design?

A. The Army has no requirement for tanks of that kind. We would be interested in that only in case there were requirements by the Infantry or Cavalry for a tank of that kind.

Q. Mr. Christie announced yesterday that he had made his last tank and has sold it to a foreign government. Do you know who he sold it to?

A. No, I don't. We had an officer up there yesterday to witness the demonstration. I don't know what the result was. Mr. Christie, however, let us know something about that tank several months ago.

Q. I have some hesitancy about this question. Has any attempt been made to obtain the cooperation or even coordination of our ordnance needs with those countries which may be expected to be neutral, if not allies?

A. I would say no.

Colonel Jordan: Colonel Lewis, you have a chance here to ask your Chief something, sir.

Colonel Lewis: I don't believe I have any questions. I think he has covered the subject very well, sir.

Colonel Jordan: I asked Colonel Lewis to show that the discipline in the Ordnance Department is excellent. Colonel Miles?

Colonel Miles: I have no questions to ask.

Colonel Jordan: General, I want to express the appreciation of the College for your taking the time to come down here and talk to us. We appreciate it a great deal. Thank you very much, sir.