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THE FUNCTIONS AND PROBLEMS OF THE STANDARDS DIVISION  
PLANNING BRANCH, O. S. W.

by

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PLANNING BRANCH, O.A.S.W.

In Army Regulation 850-25, entitled "Development, classification of, and Specification for types of equipment" one finds frequent mention of the office of The Assistant Secretary of War. The functions and duties of his office as outlined in this Army Regulation are the functions and duties that are normally performed in the Standards Division, Planning Branch, of which I shall speak this morning. In addition to the Assistant Secretary, there are two other War Department agencies mentioned in this regulation, namely the General Staff and the Chiefs of Supply Arms and Services. In order to make clearer an understanding of the duties of the Standards Division with regard to standardization of military equipment, let us mention here its relation with these other agencies.

The General Staff is charged with the decision as to the classification of types of military equipment required for use by the Army, and the approval of military characteristics for these types.

The Chiefs of the Supply Arms and Services are responsible for development of equipment, recommendation as to its classification, maintaining record of all required types, and the preparation of specifications.

The duties of office of The Assistant Secretary of War bear relation to the duties just mentioned of the General Staff and Chiefs of Supply Arms and Services in that -

"Assurance must be had that items of adopted equipment are made, insofar as is practicable, from commercial materials and by standard commercial practices best adapted to mass production."

As a means of obtaining this assurance, the Standards Division is charged with two principal duties

- a. Clearance of items of equipment for procurement as to type prior to their adoption as standard by the General Staff.
- b. Clearance of all U. S. Army Specifications for these items as prepared by the Supply Arms and Services.

Both of these types of clearances are administered as a means of determining the degree of procurability of an item from commercial materials and in accordance with standardized commercial practices. The clearance of an item for procurement as to type is based on such information regarding the procurability of the item as can normally be obtained at the time the design is completed and before the specification for the item is actually prepared. The clearance of the specification is based on the additional information that is obtained from a final preparation of the specification and its use as a procurement instrument. By means of granting or withholding these two types of clearances, the supervision of procurement by The Assistant Secretary is made to begin when the adoption of an item of equipment is proposed as standard and to continue as long as that item is classified as standard.

Discussing first the clearance of an item for procurement as to type, it should be understood that when acting upon a request for a clearance of this character, The Assistant Secretary of War does not take into consideration any change in the nature of the design of the item or of its military characteristics. These are command functions. He considers only information bearing on the procurement problem that will arise if and when the item is adopted as standard by the General Staff. This information is presented to the Standards Division by the Chief of the Supply Arm or Service desiring adoption of the item and is designed to bring out any features the article might possess which will adversely affect the procurement of either the item itself or other items. The particular points covered by this information are mentioned in AR 850-25, and are as follows

- a. What classification is recommended for the item as an adopted type? Is it to be standard or substitute standard?
- b. Whether or not item is for use in peace or war or both.
- c. How will procurement of this item affect the procurement of other items?
- d. Is item to be manufactured in government arsenals, commercial plants or both?
- e. Are production facilities sufficient to meet procurement requirements?

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Following a consideration of the above information, the Standards Division either clears the item for procurement as to type and designates the procuring Supply Arm or Service or takes such other action as appears best suited to meet the procurement problem presented. If clearance is given, recommendation for the classification of the item as one of the adopted types by the General Staff is in order. The procurement clearance of the Assistant Secretary's office is considered by the General Staff in its action and a copy of such action is furnished the Standards Division.

It is a War Department policy that standardization of at least one item of equipment be completed in peace-time for every required type so that, in an emergency, quantity production will not be delayed. Exactly what that term "standardization" means is something I think we should agree to before we go any further. I like the definition given in "Industrial Standardization", a book prepared by the National Industrial Conference Board in 1929, which definition is both simple and comprehensive and reads

"Standardization is the selection of a small number of types or sizes which are most suitable, and giving specifications to them in measurable terms so that large quantities can be made which will be uniform".

If we break this definition into two steps or phases, the first being the selection of type and the second being the preparation of specifications, we may see that both the General Staff and The Assistant Secretary of War have responsibilities in the program of the standardization. The General Staff is responsible for selecting the number and types of military equipment that may be adopted as standard. From that point, the Assistant Secretary of War is responsible for the supervision of activities concerning the preparation of specifications. Having already discussed the first step toward standardization in our brief mention of the classification and adoption of standard items of equipment, let us now discuss the second step with regard to the preparation of specifications.

A specification is defined in AR 850-25 as "a clear and accurate description of a material, article or service which it is necessary to procure and the procedure which the purchaser will follow to satisfy himself that the requirements of the specification have been complied with." It should be a complete document either directly or by reference to other specifications, while embodying the users needs it must also embody the makers ability to produce. Specifications should be drawn so as to give the user and producer an equal footing,

they should be founded on accurate knowledge of materials and suitable tests for determining their properties and, furthermore, in order to facilitate procurement they should be made to conform as closely as possible to existing commercial standards. On the other hand, specifications should not include any requirement that is not consistent with obtaining the desired product and should avoid descriptions of proprietary articles or commercial products made by processes under the control of one manufacturer.

It is sad but true that the (non-commercial) character of many items of Military equipment precludes a specification that can be written in terms of commercial materials and standards and manufacturing processes. But, where the final product cannot be so standardized, the procurement problem may be partly solved by a specification that utilizes standardized component parts as far as it is possible to do so.

Specifications with which the Standards Division is concerned fall into three classes Federal Specifications, U. S. Army Specifications, and Tentative Specifications. We will discuss them in that order.

Federal Specifications are prepared under the supervision of the Federal Specifications Section, Procurement Division, Branch of Supply, Treasury Department, and cover items of material or equipment, non-military in character, that are commonly procured by two or more government departments. Any department of the government may initiate a request for the preparation of a Federal Specification and if the request is favorably considered the duty of actually writing the specification is referred by the Federal Specifications Section to a technical committee made up of representatives from all interested government departments. This committee prepares the specification in tentative form and submits it to the Secretary of the Federal Specifications Section who in turn submits it to all governmental departments for comment and agreement. These government departments review the specification and return it with concurrence or recommendations to the Secretary who again sends it to the technical committee for revision or for final draft, depending on the recommendations of the interested government departments. When the specification is later published its use is made mandatory on all procurement agencies of the Federal government. Should, however, any executive department find that for administrative reasons a Federal specification cannot be used to meet a particular need, it is

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authorized to use purchase specifications of its own, such specifications however to include all applicable provisions of the Federal specification. In such cases where a Federal specification is not used for purchases in excess of \$1,000, a report shall be made to the Procurement Division, Branch of Supply, showing the necessity for deviating from the Federal specification.

The Standards Division has several duties in connection with the preparation of Federal specifications. It represents the War Department on the Federal Specifications Executive Committee, it arranges for War Department representation on all technical committees charged with or engaged in the preparation of specifications of interest to the War Department, and it acts as a clearing house for all War Department administrative activities concerned with the preparation, acceptance, rejection or with revisions of Federal Specifications. The War Department Members of these technical committees are appointed from the Supply Arms or Services having paramount interest in the item on the recommendation of the Chief or Chiefs of such Supply Arms or Services. The tentative Federal specification first prepared by a technical committee is received in the Standards Division for action of the War Department. The Standards Division refers it to the Chief of the Supply Arm or Service who would ordinarily prepare a U. S. Army specification for that class of item. That particular Chief of Supply Arm or Service coordinates the specification with all other interested Supply Arms and Services and recommends to The Assistant Secretary of War the action to be accorded the specifications by the War Department. The Standards Division then completes the action for the War Department on the specification and returns it to the Federal Specifications Section.

The work of preparing Federal Specifications is performed by approximately 75 technical committees, on the large majority of which the War Department has standing representation. To date, about 1100 Federal Specifications have been prepared.

Next for consideration are U. S. Army Specifications. These are prepared by the several Supply Arms and Services for all standard items of equipment and supply. They are also prepared for materials used in the construction of a standard item if such materials cannot be adequately described in the specification for the item itself. Their use is mandatory on all purchasing agencies of the War Department. The existence of an applicable Federal Specification, however, renders the preparation of a corresponding U. S. Army Specification unnecessary.

It is a function of The Assistant Secretary of War and one that is assigned to the Standards Division to supervise the activities engaged in the preparation of U. S. Army Specifications. In carrying out this duty, the Standards Division does not concern itself with engineering features or technical requirements. It acts purely in an administrative and policy-forming capacity. It prescribes how a specification will be prepared, how and from whom concurrences are to be secured, and how assurance will be obtained that the specification is adapted to commercial manufacturing methods and mass production. It requires that a specification submitted for clearance be accompanied with data indicating its acceptability as an instrument of procurement under policies of The Assistant Secretary of War. AR 850-25 is the medium through which instructions and policies on these subjects are issued. For the benefit of those here who are not entirely familiar with this regulation, I will discuss the preparation and clearance of U. S. Army Specifications in more detail.

A Supply Arm or Service in preparing a specification must adhere to the military characteristics that were approved for the item when it was classified as standard by the General Staff. During the development stage when the design of the article is being determined, its adaptability to quantity production in an emergency must be made a matter of continuous consideration. AR 850-25 not only requires this but also requires that the adoption of standard commercial items or their adaptation with the fewest practicable modifications be always considered a policy of the War Department. The design of the item and the subsequent service tests to which the item is subjected by using and interested arms are matters which enter into a determination of the suitability of the item and constitute the framework around which the procurement specification is written. Every specification after it is written must be coordinated with other interested Arms and Services of the War Department, before submission to The Assistant Secretary of War. This is required not only as a check of its correctness, but to unify as far as practicable the specifications used in common by two or more supply arms or services.

The draft of the specification, after final coordination, and accompanied by definite statements as to procurability under the specification, is then in shape to be submitted for clearance

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by the office of The Standards Division. These accompanying statements as to procurability contain information in the following categories

- a. Mention of restrictive feature within the specification which might curtail production or which may operate to give one or more manufacturers an advantage in the field of competition.
- b. Statement showing extent to which the specification has been coordinated with and accepted by industry.
- c. Mention of any features receiving unfavorable comments by industry but which are deemed essential for retention in the specification in order that production will conform to the prescribed military characteristics.

A specification satisfactory to the using or interested Arm or Service which contains no restrictive features and which has been accepted by industry can be and is cleared promptly and with assurance that it meets the responsibilities of The Assistant Secretary of War. A specification that is not entirely satisfactory in the respects mentioned is returned for further consideration and action by the Supply Arm or Service with view to an elimination of the undesirable features insofar as may be practicable.

Specifications are sometimes returned without clearance for other and less important reasons. These may relate to incorrect or incomplete form, incorrect numbering, an apparently excessive use of subsidiary specifications or like administrative matters which involve details of no particular interest in a general discussion of our subject this morning.

The revision or cancellation of U. S. Army Specifications is accomplished generally by the same coordinating process that governs the clearance of an original specification. Cancellation normally becomes necessary when the item is made obsolete or when the specification is superseded by an applicable Federal specification. This work of revising specifications requires almost as much time and effort on the part of Supply Arms and Services as does the preparation of new specifications. Standards do not remain the same over a given period of time. Improvements in design of military equipment and changing methods of commercial manufacture are constantly taking place which require modifications in specifications. Where these modifications are material ones, the revision of existing specifications become necessary and is accomplished by the preparation of an entirely new specification

to supersede the old one. However if only a minor change is involved, this does not require complete revision of a specification but is published in the form of an amendment to the specification which becomes a part of the specification until it is revised. Supply Arms and Services are authorized to prepare and use amendments without the approval of The Assistant Secretary's office.

Last of the three classes of specifications we are to consider is the tentative specification prepared and used by the Supply Arms and Services. This type of specification is authorized in AR 850-25 for only two purposes.

a. To cover the purchase of articles required only occasionally or for temporary peace-time use.

b. To test the procurability of a specification when it appears desirable to do so before preparing it in the form of a U. S. Army Specification.

The Standards Division has nothing to do with tentative specifications beyond the formulation of policies governing their use. They are not required to be submitted to the office of The Assistant Secretary of War for clearance or for any other action. No record of them is kept except with the Supply Arm or Service that prepared them.

There is one instance, however, where a tentative specification is used in a different way than we have just mentioned. This relates to the purchase of motor vehicles. The General Staff has never included motor vehicles in any standardization program except to approve military characteristics for various types. Consequently, motor vehicles during any one fiscal year are purchased under tentative specifications which are written around these military characteristics. Because of the volume and importance of this type of purchase, the Assistant Secretary has decided to make an exception to the usual practice and to require in the case of tentative specifications for motor vehicles that they be cleared through his office in the same way U. S. Army Specifications are cleared.

A knowledge of the amount of progress that has been attained in the preparation of U. S. Army Specifications is a matter of great importance to the Standards Division. I am going to show you some figures on this in a moment which have been compiled from monthly progress reports submitted to our office by Chiefs of Supply Arms and Services. These figures show that some of the Supply Services are now very active in the work of

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preparing specifications while others appear to be less so. Lack of progress, in my opinion, may be ascribed to various reasons. There may be a shortage of funds or personnel for this work, and we know that the preparation of a satisfactory specification requires both. In some quarters there may be a lack of appreciation of the essential role that standardization plays in mass procurement. Or, there may be instances where this work is left too much in the hands of engineering groups where sometimes economic and procurement considerations are overlooked. That the reasons for lack of progress are in any particular case we will not attempt to say. We present the figures for the one reason of indicating to you the selective progress made to date in the preparation of U. S. Army Specifications. (For data, see appendix).

We have now attempted to outline the work of standardization as it is being carried out in the War Department and to show the responsibilities of the office of The Assistant Secretary of War in this work. We have also considered more or less in detail the necessary qualities of a specification and how, through administrative action, the office of The Assistant Secretary seeks to obtain assurance that proper specifications will be available for production of requirements in an emergency. There is still one other activity in the Standards Division which is concerned with the subject of standardization, although it is separate from the work of supervising the preparation of specifications. I refer to the work of maintaining relations between the Army and certain national agencies concerned with the promotion of standards for commercial materials and practices.

The most important of these are the American Standards Association, and two separate divisions of the Bureau of Standards, Department of Commerce, namely the division of Simplified Practice and the division of Commercial Standards. All three of these organizations provide the forum for independent standardizing bodies and societies and the mechanism for bringing them together in their work of standardization. Proposals for the adoption of commercial standards or for the elimination of excess varieties of sizes, types, dimensions, etc., as the case may be, may come from organizations representing the consumer, distributor or the producer. The work of preparing the actual standards or simplified practice recommendations is done by committees, as in the Federal Specifications Section, and the acceptance of them is indicated where agreement among all participating bodies has been reached. The Standards Division

arranges or necessary War Department representation on the working committees of these national organizations and indicates the agreement or recommendation of the War Department on a proposed standard or practice. The administrative procedure by which this is done is similar to that previously mentioned in connection with the clearance of Federal Specifications. There is a difference however between a Federal Specification and a standard or simplified practice recommendation of the agencies we are now discussing. The former is an actual procurement specification mandatory in nature and affecting only Federal Departments, whereas commercial standards and simplified practice recommendations are national in scope, and, although not compulsory, are so widely accepted throughout industry as to be just as effective. By utilizing applicable commercial standards and simplified practice recommendations of these general standardizing agencies and of other numerous technical and trade organizations, Chiefs of Supply Arms and Services may improve the quality of specifications as well as reduce the difficulties of procurement.

Before closing, brief mention should be made of certain work in the Standards Division that fits into other work of The Assistant Secretary's office. It has been stated from this platform many times that an answer to the question of "what to procure" comprises the initial step in procurement planning. Carrying this idea further, no satisfactory determination of "what to procure" can be reached for any item, or procurement planning initiated, until that item has first been covered by a specification satisfactory to industry. Consequently, every procurement plan that reaches the Procurement Plans Division, Planning Branch, is a matter of concern to the Standards Division. Every such plan received is examined to insure that proper provision has been made in it for the use of U. S. Army Specifications, Federal Specifications, or some nationally approved commercial standard. Any plan that does not make satisfactory provision for a standard type of specification is referred back to the Chief of the Supply Arm or Service that prepared it, for revision or recommendation.

The Standards Division has interests in common with the Commodities Division with reference to the use of strategic and critical raw materials in specifications. The conservation of these materials and the use of substitutes are constantly sought. These things are usually done before a specification is prepared, since the Chiefs of Supply Arms and Services, by reason of their representation on Commodity Committees, are familiar with the

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quantities of these materials that are expected to be available and they endeavor to restrict the use of them accordingly. Sometimes, it is found necessary to revise an existing specification or to prepare a substitute specification to meet shortages.

The Standards Division also maintains close contact with the Current Procurement branch of the office of The Assistant Secretary of War in matters that concern the extent to which proper specifications are used during peace time and the suitability of existing specifications for procurement purposes.

I would like to close by giving you, without comment, two quotations from authoritative sources on the subject of the importance of standardization in the Army.

The first is taken from "Industrial Standardization" by the National Industrial Conference Board. It reads

"The War Department is much interested in Standardization. In time of war it must rely to a large degree upon proper specifications, for the reason that a considerable part of the necessary purchasing will be in the hands of inexperienced people. It is important in such circumstances to know from what sources standard goods and equipment can be purchased. In the actual conduct of war, as was shown during the last two years of the World War, success may depend to a large and even crucial degree upon interchangeability of parts of machines, ammunition and other types of equipment. Not only is variety confusing, but it is very expensive, either in war or in peace."

The other quotation is one with which you are probably already familiar. It is taken from the Annual report of the Chief of Staff for the year ending June 30, 1936. It reads

"I have been convinced for some time that the lack of standardization of equipment of every variety in the Army is a distinct detriment to procurement as well as performance, and that standardization is an essential not only for efficiency but to counteract the mounting cost of production. In past years there has been too much of a tendency to delay adoption of an item pending further test and improvement. There is no question that this procedure has resulted in a delay in the procurement of essential items urgently required for the training of troops, especially in new

doctrine and tactics. This is particularly true in the procurement of airplanes, tanks, motor vehicles, and automatic rifles. I believe that we can standardize our equipment, purchase the best that is available at the time, and change the standards annually, if necessary, as improvements or defects develop."

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Appendix

Arm or Service	No of Std Items (1)	No. Std Items for which app'd Specs are not available (2)	No U S Specs to be written. (estimated) (3)	No U S. Specs now on hand (4)	No Specs. in col 4 distributed according to years in which approved. (Figures in parenthesis represent new specs written during year Difference represents no revisions) (5)																
					1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	Prior to 1921
Quartermaster	1576	807	713*	573	43 (22)	10 (6)	31	70	27	9	45	25	39	45	29	30	27	17	21	69	36
Medical Corps	3845	2430	2430*	366	3 (0)	13 (12)	20	21	17	24	0	74	36	107	18	10	22	0	0	1	0
Engineers	116	18	36	237	31 (30)	0 (0)	2	0	2	6	21	18	10	8	19	5	1	7	18	89	0
Ordnance	662	477	370	695	81 (44)	27 (20)	35	26	23	13	32	14	40	20	63	31	92	108	76	14	0
Signal Corps	341	128	22*	609	78 (49)	65 (54)	43	55	49	78	41	25	30	31	11	23	41	22	10	6	1
Chemical Warfare Service	64	53	61	193	6 (3)	4 (4)	4	13	18	12	16	21	29	16	31	6	15	2	0	0	0
Air Corps	611	227	227*	576	120 (46)	86 (46)	50	62	36	34	34	43	18	38	52		2	0	0	1	0
Coast Artillery Corps	56	29	71	53	2 (0)	2 (0)	6	6	2	0	1	8	3	6	8	2	0	3	4	0	0
	7271	4149	3930	3302	364 (194)	207 (142)	191	253	174	176	190	228	205	271	231	107	200	159	129	180	37

\* A more correct estimate now being made will probably change these figures

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DISCUSSION FOLLOWING LECTURE  
"THE FUNCTIONS AND PROBLEMS OF THE STANDARDS DIVISION,  
PLANNING BRANCH, O. A. S. W."

by  
MAJOR CALVERT H. ARNOLD, SIG. C., PLANNING BRANCH, O. A. S. W.

The Army Industrial College  
February 16, 1937

Q. I would like to ask how far you have gone in the acceptance of commercial standards, such as the S. A. thread standard, to require designers in our various supply arms to conform to commercial practice?

A. I would like to say, before answering the question, we must remember that the Standards Division is not a technical organization. We cannot read a specification and determine that some standard should have been used in lieu of a description that is given in the specification. All we can do is lay down the policy that I have already mentioned - 850-25 - and require the chiefs of supply arms and services to take that to industry and see if the requirements as given in that specification meet commercial standards. There are any number of trade and technical organizations that we recognize in the Standards Division as representing commercial standards and in a specification where they say they are going to use standard so and so or such and such, we accept it and without question. In fact, that is the thing we are trying to accomplish. To dictate the policy and to continually call the attention of the chiefs of supply arms and services to the necessity of doing that very thing is, I think, as much as we

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can do. Does that answer the question?

Q. Yes sir.

Q. In clearing a standard article for procurement, it strikes me you have considerable difficulty in really arriving at a decision without a specification. It looks to me like you are somewhat in the dark.

A. In arriving at what?

Q. In clearing a standard article for procurement--- you have been specific that the specifications are written after it is cleared for procurement.

A. Let's take the action of our office when we clear a specification. We do not go into the engineering features of the specification. We require the chief of supply arm or service to have coordinated that specification with the other using arms and services and with other interested arms and services, and we take the report that comes with that paper that this has been done and that the specification has been accepted by industry. Now, for a tentative specification we know that the item has been manufactured either as a service test type or has been manufactured as a limited procurement type. We know that type, before it is recommended as standard, has been used and found serviceable by the using arm. A tentative specification would give us no more information than the statement of the supply arm or service. Sometimes the specification itself can be written, and there is nothing to prevent a standard specification coming in with the approval of the standard article but we cannot always require

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that. If it came in in the form of a tentative specification and they said that had been subjected to industry, and then we required the same thing for the standard specification, that might be a little bit more than the chiefs of supply arms and services can do. We must rely upon their experience in manufacturing items of that character in past developments and in past purchases, and the approval of a tentative specification doesn't seem to me would accomplish any more than we now obtain by the information that we require before we clear a standard item and by the fact that all of this must have been coordinated in a technical committee made up of representatives from the using and interested as well as the supply arm itself.

Q. Have you any particular influence over requesting standardization of articles which have unreasonable standards? Although I am from an arm I am quite convinced that a great many items for which standardization are requested have unreasonable standards.

A. Well, that might be true.

Q. Have you any control over that, or influence?

A. We take no more control than I have indicated.

Colonel Jordan: Colonel Lewis, will you give us an example of some item you have in mind?

Colonel Lewis: I see no reason why in the Division of Artillery the doughboy element, which should be situated from two thousand to four thousand yards from our front lines, should have a fifteen thousand yard gun. I see no reason why a doughboy who is interested in killing doughboys at ranges from one hundred to a

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thousand yards should have a type of ammunition which will kill the nation's commander fifty-one hundred yards away.

A. I might say in that respect that the General Staff decides that. They decide the military characteristics, what the guns shall weigh, what their projection will be, and the type of ammunition. All of that is determined by the General Staff - we have nothing to say about it.

Colonel Jordan: Isn't it also true that those specifications are approved by the chief of arm of the gentleman concerned?

A. Yes sir.

Colonel Lewis I was stating my personal convictions.

Colonel Jordan. I must tell you gentlemen something about that General Williams, who was Chief of Ordnance right after the war, invented that technical committee proposition. He said the greatest satisfaction he ever had in his life was when an Infantryman came in to see him one day and complained about his rifle. He looked at the Infantryman and said. "All I want to say, young man, is just this You had better go and see the Chief of Infantry because he approved it." General Williams said he never had any more complaints from that boy.

Q. I noticed in your talk this morning, Major, that you mentioned in one place that by using commercial standards the supply arms or services might improve their specifications. In another place you mentioned that specifications are so drawn as to not limit production by one or two concerns I have not been working with specifications for almost two years now so I do not know anything about them, but at

the time I left the engineers with whom I was associated I was of the impression that every time a revision came out: (a), (b), (c), (d), and (f), that the product that we would get under those specifications was a much poorer one each time. Were those revisions to permit a lot of jacklegs, etc , to take advantage of the Government and put a lot of cheap paint, lubricating oil, etc , on us, or what is the policy behind that?

A. The policy behind a revision is to improve the specification.

Q. For example, we would have a substitute for linseed oil, we finally wound up with fish oil. Every time we painted a house we had to air it out for two months so it could be lived in. We wanted to buy lubricating oil to lubricate 20 compressors and the specifications for the compressor and the instructions for the operation specified a certain type of oil but when we went to buy it we had to buy an oil which says "oil compressor" or "air cooled machine gun". We would take this machine gun oil and put it in there, it would emulsify and go all through the system; it was not the type that the manufacturer recommended at all. In other words, a commercial type of oil would have been much better than what we were using. For example, we had a very fine new power plant which generated 3600 R.P.M. We specified a certain type of oil but we could not buy that type, we had to buy another type - or at least they were going to insist we do it, but we did not, they made one exception. In the final analysis, if we invest all that money in those machines, use a different type of oil for it than the manufacturer

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recommends and have trouble we are out on a limb - we cannot go back for maintenance, adjustment, or anything else.

A. That specification might have been a Federal specification, I do not know. The Federal specifications cover a large number of articles of that character, but whether it is a Federal or Army specification, all interested people have had a chance at that specification and no Army specification is ever approved that does not bear complete agreement of all people interested in that specification. Furthermore, there is a clause in most, in fact in all, specifications saying that the specification is mandatory for the grade of material covered. Sometimes one might take a specification, and then be very properly authorized to use another if it did not cover the grade that they were actually endeavoring to purchase. Exactly how all that works out in specific instances I cannot say. All I can say is what the general rule and general policy is and the fact that the agreement must be complete. If the War Department does not agree to a Federal specification it is excepted from the provision.

Q. The reason I mentioned that was that you mentioned your contact with commercial interests. Do the different people who pass and desire the specifications so changed comply to a greater number of them?

A. You might find some cases, such as the lumber people who might ask that a specification take cognizance of certain things. We have had no specific instance of that. Where we speak of a commercial standard we mean a commercial standard of national acceptance.

Q. My point is that doing that with paint, etc , makes the Government accept a standard lower than perhaps has been accepted in the past I do not know whether other members of the class who have been connected with that type of work agree with that or not.

A. Of course, in Federal specifications an item is subjected to rather severe tests by the Bureau of Standards and they know exactly what that item will do.

Q. We found that the A.S.T.M. specification gave us a much better specification in some instances than our Federal specifications

A. Federal specifications pass out of date in time.

Q. Have you any idea as to the amount of lag from the time the average item is placed for procurement and the time the specification is written for that particular item? It seems to me as if that table might not be the true picture, if there is a continuous time lag.

A Some chiefs of supply arms and services will not make a procurement, the first one, until they have a United States Army specification. Others will not write a United States Army specification until that has been thoroughly tested by tentative specifications. Some of them write specifications for items that involve immediate purchase, where an item has been standardized they might not purchase it for a good length of time - they delay I do not think there is any rule that you can follow.

Q Do you make any attempt at all to push forward any of those items that are lagging?

A. This is our first attempt this form of report, which is

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hardly two months old. As we get more data on this report and as we can relate more data to it we can take over things that at the present time cannot be handled on the basis of the facts that are shown here. But some of these, the Ordnance, for instance, is active as they can be under preparation of specifications, as you can see by the way their specifications have been jumped up, 81 this year as against 27 last. Some branch will suddenly take a whirl, a big one, and then drop off. We cannot tell why.

Q. We have in our files a chart which shows the steps in the war procurement of an item. If I recall, the 20th step is to The Assistant Secretary of War for clearance. Up to that time it has had engineering and service tests, classified for procurement, for extended service tests; considerable time and money has been spent on it up to that date, and although those concerned with those tests are no doubt aware of the policy of trying to develop an item which can be procured in war, nevertheless it does not apparently have the stamp of approval of your office. Would it not be advisable, after say step (b), after the service test and engineering test, if it would have preliminary approval of your office before additional expenditure for procurement types?

A. Well, let's read what the limit procurement type is. "Limit procurement. Comprise articles of equipment which have passed service tests favorably but are not ready for classification as an adopted type and which before such classification should be subjected to an extended service test. The approval as to limit procurement type signifies

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that the item is probably suited for service use but requires further design and further use in the hands of troops." Now, anything that requires further design and further use to determine its suitability could hardly be cleared under any program of standardization. That is a feature of control all right, but it is not a feature of control under the sense of standardization, and the General Staff tells them that they can buy this and this and this. Our program is not one of procurement control so much as it is standardization.

Q. In regard to listing articles as standard articles or substitute standard articles, could you give us some examples in which your office has disapproved the request of such listing, and if so, on what grounds?

A. We received not long ago one for a certain type of uniform equipment that we could see that if that were clearly standard for use in war the procurement would be all out of proportion of industry to produce. We sent that to the General Staff and said. "This item is cleared for procurement for peace use. The recommendation is not clear - it is intended for war use. Request that you refer it back to our office for a study prior to any action of this office in preparing it for procurement in time of war" - and the item stayed for procurement in time of peace. We adopted the standard for time of peace. That happened only recently. We could see by the use of materials that they were going to put into it (they were critical materials - the large quantity that would be required, and other factors) that that item should certainly require a lot of study before it was set up as a

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standard article for use in war.

Q Could you tell us something about how coordination with the Navy is obtained? For example, take the article of binoculars - it seems to me that there might be something done along the lines of the Navy and the Army using the same type of binocular. I know the Army has a gauge which the Navy does not necessarily need.

A. Our office has thought about that a lot. For instance, at the present time the Navy has a representation on the Ordnance Technical Committee, with reference to questions of ordnance. The Signal Corps buys Navy vacuum tubes. We must rely in our office upon chiefs of branches normally initiating joint standardization in the materials of a national society. We are not an agency over both the War Department and the Navy, only the War Department. We encourage this, and in fact we have been rather interested in the Aeronautical Board whereby the Navy and the Army are trying to standardize on airplane parts, etc., but we do not direct the Army to such activities because it involves another activity over which we have no control.

Q. I do not know that what I have to say is pertinent to the Major, but here is a couple of observations that I have made in the past two or three years on the subject of specifications. I have had quite a little experience with it. I have been a member of about six of these Federal Specification Boards, that is wearing apparel and what not. About a year ago I was called down here to a meeting of the Board that was considering hosiery and I noticed there were representatives on this Board of several Government departments. There was one gentleman who seemed to be advocating this particular specification

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for hosiery, and I asked who he was. They said he was a Mr. So and So from the Bureau of Standards. Well, he seemed very strong in advocating this particular specification which covered all types of hosiery, including that required by the Army and the Navy. Of course, the representatives of the Government departments did not know much about it, so I got to inquiring more about this fellow. I found whereas he was from the Bureau of Standards actually he was what they called a "Research Associate of the Hosiery Institute" and was paid by the Institute and not by the Bureau. That made me a little suspicious. I went back to Philadelphia and we finally got the specification deferred. We made a detailed investigation and found that the specification was entirely wrong. It would not produce the result in hosiery we wanted. We would be up against the condition we had during the war we would buy a pair of wool socks from the Quartermaster and they would shrink about half their size. Well, I hate to accuse this gentleman of bad faith but that is what we were up against. I found the same thing true with the Underwear Institute. We were considering this heavy wool underwear and what he wanted to have us adopt was the commercial standard that had been put out by the Underwear Institute. We got to inquiring and looking into the proposition and we found that with the standard woolen underwear if a man is a thirty-eight chest he has to buy about a forty-two or forty-three before he can get a suit to fit him. Well, in the service we do not want that. We measure a recruit's chest and if he is a forty we want to give him a forty garment. For that and for a number of other reasons, particularly one regarding the amount

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of shrinkage allowable in the specification, we threw that overboard. So we look with a great deal of suspicion on these Federal specifications, we examine them very closely, and we find that there is this undercover proposition in this Federal specification thing

Shortly after that we commenced getting specifications which were sent by your office to the Quartermaster General for concurrence in such items as calico and gingham, etc.. We knew that very few Government departments bought anything like that. The quality of the goods was not even a fair quality, it was a low quality, so we got underneath the surface of that thing and we determined there was some ulterior action underneath. We figured that some one wanted to get the Federal Government to put its stamp of approval on this low grade goods, thereby they could advertise "This meets Government specifications for calico", and of course that is a fine talking point in selling. We wrote a letter to the Quartermaster General and stated what it looked like. We said "In the first place there is only one Government department wants to buy this and we consider it extremely questionable whether the Government should issue a Federal specification, particularly in view of the low quality of the goods." They sent that to The Assistant Secretary. We got a paper back saying that was not a matter of concern for the War Department. Some Government department had said they wanted that and the War Department would not go to the bat and put these facts up as they appeared on the surface. We got kind of slapped in the face on the thing.

There is only one other point that I want to make, which is a

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little more pertinent. I was stationed at a point where we had to make purchases in a hurry. We would dig up the specification and try to get a change possibly in some things to bring them into conformity with modernized practice. Before we could make the purchase we had to have the specification, so we tried to get it changed several times. It was a long, drawn out process and took much time. As time was the essence we speedily got into the practice of saying: "Well, it takes so much time we cannot make the purchase within the delivery time that we have available", and so we would issue a tentative specification and buy on that tentative specification. Of course, that is the only thing you are concerned with, and I am interested in the amount of time it takes your office to clear a change in the standard Army specification from the time you get it until you send it back to the particular branch? Also, I wanted to go into a little broader aspect as to whether, inasmuch as the supply arm or service makes all the technical tests and has to assure themselves that it is in conformity with commercial practice, there is actually any necessity for The Assistant Secretary of War passing on these specifications or not?

A. You mentioned three things. One, concerning Federal specifications, I think you showed right there the necessity for a technical committee and for concurrence, because where those things are brought up naturally the Army does not accord with the views on the specification and there is nothing that makes the Army use the specification in which it is not in agreement - an exception is made to the Federal specification to the Army insofar as the Army takes exception

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to the specification. The next one, regarding the time it takes to clear a specification - that all depends upon the size of the specification and the completeness of the data that accompanies it, but if the specification is properly written in proper form and is complete with reference to the data that we would like to know, and which I have already mentioned, I would say that the specification normally leaves the following day. It is very seldom that the specification remains in the Secretary's office over two days, many of them get out the same day in which they are received. I do not think at the present time that any one can point critically to the lack of promptness there. Many of them come down with a red tag on - we get them right back.

Q. I think there might still be some confusion about the questions raised by Colonel Lewis and Captain Bassett, in view of the inspection trip we took to Aberdeen this fall.\* Colonel Wesson was there and described in quite considerable detail the trouble he was having converting the ~~field powers of~~ 75 mm guns, the howitzer, ~~trying~~ to make them mobile from the old mount, increase the range and do it at a small expense. The original field tests they ran were perfectly satisfactory, as I recall, for the purposes of Artillery. Then, as he stated, the gadgeteers got on it. They wanted a sight which was not necessary, they wanted other parts of equipment on it, and as it finally evolved a type of weapon was produced which caused, I think, about three times as much as the original estimate would be for converting that mount and it did not improve proportionately the military characteristics of the weapon. There might be an open question as to

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why the problem was not presented to the Standards Branch with a view first of assuring rapid procurement at small expense, and where the Standards Division versus the General Staff enter the picture in the development of that type of procurement. That is one question. The other question is that we went to the Bureau of Standards and listened for a great length to the man in charge of optical glass there. He emphasized the point that our specifications for optical glass were much more stringent than the Navy's were - the type of instrument that the Navy had permitted the use of optical glass of a type which was not as difficult to manufacture. In each case would you explain the functions of both the General Staff and the Standards Division? It would appear on the surface that the Standards Division had an excellent opportunity there of assuring the procurement of war materiel, as we are charged with in Section 5a.

A. Regarding your first question, I cannot answer it any better than to say that the points you mention in connection with that gun are questions of design and military characteristics. Isn't that true?

Q. Yes, it is true, but the development of that during war time is greatly affected - as I say, the gadgeteers are requiring-----

A. All right, I see what you mean. We can clear it for procurement as to type, if and when we might, but we have to consider at the time of doing so the directive from the General Staff. We have attended all these technical committee meetings. We know about these things in advance of their reaching our office. We have a representative

at every technical committee meeting and when these things are discussed there we get a pretty good picture of what the item is and its difficulties before the item ever reaches our office. To say that we will not clear procurement because of the design or because of its military characteristics is infringing on the functions of the General Staff. When we clear it we clear it with our best judgment, backed up by what has been done before. Then the supply arm or service begins writing a procurement plan for that item, and there again it comes under the supervision of The Assistant Secretary of War. Remember, it does not stop with the clearance of the item as adopted standard in our office. Also, there is a procurement plan to be written on it, and again The Assistant Secretary approves the procurement plan. Where there is a delay in the procurement plan that matter, of course, is a matter taken up in connection with the procurement plan for the item.

Colonel Barnes: I think this point that Captain Burgess brought up is clearly a matter between the Chief of Ordnance and the using service. The Chief of Ordnance must have full authority to design the pilot, that is, the first howitzer or whatever you are talking about, and when the Chief of Ordnance has tested it at the proving ground and is satisfied that it is a good weapon he sends it to the using service for test. Now, if they want some gadgets added, that becomes the responsibility of the arm. Finally, the weapon, of course, is standardized by the General Staff. The Assistant Secretary of War does not come into that picture at all, nor should he, in my opinion.

Major Arnold. Your second question concerned---

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Captain Burgess: Optical glass.

A. Very often a branch will write its own tentative specification where a confidential or secret process is involved and we never see it. I do not think at the present time there is an Army specification on optical glass, so the specification that he was referring to is probably a tentative specification by the procuring arm and one we have never seen. We have no specification on optical glass.

Q. I should like to ask a question about the standardization of procedures. As a specific example, the procurement of a commercial airplane transport presents exactly the same problem as the procurement of an automobile by the Quartermaster Corps or by the Ordnance. We had occasion about three years ago to change our procedure relative to airplane specifications, so we took as a guide an Ordnance specification for the procurement of a motor vehicle and the classification of it. We followed that very carefully and published a bulletin on how it would be done, but when it came to clearing the specification, remembering that the General Staff, G-4 Section, approves military characteristics/exactly the same manner for the airplane as they do for the automobile, we had to have the approval of the type specification whereas the Quartermaster Corps or the Ordnance simply bought the motor vehicle, as you have pointed out, on a tentative specification, and up until recently it was not necessary to clear the tentative specification. To make that clearer, the airplane specification that might be used for war-time purposes is the detail specification that is prepared by the manufacturer. It does not make a great deal of difference with the

exception that confusion sometimes arises and it is a convenience not to have to go down on paper and say that this is a standard article, and clear it through the channels for a standard article, for the reason that in addition to G-4, General Staff, and The Assistant Secretary of War, the budget comes in and when your funds are once set up they apply to development types and adopted types - the monies that are available for adopted types are in another pocket than those for the development types - and there are instances where it is an advantage to evade, if you want to put it that way, Army regulations, as you have indicated, by not requiring specifications and clearing a tentative specification. I would like to know how the Ordnance Department and the Quartermaster Corps, being older services, arrange that detail?

A. As far as the question of funds is concerned, I do not know what funds they buy from, all I know is that the motor vehicles they purchase are in accordance with the number of vehicles that the General Staff has authorized for purchase that year. The General Staff told them what type and how many they would buy and how much money they would have. Based upon the number they are going to buy, they write a specification, but they do not claim that as a standard specification for a standard item because that is approved at the time. Therefore, they write a tentative specification around the military characteristics for that type and we approve it because The Assistant Secretary of War wants to maintain supervision of a type of procurement that is as important and involves as much

money as that, also for competitive features - they must have competitive features.

Q. May I put my question another way -- When you referred to certain types of specifications for standard articles that did not require a specification, just what class are those?

A. Only these classes (indicating on diagram on board) - something that is not standard. Putting it the other way - that is used occasionally. The Chief of Ordnance might buy one carpet sweeper to clean up an arsenal in a certain place - something that is bought occasionally in peace-time that is not on any supply program, or an item for which he wishes to test a United States Army specification. He wants to see that the United States Army specification, that specification to be cleared is a United States Army specification, is a proper procurement specification; therefore, he tries it out first in the form of a tentative specification.

Q. That is what we would like to do.

A. Well, you might be able to do it. I cannot say.

Q. I am not quite clear yet, sir, on one question that I asked. In view of the fact that the supply arm or service does all the engineering work, they contact industry as to the procurability, and The Assistant Secretary has a representative on the technical committee which considers that, I would like to have you speak a little bit further as to why it is necessary to clear these specifications in your office.

A. I will be glad to. The Assistant Secretary of War must

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have assurance that articles can be procured in an emergency in accordance with requirements. I do not see how he can obtain that assurance unless he exercises some control over the clearance of specifications. He announces certain policies and certain procedures necessary for clearance of specifications and then carries that forward and sees that it is complied with. Those are two functions that always go hand in hand issue instructions and see that they are complied with. That is one reason: to clear specifications, to see that the policies are carried into effect, and to take exception in cases where they are not. We send specifications back. We say that we do not go into the technical part of specifications and we do not, but sometimes we see that a component part is restricted in that the item itself might be restricted because it complies to a proprietary article or article under control of one manufacturer and that cannot be susceptible to competition. We see sometimes that the performance required on an article or its guarantee is in excess of what industry will probably want to furnish. Sometimes they want industry to guarantee a motor vehicle for five years. There are many cases where little things come up in connection with the policies that he has announced and there are many times where from the experience he has obtained in clearing specifications he wants to change those policies and take over or release certain functions he has theretofore exercised. It is purely a matter of assurance that orders are being carried out.

Q. I would like to make one suggestion and one remark. The

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list that you have there on the specifications as they come to your Standards Section indicate that you have in mind the requirements of the Comptroller General. In other words, the specification for the article procured, both in peace and war, must meet his requirements. I would suggest that we might have a set of war-time specifications which would meet the objections that Major Middleswert has raised. My second point is that I would like to say a word for the specification writers. I know of no more difficult piece of writing than attempting to write a specification, I do not care what it is for. For the past two years (I pass this on to the Class for what it is worth) I have had the unusual opportunity of associating with a rather large section of Engineers and men engaged in writing specifications for structures, machinery, pretty nearly everything from a needle to an anchor, and at the same time and concurrent with this specification writing having the articles manufactured, installed, and put into operation, and I do not care how good a specification writer you get or how good and how fool proof you think your specifications are when you get them on the job there are more bugs develop in them than a dog has fleas.

A. I think your second remark answers your first, and that is if you write war-time specifications you have no chance to get those bugs out prior to war.

Q. Yes you have.

A. How?

Q. By your procurement tests.

A. That might be possible but all articles, mind you, do not go through limited procurement

Q. That is true, but for the purpose of tests you could suggest that they go through that system if you write a war-time specification. For example, the socks that were mentioned or the rainless raincoats that were issued in the last war would be avoided.

A. Well, we do have specifications which are really emergency specifications. We have specifications which in time of war we feel will not produce the required quantity, therefore, we have a substitute specification for that same item, an emergency specification, so a provision has been made for a substitute specification which the chief of supply arm or service may clear for purposes of emergency procurement.

Colonel Jordan. I have listened to Major Simpson tell about the troubles of the Quartermaster Corps specifications - oil and various things. We have a sister branch of the service that is afloat. They haven't a corner grocery store and a corner supply store to go to and get things, they have to work with what they have and it has to function. I do not know exactly how the Navy seems to always get by and do things perfectly but they seem to do it. I would like to have a Navy man answer Major Simpson's story and tell us how the Navy manages to handle things of that kind. I want Commander Dunham to do it, I do not want Commander Foster.

Commander Dunham: I do not get that implication, of course. As I listened to Major Simpson, it seemed to me that the trouble is a

matter of administration. If the Quartermaster constructor needed linseed oil I do not see why he did not get it, unless the Quartermaster General has stated that linseed oil should not be used for that purpose. Very often in the Navy where we have been using the Federal catalog, we get a requisition from one of the heads of the departments for an item which was not in the Federal catalog listed as an item for Navy procurement. In other words, there was not an X in the Navy column - it was obviously an oversight - we put in the requisition just the same and very often we would get by with it from the Supply Yard, but if the Supply Yard came back and said: "That is not a Navy item, we cannot issue it", we would immediately take it up with the cognizant bureau and request that that item be placed on the list and furnished for our ship. I would say the trouble Major Simpson brings out seems to be very much a matter of administration. I cannot understand it.

Colonel Barnes. I might add that the lubricating oil that Major Simpson was talking about is all purchased under Navy specifications.

Q. I want to subscribe a hundred per cent to what our friend, Major Lyons, has said about the difficulties of writing specifications. I have been very much concerned with it for something like ten years and I think it is one of the most difficult jobs we have. It is such a complicated question that you could spend a week talking about it. There is one angle that just occurred to me - I do not know why I never thought of it before. The specifications are intended to tell the manufacturer what we want. For a great many items that is all you need but in the case of a mechanical device, for instance, such as the

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Ordnance has a great number of guns, carriages, etc., we have to have an equally important document called a "drawing". The drawings can be quite elaborate in case of a complicated item and they contain a great deal of the information which tells the manufacturer what we want. In fact, the drawings may contain far more of the total information than the drawings plus the specification. Now, of course, the drawings are made a part of the specification by one of the first few paragraphs. The Assistant Secretary's office does control, as you have explained, the preparation and standardization of the specifications, or at least the clearance. However, you do not, as I recollect it, have any contact with the drawings themselves and yet they are just as important as far as the procurement of an item is concerned as the specification. I had not thought of that before. I can see what you would get into in trying to do it, but what is the reason you do not?

A. Your suspicion is the very reason - that is engineering, we cannot get into it. We are purely an administrative policy forming organization without any technical responsibilities. That is entirely up to the chief of the branch, he has to exercise that himself.

Q. I would like to make one more remark about Federal specifications. Let us take the matter of lubricating oil the Army is forced to use the Navy specification. In the work of preparing some instructional matter about two years ago I had occasion to consult some of the largest fleet owners in the United States, four of them particularly (I will not mention their names). They were asked about the quality of lubricating oil they used and every one of them gave the same answer

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they used the cheapest lubricating oil that would do the job. Then they were cornered on the question of using this Navy specification oil, and not one of them would use it, or anywhere near it. I would like to ask the Navy how come?

Commander Dunham I think you will find, if you look over the specifications for Navy oil, that they have the better oils and the poorer oils and each is used for the purpose intended. I think they have an oil for practically every use.

Q. In the last three years I have been engaged in buying materials for the new Navy Construction Program as it is applied to Navy Yard built ships, and in that time I have bought an infinite number of mechanisms. In our contracts we always require for a mechanism a lubricating diagram. I do not think that would be unusual in that we require that the contractor give on his lubricating diagram the applicable Navy specification for the type of oil that is to be used, and I have never yet had a contractor say that his mechanism required a grade of oil that there was not a Navy specification to adequately cover.

Q. I do not believe that the Navy specification or any other specification for lubricating oil covers quality. It covers viscosity and a few points like that, flash points, but no one has ever yet written a specification which actually determines the quality of oil.

Q. On the question of oil (of course this has nothing to do with fish oil), I went into the amount of Navy contracts to quite an extent at one time due to the fact that I thought we were not getting the proper quality oil. Each oil is for a specific purpose, and I

found that the only difference between the lubricating oil on Navy contracts was the fact that they were not wax free but as far as their lubricating qualities were concerned they had every quality that the wax free oils have. I think in general that that is the reason for the specification on which Army and Navy requirements are purchased.

Q. We may not know anything about lubricating oil but we have an experimental station that takes all commercial lubricating oils and breaks them down - you would be surprised at what some of these lubricating oils will do or will not do. We have certain requirements out at sea for lubricating oils and we have been getting away with it. Regarding air compressors, the oil there is a certain kind of oil and we use it. We think we know what we want. If we get away with it I do not see why the Army cannot get away with it, too.

Q. Industry will not accept our oil.

Q. Industry will not accept our oil because the quality that industry puts out is cheaper. I do not see why this argument. It looks to me like trying to find split hairs. You have got to look at it from its raw point of view. When the Army begins to pick at the Navy I merely smile to myself and say "Well, they do not know what they want."

Colonel Jordan: I want to again leave the thought with the Class that I have repeated a number of times, and I am going to repeat time and again before you leave this school: The keystone of our arch of preparedness is the Joint Army-Navy Munitions Board. On one side of that the stone that supports it is allocations and on the other side is the work of this division which we have talked about here this morning -

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the Standards Division.

I cannot thank the speaker half enough for the fine way he has put across his job. It has been a very instructive lecture, sir. Thank you very much.