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INDUSTRIAL STANDARDIZATION

14 March 1949

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GENERAL HOLMAN: To those of us in the Military Service, standardization is not a strange word. We have long recognized the value of standardization of weapons and interchangeability of parts of weapons, but the process of standardization is not easy of achievement. In both the industrial and the scientific fields this problem has been given, and is being given, much consideration. This morning we have with us Brigadier General Donald Armstrong, who is a director in the American Standards Association, but who is better known to us as a former Commandant of this College. He is a writer and lecturer on many subjects of the military art, and his contributions have been extensive.

It is a great pleasure to welcome back to this College General Armstrong.

GENERAL ARMSTRONG: Thank you, General Holman.

General Vanaman and gentlemen of the Industrial College: It is a great privilege to return here as an industrialist and retired officer of the Army to talk to you about a subject in which I have been keenly interested for at least twenty years. The subject of standardization is certainly one which the Industrial College has emphasized since I was a student here in 1926 and 1927. I think the College, incidentally, deserves a great deal of credit for emphasizing the importance of the subject.

For about a year and a half after I retired from the Army in 1946, I undertook the rather difficult job of trying to explain to top executives in industry the importance of standardization. You might think that inasmuch as mass production in the United States is based fundamentally on standardization, you would have no particular difficulty in persuading American industrialists of the importance of standardization. I don't mean to say that standardization is not recognized frequently as the important element in production that it actually is. Yet it is certainly frustrating and melancholy to find so many industrialists who fail to recognize standardization as a tool of management and as an important element in reducing costs.

I define standardization the way that Dr. Agnew of the American Standards Association has defined it, that is: "The establishment by authority or by custom or by general consent of a rule or a method to be followed." There are not many here who are contemporaries of mine, but those of you who are will remember that we set up a standard in the

Military Service for solving our military problems. It was known as an "estimate of the situation." Now, that definitely conforms to the definition of a standard that I have just given you. It is a managerial standard, but it tells you how best to solve a military problem in the face of an enemy. It sets up a standard which experience has shown to be worth following. So I hope that illustrates in part one meaning of the word "standardization."

I would like to start my talk this morning by showing you something about the timing of standardization. I have a chart (page 17), that is an ideal representation of what happens in the development of, say, the automobile or the airplane or radio or television or anything else. First of all, a hundred years or more ago somebody had an idea of some means of transportation that would travel on a road. Many years ago the steam wagon was invented, designed, and actually made in France. Then the idea vegetated a long time--the same way with aviation and television--while the various economic and technical conditions were becoming ripe to go into a research and development phase. That phase may take many years, it may take only five or ten, or it may take a hundred years. With the rapid acceleration of technology today it may take less than it did in the old days.

Then you run into the experimental stage, in which the progress becomes much more rapid. Then comes a development stage, in which the progress continues to increase, in the stage represented by the line from B to D on the chart. You can't set up a standard during that stage, because the changes are too rapid. However, when the thing begins to be stabilized at point D and the changes become fewer, you can begin to standardize. So we have shown our first standard at point D.

Then, as you see, the rise continues, improvements continue to be made, and finally you have the point where you have to change this standard, modify it, and raise it to another level. That illustrates one of the points that I want to make here today, which is the need for flexibility in all the standardization procedures.

First of all, you will note from the curve on the chart that it is an exceedingly harmful thing to start standardizing too soon. We know, for instance, that German aviation in World War II standardized its planes a little early, with the result that although the Germans got out mass production of those planes, the quality of the British and the American planes later on was superior. Also this shows that timing is one thing and flexibility is another. You must be ready to change your standard if and when advanced technology or some other development justifies.

When you look at standardization--I am looking at it as an industrialist and not as an old soldier today--you look at it from the point of view of the economic advantages of it as well as the social advantages.

In the economic advantages you realize that standardization is necessary for the mass production that characterizes American industry. It reduces definitely the amount of capital tied up in inventory. The reflection of that in the Military Service is, of course, that you have a smaller quantity of materials in the pipe lines for maintenance and repair if you have standards than you do if you have an excessive variety of types of equipment.

Second, there is less labor required for each end item of production.

Third, you reduce your maintenance cost of productive equipment. In my company, the United States Pipe and Foundry Company, the operation is largely mechanized. We use literally hundreds of electric motors. But insufficient thought was given in the past to the idea of getting standard types of motors. We are trying to do that now so as to decrease the amount of spare parts for repairs and maintenance that we must keep in our storeroom. In other words, you simplify your storage and distribution problem by standardization.

Fourth, of course, you increase the interchangeability of parts.

Then, if you look at it from the standpoint of its social advantages, you will find that the safety codes, which are prepared under the direction of the American Standards Association, have accomplished wonders. That is reflected in the experience of the individual companies. I know in my own company that the record of time lost by the 3,600 men who work in our five plants is just about one-fifth of what it was three or four years ago, because there have been standards of safety set up which are carried out and obeyed throughout the organization. That is a very distinct social gain due to standardization of methods of operation.

Then, of course, we have lower prices, as you know, to the consumer because of standardization. That is another social gain.

Then through standardization you enable the consumer to maintain his automobile, or whatever he has, by means of the spare parts which are made available as a result of the standard design.

I don't think that to this audience it is necessary for me to emphasize the military value in national security of the points that I have just been making for standardization as applied to its social and economic values. If we reduce the number of types and sizes, if we simplify, if we have as a result of standardization conserved materials and labor, it is obvious that standardization is a most important factor not only as a tool of management, looking at it from the industrial point of view, but also as a tool of economic mobilization, looking at it from the mili-

tary point of view. From that latter point of view each one of you should certainly bear in mind the importance of it and the need for advancing it on every possible occasion.

Now, there are two functions that must be fulfilled in industrial standardization. First of all, you must have the establishment of a temporary constant level of conditions when the technical and economic factors justify or warrant standardization. That is what point D means on the curve on the chart. You didn't have economic or technical conditions that justified standardization until you reached that point.

The second function is the need for coordinating all the factors which make working together necessary for standardization. Let me explain what I mean by that. Let us take a shell, with which all of you are familiar. You have a standardized shape of that projectile; but when the conditions change, that standard changes. When I was a young artilleryman, the ogive had a radius of two calibers. Nowadays with the high velocity the radius of the ogive has a minimum of seven calibers. That is a technological change in standards due to technological advance.

What I am trying to explain is that you must have coordination of all the factors which are required to be considered in setting a standard. With the shape you have the dimensions as well as the caliber. You have the length of the projectile. Then you have the type of steel that is used in the projectile. That is a considerable problem, and the type you use depends on the end use of the projectile. Then you have the fuze problem. That also is a separate problem of standardization. But you have a standard fuze for use in the projectile. Then of course you have to standardize the explosive and the copper rotating bands. Those are just some of the factors which must be coordinated in standardizing a shell.

So, gentlemen, those two functions have to be fulfilled. You first of all have to be ready to establish a temporary constant level of conditions. Don't fail to get that point. And the next point is, you have to coordinate all the factors entering into the standard.

The point I just made about the various elements in standardizing a projectile leads me to another principle that I think must be emphasized in the problem of standardization. You must standardize the greatest possible number of components. In an automobile you can standardize the transmission, the carburetor, the ignition, and various other parts. The first essential of standardization is to standardize components. And that, of course, has a very important application in all military and naval and air devices.

As you change the model of the end item, you can sometimes keep the same components. Thus the standardization of components also gives a desirable flexibility, so that you can shift from one model to a better one and still use at least some of the components that have been standardized.

The statement of the problem which was given this class very clearly denotes that you have understood here the distinction between the two types of standards which come to the attention of an industrialist. The industrialist must look on standardization from two points of view: first, technical standards and, then, managerial standards.

Technical standards concern the tools and materials and methods of work, the performance, dimensions, and so forth. Technical standards specify what shall be done and how it shall be done. On the other hand, managerial standards tell you when a job has to be done and who is in charge of it.

I think American industry is probably far behind in general in the use of managerial standards; this is one place where the Military and Naval Services have really forged considerably ahead of industry. Take, for instance, the standardization that is set up in accounting practices in our military organizations, in quality control, and in job evaluation. You would be surprised to know how backward American industry is in those particular factors of managerial standardization. The Army and Navy and now the Air Force have certainly been practicing all these phases of standardization for many, many years. Industry is just beginning to wake up to the need for managerial standardization. However, I am not going to talk to you about those standards. They are of vast importance to any executive who is trying to run his organization properly in civil life.

Besides having managerial standards tell you when a job has to be done and who is in charge of it, I think it is excellent practice for management to tell the workers why it is done. I used to think it was a good idea to do that even in the Military Service. I can remember a lot of old soldiers, though, who thought all they needed to do was to give an order. I always found in the Army, and I found later in industry, that if you want high morale, either in the Army or in industry, it is vital to tell people why you set up these standards, why you have job evaluation, etc. You know, when you present something new to anybody, the human reaction is to find it objectionable. If you explain why you set up these standards, I think a great deal will be accomplished.

Standardization goes through a number of phases. You first of all have standardization within a company, which we call company standardization. Next, the companies that have built up a trade association will standardize as between the companies. Then you will have the overall standardization, which I will explain to you later; this is accomplished by the American Standards Association. And then you will go on to international standardization in certain fields. In other words, there are four successive steps.

Looking at this now first from the point of view of company standardization, the great need--and this applies to you in all the jobs that

you may get when you leave the College--is that the top man in any organization understand the values, the objectives, and the needs for standardized practices in management and in technical production. I think that probably not more than ten percent of American industry today--I have very good authority for making that estimate--is organized with any kind of standardization group or standardization chief. I think it is important that American industry develop such an individual as a staff officer in a company. I have done it myself. I set up such an individual in my company, and I emphasized in his case quality control, which is also another problem of standardization.

I have had that man report to the top executive in my organization. Now, why is that? Well, for the simple reason that standardization requires a coordination of research and development, of engineering, of production, of sales or marketing. If you don't coordinate them all, you will not get good standardization. If you put it, for instance, in the Engineering Department, you are going to find, as any number of us did who were in the Ordnance Department in the last war, that your Engineering Department is going to design things which are perfect from an engineering standpoint but extremely unfortunate from the point of view of production. I can tell you a story about that. When I went to Chicago in 1939 we had an educational order at that time for the production of 75-mm shells on the upsetter. It took me a matter of six months to change the standard which had been set up by a good engineer, in Washington, who was unfamiliar with the problems of production.

Gentlemen, if I don't leave any thought with you other than this, I hope you will remember that in setting up standards you must see that there is coordination between the people who design and the people who produce. Their interests are antagonistic in many ways. Therefore keep your standardization job out of engineering, keep it out of production, and keep it out of sales or any other department; it must be independent. Fortunately, in the national security setup today that is exactly the way it is. But industry again has not seen it that way until comparatively recently.

The first point that I think I have made is that we want that man in charge of standardization in a company to coordinate engineering, production, sales, inspection, and so forth. He also has another function, which is to represent that company in the higher echelons of the process of standardization--in the trade association, in the engineering societies, and finally in the American Standards Association.

Gentlemen, your committee and I could by investigation give you case histories which would emphasize to you the great value to any company of company standardization. I have here just two samples. I remember Mr. Robertson, Chairman of the Board of the Westinghouse Electric Corporation, said a few years ago that it is now possible to assemble the 30,000 different types and ratings of motors that Westinghouse offers to its customers from just 126 standardized parts, as

against the 2,800 parts heretofore required. That shows you what giving thought to this problem of standardization can do. It serves as a good example to illustrate what can be accomplished if military, naval, and air officers who are in positions of authority will do likewise and will give thought to this problem of standardization in military equipment.

General Motors has standardized for its Diesel locomotives the pistons and the motors, so that there is interchangeability between the switchers and the streamliners. Standardization by General Motors has been carried out most effectively. Your committee could find innumerable other examples where standardization has been performed to the profit and the advantage of the company and the people of this country.

But the company standardization which I just talked about is not enough. You need to have the further stages that I have already named. You must have standardization in the trade associations and engineering societies. That is one phase. Then there is the standardization by the American Standards Association. Finally there is international standardization, such as is taking place now between Great Britain and ourselves in screw threads, which is certainly one of the most fundamentally needed standards that we ever set up.

I would like now to talk about the American Standards Association, because that is the top agency in the United States by which standards are generally established for over-all acceptance.

I think it would be interesting for you to know that setting up standards even by the American Standards Association or any other source does not necessarily mean that you are going to have standardization. We have standards in the cast iron pressure pipe industry, but there are three major cities on the Atlantic Coast that are still using the design of pipe and fittings, mainly fittings, that they have been using for the last fifty years. Of course, that is one of the obstacles to standardization. These people have millions of dollars invested in pipe lines for their water supply systems. It is going to be extremely difficult to change the types of fittings to the standard type, because if they do, they won't fit. You have that problem throughout. All you can hope for is that, as time goes on, standardization will be effectuated and more universally accepted.

What is the American Standards Association? It is an instrument of the free-enterprise system. It has no connection with the Government, although the Government is represented on the ASA Council and on the various committees of the Association. But the Government is represented there with the same type of representation that you find in every other of the hundred trade associations and engineering societies that form its membership. In other words, it is not a government operation.

The American Standards Association was established in 1918, when five engineering societies came together with the realization that unless there was some coordinating body for standards, we could not get a real standardizing job done. Take the pressure pipe industry as an example and see of what its particular committee in the Association consists. First you have representation from the companies that manufacture pipe. They represent the industry. The American Waterworks Association and the American Gas Association represent the users. You have a great many engineering societies. You have the American Society of Mechanical Engineers, the American Society of Civil Engineers, and the American Society for Testing Materials. You have also the Bureau of Standards. You have the Canadian Standards Association. You have the Underwriters Laboratory. And then representing the public interest you have three or four outstanding engineers in the field of waterworks, sewage disposal, and gas lines. That illustrates what the American Standards Association is and how it operates. The American Standards Association wants to be assured that anything that is presented to it by a trade association or an engineering society or individual company is considered from all points of view--those of the producer, the consumer, the distributor, the Government, and the general interest. And that is exactly what the American Standards Association accomplishes.

That Association does not make standards. It merely provides machinery for securing national acceptance and use of standards. It is a democratic process. It insures that a consensus exists before anything is published as an American Standard.

I don't know if I am completely up to date on the Federal Specifications Board and the specifications work that now goes on in the Munitions Board and what is being contemplated by the National Security Resources Board; but as I see it, the National Security Resources Board is one agency in the United States that certainly needs to recognize standardization for the importance it has for our military security. It does recognize it. The only thing that I would want to be sure of is that there is the most complete coordination between the Federal Specifications group and the Munitions Board group, and that there is a two-way street between those organizations. You can't afford to neglect any degree of coordination between those groups.

The Industrial College, I think, is doing an adequate job of training top officers of the Army, Navy, and Air Force in the importance of standardization, but the education must go on. When you go out to your next job, you must certainly try to do everything you can to see that not only from the managerial but from the engineering point of view standardization is carried out effectively. I am certainly doing all I can in industry on every possible occasion to emphasize the importance to management of standardization. It seems to me it is one of the most essential elements in economic mobilization, because it does the many things that I have described.

I am a consultant to the National Security Resources Board and am trying to give it some of my thoughts on various subjects. The other day I sent the Board a memorandum on standardization in economic mobilization. I said in that memorandum that many people fear standardization because they misinterpret it to mean regimentation of design, loss of competitive position, and possibly loss of replacements. There is little justification for these alarmist views if standardization is properly conducted. In addition, there is the generally recognized benefit for industry and the Nation of standardization in that it makes possible expeditious methods in the mass production of war materiel. Standardization thus speeds up our economic mobilization.

Standardization in its broader sense is a term that covers much more than the mere setting up of standards. The term "standardization" from the military point of view includes simplification in the preparation of specifications. It includes the substitution of materials more readily obtainable for rare and costly materials; and the substitution of processes that are more advantageous.

The objectives that we must have in mind in our efforts toward standardization can be summarized as follows: One is the conservation of materials by substitution and by reducing the requirements both of components and of end items. Gentlemen, I think that all of us must understand that it is extremely important to think about substitution and conservation of materials not when war hits us but right now. I will tell you in a moment how I propose to do that. Let us go on with the advantages and the objectives. A second one is economy of manpower and machine hours in the use of production equipment. Then there are simplification in types and sizes, interchangeability, and reduction of inventory.

What I call simplification and interchangeability obviously reduces the difficulty of training workmen. It reduces repair and facilitates maintenance in the field, which we can't neglect. By standardization you reduce the quantity of parts needed in the supply pipe lines and the depots.

The history of standardization shows that not only in 1917 and 1918 but in 1941 to 1945 there was a decided stimulation of the job of standardization. The point that I would make in conclusion here today is this: How do we dare wait for a war to stimulate standardization? How can we justify any indifference to standardization in the world in which we live? How can any of us fail in any job that we have to emphasize the need for managerial and technical standards established now which accomplish these ends that I have just named?

We have a great number of task committees or advisory committees that serve both the Munitions Board and the National Security Resources Board. My feeling is that every military specification that concerns, say, the foundry industry will be handed over to the foundry advisory committee for study; and to comparable committees with all the other specifications.

There are two types of education needed. First of all, we need to see that wherever the Army, Navy, and Air Force specifications differ from commercial practice, industry is told why that is necessary. Such differences irritate industry. Frequently they don't see why you can't use standard commercial practice. You and I know that with the high temperatures of the tropics, the severe low temperatures of the Arctic regions, the humidity and other things like sand and dust, that military equipment is subjected to, frequently a departure from commercial standards is needed. But let us make industry understand in time of peace why these military specifications are more severe than the commercial specifications.

Let us in the second place assimilate the military specifications with the commercial specifications whenever that can be done. Very frequently it can be done. There are too many engineers both in industry and in the Military Services who want something special. It is human nature. They like to be the father of something that is different from anything else in the world. You will have to fight that attitude and that trend.

I suppose everybody who comes down here and talks on a subject wants to give you the impression that his particular subject is of the greatest importance in industry and in social and economic life. I don't want to exaggerate this, but I hope that this morning I have given you some concept of the importance that I personally attach to standardization. And I hope that you, as a result of your committee's work, will go forth as missionaries to fight the good fight for standardization on a sound basis, to get the Army, Navy, and Air Force together first of all, and then get the Military Services together with industry. Believe me, American industry will meet you more than half way in that job. Thank you very much.

QUESTION: On the subject of standardization between different nations, could you say a bit more as to whether there is much standardization in factory techniques between Great Britain and America and possibly also as regards design in the Military Establishment? I imagine the various production teams visiting the different countries have done a great deal. Would you care to say anything on that?

GENERAL ARMSTRONG: I can speak for my own industry. The Stanton Iron Works in England and the United States Pipe and Foundry Company in the United States, which I am with now, are the largest producers of pressure pipe in each country. The two companies operate now, and have operated for years, with the closest collaboration. Our processes are pretty well standardized. They send engineers over to our company and we return the compliment.

What is going on in other industries I don't know. I only hope that as between Canada and Great Britain and ourselves we shall develop the greatest possible standardization of such things as drafting room

practice, which is so fundamental. Of course you all must know the story of the time that we took over the manufacture at Packard of the Rolls Royce engines, and the difficulties that we had, the months and months that it took just merely as a preliminary to translate the drafting room practice of Great Britain to the drafting room practice in the United States.

Incidentally, we can't throw any stones at anybody on that, because the drafting room practice in the United States is far from being standardized. You may be surprised to learn that, though it is not standardized, some progress is being made. And it was formerly not standardized in the Army. The Ordnance drawings were quite different from the Quartermaster, Engineers, or Signal Corps drawings in the old days. So as you go back you will find that you don't have really the first three fundamental types of standardization--company, trade association, and ASA standardization--which you must have before you can get standardization with Great Britain. There is too much absence of that fundamental standardization.

But the American Standards Association, the British Standards Association, and the Canadian Standards Association are most closely integrated and on a very friendly and cooperative basis. As a matter of fact, I think I have to admit that the British have done better than we have. The British Standards Association was the first one to be set up. We set ours up in 1918. The British already had theirs going long before the First World War. I think that one thing which brings out what we could call the rugged individualism of the American industrialists is that it took us so many years to get going. It still takes time to get organized.

QUESTION: General, now that you have seen both sides of the fence, what concrete steps would you suggest to the military to get a more effective utilization from industry's standards, or how could we encourage industry to develop standards that we could use more effectively?

GENERAL ARMSTRONG: I would say that the industrial advisory committees that have been set up in the Munitions Board and the National Security Resources Board--in which, incidentally, great care is being taken to avoid any overlapping or duplication--can serve very effectively in carrying out exactly what I have been trying to preach for many years, which is the need for coordination between industry and the Armed Forces. The Armed Forces need that coordination. For example, I had experience as chief of the Chicago Ordnance District from 1939 to 1942, when something over two billion dollars worth of contracts were let to about eleven hundred industrial firms. Again and again I took it on my own shoulders to give these people authority to deviate from specifications where it was my judgment that they were unnecessarily severe. I was taking a chance, I knew. My initials were

on this materiel as inspector. But I took the chance because the Armed Forces in the field needed that materiel and I thought that I was justified in doing it; I believe that events proved that I was right.

But the time to get that coordination, gentlemen, is now. It is folly to wait until we have the storm and stress of war to find out that our specifications are unnecessarily severe or to try to prove to industry that there is justification for the severity in those specifications, as there frequently is. It is again the need, as I explained earlier, of explaining why. If you explain to an industrialist why something that he is not accustomed to doing in the ordinary practice in his production is needed for the Armed Services and explain it right now, then when the time comes he is not going to be resentful or think that the Armed Forces are a lot of nitwits that don't know anything about production and therefore have established these unnecessarily severe specifications.

The answer to your question in short, in my opinion, is to utilize these industry advisory committees, and to see that all Federal specifications, including all Armed Forces specifications, are subjected to the scrutiny of these committees. I think it is most important that this be done. On the other side of the fence I am sure that industry is more than ready to help. Representatives of industry complain, not about serving on these industry committees, but they feel, as I do from my own experience, that they are not asked to do enough. Industry is ready to do exactly what I have just suggested to find an effective answer to your question.

QUESTION: Sir, how would you refute the argument that standardization tends to stifle competition? For example, had the automotive industry standardized on a low compression engine along about the time Chrysler came into the picture, we would still have a low compression engine in the automotive industry.

GENERAL ARMSTRONG: The answer to your question is that standardization, when it is properly conducted through the medium of the American Standards Association, is the legal answer. The point is that there should never be standardization by any trade association or any company alone.

You are quite right. Standardization can be, and it has been, a practice which is monopolistic and in restraint of trade. Heaven help any industrialist who is guilty of such practices today, because there are plenty of people over in the Department of Justice who have wide-open eyes for that kind of industrialist. They are not going to tolerate such practices--and quite properly so.

But what can be accomplished--I think this answers your question--through the American Standards Association is that you get a consensus.

You have not only the producer. He doesn't set up his selfish monopolistic standard at his own sweet will. He is in there sitting at the table along with the users of that equipment, along with the distributors, along with the Federal Government, with some state governments incidentally, and along with the people representing the general consumer interest. And unless you have five-sixths, I think it is, of those on any committee in agreement that something should be adopted as a standard, you don't get it. So when you have that consensus, you have the democratic and legal method of standardization, which prevents the kind of malpractice to which you very properly called attention. I say it can't happen then.

QUESTION: In some fields there are no national standards, in some we have no standards at all, and in others we have SAE standards, electrical standards, and so forth. What methodism is used and how aggressively is the American Standards Association pushing toward standardization to meet the needs?

GENERAL ARMSTRONG: The American Standards Association can do very little. There is too much futility and frustration in standardization in this country. I don't know what you can do about it unless you interest American industrial executives sufficiently to make them stimulate standardization where it is so badly needed. The American Standards Association itself is without authority.

The ASA can't even prevent things like this: Some of these standards have taken fifteen to twenty years to be put through; but, gentlemen, I happen to know that in Russia it is different. We have about eighteen engineers--less than that now--in the American Standards Association who are heading up the technical work in these standardization committees of which I spoke. As I say, too frequently it takes us years and years to get our standards. We know from the Russian members of the International Standards Organization that they have two hundred engineers working on standards in Russia, and that their rate of progress is about two standards a day. I think that if American industry could be persuaded as profoundly as I personally am of the need for standardization, you could strengthen the procedure for initiating and expediting standardization in this country.

There is a danger--I can't fail to mention it--the kind of thing that I tried to point out in the answer to your question. You cannot be autocratic in setting up standards. In the first place, if you are, nobody will pay any attention to you. You can't enforce standards by any law or regulation in this country today. But I think if you get the moral force of the American industrialists organized on the side of expediting this end product of interchangeability and simplification, you can accomplish something. It is a tough job. You don't have it today.

QUESTION: In designing quality into an item where would you recommend that we do it? In time of peace would you design for the marginal producers or for the high-production ones, or have you any suggestions on that?

GENERAL ARMSTRONG: I suppose you mean the marginal producers from the standpoint of the technical effectiveness of their product. I would certainly hate to design for the marginal producers. But that is a little difficult to answer. Considering the greatest effectiveness, the greatest social value, and so forth, the answer, of course, is that you want to get the highest type of production that you can in the United States; so your standards should be high. If you set up minimum standards in all your company specifications and institute quality control along with it, I think you will accomplish that objective.

Quality control is being developed rapidly in the United States. Most well-organized companies now have it. They have set up minimum standards, both in the companies and throughout the industries. Certainly the consumer is very quickly going to notice any company that produces below the minimum acceptable standard, and that company is going to face trouble.

QUESTION: Could you give us your view on the desirability or lack of it of a Federal charter for the ASA?

GENERAL ARMSTRONG: There has been some difference of opinion on that. I think most people concerned are in favor of a Federal charter. They have brought out a great many reasons why a Federal charter would be advantageous through enabling the Association to operate on the highest level. It would unquestionably, I think, enhance the prestige of the organization if it were elevated by the acquisition of a Federal charter.

Incidentally, it would help the Association also in its relations with the other national standardization groups, because to all intents and purposes they all have something that is exactly similar to a Federal charter. My feeling about it is that it is entirely desirable to have it. I don't know exactly from what stems the opposition to a Federal charter, but it does exist.

QUESTION: We were told the other day by a government standardization representative that the ASA was not looked upon as the top standards group in this country. What is your opinion on that?

GENERAL ARMSTRONG: May I ask this: Did he suggest any other group that was?

QUESTION: No. He didn't make a satisfactory answer; not one that was satisfactory to us at all.

GENERAL ARMSTRONG: The Department of Commerce after the war accepted the American Standards Association as the over-all agency in the field of standards. The Secretary of Commerce accepted a report from a board headed by Mr. Wilson of General Electric. It had a very distinguished membership. There were Mr. Jewett, Mr. Francis of General Foods, Mr. Zimmerman of the Steel Corporation, and others. That board set up the American Standards Association as the top agency; I mean, they recognized it and said that it should be strengthened and should be organized to do the top standardization job in this country.

I might as well tell you that in the field of standardization we have excellent organizations, like ASTM, ASME, SAE, and other groups, all of which are standardizing within certain specific fields. When you pass one of their standards on to the American Standards Association, and they bring in the much wider representation of everybody concerned with a standard, which is legally necessary and socially desirable, that standard which has been set up through the hard work of the SAE or ASTM in a sense loses its identification and becomes an ASA standard. Now, if you are a manufacturer, you like to see your own label put on the end product. So there is naturally a considerable degree of, well, I wouldn't exactly call it hostility, but let us say the obstacle of human nature, between such organizations as those I have named and the ASA. On the whole they work pretty well together. They recognize the over-all importance of the ASA, but don't welcome too heartily the loss of identification of the standards that they establish.

Of course, those things still come out. There will be "ASME standard" or whatever it is, and then up at the top there is the ASA standard number. So you have both. It shows they have been through both mills.

But I can see that as time goes by, the industrialists who are really responsible for ASA will increase the prestige of that body. It is up to industry to do that, or the first thing you know we will find that the free-enterprise system has no control over standardization; it will become a government function. Believe me, manufacturers will tear their hair if that takes place, although they will have nobody to blame but themselves. I was out with Mr. Howard Coonley for a year and a half trying to sell the American Standards Association to top executives of this country. It was the toughest fight and probably the most unsuccessful fight I ever had.

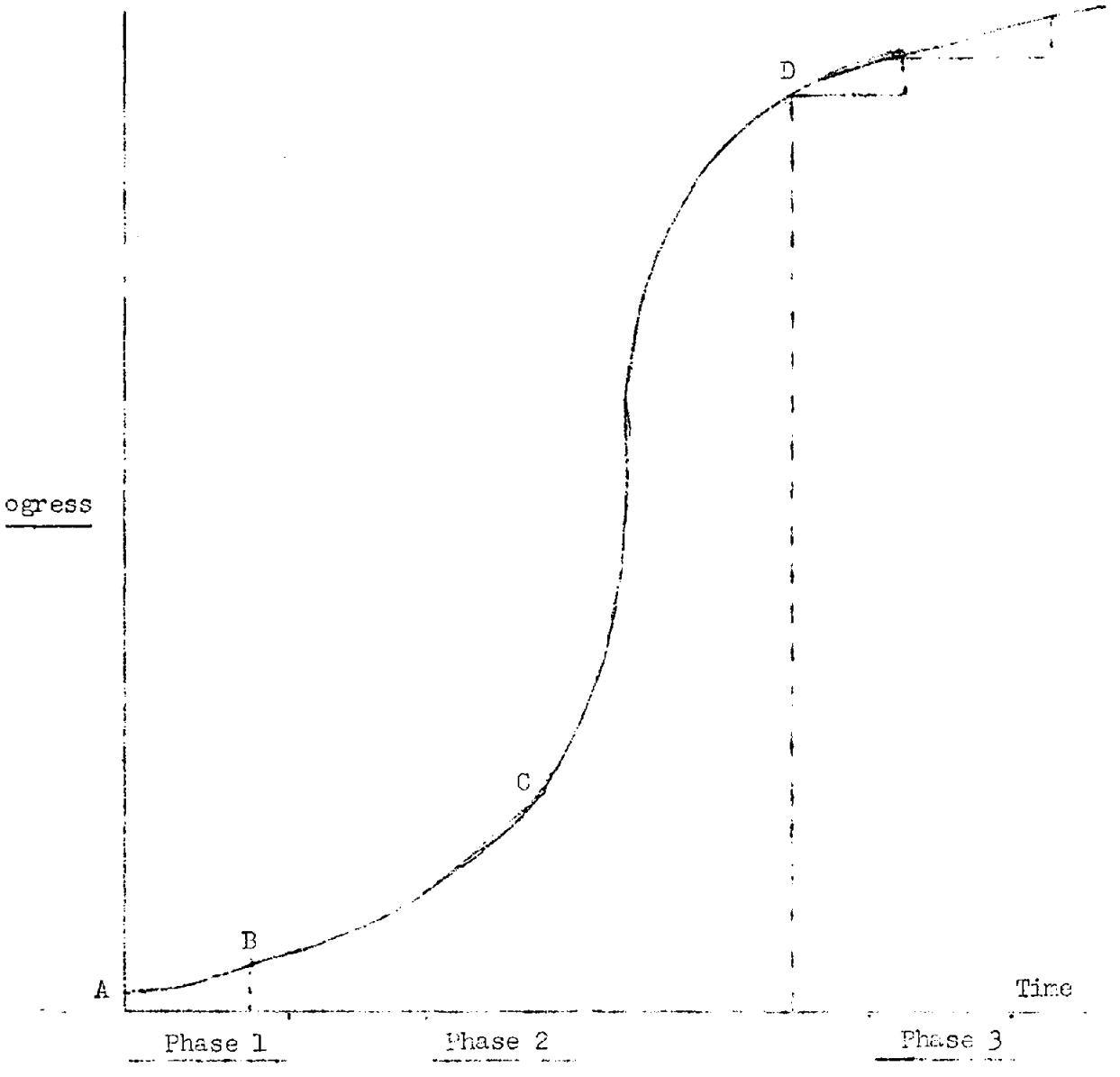
I don't know why American industrialists don't see the need for supporting standardization. Now that I am out of ASA except as a member of the board of directors, I can carry on the fight much more effectively, when I do not feel that I am carrying on the fight for an organization of which I am a member, than I did when I was there. And we have a job to do.

COMMANDER FAIRCHILD: General Armstrong, you seem to have answered all the questions. On behalf of the College I thank you for a very excellent lecture and question period.

(8 April 1949--750)S/kb

DEVELOPMENT OF A MANUFACTURED PRODUCT

PROGRESS-TIME CURVE
(After Dr. John Gaillard, ASA)



Phase 1. This phase begins with conception of a basic idea, the result of an invention or discovery. (Television, radio, de Lavaud pipe, airplane.)

Phase 2. B C -- experimental stage.
C D -- development stage.

Phase 3. At D changes and improvements are few. Here standardization can be applied.