

PRODUCTION OF COMMON ITEMS

2 January 1947

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General Armstrong

Students

THE INDUSTRIAL COLLEGE OF THE ARMED FORCES
Washington, D. C.

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PUBLICATION NUMBER I47-62

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GENERAL

Gentlemen, this morning presents an exceptional opportunity for us. We have with us my distinguished predecessor. While I was down here for about fifteen days before I became Commandant, I was daily the subject of a great deal of fun from the platform. On this day after New Years I have an opportunity to get even. But I am going to return good for evil instead of trying to get even. The only thing is, I am not going to read all these nice things about General Armstrong that I have on this card. I am only going to give you some of his background, for the benefit of those who may not know him as well as we do who continued on here after his departure. It gives me great pleasure, of course, to welcome him back, and I think he feels the same way about being back.

General Armstrong got his group of degrees originally at Columbia. He joined the Coast Artillery in 1910. In the First World War he went to France. In 1922 he became identified with the Ordnance Department. Later he went to duty with the Office of the Assistant Secretary of War. In 1939 he was assigned to the Chicago Ordnance District. Later he became the head of the Ordnance Replacement Training Center at Aberdeen Proving Ground. There his command involved the training of personnel of Army Ordnance units.

In the spring of 1943 General Armstrong was promoted to brigadier general. In the summer of 1946 he received his doctor's degree from Columbia University. He is considered to be an outstanding military historian, and for some time was president of the Military Institute.

Since retiring several months ago, General Armstrong has been deputy to Mr. Howard Coonley, who is chairman of the Executive Committee of the American Standards Association.

This morning General Armstrong has been asked to speak on the subject of the production of common items. I have been warned that he proposes to go far afield. It gives me extreme pleasure to introduce to you my old friend, General Donald Armstrong.

GENERAL ARMSTRONG:

Thank you, General McKinley.

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GENERAL MCKINLEY, students, and ladies and gentlemen: I must admit that my successor has certainly returned good for what he calls evil. The only evil I ever did him was to accentuate his youth. I pointed out, which is entirely unnecessary, I should say, that I was being superseded by a very young man. To prove the point I used to tell about first meeting the then Major McKinley. He was a classmate of my son at the Graduate School of Business Administration at Harvard.

Well, ladies and gentlemen, it is a privilege to come here and tell you something about the work that I am doing and to give you a very broad interpretation of common items, which, of course, is contrary to what we do in standardization, because there we tighten things up. But in talking to you this morning about common items I am going to consider them in a very broad way and talk to you most informally.

General McKinley didn't tell you that I really had a basic education in the classics. I remember that in reading the Epigrams of Martial forty years ago I came across one that stuck in my mind and that applies with great force in my case. He said of a certain Diaulus, "He used to be an undertaker and now he is a doctor. He does exactly the same thing as a doctor that he did as an undertaker." I used to be an officer of the Army and now I am part of the organization of the American Standards Association. There is hardly any difference between what I was doing here at the Industrial College and what I am doing now in my association with industry.

I have a certain function in life which I have been carrying on for years since I first became associated with the problems of industrial mobilization, and that is an effort to break down departmentalism wherever I would find it around the War Department and between the War Department and the Navy, and to integrate to the greatest possible extent the various activities which needed integration.

I know of nothing in which there is greater need of integration than in the field of standardization. You can do in standardization--and I am afraid a great deal of it is being done--what somebody once called mounting a horse and riding off in all directions. Standardization is being carried out in companies, in trade associations, in engineering societies, by Government organizations; and over all is the American Standards Association, which is trying to integrate and to do a job which is very similar to what I was trying to do here in the Industrial College.

Now, I have seen the seminar that was prepared by Colonel Gallagher and I know what Howard Coonley told you in the talk that he

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gave here at the College. Therefore I realize that my being here today is something in the nature of a point, that I think I can best illustrate by telling you about a bishop to whom a parishioner sent a jar of brandied peaches. He wrote a letter thanking the parishioner for the peaches telling him how much he enjoyed them, and he said, "What particularly pleased me was the spirit in which they were sent." So what I value here this morning is the spirit which prompted my good friend General McKinley to ask me to come here as a new member of the American Standards Association and speak to you.

But then to illustrate another point I want to tell you another story about this same bishop, who discovered one fine day that his maid was using his private bathtub. It annoyed him no end, and he debated whether to speak to her or write her a letter. Finally he decided that a letter was the thing. So he told her how disappointed he was in her to find that she had been using his bathtub. "But," he said, "what displeases me more than anything else is that you could do such a thing behind my back."

The thing that grieves me, of course, is that this seminar and Mr. Conley's talk were held behind my back; that I didn't have the opportunity, as I should have so thoroughly enjoyed, of participating in the discussion. But it happened that I was off on a mission in the West and could not be here.

Now, that mission, gentlemen, I am going to explain briefly to you, because to a certain degree I am here on exactly the same mission with you. A moment ago I think I gave you an inkling of what it was. I told you that I am talking to the top managements of American industry, to the directors of the various trade associations that are not yet associated with the American Standards Association, in an effort to make that organization more truly representative of all industry, of Government, and of engineering. The amazing thing is the almost complete and certainly colossal ignorance of American management of standardization as a tool of management for economy and for profit.

Now, "Business Week," which came out with a report on one of my talks given to one trade association, said, "Something new has been added." They pointed out that as an old soldier I am adding to the social and economic advantages of standardization the advantage of greater national security. I am pointing out as earnestly as I know how that modern warfare is a conflict of industrial systems; that to be capable of waging war, and, better still, to be capable of preventing war, American industry must be strong; and that standardization is a tool not only for profits, but for tremendously added national security.

I point out to these groups that in Russia today, compared to the thirty engineers in ASA, their corresponding organization has over two hundred engineers and is turning out about two standards a day.

We must think of this instruction not only from the point of view of a potential aggressor, which I speak of within these walls and don't mention outside, but also from the point of view of a definitely potential competitor in the field of international trade. That is a situation that we must watch carefully in American industry.

But above all, the point that I emphasize to these industrialists, who have just gone through a mobilization and who are quite willing to agree with me, is that standardization offers a tool of increased national security which cannot be neglected. I think many of them are convinced by the argument.

I can show them the curve of standards as they have been adopted through the machinery of the American Standards Association. There is a great peak in that curve in 1918 and another great peak in 1941 to 1945. The point that I make is that in the atomic age we shall fight with what we have, and not with what we shall be able to mobilize. Not that we cannot definitely make plans profitably, but that to try to expedite standardization or to try to make it effective after what is a ridiculous concept of M-Day, which I hope will go out definitely, is too late. Industry listens to that and they seem to be convinced.

But, gentlemen, I have been an old soldier and I know that while my work started in Ordnance, as General McKinley pointed out, in 1923, it has gone on from there. After spending two years in the laboratory at Watertown Arsenal, among my other duties I had something to do with standards and standardization. I realized that it is not only the industrialists of the United States that need to be persuaded of the value of standardization as a tool of management, but it is equally essential that you gentlemen, and all officers of the Armed Forces in the United States, need to be convinced that standardization is a tool of security that we must use intelligently and effectively.

Now, I could catalogue you no end of samples of the failure of standardization. I am going to touch on only a few of them here this morning, because I realize that in hearing Mr. Coonley and in the seminar that followed, a great deal of standardization has been covered, and covered very effectively. But it will certainly do no harm to repeat the points that I think are down to earth and are of extreme importance.

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In the first place, I want to say I am in complete agreement with what I have heard Colonel Neis say on many occasions--that we talked about unification in the Army and the Navy way up top-side; but he believes, and I agree with him, that the kind of unification that can be more effective than anything else, particularly in the work of industrial mobilization, is in the basic fundamentals.

For example, let us take drafting room practices. Now, there is something that is basic and fundamental. We have in the American Standards Association, as a result of a contract with the War Production Board starting in 1943, I think it was, undertaken the job of preparing drawing room standards. Now, that job is not progressing as it should. I think that definitely we might say that we have not really gotten integration between the various branches of the Army and between the Army and the Navy. I say that with some hesitation, because I am not too familiar at present with the standing of that project in the Armed Forces.

But the point that I would make to you is that our procedures in drawing, in symbols, in abbreviations, and everything that comes out of the drafting room must be standardized so that, when it gets into the hands of the industrialist, he won't have to sit down and spend weeks translating that into his practice. That, I think all of you will agree, is a very important fundamental. Undoubtedly Colonel Gallagher and the others have talked to you about drawing room practices, so that you are familiar with them. I ask you gentlemen, when you go out to your posts in the Army and the Navy, that you bear it in mind and remember that it is one of the fundamentals that we cannot afford to neglect.

Then I would talk to you very briefly about nomenclature. You know, a rose by any other name would smell as sweet; but there is a very decided stench, for example, that arises from trying to fight a war with a ball bearing, like one small SKF bearing that has 207 different numbers and designations. I got that figure from Mr. McLeod, who is in Treasury Procurement and about whose organization I shall speak subsequently.

But, gentlemen, that is a problem. I have talked to the automotive people about it, and here is what you are up against: We in ASA believe in the free enterprise system. We argue that we cannot afford to let standardization become a part of the Government's function. We argue that ASA is an adequate way of reaching standards; that it accomplishes this through the adequate procedure of bringing in everybody concerned--the producer, the consumer, the distributor, and the Government--and sitting around the table. They are able to reach a decision in a democratic fashion.

Here is what goes on in the automotive business: Everybody uses that particular SKF bearing; but, for example, International Harvester will put it in an envelope with their name and number. They will put on it, "Genuine International Harvester part". The same thing will be done by General Motors, Chrysler, and all the others. And that same bearing is used in scores of places for military equipment.

How important is it? Well, the Navy will tell you about one ship that came back to port during the war, a distance of five hundred miles, stopping in its important mission, to put in a new bearing, only to find, after the bearing had been installed at one of the bases, that the bearing was in the ship's stores and could have been installed at sea; but it was under a different number.

Now, I am going to give credit to the Navy here today for doing a valiant service for advancing a new scheme of standardization of numbers in anti-friction bearings. Whether that particular system will be adopted or not remains to be seen. But at all events it has come before the ASA's sectional committee at present, and it is being studied.

It is most important, gentlemen, that we know what these bearings are. A great deal of work, incidentally, has already been done to accomplish exactly that sort of thing. I remember hearing that the Signal Corps, by examining their records and finding duplications of items under different numbers, were able to reduce their storage from about 260,000 items to 50,000.

When I was chief of the Tank Automotive Center I had the problem of procuring many hundreds of thousands of spare parts. I am convinced-- and I think there 's no question about it--that those parts, which took man-hours, machine-hours and materials which were hard to get, which filled up the pipe lines and made distribution more difficult, could properly have been reduced to fewer items by far if this thing had been properly thought out.

So I say to you that this business of name and designation is one of the most important things that you gentlemen in authority in the management of our Army and Navy on the industrial side will have to face. So there, again, gentlemen, I ask you to bear in mind that you can be instrumental initially in seeing that something constructive is done on this question of nomenclature.

Now, there are several other things that I want to speak about. I want to speak particularly about commercial designs.

We in the Army have come a long way from the kind of standardization that the Ordnance Department used to force on artillerymen in past years. I know when I was a young artilleryman nobody ever referred to Ordnance except as "the God damned Ordnance Department". The reason, of course, was that the Ordnance Department was arbitrary. They designed something and then they told you to use it and like it. But now it is different. Improvements have taken place in methods and standardization.

I would say likewise to you gentlemen here from the Line who are going to be in tanks and have something to do with infantry weapons and artillery and things of that sort and aircraft, bear in mind what happens when you change designs; and try to resist the temptation to make changes in design unless they are absolutely essential, particularly in the atomic age.

I am speaking now on the third subject that I had in mind, and that is the question of using commercial practice to as great an extent as possible. And let me add hastily that commercial practice does not always by any means suit what the Army and Navy need. I make that point very definitely with industry, because industry always complains about our specifications being unnecessarily severe and our tolerances and finishes being unnecessarily severe also.

Truly, gentlemen, there is too much of that. I can give you a sample of what I mean. In 1939, when I went to Chicago, we had an educational order for the production of shell forgings. Those shell drawings had been made in Washington by people who didn't know too much about the problem of production. They established a limit of eccentricity which was entirely unnecessary, which resulted at the time I went there in getting about 90 per cent rejections of the shell forgings that they were making.

Well, it took me five or six months to convince the people in Washington that they could relax those specifications; that it would be entirely justifiable to use a greater degree of eccentricity than had been called for in the drawing, because the machining operation could very well take care of it. If we hadn't solved that particular problem before Pearl Harbor, it is very difficult to see just where delays in shell production might have led us.

I would like now to give you the other side of the picture and to point out why it is necessary for the Army and the Navy to stick to their guns when they feel it is essential. In 1937, when I was chief of the Maintenance Division in the Chief of Ordnance Office, I began to get complaints from Panama that the directors in the anti-aircraft

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batteries had all gone out. In those days, when we had only a few hundred thousand dollars for maintenance purposes, having something like that land on you was a pretty severe blow. To make a long story short, we found that in the conditions of service in Panama the die castings that were in these little electric motors in the directors had completely disintegrated. So there is another side to this business of whether or not the military can adhere completely to the standards used commercially.

Gentlemen, the No. 3 point is, use them if you possibly can. Insist on using commercial components in every possible instance where they can be used.

I should like to touch on interchangeability, which is more or less along the same lines that I have just been talking about--the interchangeability of parts. I think you understand what I mean. That also is a most important point to remember.

Now, gentlemen, I think it would be helpful to leave some time for any questions or any discussion that you want to have. But I said earlier that I would say something about Mr. McLeod's organization and about the other organizations that we have within the Army and within the civilian branches of the Government which you gentlemen should know about and utilize and cooperate with.

I haven't always been entirely satisfied with the cooperation of the Army and the Navy. I have never heard anything from Mr. McLeod on this score, but I sat in a meeting and was not very much impressed with the degree of cooperation on the part of the Armed Forces.

It seems that the Armed Forces have an instrumentality there in that organization which it is most essential to cooperate with and use wisely. As you know, they take care of the procurement of commercial items and articles that are used by all branches of the Government. I think there is a definite danger in this country that if the Army and Navy don't watch their step, we shall see the Army and Navy procurement taken over completely by a civilian organization. We know that was a thing we barely escaped in the last war.

Now, certainly one way to avoid the danger of that sort of thing is to see that we utilize agencies effectively and utilize them loyally, as I know they would like to be used. And so Mr. McLeod is here today; and possibly, if any of you have questions that concern the Federal Specifications Board and its relationship with the Army and Navy Munitions Board and the other agencies--the Army and Navy Specifications Board and so forth--he can touch on that personally.

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I would like to say in conclusion, gentlemen, that this business of standardization can be dangerously destructive or it can be highly beneficial. Upon how we utilize it is going to depend the outcome of how useful it is going to be to us for our national security. And that has been, even if vaguely brought out and somewhat concealed, the subject of my talk to you here this morning.

I believe that our mission, which is to prevent war and escape from the results of war in this generation, is going to be extremely difficult. Therefore anything we can do to persuade a possible aggressor that this nation is in a position to retaliate--I won't say, to defend itself--is going to be a preventive of war to which we can contribute a great deal. But it is going to take a degree of integration, a degree of team work, between all these varied agencies that are concerned with standardization.

Fortunately, at least fortunately from my point of view, I am now in a position where I can do something about it on the outside; where I can see to it that we can bring together, as I propose to do after talking here this morning, the various people in the Army and the Navy and in the civilian agencies and sit around the table and discuss our problems in standardization.

I know that you can look back over history and you can see how much many civilizations have been hampered by destructive standardization. I believe some of that sort of thing took place in China and very definitely prevented that civilization from advancing. Or it can be, I repeat, extremely beneficial.

I think it is our job, you particularly who are educated in this field, to see that standardization becomes an instrument of constructive service to our national security. I want you, General McKinley, and the people on the Army and Navy Munitions Board and Mr. McLeod and everybody else concerned with this undertaking, to know that I am considering it as a definite part of my duties in ASA in New York to see that it is used as an instrument of national security with its use as an instrument of profit.

I have to emphasize the profit side of it, because that is what industry is in business for. But I can assure you that I discovered in my talks to business men and industrialists that they are fully conscious of the implications of standardization for national security. And, as I get more and more of them to back ASA, to support our activities, and, best of all, to participate wholeheartedly in them, I know that they agree that the security value is great and well worth while.

Thank you very much.

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GENERAL MCKINLEY: General Armstrong very kindly has offered to answer questions. So we will throw this open to you. Are there any questions that you want to ask?

A STUDENT: General Armstrong, you mentioned that if the Army and Navy didn't behave themselves properly, they would find a central procurement agency taking over their procurement along with the procurement for civilian Government agencies. Do you consider it wholly an evil if that should happen?

GENERAL ARMSTRONG: When I was the Commandant of the Industrial College I thought it would be a terrible evil. I still think it would be, because I don't think that the problem of design can be divorced from the problem of production. I would hate to see a civilian agency try to take over the job of designing our guns and tanks. I doubt very much if the separation of the design and inspection in one agency and production under a separate agency would ever work.

Did you have in mind a change that would take over the whole business of procurement from the blueprint to the end products?

A STUDENT: No, sir. I thought that the planning part of this thing should remain with the technical services; but that the actual procurement, buying from the manufacturers, dealing with the manufacturers, determining who would make things, consistent with their facilities, might be for a civilian agency. I think that is about what the English did.

GENERAL ARMSTRONG: Yes. Well, I am not sure that the British system works that way.

My answer to that would be that I think if we get a unified system of procurement, something that is infinitely better unified than we have had, particularly with the Navy--take common items. There you are going to have to get a far better degree of integration than you have ever had in the past. I think the answer would be in that case that if you don't get that integration, then it will be taken away from us.

That is only a guess that I hazard from comments that I hear from industrialists from time to time. Most of them are definitely in favor of the status quo. They felt that their relations with the various branches of the technical services of the Army and with the Navy were entirely satisfactory during the war. I have heard very little adverse comment except from a number of people who have been rather bitter about unnecessary finishes and unnecessary tolerances, which I mentioned, as departing too much from customary practice and being entirely needless.

You remember the instances where someone--I think it was Mr. Nelson--said that he was going through a gun factory in Russia and he saw unfinished guns going out to the front. They were unfinished on the outside. When he expressed some surprise about it, the Russian said, "It is the inside of the gun that we use to kill Germans with." The outside didn't make much difference to them. Imagine our turning out anything that didn't have a beautiful finish. Maybe we will have to the next time, if there is a next time.

GENERAL MCKINLEY: I have an interesting comment to make in connection with what you just said. In these industry advisory committee meetings these people say that they are very happy with their past relationships with the armed forces, that is, their dealings with them. They do show some feeling that their relationship with the civilian agencies--and I don't mean by that the established civilian agencies, but the wartime superagencies that were brought in--was not as pleasant as their dealings with the military. I don't know why, but they have sort of a feeling that they will get a better deal at the hands of the Army or Navy than they got at the hands of their own people who were at that time representing the Government. That is the feeling that comes out in those meetings. I am giving it to you for what it is worth.

A STUDENT: I would like to ask how the ASA and the Justice Department get along on standardization. I understand that every time the heads of companies get together on standardization, the Justice Department sends a man down there to look the situation over.

GENERAL ARMSTRONG: I can say the same thing to you that I said to the Farm Equipment Institute, which is one of the big organizations that is not yet a member of the American Standards Association. I think we will be getting them in pretty soon. I said that the American Standards Association represents the one sure way that organizations like that have of standardizing within legal limits.

They told me in my first contact with them out there that they had been afraid of standardization for the same reason that your question indicates. You gentlemen realize that the first standardization that the world ever saw was in military equipment. Spears and then bows and arrows were standardized before anything else was. Then agricultural equipment was the next thing to reach a degree of standardization.

But they told me they were afraid of standardization. They had standardized things like power take-offs. That represents a tremendous saving. The dimensions of draw bars have been standardized. They said there were many other things they would like to standardize,

but they were afraid to do it. They handle the thing with such care that they let many opportunities for standardization go by.

My answer is that for the present at least we have the blessings of the Department of Justice for our organization and methods. I don't know about 1947, but we have them for 1946. The reason, of course, is this: The Department of Justice is trying to prevent monopoly; and, when you get standardization carried out exclusively for the benefit of a small minority, it certainly is monopoly. So standardization is very properly a concern of the Department of Justice.

But when you bring in the Society of Agricultural Engineers, when you bring in the Department of Agriculture, when you bring in everybody concerned, the Consumer's Farm Bureau and things of that sort, and they all sit around the table and have a voice in whether or not those standards are to be adopted, then that is a democratic process which the Department of Justice says is all right. That is why we hope that the Farm Equipment Institute will see the advantages of becoming members of the ASA and participating in the work that we are doing. In other words, I think we have no reason to fear the legal side of standardization through ASA.

A STUDENT: How are you going to handle the pricing problem? If an item is to be standardized and ten companies are making that item, and one company, a large corporation, can make that a lot cheaper than a smaller outfit, the price has to be standardized also.

GENERAL ARMSTRONG: There is something in that idea. But the point is that the standards have really nothing to do with the appearance of the outside of that thing. The only thing, for instance, that is standard about these draw bars is the distance from one point to the other. That is a standard dimension in number of inches. Whether that is going to be a drop forging or a casting or anything else, wood or steel, is the manufacturer's own decision. He can make any quality of draw bar that he wishes to.

But let me tell you--I think it is interesting now and I think we have a moment--of one of my friends who has a farm, who told me that he was out looking it over one day recently, and he said: "I saw three pieces of equipment which had twelve steel wheels on them. They are used at different seasons; while one set of four wheels, if they were interchangeable, could do the job for those three vehicles."

Those wheels were designed individually. The hubs were different. The bolt holes holding the hub on the axle were different in diameter. The bolt holes were all in different locations. If those things had been standardized, obviously the farmer would have been better off

during the war, instead of needing twelve, he could get along with only four wheels. You can see very readily the importance for maintenance as well as for new equipment of that kind of standardization.

GENERAL MCKINLEY: Thank you, General Armstrong, for coming down here and giving us this very instructive and enlightening talk. We appreciate it very much.

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