

1024

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SOME EXPERIENCES AS CHIEF OF ORDNANCE  
BEFORE AND DURING THE WORLD WAR

by

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1025

SOME EXPERIENCES AS CHIEF OF ORDNANCE  
BEFORE AND DURING THE WORLD WAR

There are few advantages of attaining an age which places one on the retired list by a large margin, but one of them is that when one falls under the kind auspices of a friend like Colonel Jordan and gets such a gratifying and pleasant introduction as Colonel Jordan has been kind enough to give me, there is no longer any necessity for living up to it.

As I look over this pamphlet, gotten out by this institution, "The Industrial Mobilization Plan", I am so impressed with the difficulty of saying anything which will be of any usefulness to those who have given so much thought and so much careful attention to gathering information and digesting it into an output like this that I hesitate to come before you. I hesitate even to tell about some of my own experiences because that terrible demon "time" has been at work on my faculties now for nearly twenty years since the war ended, and has undoubtedly produced some effect on that faculty most vulnerable of all, the memory, which I would most particularly want to make use of on an occasion like this, to tell you of our experiences in the Ordnance Department. However, it is possible that, without attempting to make suggestions for any improvement of the plans which you have already arrived at, I can perhaps say something about some of our experiences which you yourselves can take and maybe find something in them that will be useful as a guide in some direction in connection with your deliberations on this subject and in your research.

I have noticed the stress that is laid upon the subject of raw materials, how you have committees which are supposed to give their attention, for a time at least, almost exclusively to raw materials. That comes very strongly home to me when I remember some of our experiences with raw materials, after securing the plans and the timetables for the production of the different kinds of material which have to be considered in the Industrial Mobilization Plan.

There is one thing (I suppose you have it in mind) that has not fallen under my eye that seems to me to be important enough to be mentioned at least, as one of the principles which should govern the operation of a war, and it is this. It is always the case that in a progressive art, such as the construction of ordnance, which is the one I am most familiar with, (the other branches of the service are equally

important, of course) there is always an evolution, there is always something in the way of an improvement which is probably at the time under way in some part of the matériel with which the department is charged, and it is a temptation to suspend the production of an older model of the same piece of matériel pending the development of the newer one. We fell under that temptation at the outbreak of the war, and somewhat, I think, unfortunately. I will mention one or two instances

One was in field artillery, which is the most troublesome, and which requires the most lengthy attention of any of the supplies that we were concerned with. The Field Artillery was armed, as its smallest and most important weapon, with the three inch rifle, and carriage of the model of 1902. At the time of the outbreak of the European war we were engaged in the development of what we thought was a better model, and we had gotten so far when we entered the war as to have had more than one experimental model made and tried and found to be satisfactory. Therefore, we suspended the manufacture of the gun and carriage of the model of 1902. I may say here to the Ordnance officers, and also to the others, that it was not the gun in this matter of field artillery particularly which was the subject of the most preoccupation, but the gun carriage. The famous French 75 mm gun had no special points - it was a little longer and of slightly greater range than ours but did not embody anything that was strikingly new. The significant element of that piece of artillery was the gun carriage, in the recuperator system. The significant thing concerning the model of 1902 was the gun carriage, and in the new model, which we were developing to take its place, the significant thing was the gun carriage. The model of 1902 carriage was a very good carriage. It had been out in the service so that we got the final and conclusive test as to its quality, which was the opinion of the Artillery service which was using it, and the School of Fire at Fort Sill. It was most satisfactorily received and most satisfactorily practiced with. Indeed, after we got the French 75 mm guns over here it was recommended from the School of Fire that we should make the model of 1902, and not the French 75, the standard. I do not consider that conclusive as to the relative merits of the model of 1902 and the French 75 but it was an indication, at least, that the model of 1902 matériel was serviceable matériel and quite such as to be placed in the hands of the troops. I think we made a mistake in not giving sufficient weight to the merits of the model of 1902 and in suspending the manufacture until we developed a superior carriage. I think that it is worthwhile to mention in connection with the plan of supply at the outbreak of a war, that that kind of error should be carefully avoided. Very few

1026

wars are fought with the very latest model of any recent matériel. In most of them the troops are armed with one which is older, which in the drafting room at least, the designing office, has been rendered more or less obsolete. Things get obsolete in the designer's office before they do in the service.

There is another item - the machine gun. Our service was aimed at the outbreak of the World War with the Benet-Mercier. A good deal of fault was found with the Benet-Mercier. I think that arose from the fact that it was not appreciated in our service that there was no machine gun which was of such simplicity and robustness of construction that it could be placed in the hands of troops and be operated satisfactorily without annoying balks and hindrances and stoppages, as the rifle or the pistol could be. It had not been appreciated that the machine gun is a little engine, operating with enormous pressures, enormous velocities of moving parts, and subject to the need for careful training and practice in the items under which it is always trying to go wrong. It was expected to render good service without the special skill and training which are needed in the case of any high-class piece of engineering mechanism, and the prejudice against it was such that it got to Congress and they refused appropriations until we evolved another model. I believe that was a mistake. We should have gone on with the manufacture of the Benet-Mercier gun because the manufacture of it was under way - one or two concerns at least were going on it - whereas with any other gun they would have had to go through a course of development before they could turn it out in quantity.

These are two instances where we failed to realize that something less than the best that was on the horizon was something which still ought to be employed and could be usefully employed in the war.

In looking over these plans, I noticed a quotation in the early part of this pamphlet from the final report of the War Industries Board. I have a great regard for the War Industries Board. Some of the members of it became my personal friends during the war. They rendered an indispensable service. It would have been impossible to get along without some such organization as theirs, and I think, under the circumstances, certainly a very high-class, patriotic, and intelligent group were put together. This is the quotation that attracted my attention. In the final report, as I say, it is stated: "That much of the confusion experienced in collecting the supplies for this war could have been avoided by a more painstaking, thorough, and comprehensive effort on the part of the Government supply bureaus

to work out a program of requirement, even a program tentative in many of its details, there is little doubt" I think that our friends made a little mistake in what they stated to be the important shortcoming. It was not so much a program of requirements as it was a program of procurement that was lacking. Requirements are pretty much a matter of compilation, and the department which is concerned with the particular branch of matériel can, by putting on it a few experienced officers, in a short time, measured in days, prepare a list of requirements, provided the types of matériel have already been decided upon. The difficulty is with the subject of procurement when it comes to such an enormous requirement as was necessary for the World War. The method of getting the industries of the country going and turning out the material is a matter of much more difficulty than of making a list of the material which is required. The last requires, of course, as I say, that the types have already been fixed. With reference to this last point, a good many of our types were fixed. One which ought to have been fixed in field artillery was the model of 1902 gun and carriage. We made a mistake in not fixing that, because we needed a little more time to settle down on the new model, which was the split trail. In reference to that split trail, I might say that it was a French invention. The French recognized the merit of it but they realized the necessity for something immediately available that was usable and efficient, that that was more necessary than to go ahead with something better at the risk of being short. They did not make any attempt with the split trail in their own service, although they recognized the superiority of it. The only ones built prior to the World War were built by the French for the Italian government.

In this matter of types, we were short of some types, particularly the heavy field artillery. Here I come to the point where I think the War Industries Board failed to appreciate the reason for some of our shortcomings - the lack of personnel. I was most distressed to find officers that I could put into the designing room and have them give their attention to the classes of matériel that we were short of types for. They simply could not be found. We had ninety-seven officers in the Ordnance Department at the outbreak of the war. We had for several years had that number instead of fifty-six, which number preceded just a short time before (and for the increase of which to ninety-seven I had to work about six or seven years, prevailing on Congress to give us the increase) and ninety-seven officers could not at all cover the duties that the Ordnance Department was called on to perform. At the same time, we were really deficient, more deficient than in anything else, in these procurement plans which have been so ably worked out and embodied in this pamphlet.

127

Among the procurement plans is the item of allocation. What does allocation require? It requires that some people shall devote themselves to ascertaining the establishments in the country which can produce all the different kinds of material that are required by the War Department. That is very simply and very shortly stated, but it covers an immense amount of labor, an immense amount of trouble, and a large personnel. You have gone through it and have placed a part of your conclusions in this pamphlet. Consider what that has required in the way of personnel. Look at the number of people that have been engaged in this process, the labor it has taken, and the time it has taken, even with the advantage of the experience we gained from the World War. Now project yourselves back to a time when there was practically almost nobody available for this purpose. The officers of the Ordnance Department were more than occupied. The junior officers, of course, are principally engaged in learning the business. You can not make an Ordnance officer simply by transferring him to the Ordnance Department, any more than you can make a Cavalry officer by giving him a horse to ride - for some time he is not useful to the organization, he is under instruction. The Ordnance Department had very very few men who could give any attention at all to the subject of ascertaining who could do what, and getting in touch with him so that he would understand what would be expected of him and would have some kind of idea how to go about it. We tried something of that kind before the war with reference to some of this matériel. We got out drawings and specifications for some items, such as fuses and smaller sized projectiles, that sort of thing, in which we had the assistance of a civilian engineer, a manufacturer who was one of the very few, almost the only one, as I remember, who before the war interested himself very much in this subject of military procurement. He was particularly interested in this subject and he asked me for drawings and specifications that he could lay before people whom he knew (their business was like his), get them interested in the department, and give them some trial orders for practice, etc., so they at least would know something about what would be expected of them in time of war, and how to do it. However, that is as far as we ever got. I told this gentleman, repeatedly "I have these drawings that you can use, I have these specifications for manufacture that you can use, and I have an officer whom I have detailed to accompany you in going about the country and interviewing the people, that we may get somebody going on what he can do usefully in case we get into the war," which was then going on in Europe. But he never got time. He himself fell in among the Army people and found that there was so much to do and so many directions in which the energies and time of a man like himself were

needed that he never got to this point. I never could get him to make any use of the drawings and specifications. He was particularly concerned with aviation, which was a more troublesome service than even the Ordnance Department.

We have to confess the lack of a procurement plan anything like the one that is laid out here. The reason we did not have one was because we did not have the personnel to get it up. With reference to that, it is a very easy matter to lay the blame for all these shortages, shortages of personnel, shortages of appropriations (particularly troublesome was the matter of artillery, which is the longest in manufacture of any of the matériel the Ordnance Department has to produce) upon Congress. Of course, Congress would have to take the first step, would have to respond to the first entreaties to remedy the condition by granting necessary personnel and necessary appropriations, but, after all, these Congressmen represent the people, and they have to represent them in accordance with the people's ideas. Now there was not a constituency in the United States in which the return of the Representative or the Senator depended in the slightest degree upon his attitude on any military question. The Chairman of the Military Committee of the House of Representatives said to me that not only was there no encouragement in the kind of effort that he really did make to improve the condition of the military service, the state of preparation for war, but on occasions when there were appropriations some newspaper would call attention to it as being an expenditure of a good deal of money, and instead of receiving encouragement from the constituency he actually had to defend his course.

With reference to this troublesome matter of field artillery, the appropriations for field artillery in those days were recommended by the Appropriations Committee of the House of Representatives, not by the Military Committee where the subject properly belonged. The subject was gone into quite thoroughly by a sub-committee, under the Appropriations Committee, on fortifications. During the session preceding the presidential campaign of 1916 (the war having been going on for some time and the National Defense Act not having been passed until 1916), the chairman of that sub-committee went into this subject with more thoroughness than usual and this particular chairman of that committee said that he felt on easy street with reference to his campaign work, he did not have to prepare himself for the campaign speeches which he, as a member of the party, would be called upon to make because they had gone into it so well in the sub-committee that he was well primed with all information necessary to form the groundwork for his speeches. But he could not

get anybody to listen. He could empty the hall any time in a speech in his state upon the subject of any sort of military preparation. They were interested enough in the European war to be willing to listen to information about battles and campaigns and troubles over there, but when it came to anything like military preparation and what it meant, what it required in the way of expenditure, it was no use whatever, and he had to abandon that subject, study up the records, and carry on his campaign speeches on another plan. Now there you are. The people of the country simply were not prepared, and not interested enough to get prepared for carrying on a great war.

Here let me say a word in regard to these friends of mine on the War Industries Board, whom, as I said, I admire greatly. I do not think there is one of them that I do not have admiration for. Nobody's admiration for their achievement can exceed mine. But as I remember, I think I can say with safety, there was not one of those able and patriotic gentlemen who at any period before the war undertook to instruct the public opinion of his neighborhood or the subject of military preparation, not one of them who asked in any pointed or public or semi-public way the views of his Representatives in the House or Senate upon the subject of our own military preparation, so that the Government departments were guilty of shortcomings, I think we can assuage it, gentlemen, by saying that there is a very plain duty on the part of a citizen of a republic, and particularly a man who is in a position to be a leader of public opinion, a man who is listened to with respect, and that plain duty on the part of every one of these critics was more neglected, perhaps more flagrantly neglected, than our duty was neglected, with the kind of excuse we had, which condition they could have improved for us. I intend all that to be good natured, I am far from intending to make a damaging criticism of those able and useful gentlemen.

Another subject which you lay great stress on in this plan, as I said in the beginning, is the subject of raw materials. There were two instances, among others, among very many others, in which the subject of raw materials was a matter of very great concern to us in the Ordnance Department. The first one, and the one which is best known, is the subject of nitrates. We all know that we can not make war without nitrates, and our entire supply of nitrates was dependent upon Chile importation. Well, we thought the chances of our getting into a war in which we would have any effort on the part of the British Navy, which commanded the seas, to interfere with our transportation of nitrates from Chile for our own use, were negligible. We had no apprehension that that transit would be very seriously interfered

with by hostile cruisers in case we should go into the war, but we did not know about the ownership of the nitrate beds, nobody knew - we did not know but what something of that sort might cut us off and make very serious trouble for us, so the preoccupation about nitrates was very acute and it fell to me particularly to make representations upon that subject to the Military Committee in the House of Representatives, the result being an appropriation in the National Defense Act of June, 1916, the only appropriation made in that Act, for a plant for the fixation of atmospheric nitrogen. That resulted in the Mussel Shoals plan. The matter was very involved. There was, in the first place, the question of the selection of a site. There had been an attempt for several years on the part of the Southern Delegations, in the House of Representatives and the Senate, to develop Mussel Shoals, to produce cheap nitrate for Southern agriculture, but the Representatives of the rest of the country regarded that effort as something that was for the benefit of a special section of the country, and it met with no success. However, when to the efforts of the Southern people were added the efforts of the War Department, for military purposes, Southern representatives could no longer sleep nights because of anxiety concerning our risks, and with that additional push the thing went over and we got this appropriation. The Administration was very desirous of avoiding the appearance of special favoritism for the Southern Democratic element in Congress, and so they moved slowly, reluctant in the beginning to adopt a method of fixation of atmospheric nitrogen, which would require the large power of Mussel Shoals. So the question as to the method of fixation was referred to the National Academy of Sciences. The National Academy of Sciences had been created back in the '60's of the last century, to advise the Government on scientific matters, and I do not think any question had been asked of it for about forty years. And when we gave them that question they, of course, went into the subject enthusiastically and became very active. And, by the way, they have been very active ever since, with their auxiliary, the National Research Council, in the building down here across Constitution Avenue. They gave us all kinds of help, but that all took much time. After that there had to be the selection of the site. The administration knew very well what site it wanted - it wanted the site down at Mussel Shoals. However, the political side of the administration in power did not wish to appear to favor that particular section of the country, and the delays were such that we finally got ourselves into the war before we had even gotten started with the construction of the plant. Nevertheless, finally we got the project settled for the nitrate plant down at Mussel Shoals - but too late for hydroelectric development, and we used steam development. The

107

plant was completed and operated satisfactorily, when the war ended - so it was never used, and never needed for the war. There is an instance of the importance of raw material, and the desirability of making preparations for that raw material long in advance

There was another item with regard to a matter of raw material which might have been the subject of a very considerable newspaper explosion. There came into my office one morning a gentleman who was at that time a representative of one of the Philadelphia newspapers, Mr Bullitt, now Ambassador to France. He showed me a dispatch he had just gotten from the other side, which stated that the ammunition furnished to the troops was found to be defective, and ordered to be turned in as improper for use, and he asked me if there would be any objection to publishing the item. That was a very decent action for that young man to take. The item would have made magnificent headlines, of course, of the most flaming variety, and there must have been a temptation to use it. I told him there was no objection to his publishing it, provided he would publish the whole story, and the story was this. This item of raw material was an ingredient which we used in the primers of small arms ammunition. The particular chemical that we had been in the habit of using we got, as we got everything, from the trade, and the trade had been in the habit of getting it from Germany, which was rather startling. Now when the Allies got into a war with Germany, Germany shut off and we had to get another source of supply, we had to get it from somebody else, and this material which we got from somebody else had in it a particular impurity which the German material did not have, but it was sold and bought as being pure. Of course, it is not the practice of manufacturing establishments, and certainly not of the Government arsenals, to take such things on faith, simply on the seller's say so. They are always tested. Now it happened in this case that the usual test, applied as it had always been applied, did not detect this particular impurity. However, the impurity was found out at the Arsenal before it was found anywhere else. The discovery that this ammunition was not of the proper quality and the requirement to have it turned in came from the Ordnance Department. That is the story. The ammunition was all drawn in and replaced, and no harm ever came of it - many people never knew anything about it. Now there is an instance where we see the necessity for, as is stated in this pamphlet, agencies of the War Department that will follow through from the original source of supply all the raw materials that are furnished to the War Department that are essential in time of war. You see, in this particular case, and in all such cases, of course, there should have been somebody who would have known about it. That

person would naturally have been at Frankford Arsenal, would have taken this piece of raw material, would have known about its source, and made a most careful and expert analysis, detecting any impurities it might have had in it. An iron-clad system should have existed to insure that what did take place should not take place. That should have been done in regard to the hundreds of items of material which are turned out as the product of that one arsenal. Now there it is - you can see what personnel that would have required. The arsenal would have had to shut up all the other operations while it gave particular attention to this particular one, or a similar one, if we had attempted that meticulous care in following up the subject of raw materials with our limited personnel. I give this simply as an indication of what would have been necessary if the departments had had the degree of preparation or the degree of arrangement of all these types of procurement and allocation, concerning which we are criticized, in no possible unfriendly spirit, in this fine report of the War Industries Board.

I am afraid I am running on -- trespassing upon your time -- so I will cite only one other case of action where I think there was some lack of realization of what had been done by the Ordnance Department, and an inference that it had been done by one of the civilian agencies which so efficiently and patriotically came to the assistance of the department at the outbreak of the war, and that is in the matter of rifles. I mention it because it is a matter of such universal interest. Although I suppose the details of it are well known to a good many of you, (I see quite a number of gray heads in this audience) some of you may be young enough not to have been through the period in which rifles were very much to the fore in the discussion up to and clear through the late war. I think it is safe to say, the most important weapon with which people go to war is the Infantryman's rifle. If we could wipe out any single weapon that constitutes the fighting material of armies, I think the rifle would undoubtedly be the last one to go. The British had been dissatisfied with their service rifle. They had experimented with a new model, which had gone through the arsenal experiments and through service tests, (a number of them, a thousand or more, had been in the service in the hands of troops and had been tested in all the ways in which the service can test them) and they had decided to substitute it for the old model, and just at that point the war caught them. In the meantime, the manufacture of the old rifle had stopped. There was no time taken to convert the factories to the manufacture of the new model, that would have required something like nine or ten months. They had to go ahead with the old rifle, but they thought that their own factories would not turn out a

sufficient supply so they came over here and made those well known contracts with our people, particularly with the Winchester Arms and the Remington plants. But as the American plants were not equipped with the special appliances, gauges, jigs, etc., to manufacture either the old model or the new model they could get ready to manufacture the new as simply as the old, and as the new one was better they directed the American factories to turn out the new model, with the one exception that, as they did not want two kinds of small arms ammunition in the theater of war, they directed them to make the chamber in this new gun so as to take the old ammunition, and they kept on manufacturing the old ammunition at home. The job of altering the drawings, etc., so as to make the chamber of this rifle suitable for the old ammunition was given each one of these factories independently, and they did it independently, the three of them, and the result of that was that the rifles manufactured by the three establishments were not interchangeable in their parts. Not only that, but the whole thing was done so hastily that the interchangeability of the parts of the rifles, even in the output of a single factory, was very poor, was not what it ought to be. When we got into the war, we had something like five hundred thousand Springfield rifles in the hands of troops and in storage. We had two places of manufacture - Springfield, with a capacity of about a thousand a day, and Rock Island with five hundred a day, and Rock Island had been shut down for a time. It was evident that fifteen hundred rifles a day were not going to meet the requirement of our Army. Of course, we were going to mobilize troops at a much higher rate than that, so it was necessary to supplement the Government output; and, of course, as anybody in my place would know, secure these factories which were just coming to the end of their contracts with the British Government, so their capacity and facilities would be available for us. That was done entirely by the Ordnance Department, by myself, as it happened to be, as it certainly would have been done by anybody else in my place. Now there came a point where there was a difference of opinion, which lasted until the war was well along, concerning the way in which this new manufacture was instituted. As I have said, the interchangeability of parts was entirely unsatisfactory, and I took the time to have that matter corrected, to have a set of gauges and templates for the inspection of manufacture and for the manufacture itself made for all three factories, and such other changes as were required to give the proper degree of interchangeability between the factories. Another thing, I required a change to be made in the boring and chambering of these rifles so we could use our ammunition, which was superior to the British, as the British very well knew and had intended to use if they had not been obliged to go on with their old type. Now these two changes

took about two months' time. That is to say, the output of rifles from these three factories was delayed by about two months, and that was the occasion of tremendous criticism. There was a little of it in military circles but not very much, there was a great deal of it in Congress, a great deal in the press, and a great deal by (well, I will not mention his name) a gentleman who had held high political office and was prominent before the eyes of all the people of the United States sometime before the war.

Here was the situation. As I just said, we had some five hundred thousand rifles that were in storage or in the hands of troops when we went into the war. In April of 1918, one year after we declared war, we had in Europe some three hundred thousand American troops, and of those about one hundred and fifty thousand carried rifles, so in the five hundred thousand which we had on hand when we went into the war we had three times as many rifles as were required for arming the troops in the theater of war a full year later. That was the margin upon which we endured this two months' delay. Long before any demand arose in Europe, or any need arose to arm troops going over, we were sending over to Europe a most abundant and satisfactory supply of rifles from our own two armories and from these three private factories, whose output amounted by December of 1917 to something like ten thousand a day. I think it was a greater figure than that but I do not trust my memory sufficiently to state it definitely.

I have listened to lectures by some of the members of the War Industries Board since the war on the subject of this output of rifles and the utilization of those private factories, and it was assured by these lecturers (I have one in mind in particular) as being something which was an illustration of the efficient cooperation of the War Industries Board with the Government officials in carrying on the war. Of course, the situation was such that there was so much to be done, the members of the War Industries Board were so burdened and overburdened with matters to attend to that they did not know about this particular situation, and it was an assumption on the part of this lecturer that his own Board had brought these private factories into use, which they would have done if there had not already been somebody else to do it.

Gentlemen, when any one arrives at my age and is placed in a position where he can talk about things of some time before, when he was active, you are in great danger of being a victim of reminiscences. I, of course, feel a temptation to go on and utilize a great deal more time than your other

101

duties would permit in listening to me, so thanking you for your attention, the courtesy of your Director in asking me down here, and with apologies for the fact that my absence from the United States during seventy-five or eighty per cent of the time that you have been at work has disqualified me from giving you any product of thought along the line in which you are so efficient, I release you from further attendance on these stories of olden times.

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Colonel Jordan. I want to start this question period out by telling you gentlemen something that occurred yesterday. General Crozier came into my office and said "Have you a book of War Plans, It is about so long" - he described it - "and was published by the War Department just before the war. I do not know what I have done with my copy and I would like very much to see a copy of this War Plans book." There is a story back of this and I would like the General, if he will, to please tell the class something about the fact that the War Department did have some war plans before the war started.

General Crozier. It was gotten out in the year 1913, and was compiled principally by Colonel Thompson, my principal assistant at the Ordnance office. It related to a kind of mobilization which was the only one that we had been imaginative enough to foresee, and which was used generally in our explanations to congressional committees as to what we were getting ready for, and as to the appropriations that we were asking for and not getting, at least to any great degree. The particular thing then in mind was something like a repetition, on a larger scale, of what took place in the war of 1812, when a British force, as you all know, came through the channel to Chesapeake Bay between Cape Charles and Cape Henry. We thought we might be vulnerable in that location through a coalition such as was threatened during the Spanish war, but averted because Britain would not take part in it. Some other countries might do so, however, at some other time, and that was the contingency we appeared most vulnerable to. Then, of course, we might have had difficulty with Great Britain (we have to think of everybody in regard to such exercises for the General Staff) coming down over the Canadian border. So it was with reference to mobilization for something of that kind that these plans were gotten up. The planning was largely in the way of preparation.

of letters and orders and telegrams and lists of supplies and places of mobilization and locations from which material was to be issued after having been collected there during the period of preparation. This was thought of and embodied in book form back in 1913.

Colonel Jordan: I might say that General Tschappat told me this morning that he had read this book more than once lately and consulted it, so it is not out of date yet, gentlemen.

General Tschappat: In connection with that book, I want to say that I was detailed to go with the expedition that went to Cuba in 1906 as Ordnance Officer. That was before this book was gotten out, but the plans had been made for the supply of ordnance equipment to divisions, and when there came the question of what to take down with this expedition that went to Cuba (about five thousand men, I think) there wasn't any trouble at all about finding what should be taken. We had to list the whole thing, took that, and went with the expedition two weeks later.

Colonel Jordan: General Crozier, on behalf of the College, each one of us individually, I want to express to you our appreciation for your coming down here. We just can not thank you half enough, sir. This is one of the redletter days of the College.