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INDUSTRIAL PREPARATION FOR WAR

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It is always a pleasure for me to come here. There is no place in the world except my home where I receive so heart stirring a welcome, and it is the one place in the world where I am always tempted to forget what Henry V said to his soldiers: "In peace there is nothing so becomes a man as modest stillness and humility." When I get down here and face you men who are studying the problem that I have enjoyed so much myself, I feel as if conversation ought to be limitless - there are so many things that I should like to say and I am sure there are many questions in which we would have a mutual interest.

I thought this morning that I would try to divide our subject into two phases, and I am now going to speak to you as a temporary member of the faculty. The first phase relates to what we encountered in 1917; what we did about it and why we did it, of course covering that very briefly.

We will not go into the subject of our own lack of preparedness prior to the World War. That was a political situation about which we all know. The whole country was responsible. We can just acknowledge that in an industrial sense we were totally unprepared. That does not involve the officers who were here or elsewhere on duty. It was just a situation that they could not help; perhaps that the country itself could not help.

After war was declared, and we were entering the greatest of world conflicts, our preparation economically and industrially was represented by five departments of the War Department: Ordnance, Quartermaster, Signal Corps, Medical Corps, Corps of Engineers; and five bureaus of the Navy (if I remember them correctly): Construction and Repair, Ordnance, Bureau of Supplies and Accounts, Yards and Docks, Steam Engineering; and then there was an eleventh element: Panama Canal. Those eleven military branches of the country each had legal authority to buy on its own account. We were entering a situation where demand was greater than supply. We had three allies in our markets already straining the then developed war industries of the country: England, Russia, and France, and some of those countries representing subsidiary countries whom they were financing, and all of those agencies about to compete with civilian industry which was then caring for 110,000,000

people. We were entering that competitive field in that loose way with Uncle Sam footing the bill for everybody, not alone financing his own military departments but footing the bill for the allies. You can see the very first problem that presented itself.

I might say, in parenthesis, that I was called by the Ordnance Department to take my commission, and it happened that on the same day I was asked by the Secretary of War to come down and talk with him and the President about this problem of coordination. I had made a little study of General Staff work in Europe on my own account prior to the war, just as a hobby, and when I came down I of course had to set aside the idea of a commission and take up the work of coordination. What faced us was this situation: We could follow the program that England followed, and a quite similar program in France, of setting up a great civilian ministry of munitions. In that case our own departments would have become subsidiary. The officers who had spent their lives in those departments would either have been eventually transferred to troops or they would have been submerged among a great mass of civilians, and when the war was over we would have been just as helpless, and as I saw it, more helpless than we were before the war began, because we would have destroyed the morale of those great departments. We would have taken the heart and ambition out of the technical officers for the future; we would have robbed them of the opportunity to get the experience which the war would produce for them. From the very first hour, as far as my mind was concerned, that idea was rejected although there was strong pressure for it. My thought was that if we could sustain these departments just as they stood, and if we could build into them civilian elements that fitted the several problems of the departments, then the departments would get everything that otherwise the ministry of munitions would acquire and when we got through with it we would be just as much stronger as we are today because the departments themselves, the Army and the Navy, would have learned their lesson and would be in a position through their own official family to apply those lessons after the war, just as you are applying them in sustaining and attending this Army Industrial College.

Time! That is the one element which in a war is the only one you need worry about. Men - there always seem to be men. Money - we can get along without it if we have to because we can take the stuff. Time is the important element, and that was the next problem. How would we

stop this chaos that was developing? How would we do it so that we did not expose to peace-time operations of the law officers who were going to be compelled to step outside of what the peace-time laws permitted them to do? Our country (England a little less than our country) is peculiar among the great nations of the world in that we have a vast body of peace-time statutes limiting one in this respect, preventing one from doing that and saying this; only under such and such circumstances may you perform this over here, etc., and those statutes are not automatically repealed when we declare war. In 1917 we could not hire an additional draftsman, for instance, in the Ordnance Department; we could not go out and rent an office; we could get clerks only through the Civil Service Commission; if anyone signed a contract for more than ten thousand dollars for which an appropriation had not been made there was the penal statute to take care of that officer. And by the way, war was declared on April 6 and the appropriation bill was not passed until June, 1917. Suppose we had all respected that statute and nothing had happened in preparation from April 6, 1917 until the appropriation bill was passed in June? The war would have been lost. That much delay would have resulted, in 1918, in losing the war. Therefore, we had to find means of moving forward with all the power that the Government could exert and at the same time not so flaunt or disregard these limiting things as to draw fire which would create a reaction on Capitol Hill or in the press or among our people, because war is, as you know, (I think Napoleon said it) sustained no less by the moral than by the physical resources of a country or a people. So you must not in your activities do those things which create so much reaction that you are practically brought to a standstill by that.

This is the explanation of the General Munitions Board: We decided that we would use all the legal powers of the chiefs of departments of the Army and the chiefs of bureaus in the Navy, plus all the legal powers of the two secretaries, by having each of those offices represented in a board by an officer who received from his chief an order authorizing him to become a member of this board and there to perform his functions, etc., etc. The purposes of the board were then set forth and were passed down through the Council of National Defense, the act constituting which, plus the appropriation act of August, 1916, had contained certain broad clauses that when you put the most liberal interpretation on them gave a little entrenchment of legal security, and so that board was able to begin functioning. Perhaps you men who are studying it know better than I,

but I think we held our preliminary meeting on March 31 just prior to the declaration of war, and from that time on we met every morning at 8:00 o'clock - some part of the board was in session all the time.

To give further strength to it - I am telling you this so you will not get the impression that it was all out of the blue - this method was carefully thought out beforehand. Newton Baker, who was one of the men who thought this out, is one of the greatest constitutional lawyers of our time. I had made some study of the exercise of the war powers of the President by Lincoln during the Civil War. That is an immense reservoir of power as of course you know, and so through letters from the President to the Chairman of the General Munitions Board who happened to be, as you know, myself, certain of his powers were delegated. Now whether that is legally possible or not I do not know; we did not ask; the Attorney General was not called upon to express an opinion. We only knew that the President was Commander-in-Chief as long as the war lasted, and when he directed any of us to do a thing we did not question whether he had power to do it.

When we came to the aftermath, when the Congressional inquiry was held (which will always be held after each war), we found that there was very little criticism of the legal status which we had given, first to the General Munitions Board and then later to the War Industries Board. Congress directed its fire at our acts, for instance, cantonments; they directed their fire at the rifle contracts - a few specific things - but there was no general criticism of our set-up. I am emphasizing that because that was obvious improvisation. You will have the same phenomenon in the next war. It makes no difference how carefully we set up all the things we are setting up (I hope we will continue to set them up); or do all the thinking that we can do as to what specifically we would do today if war were declared today; when we come to the actual moment a war is declared, and we are acting as men under the stimulus of war and our country is reacting in that way, we will find all the peace-time plans are meager compared with both the need and the opportunity; that what we have on paper will seem feeble. We will instantly begin to improvise greater and greater structures to utilize the power that this country will develop after the declaration.

Every country except those which prepare for aggressive war experiences that. England and ourselves have

always relied upon it. Germany tried the other method. Germany endeavored before the World War to have everything, ramifying out to its civilian life and into its schools, prepared for the day. I think she did a marvelous piece of work in that preparation, and yet when war came it looked as if the German General Staff had been observing the war through the wrong end of the telescope. Even with her great knowledge of war, her willingness to prepare, her desire to prepare, her need for overwhelming force if she were going to be secure after the war began, her preparations were pitifully small compared with the need and with the opportunity and with what her country could have sustained in the first two years of the war. I would like to emphasize to you men, not more than any thought that I have to emphasize this morning but as much as anything, that whatever you are thinking today, when you have thought the thing as far as you can and as large as you dare, then say to yourselves, "I know it is not large enough," because that is what it would prove to be if you were to find yourselves facing war.

We had, through the General Munitions Board, almost immediately to get control of two elements: priorities and prices. Where demand exceeds supply and there is no control, of course you know the effect - prices mount, mount, mount, and those mounting prices, with Uncle Sam footing the bill for everybody including the allies, meant that we were going to lose the war right there because we would have reached the point where we could not have financed the war. It was not because we cared very much about what profits people made; that is amusingly over-emphasized. We can always take it away. We were taking it away from them then with the excess profits tax. That was not what was concerning us. But how could we raise from our people an amount to pay the bills we were piling up if we did not draw a double line at the top somewhere, instead of at the bottom, and say that prices could not go further?

There is no way legally, so far as I know, there is no ability in law, to control price. It has been tried unsuccessfully all over the world in every age. Therefore, although President Wilson told me he was perfectly willing to have Congress pass any statutes that I thought would help the situation, I did not see how they would help the situation, I did not see how they would help the situation any more than our constitutional amendment to declare ourselves dry made us dry; I told

him in response that I thought the one way to do it was through the cooperation of industry, beginning with the industry that was easiest to handle and then, having that industry under control, proceed to the next easiest one, etc.; until like a house of cards we applied it to the whole country. The President was a little skeptical about that method but was willing to permit it to be tried. I selected the steel industry first. I had already made a similar arrangement that had been voluntarily proffered by one of the great lumber organizations, I think it is called the Southern Lumber Association. They had voluntarily offered to let prices in their industry be controlled, and they were out of the road. I picked the steel industry because forty-five percent of the steel industry at that time was in the hands of one corporation, the United States Steel Corporation, and that corporation was in the hands absolutely of one man - Judge Gary. Judge Gary's voice carried through the whole industry. I had confidence that Judge Gary would respond as a patriot, and I felt certain that if Judge Gary could be brought in the whole industry would follow him; and as the steel industry is not only the largest industry next to agriculture and transportation in peace-time, but in war the most important next to agriculture and transportation, I thought, if we could pull that industry down there would not be any question about the rest. It worked.

The President did ask how we would police it and I told him the industries would police themselves; that we could be perfectly sure that if eighty percent of an industry was accepting a stated price range, and they discovered some devil in the industry who to make a little more money was getting a higher price, we would learn about it - the eighty percent would all be down here telling us about it. If they did that, how were we going to control the man up in the sinful twenty percent? By priority. Under the exercise of the war powers of the President, which had been delegated to the General Munitions Board, we could cut off coal, coke, limestone, ore - just direct it elsewhere. Nobody dared, after they had once agreed to maintain prices, to violate, and nobody did violate, so far as I know.

Priority as between the two military branches, as between the several bureaus and departments, as between the allies and ourselves, had to be established; and then eventually, as you know, priority as between civil industry, but we did not get into that until we were forced into it

months later. Our method - exactly a military method - was first of all using the resources that we had, defending ourselves against those things that were right up against us and needed to be defended against, and not attacking our far off major problems until we had more strength and until they had arrived in such a relationship to us that we needed to attack. It was just that system.

Perhaps, for that period that is enough. I take it the class has studied that time. The members of the class probably have in their minds this morning better than I have the details of that period. I am now just trying to fill in the background of why we did the things we did. I might add that although the attitude of the country at large in the beginning was that of course all civilians here were having a tough time with the military people, that was not the case in the least degree. The military people here cooperated from the outset better than any group of civilians with whom I have ever worked; and their cooperation was effective because they had what, to shortphrase it, I will call the "know how". In our Navy yards and arsenals we had developed a standard of quality that was worth striving for, and we could not claim to have done very much else because of course our manufacture during time of peace in our Government works is so limited that we get laboratory methods in almost everything except small arms ammunition. Laboratory methods have to be discarded when you start quantity production, but you are able to attain a standard of quality that perhaps could not be attained except through years of laboratory work.

I would like to emphasize upon the class consideration of the war powers of the President, because there has been a good deal of discussion within the last few years of a bill to define the war powers of the President. It would be a little like trying to define what a sea captain shall do under certain circumstances - that under wind with such a velocity he must put his helm thus and so; with the sea running in such a direction and such a height he must trim his ship thus and so. We do not know the conditions under which the sea captain is going to have to try to keep his ship afloat and so we do not tell him that kind of thing. We do not know, and we cannot by any human method apprehend, what the questions may be that the President of this country will have to meet when there is a war, so how can we define for him what he shall do? It is because his powers are both unlimited and undefined that they constitute the protection to our country that they do, and you cannot define anything without limiting it, so far as I

know the meaning of the word. Do we propose to limit the war powers of our President? Do we want a man in the President's chair during war who has got to risk the life of his country because in peace time we decided that when there was a war he might not move more than a foot and a half to the right or one foot two inches to the left? From my point of view it is such a silly point that I have not even the patience to discuss it.

Lincoln exercised his war powers in a way that in that period did save our country. He saved the Union. He called for seventy-five thousand men - he had an army in the field two months before Congress came into session. He had no authority for it. He suspended the writ of habeas corpus because it was a civil war. That is a terrible thing for the ruler of an Anglo Saxon nation to do, but he did it. You would never grant the President the right to do it if you were trying to define his powers. You certainly would grant no President the right to call an army into the field without authority of law in some form, and yet probably the Union would have been destroyed had it not been for those two acts by the then President under his war powers.

By the way, after the war, as you know, the Supreme Court decided that the President had gone beyond the limit of his powers when he suspended the writ of habeas corpus, and I have no doubt that if the President had been living at that time he would have agreed with them. I told Mr. Farrell, the President of the Steel Corporation, that. When we were discussing this business of prices he said his counsel over in New York had assured him that we had no legal right in that matter, and I assured him that I agreed with his counsel. He said they could carry the matter into court if we insisted upon it, and I agreed with that, and that probably two years after the war the court would tell him that we were all wrong and they were all right - in the meantime we would have the steel and the war would be over. I should add that Mr. Farrell cooperated with us most helpfully.

In speaking of the value of improvisation, I encountered something in Liddell Hart's last book that related to an almost up to the minute situation. England, as you will remember, made a threat toward Italy and then discovered that the threat was not well timed and started in for a program of arming herself. Here is Liddell Hart's reference to that: "The emergency revealed not only the shortage of men and materials but a failure to make adequate arrangements before-

hand. Hasty improvisation had to make good the absence of plans." That was almost day before yesterday in England, after the lesson of the war. However, at another point in his book Liddell Hart acknowledges that improvisation is valuable because it holds the situation more or less fluid, and that to be too committed to a plan in advance may lose for us an opportunity that is entirely available if we do not have to mobilize too quickly on a previously prepared plan. He outlines almost the situation that we had here, and this, you see, is just this last summer in England. "A detailed survey has been made of the industrial field to examine and clarify the material and technical resources of the country. Hundreds of engineering firms have been inspected to see whether their plants are adaptable to munition production in war time. Production for present needs, however, has been delayed by lack of the necessary machine tools and gauges." And that will be a limit that we will find always on our preparation here. Lack of gauges and jigs and fixtures will cramp our program when we start; yet you must have them if you are going to go anywhere, so you might as well make up your mind to be patient on that point.

After this coordinating work was started and we really began to roll the business through in volume; if you read the minutes of the General Munitions Board and realize that there were in some of the departments not more than a dozen men, I think you will be astonished at the volume that was transacted within the first few weeks of the war. We really began to get things under way in a very superior sense. We acquired the rifle plant that the British had on this side of the water, which England was going to dismantle and move to England or to India - they thought to India. By May we had a million two hundred thousand rifles under way, whereas we had made in the ten years preceding the war only six hundred seventy thousand of our Springfield model. We had located at least seventeen firms capable of making guns from three inches up, that is, making the forgings, and by the time we could get the forgings made we had a reasonable time to prepare the machine facilities for those guns. We made fifty-five guns of all calibers in the year preceding the war; in the sixteen months after our declaration of war we produced about fifty-five hundred, if I remember correctly, and we did that without interfering with the production for the allies. The allies machined the gun forgings we supplied and turned over to our expeditionary force the first equipment of guns, and our five thousand guns on this side would

have been a reserve if the war had gone on, or would have armed us if we had fallen into a quarrel at the peace table.

The appearance of things at that time would have impressed anybody with the thought that nothing was being worked out clearly, that everybody was running around in circles, that time was being lost. The newspapers rather took that attitude, and Congress, even before it passed the appropriation act, began to take the same attitude. In the commencement address that I made here three years ago, I think it was, I used this expression: "That three or four months' period immediately following our entrance into the war in 1917, to one near the center of power in the War and Navy Departments, created somewhat the effect ascribed by observers to a peek into the crater of an active volcano - the general impression was chaos."

I am going to quote this paragraph: "All work had to be done at a furious rate amid countless interruptions, ceaseless alarms, and the wildest public confusion. Every one wanted to fight, even the men in the departments all wanted to go to the front; few were willing to recognize that war calls first of all for ordered preparation. The public seemed to think that arms and ammunition and all the equipment of an army could be provided instantly and by magic and all that was needed was the word to go forward and overwhelm the enemy." That is a quotation from a volume describing the condition in Richmond in 1861. You thought I was describing Washington in 1917. It does describe Washington in 1917 - I could not have done it so well.

War psychology is never present at the beginning. After the declaration of war there is a flare in the newspapers, a lot of big headlines, and then everybody goes back to "business as usual" as the English say. That is a matter of slow growth. The files that you have here must contain many letters from leaders in this country to whom I wrote asking them to come down here and help us. They could not come. This one had married a wife, just as the man in the scriptures; that one had bought a yoke of oxen; and some other man had made a plan to do something else. In any case they could not come. The draft act was passed in May and it began to sink into people that Tom, Dick, and Harry were going, sons, nephews, brothers, brothers-in-law, and those gentlemen behind the kind of desks that I used myself out west, feeling undoubtedly the way I would have felt if I had not been

interested in the subject, immediately began to realize that they were involved in the war; and so by fall of 1917 we could get almost anyone in the United States that we were willing to have down here, and of course by the end of the war you know what a nuisance everybody became - well, you do know.

In judging what we did at the outset, remember in your appraisal that we did not have the talent available in the beginning that was available, for instance, when Mr. Baruch formed his War Industries Board in March, 1918, at which time everybody in the United States was ready to come. The Army and Navy did not have that help in the beginning. Our War Industries Board of July was well-manned: Judge Lovett, Brookings, Baruch, and the other men that were fine, strong men; but they had been carefully picked and urged by the President himself to come down. By March, 1918, as I said before, we needed only to indicate to a man that we wanted him and he blew it all over town, "Somebody in Washington had called him to come down and help win the war", and he came down. The newspapers talked about him and they flew the flag at home, etc. Therefore, if you do see a war do not be too disappointed at the reaction at the beginning.

I am now going to say what is, up to this morning, my final conclusion on some of the things that I have thought about and read about the war. Any prolonged war, from this time forward, which involves nations highly developed industrially, (I want to emphasize that on you - "nations highly developed industrially") will be decided by what may briefly be designated as machine power. The elements of that machine power you and I do not know exactly, but let us say in order to get it before our minds - aircraft, chemicals, motorization; and then you can add countless things such as means of communication, acoustics and control by electrical waves, etc.; things that in war we will certainly develop. I tell you, as a manufacturer, that there would be things that could almost be known to us week after next if we went at them with a war spirit, and they would certainly change the face of war, but we will not do it industrially; we are not stirred up to it; we do not know whether it will pay; so we just drift along in peace time, let things take their natural course, but that current does take on force the moment war is declared! Just remember that in all your thinking and planning. Our own offensive and our defense must comprehend methods of attack based on these elements; that is, aircraft, chemicals, motorization, and a lot of other things I have not stopped

to enumerate; and I do not mean tactical attack, I mean the whole attack problem. Therefore, the industrial side of war has become at least equivalent to the so-called military side; indeed is superior to it, inasmuch as were the industrial side omitted or neglected there could be no military side.

I go back now to remind you that I am talking of nations that are highly developed industrially. If we do not adequately prepare our industrial side there will be no military side. We can get a lot of men killed, but of course that would not be war, that would just be murder. Keep in mind, I am visualizing war between nations developed industrially. That is the only kind of war we need to visualize in our problems of national defense. We certainly are not going to attack any weaker or smaller nation. If we become embroiled it will be with an enemy or enemies approximating ourselves in potential strength. Our problem is different from the British problem because as an empire they are carrying on war almost all the time.

The improvement in mobility, made possible by motorization, and the development of all forms of fire power, have so increased the power of defense that any one of the larger nations can now probably defend itself indefinitely -- certainly long enough to wear down an adversary, if only it makes its resources available in time. You can see what even China has been able to do against such a powerful and well prepared nation as Japan. This, then, I take to be our major problem: how can we, for military purposes, make quickly available the unrivalled industrial resources of our country? With half of the world's steel supply, half of the world's machine tools (and ours so much better integrated than any anywhere else in the world), with the exception of very, very few things: a few hardening metals, a few drugs, rubber, etc., but of even those things we usually have a supply that would start us off -- no nation could make the preparation that we could make if we apply our brains to it, as you gentlemen are doing.

The World War was really a gigantic industrial struggle. So far as men, mere men, attempted to attain victory by courage and sacrifice alone they failed utterly. We know they did. I cite only the fate of the Russian armies. Poorly armed -- I am sure they did not lack for courage, devotion, or soldierliness. In the end they failed, strong as they were; and it was not the revolution that made them fail, it was lack of equipment. I could go into detail on

that because I was in Russia twice and know about it, but it is needless to labor the point. War is the most ruthless of all man's activities and machines are more ruthless than men. Therefore, we face the problem of matching machine against machine, not men against men, and certainly not men against machines. Any military man high or low who fails to take account of this is sowing seeds of disaster.

I am amazed at the tardy acceptance by military minds throughout the world of lessons taught by the wars occurring since the development of long range weapons, and I begin by calling the rifle of the Civil War a long range weapon. When you had developed a weapon that would carry so far and was so simple to operate that men charging in had to face more than one fire, which was all they ever had to face when there were smooth bore muskets; when you got to the place where an easy range was eight hundred yards and an easy volume of fire was three shots per minute, why immediately it was only a question of arithmetic to know it would be an accident if you could take a point by charging. Is not that true? We can see it is a question of arithmetic. Just put in the defense a certain number of hundreds of men, allow for a certain number of misses, allow for a certain number of hits, allow the time necessary for a charging column to cover the space, and see if you can get enough men up to that line to take it. Just read the account of Fredericksburg - that will do on the Union side, although it was repeated again and again around Petersburg. Go to the other side and read Pickett's Charge at Gettysburg; move to the Franco-Prussian war and see what the Germans did and what the French did to them; go then to the World War and read of those battles where the same military minds controlled the same type of fighting, ignoring what had happened in the machine world in the meantime; move on to the Russo-Japanese war, and you will remember in the Russo-Japanese war that the Japs landed and rendered mobile eleven inch naval guns and the only nation in the world to take notice of it was Germany - you know what her eleven inch guns did to Liège when she got there in 1914. The rest of the world ignored it - Germany learned the lesson and used it, and she might have used it to secure world dominance.

If you will read the history of the actions of those wars, pondering not whether they should have moved to the left or to the right or anything of that kind, but just the mere question of what chance was there in pitting men against machines under those conditions, I think you will be stimulated still further in your devotion to the idea

that it is machines we want. Of course we will have to have men and we will have plenty of them, but we do not want to pit men against machines. I will cite only two men in high places who could not learn these lessons, and these two examples are based on what I believe we may accept as indisputable evidence. I am surprised that the whole military mind of the world has been so slow to learn those lessons. The first involves Kitchener. Earl Balfour told me in May, 1917, when he was here as the head of the British Mission, that he had been unable to persuade Field Marshal Kitchener that they needed high explosives and more large caliber artillery. Kitchener had witnessed his own success at Atbara, where he had been fighting the Dervishes; he had seen the Dervishes swept away by shrapnel, and he continued to carry that picture, so he was all for field guns and direct fire and shrapnel. Earl Balfour got so excited about it; he said to me that Kitchener was taking that attitude while his wretched fellows (I can remember yet how Earl Balfour kept smiting himself on the breast) were holding their trenches with their bare breasts. Now Earl Balfour was not an excitable man, he was one of the coolest humans I have ever seen, but he was excited over that stupidity.

The second example that I want to cite is Earl Haig. Mr. Churchill told me himself, Mr. Lloyd George has it in his book, that when they tried to deliver to the army more machine guns per regiment Earl Haig declined to take them, and at last only grudgingly accepted a part of what the Civilian Munitions Ministry was trying to force upon him. He preferred men to machines.

You can see that this is not just my opinion. I am citing two things on which we have indisputable evidence. Personally I think it is terrible. Now why, and I am very earnest about this, any soldier or sailor would prefer to have flesh and blood try to do what machines could do better with no loss of life, or little loss of life, I leave to be explained by somebody who has more patience than I have. As I said before, I cannot comprehend it. Just a matter of metal, machine hours, money, and a little time, and nine out of ten of the boys who were lost in many of the World War actions would have been saved. It was not that their countries, in every case except Russia, could not have supplied it; it was because their military people were not ready to use it. It would be exactly the same as if in the steel industry, instead of using what we call the "Wellman System" in charging blast furnaces, we preferred to charge them by man power the way we used to do thirty or more years ago.

It is primer business in industry, just plain A B C, that we always substitute machinery for man power when, thereby, we lessen risk and strain or increase efficiency. If we did not do that we just would not manage the industry; the directors would discover it and we would be out. If we accept that simple formula militarily, then we immediately give adequate recognition to the importance of industrial preparedness and mobilization. If I go on this way you will begin to suspect that I am a partisan of this College.

Prior to the World War our industrial preparation was almost entirely confined to the work of the Ordnance Department of the Army and the Bureau of Ordnance of the Navy. That the officers in these departments produced impressive results with the inadequate means at their disposal I am sure we will all agree; but that this work was pitifully meager compared with the needs after we were at war I think we should also all agree.

Now, through this College; through the work of The Assistant Secretary of War; through the Ordnance Department districts and Quartermaster allocations, we are endeavoring to apply some of the bitter lessons we learned in the early months of 1917. These plans and methods and forms of organization doubtless will help us in any future emergency. I support them and have cooperated with them. Speaking to students, however, I must in honesty say that, of course, what we are doing is not planning the next war, but re-planning the last war. Just question that if you want to; then face it and see what you are doing. I told them that down at the War College some years ago. I thought I discovered it in them; I certainly discovered in myself that I was approaching the problem from where I left it in 1917, and not trying to approach it from where I would find it if we have another war.

If we were out in the field we know what we would be doing, we would be trying to discover what our enemy is doing, where he is, how many people he has, how they are disposed, what is the approach to them, how we are going to sustain ourselves. Well, that is the way we have got to deal with this problem; but we are not dealing with it that way unless we keep shaking ourselves, trying to get our minds forward to where we are dealing with something we do not just know clearly.

I am not at all sure that we may not live to witness a war where we will pour down gas around a given area and radio the commander, "We have got you locked up; if you doubt it send somebody out." All right, he is locked up. "What are you going to do about it?" "When you are ready to surrender we will neutralize a zone and let you out; but you come out only as prisoners of war." That sounds fantastic but if I were to live twenty years more and see another war I would not want to make a very heavy wager that we would not see that. Think about it - it will do no harm to think about it.

War produced phenomena impossible to reproduce in time of peace. The intensity of the next war, therefore, will surpass that of the last war by what may be comprised in the combination of increased industrial efficiency; improvement in arms and means of defense and transport; improvement in means of communication; extension of knowledge in such fields as chemistry and acoustics, and all these intensified by the release which the war spirit will effect in all these and other areas of thought and work. In every industrial plant there are boys thinking today about things they do not dare mention to their foreman for fear he would think they are too smart; but if there were a war on, and that thing applied to something the Government wanted done for war, the boy would march right up to the foreman; the foreman would welcome him, the manager would take him in and pat him on the back and it would be applied. War changes things that fast. Now believe that - I saw it. I saw it from my position in Washington; I saw it from my position as the man handling a great industry that was itself involved in the war even before we went into it.

How, then, may we hope to plan a program of industrial preparedness? Only partially on paper and by allocation and all the other practical and common sense methods; the rest has to be done in the minds and spirits of men. That is why I take such joy in coming down here and haranguing this class, and each class that I have had the pleasure of seeing, because we are reaching the next war and solving its problems when we reach your minds and stir up your spirits on the problem. Here in this Industrial War College we hope to make a great contribution by training the minds and widening the horizons of the officers who form these classes.

Except as it may relate to things of the spirit, we must avoid tradition. That is a terrible thing to say to military people anywhere, in our country or any other country. Of course things of the spirit: valor, honor,

those things traditional in the military services everywhere, we maintain. "New occasions teach new duties!" Doing a thing this way because we did it that way yesterday - out of the window with that thought every time it occurs to you. Our plans and programs should be definite enough to assure a prompt start and flexible enough to allow us every advantage arising from changed conditions and expanding knowledge.

We could not make war without resources; but in this presence it is unnecessary to discuss them. You know they are here and if we fail in any emergency it will be faulty thinking or absence of forethought that will prove our undoing.

I witnessed so many things, in the early days of the war that would have been more promptly accomplished, and perhaps better done, had hundreds and hundreds of our officers had opportunity, as fortunately now they have had, to quietly study that type of problem as you are doing in this Army Industrial College.

Among all the groups of men I have met in the world, and I have been fortunate in being permitted to go to many countries and see many types of men, the group which I would put first for sense of honor, for devotion to country, for self-abnegation, for industry, and for high average intelligence, are the Regular Officers of the Army and Navy of the United States. Mentally, and in my heart, I pay them the highest tribute among all men. And so each time when I come down and meet these classes, look into the faces of the earnest men here and know from my experience what is behind these faces - character, mental resource, determination, devotion to their country - I go away perfectly satisfied as to what will happen to this country if ever again, as probably we shall, we have to enter a great war.

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Q. In your opinion, Colonel Scott, would a centralized purchasing system such as the Navy has be feasible and workable for the Army?

A. You are now referring to an actual purchasing system?

Q. Yes.

A. Off-hand, I know of no reason why it couldn't be worked out. If I studied it I might know. In the World War I didn't want to interfere with the machinery in existence. The Quartermaster Corps wouldn't have liked it. Purchase, Storage and Traffic started to work it out but didn't have time to do so, as I remember. We made no attempt to do it in the beginning of the war. I don't know what could be worked out.

Q. Colonel Scott, do you think we could utilize, in the event of war, the new government agencies that have been set up in the last five years, or would it be better to have a separate super-agency as we now plan?

A. You are referring to the use of The Assistant Secretary's Office and his organization as against, for instance, the War Industries Board?

Q. No, sir. I mean the War Resources Administration which we plan as opposed to breaking it down and utilizing the Securities and Exchange Commission and other agencies which the Government now has already in existence to handle separate types of problems?

A. I think that we will find because of that phenomenon that I mentioned, of the development of war spirit in the country, we will almost be forced to utilize a super-agency of some kind. Our program will probably prove inadequate if it is worked out as the Council of National Defense. For instance, the Advisory Commission of the Council of National Defense had worked out what programs it could prior to our declaration of war. You see, when I -- if you don't mind my using the word "I" -- came down in February, 1917, the Council of National Defense had already made an industrial survey and they already had committees in existence, but everybody was taking it in the peace-time state of mind. It was when they saw that the Army and Navy, through the General Munitions Board, was in the war spirit that the Council of National Defense delegated everything to that General Munitions Board, and the War Industries Board was created as a branch of the Council of National Defense. Eventually the Council of National Defense disappeared and the War Industries Board continued. I think probably that same thing would result in another war. You will probably start off with your organization as you have it and then a more intense form will develop, just what I don't know. You don't need to try to know. Let the situation develop

itself. You will be in a position to move at the outset, which is what we want to be able to do.

Q. Do you think that labor will have representation and should have representation on the War Service Committees?

A. Yes, I think it is a very good thing. Certainly we can't fight a war without labor. I do not believe labor is unpatriotic. I think many times you will find you could arrive at decisions more rapidly if you didn't have to deal with union problems, but that is a human problem. It is part of our national life, and I think we have to reckon with it and should reckon with it. As far as I am concerned, I had Mr. Frayne representing the American Federation of Labor on my War Industries Board. Mr. Frayne cooperated as well as Judge Lovett or Mr. Brookings or any other member of the Board as a practical thing. There was no difficulty, and certainly it did give us an approach to the great union forces of the country that we would not have had if they had been omitted from our organization.

Q. Colonel, do you see any danger in turning over to the existing agencies control, such as the Federal Power Commission taking control of electric power during the war? Do you think that they might get so much control during the time of war that it would be difficult to release their hold at the conclusion of the war?

A. I think that might be possible. That was the thing that President Wilson and I discussed. I didn't mention it because of lack of time. You will remember we took over the railroads. The President was in favor of taking over the steel industry, as England did. I was against it. When I look at that picture you have out there -- I was younger than I am now -- I don't quite see how I dared be against it when the President was for it. At any rate, I was against it and the President was very patient with me and wanted my reasons. There were two. First, the steel industry of the United States is a perfectly gorgeous industry. Its man power is developed and handled in a way to awaken your admiration. We couldn't take it over without interfering with control way up. It is a family. The plants are families, Bethlehem, Jones and Laughlin, Youngstown, Republic, etc. They have their own traditions and you just couldn't get 100% reaction if you took it over. That was one objection. The first objection I had because we did not want production to lessen. We wanted to stimulate it to super production. The second was -- and the President

I think hadn't thought about it — that in the steel industry when you take it over, you then go back and take in ore mines, limestone quarries, coal mines, railroads, fleets as numerous as the Navy of the United States; and I had the fear that if we got the two things, railroads and the steel industry, then we never would get rid of them. The President, I think, certainly entertained that view because he permitted me to have my way and the steel industry wasn't taken over. We did control prices and the industry cooperated with us and maintained a committee here in Washington to give prompt attention to needs as they arose right here in the Department. Yes, I think you might find that would be a menace.

Q. Was the President opposed to the matter of retaining the communications industry under the Postmaster General after the war? It was taken over and put under the Postmaster and there was a great deal of discussion as to whether it should be retained under the Post Office Department.

A. I suppose that being related to the industry, and especially in view of my friendship with General Squier and General Carr, I ought to be able to answer that question. I have no clear memory on it. I don't know. If Mr. Gifford comes down, ask him. He was Vice President of A. T. & T.

Colonel Jordan: Mr. Gifford was here and Major Cochran neglected to ask him. Colonel Scott, I want to assure you of one thing. You spoke about tradition and not letting that govern our actions too much. Here at the College, and I want you to take this thought away, we have no accepted solution to any problem. There is no approved solution to a single problem, and that is one thing that the students are told when they come here. We expect solutions based on three things: their own experience as an officer, good hard common sense, and the research which they can do while they are here. That is what we are trying to turn out and give to you, sir. We certainly appreciate your coming here, and you are going to be on the list of the faculty hereafter. That list on the board is going to be changed. Thank you again.