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PROBLEMS OF AIR SERVICE PROCUREMENT OF MATERIAL.

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THE AIR SERVICE PROCUREMENT PROBLEM.

The major procurement problem of the Air Service in simple terms is, of course, securing the needed amount of aircraft and aircraft accessories to meet our war-time requirements. It resolves itself, however, into a great number of minor problems but minor only in name, as they are of the gravest importance, exceedingly complex and difficult of solution.

It may be well to hark back for just a moment to the conditions which prevailed when we entered the World War eight years ago. Until then the War Department had done practically nothing in the way of training personnel or in procuring aircraft. Our unpreparedness in other branches is well known but bad as this was, it could not compare with the entire lack of preparedness in the Air Service branch. The result was confusion worse confounded. No one knew what we wanted in the way of aircraft, nor had they known, was there any knowledge of how it could be secured. We sent commissions abroad and their recommendations were conflicting and perplexing. Unfortunately, also, there was too much of the "frantic boast and foolish word", predictions as to the vast number of airplanes we would soon have over the German lines. The expectations of our people were thus unduly aroused and when the comparatively small results of our enormous effort, of our great expenditure, were borne in upon them, these optimistic prophets, who by the way should have known better, were rather harshly treated.

In the War Department there were very few officers who knew anything about aircraft or its procurement, there was no organization which could be expanded, no experience to guide. After considerable floundering there was created "The Bureau of Aircraft Production" which tried to bring order out of chaos, which did much useful work but which, composed of civilians as it was, disbanded when the war ended and such experience as its individual members gained was taken back with them into civil life, whence they came.

Possibly you will remember the oft-repeated criticism that the United States did not build a single fighting plane during the war. These critics mean the single-seater pursuit planes, as we call them, and it is a fact that none of them were produced here. This was directly in consequence of the recommendations made by the Commission sent abroad to determine what types should be built in the United States and in the light of the knowledge we now have, this recommendation was a wise one.

All of the countries then engaged in the war against Germany united in recommending strongly that the United States should concentrate on the building of engines and on types of planes which had become in a measure standardized. Changes in aircraft were very many while the war progressed and this was particularly true of the single-seater pursuit plane. It was felt that should production start here on that type, it would be obsolete long before it could reach the fighting forces. Our own representatives accepted this view.

It was arranged that certain raw material should be supplied by the United States to be used abroad in the fabrication of these particular airplanes.

So far as airplane motors were concerned, it has been stated, and I think quite correctly, that possibly the Liberty motor was the greatest single contribution of the United States in the way of material to our own air effort and in a measure to that of those associated with us in the war. It must be remembered, however, that it was not until the last quarter of the calendar year 1918 that these motors began to come through in quantities. Exactly the same thing is true of the observation airplanes which we undertook to build here for use at the front. In other words, it was some 18 months after we entered the war before we were beginning to supply aircraft and aircraft accessories in the quantities which we needed.

One of the problems before the Air Service now is to plan sufficiently in advance so that should we again go to war, such a long time will not elapse before we are able to equip our Air Forces with the material which they will need.

The difficulties in the way of formulating a proper plan are, however, unfortunately still many and grave. Should I endeavor to range them in their order of gravity or of importance, I should have to say that the lack of standardization of aircraft is probably the one which stands first. If we were to go to war tomorrow, I do not know what we would have to produce in the way of aircraft and aircraft engines. So far as our training, pursuit and observation planes are concerned, I think that the types we would have to put in production should war come two, three or four years hence, would be substantially the same as the ones we are now building. This is a degree of standardization which we have attained. But for bombing and attack planes, the selection of the proper types is still a matter for future experiment and decision.

It seems to me obvious that our material problem is thus greatly complicated by reason of the fact that we do not know definitely what we want and consequently are unable to state with certainty just what are necessary in the way of either finished products or of raw material. We have been working intensely upon a plan for such procurement but we have had to

deal with things as they are, with the thorough consciousness that such work will have to be done all over again, from time to time revised as new developments take place, altered to suit new conditions as they arise.

Take the question of raw material alone. Until very recently airplanes have been built of wood, wire and fabric. Spruce was the wood which was absolutely necessary and the need for it resulted in the development of an intense effort to procure a sufficient quantity of it while the war was in progress, and even since the war we have been largely dependent upon this material for the component parts of all of our airplanes.

Although not strictly pertinent to my subject, it may be interesting to tell you that ever since the war we have been endeavoring to liquidate these spruce production matters. Crediting ourselves with the value of the spruce we actually used, adding the sum which the Allies agreed to pay and the proceeds of the sales of the various Spruce Production properties, we can see now that the actual return to the United States will be considerably over 80% of the total amount expended for spruce production.

Metal, however, is being used more and more for building airplanes. We shall, therefore, have to shift our requirements from wood to special alloys fabricated into shapes which can be used for the structural members of airplanes. As nearly as possible we are trying to standardize this material and are likewise endeavoring to use wherever possible the ordinary commercial products of metal manufacturers, but it is evident that here, too, we have not reached the point where we can formulate the necessary specifications to cover just what we require.

In the last analysis we are dependent upon the aircraft industry for our finished products. This industry during the war had a mushroom-like growth. It sprang from nothing, expended enormously and then when the war was over there was no demand for its product. The United States, like other countries, was left with a large number of aircraft and aircraft engines on hand, all of which represented enormous expenditures of money, which had to be utilized, and there being no commercial demand for aircraft and few orders placed by the Government for new ones, this industry rapidly shrank until it almost reached the vanishing point. A few concerns have lived a hand-to-mouth existence, endeavoring to keep in business, visualizing the day when there would be a commercial demand, and in the meantime building such new aircraft as the Government ordered, but always under serious handicaps.

This war produced materiel, except the large number of Liberty engines which the Air Service still has, is now practically used up and in the future such aircraft as we place with our organizations must be new and of the most modern types. This offers to aircraft manufacturers a somewhat more cheering prospect, particularly as there has been an indication of the willingness on the part of the powers that be to devote somewhat larger sums to their purchase. It is manifest that we should keep a sufficient number of manufacturers in being. We must have them in order that we can secure the materiel we desire in time of war. It is equally true that we should work toward this same end, so that when the commercial demand for aircraft does come, as come it must and will, there may be agencies capable of meeting it.

Under existing laws and regulations it has been doubly difficult to accomplish this desirable end. Certain of the aircraft manufacturers have endeavored to maintain engineering staffs capable of designing aircraft, while others have contented themselves with being mere copyists, ready to build according to any plans as might be furnished them, but incompetent to make designs of their own. Naturally, when the United States asked for competitive bids for particular aircraft, these concerns, not burdened by any engineering overhead, were able to offer lower prices. Had all of the work been given to them, the other manufacturers would have been compelled either to go out of business entirely or else to disband their engineering organizations.

Furthermore, very little knowledge existed of the actual real cost of building airplanes and therefore some of the bids were sadly unbalanced. The unfortunate successful competitors, if one may style them thus, frequently lost money, sometimes very considerable sums, and manufacturer after manufacturer has in consequence been compelled to shut down or has gone into the hands of Receivers. Again, I think that certain of these manufacturers knowingly took work at too low prices, hoping that as developments took place they would be called upon to make change after change in the articles they were building and that they could exact sufficient sums for these changes to counter-balance their too low bids. One of the very first things I had to do was to insist that these Change Orders, as they were called, should be reduced to a minimum. It was impossible to eliminate them entirely for the very reason that this development in design and manufacture came too fast.

Another great trouble has been the feeling on the part of manufacturers that the Government was competing with them officially, not alone in designing but in manufacturing aircraft. It is quite evident that if the Government should do

its own designing there would be a concentration of such talent in Government employ, no incentive for manufacturers to do work of this sort and it would follow that their designing staffs would have to be eliminated, initiative would be checked and as the Government was dealing solely with military aircraft, when the time came for the commercial use of these new vehicles of transportation, there would be few, if any, who would be able to design them.

Similarly, if the Government actually undertook the manufacture of aircraft, the private individual manufacturer will find nothing for him and he too would likewise be eliminated.

For the last two or three years the Air Service has been radically reducing the amount of actual designing which it was doing until it can be said that today it does practically none of this work. Similarly, the Air Service has rigidly abstained from manufacturing aircraft. We have built a few, a very few planes at the Engineering Division, merely enough to familiarize the staff there with the quality of work which we must have done for us and with the materials which have to be employed. The idea has been to have at this Engineering Division a staff competent to pass upon the designs of others, ready, willing and capable of testing any aircraft which might be produced, while at the same time studying the military requirements and being able to specify at any particular time just what we wanted.

Recently an effort has been made to crystalize this procurement policy and there have been a number of conferences with aircraft manufacturers in order to reduce it to a workable formula. While this policy has not been officially promulgated, briefly it covers

(1) The agreement on behalf of the War Department to refrain from competition with established manufacturers, either in designing or in producing aircraft.

(2) It recognizes the design rights of those who are able to create aircraft such as we need, and the propriety of placing orders with them for aircraft of their own design.

(3) If new establishments offer their services as builders of aircraft, the United States will require them to show their good faith and their ability by actually constructing and offering for test such machines as they can manufacture before placing orders with them. Furthermore, such orders will not be placed unless these new machines surpass in performance those already in production by other agencies.

There has been an effort on the part of the Air Service to induce manufacturers to specialize on particular types of machines. There are, as you no doubt know, five types of airplanes which are needed, training, pursuit, observation, bombardment and attack. As I see it now, the Government orders which can be placed within the next year or so will not be sufficient in volume to keep in being more than about ten or a dozen aircraft manufacturers, giving each of them a reasonable amount of business. If, therefore, we could have about two plants devoted to the production of each of our five types of airplanes, we could keep them alive and at the same time there would be a certain measure of competition which would enable us to check prices and we would have in time of emergency at least a nucleus which might be expanded to meet our war-time need. Should this ideal state of affairs be brought about, we would require the manufacturers to make their own plans for expansion, these to be formulated in sufficient detail, subject to our approval or at least to our advice, and thereby avoid the immense confusion which existed when we entered the World War.

Just as an illustration, I do know of one particular firm which did go to all the trouble of making just such plans for expansion. It showed in detail how much floor space would be needed, how many employes, how much raw materiel and gave an estimate of the numbers of its product which could be produced at successive intervals. And it is quite pertinent to add here that this particular product was obsolete within six months after these plans were made, so that in a measure this work was thrown away. This is another illustration of the rapid changes which take place in all of this materiel, and a further excuse, if I may say so, for our failure to have perfected at this date a workable plan which we could present to the War Department and one which we could follow if we did go to war.

In the endeavor to perfect such a plan, the Industrial War Plans Division of my office has done yeoman work. The Chief of this Division and the officers associated with him have done everything in their power, they have made a survey of the industry, have endeavored to establish our requirements and to devise ways by which they could be met. The amount of work they have performed is really remarkable. I am thoroughly satisfied that within the limitations imposed by existing conditions, this work could not have been better done. At the very outset it was necessary to assume that the Air Service, under the maximum effort program of the War Department, would need certain numbers of aircraft. It was likewise essential to select the types which would fill this need. These types were those which would have had to be put in production the day when this industrial war planning work started. Long before the huge task was even approximately completed, modern development had made it apparent that types other than those considered must be built.

When consideration is given to the immense amount of data which must be available to produce planes of any type, the volume of the work required when the type is changed is quite evident. It is a matter of fact that in order to build, say a Martin Bomber, a type, by the way which is practically obsolescent although still in service, we must have not less than 6,000 drawings. Some idea can thus be obtained of the difficulty of estimating the amount of material and preparing for its incorporation in the finished product.

The recent Procurement War Game was of great interest to the Air Service. We went into it trying to learn all that we possibly could and from the very outset it became evident that it was necessary to draw into it the Supply Division, the Engineering Division, and the Personnel Division, all of which were directly or indirectly concerned with the matter of procurement.

This war game certainly brought out the necessity for the existence of a program, should war be declared and for a definite plan to carry out that program. Any plan or even any part of a plan is better than none. The time, the thought and the hard work which have been given in an effort to prepare such a plan will not be wasted. All of this will no doubt mean a saving of time, which in turn will save men and save money. We shall continue to try to perfect such a detailed method of procedure for use in time of an emergency but again and again I must call attention to the many lions in the path, not in order that we may turn aside from it, but that we may be prepared to meet them and to overcome them.

While I believe that the Office of the Assistant Secretary of War desires to bring about decentralized procurement, it is impossible for me to agree at present that this will be feasible so far as the Air Service is concerned. Our procurement is now highly centralized. It cannot be otherwise. I believe we would commit a grave error if we attempt at the outbreak of war to shift from the present procedure and to endeavor to decentralize all of our procurement. Our District procurement organizations exist on paper only and there is little foundation upon which to build at the outbreak of war.

It seems to me that there is need for the enunciation of a clear-cut policy which will outline the procedure in the matter of procurement, the degree of supervision to be exercised by the Assistant Secretary of War, and fix definitely the responsibility of the Chief of the Supply Branch and his essential authority. Furthermore, I am satisfied that we should plan so that the existing peace-time agency might be readily and simply expanded in time of war without any radical change in its organization or in the methods followed.

The Industrial War College is in a way beginning to fill the place in relation to procurement that Fort Leavenworth and the War College fill with relation to the combat units. I appreciate very highly the value of the training given by this college. I believe that its graduates should be used as far as possible upon procurement work so that they can apply the knowledge they have gained. So far as I can, I mean to assign the graduates to work of this sort and it is my sincere hope that with their aid we may, before an emergency does confront us, have a definite plan, a real program, one which we can put in force, carry on with the assurance that it will aid us greatly, add to our ability to carry out our war-time mission.