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OBSERVATIONS IN EUROPE

by

Brigadier General C. L'H. Ruggles
Assistant Chief of Ordnance
U. S. Army

Presented in the Ordnance Office
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I was sent to Europe primarily as a delegate to the Conference for the Supervision of the International Trade in Arms and Ammunition and in Implements of War, held in Geneva from May 4 to June 18, inclusive, but since I was to be in Europe, the War Department requested that I deliver two lectures on West Point: one at the Royal Military Academy at Woolwich, and one at the Royal Military College at Sandhurst, England. General Williams also directed that, after the conference, I make a tour of the principal countries in Europe for the purpose of inquiring into the trend of anti-aircraft development.

I will talk first of the impressions I received at the Conference in Geneva, and later of the impressions I received in the various countries concerning anti-aircraft particularly, but also some other impressions that I received as to how the United States was regarded in European countries.

GENEVA.

Before discussing the Conference for the Supervision of the International Trade in Arms, it would be well to state briefly the principal features of the treaty as drafted.

The object of the conference was not to limit the production of arms, but to stop, if possible, illicit trade in arms. One of the first principles adopted was that a government had a right to purchase any amount of military arms for its own use, but that the amount of such arms purchased by a government should be published. With only one exception - that is, arms for rifle clubs - no one other than a government was allowed to purchase military arms where an exportation from one country to another was involved. In addition there were established certain restricted zones in Africa and Asia Minor where no purchase of arms by the people residing therein was permitted except by authority of the government exercising control; and very strict regulations as to the transportation and keeping of arms in these regions were established. Furthermore, the conference agreed to the right of search of certain native vessels in the waters surrounding these regions, in order to prevent gun-running. In these restricted zones all types of firearms were prohibited except by special permission of the government, whether of military value or not.

Arms and implements of war were originally divided into three categories, to wit; Category I, including arms designed for military use, warships and military airplanes, tanks, and so on; Category II, embodying arms and ammunition principally of the sporting type which, while not primarily designed for military use, were capable of being so used to considerable advantage; Category III, covering arms of no military value. In each category was listed nearly everything in the way of an arm or implement of war that could be thought of at the present time as coming under the category; the definitions, however, were sufficiently general to take care of much new arms and implements of war as might be invented. The conference finally decided to have five categories instead of three, as will be explained more fully later. Arms and ammunition in Category III were removed to Category V; warships and their armament were placed in Category III; aircraft and aircraft engines were placed in Category IV.

Licenses or export declarations approved by competent authority are required for the export of all arms in Categories I and II. In addition an authentic order from the government requiring them is necessary before a license or export declaration can be approved for arms in Category I. Furthermore, if the legislation of the importing country requires it, and that fact has been notified to the exporting country, no arms in

Category II can be shipped to a country without the approval of an authorized representative of that country. Licenses or export declarations are not required for warships or their armament, or for aircraft and aircraft engines, but publicity in respect to these categories is required. There was no requirement made as to licensing for articles in Category V (arms of no military value) except that these arms cannot be shipped into the restricted zones without permission of the government exercising sovereignty in those zones.

On the proposal of the United States, there was also added a Protocol for the prohibition of the use in war of asphyxiating, poisonous, or other gases, and of bacteriological methods of warfare. This, so far as poisonous gases are concerned, simply extended the provisions of the Washington Treaty in this respect to all such nations as would agree to the Protocol. It was agreed to by practically all the delegations present, and a large number of them have already signed the Protocol. The prohibition of bacteriological methods of warfare was added to the gas prohibition on the original suggestion of Poland.

* * *

One of the most interesting things at the conference was the personality of the various members thereof, but particularly the military and naval members. There were only a few

naval members, but there were military members from all the countries of Europe; and from the newer countries most of the military members were men who occupied prominent positions in the World War. All of them appeared in civilian clothes and all of them were very modest when one thought of what experiences they had had.

I soon formed a friendship with the Chief of Staff of Finland and used to walk back and forth from the conference a great deal with him. He was a Captain on the General Staff in the Russian-Japanese War, and later was a colonel on the General Staff of the Russian Army. He saw much service in the early part of the World War; and became a general and Chief of Staff of Finland after that country had secured her independence. This Finnish general - General Tuchell - is only about 47 or 48 years old now.

Sitting alongside him, right opposite me in the Military Committee, was a very modest looking man about 38 years old, possibly 39. He and I did not have much to say to each other, as he spoke no English and I could talk only a limited amount with him in very poor French. He did not impress me much and for a week or so about all I knew of him was that he was a delegate from Esthonia. I soon learned, however, that he was General Laidoner, who had also started out as a young officer in the Russian Army and had become Chief of Staff and

Generalissimo of the Esthonian forces upon their separation from Russia. One day, while walking back from the conference with General Knokell he told me something about General Laidoner of Esthonia. It seems that while Chief of Staff he was called up during the night about 1:00 A.M. and told by the President of the Republic that there was a very dangerous Bolshevik uprising in the Army, that the government was very much frightened and had decided to make him Dictator until the crisis was passed. The President then asked General Laidoner how long it would take him to settle the difficulty and he replied that it would be over by 8:00 A.M. It was over by 8:00 A.M. General Laidoner got up, got together some loyal troops, rounded up the Bolshevists, lined them up against a stone wall and shot them all, so that by 8 o'clock the mutiny was stopped and those who were forming it were either killed or were so badly frightened that nothing more was ever heard of it. This story is authentic, although I am not sure of the number of men who were so summarily executed in this manner. Long after this story was told me by General Knokell I saw it mentioned in accounts of General Laidoner in the press. General Laidoner was head of the mission recently sent by the League of Nations to inquire into the Turkish atrocities in the Mosul region. The thing that impressed me in connection with the above story was the very mild appearance of General Laidoner and the fact that no one

would suspect him of taking such energetic and peremptory measures. However, I was told by a number of representatives of countries bordering on Russia that all these countries gave Bolsheviks very short shrift; they simply would not permit them in the country as they felt the life of the nation was at stake.

The Chairman of the Military Committee was General Sosnkowski of Poland who spoke very good French and some English. I got to know General Sosnkowski very well and held frequent conversations with him in a mixture of French and English, but mostly English. General Sosnkowski made a very good presiding officer and was apparently a great admirer of America. He continually expressed his desire to come over here some day. He was Minister of War during the Battle of Warsaw and is at present commanding a corps of the Polish Army.

Another very interesting personality was General De Marinis of Italy. He struck me as having probably as much common sense as anyone on the Committee; he always had something to say to smooth out difficulties and always could be found ranged on the practical side of any proposition. He had an important command in the Italian Army during the World War and is at present a Senator of Italy.

The representative of Japan on the Military Committee was Admiral Kiyokawa; he was assisted by several generals.

The thing that impressed me about the Japanese admiral was the importance he attached to what seemed to me rather minor matters, but the whole Japanese delegation seemed to attach equal importance to such things. The number of nations that should ratify this treaty before it would become binding on any one of the signatories was under considerable discussion for some days, the United States delegation holding out for about twelve and the Japanese delegation holding out for about twenty. After considerable discussion the Japanese agreed to compromise on some figure such as sixteen, but the American delegation still held out for twelve. This matter was to be brought up again on the afternoon of a certain day and in the morning the Japanese admiral saw me and said that he would consider it a great favor if the United States delegation would agree to fourteen. He was very willing to compromise on fourteen. He stressed this matter very greatly and seemed to attach the utmost importance to it. It will be noted that this was a reduction from the original twenty of six to meet the ideas of the United States. I told him that of course I could not speak for the entire delegation, but so long as he felt as he did, I thought the United States delegation would agree to fourteen. He was very much pleased and assured me many times how delighted he would be if I could arrange it. That afternoon the Japanese admiral was not present, having had an attack of heart disease during

the noon hour , and was quite ill. However, one of his generals came to see me just before the afternoon session opened and repeated the request of the admiral and said that he hoped the United States could agree to this, that it meant so much to the admiral and he was sick. I told him that the matter had been taken up and that we would agree. He was overjoyed and very profuse in his thanks. The measure was passed agreeing to the compromise between the Japanese and the United States delegations, but it was some days before the admiral could appear at any of the sessions. As soon as he did, he immediately came to me and expressed his tremendous obligations to the United States; he said how delighted he was that there was no difference brought out between the United States and Japan and that he believed the agreement of the United States delegation has practically saved his life. He said that he had had this dreadful attack of heart disease and thought he was going to die, but as soon as the general had brought him word that the United States agreed in this matter, he took on a new lease of life and got well. He afterward told me that he was thinking of the Jingo press of Japan; he felt that if there was any disagreement, even very trivial, between the United States and Japan that had to be brought out in the general committee which passed on all the recommendations of the other committees, his leading delegate would have

to defend the Japanese stand and the chairman of the American delegation would have to defend the American stand; then their differences would appear in print and would be made a very great deal of by the Jingo press in Japan. He wanted to avoid all this if possible.

There were of course generals from Czecho-Slovakia, from Jugo-Slavia, Roumania, Turkey, Greece, Persia, and so on. All of these were interesting and cultivated men. They made a very good impression upon me. The Czecho-Slovakian general was quite an interesting character, although a relatively young man. He had been forced into the Austrian Army at the beginning of the World War but was taken prisoner soon by the Russians and was allowed to enlist in the Russian Army as a private. He rose therein to the rank of general and finally became a general in the Czecho-Slovakian Army.

The French members of the Military Committee were not of very high rank, although one of them is very well known here - Colonel Requin - also Commander Delouse. Both of these men were exceedingly capable and very shrewd in debate. Their principal object, however, seemed to be to annoy the British delegation and, to tell the truth, they were smarter than the British delegates and had many chances to annoy them. However, I could not see the point of it at all. Their tactics annoyed me and I marveled at the patience of the British. I could not

understand why the French would deliberately antagonize the British at a time when there was every reason for them to keep on good terms with Great Britain. I was told that a great deal of their attitude was caused by the tactics of the Socialistic government in Paris. Notwithstanding this deviling of the British delegation by the French in the Military Committee, I really believe the personnel of the two delegations were at heart good friends, since they had been attending meetings of the League for some years and certainly appeared to be on excellent terms.

There was a little Chinaman, Dr. Tchéou Wei, whose principal asset seemed to be a great fluency in speaking French. He did not bear much weight in the conference because, among other things, of the uncertainty as to whether he represented anything substantial in China. He was a representative of the Peking government. However, he desired to have something to say on every subject. My attention was first drawn to him in connection with the discussion on the different categories of arms. As mentioned previously, the original draft of the Convention presented to the conference divided arms into three categories:

Category I	Arms used for strictly military purposes;
Category II	Sporting arms which might be used for military purposes;
Category III	Arms of no military value.

The United States delegation did not see any reason for including arms of no military value whatever in the treaty and proposed that the number of categories of arms be limited to two, omitting the third class of arms having no military value. Much to our surprise, there was great opposition to omitting arms of no military value and there was considerable questioning of the United States delegation as to why they proposed such an omission. The United States delegation replied that they proposed this merely for simplicity, but it was a matter of no importance to them whether the categories included arms of no military value, or not. After considerable discussion the little Chinaman got up and noted a grave omission in the various classes of arms listed under arms of no military value. He insisted upon including in this list such arms as bows and arrows, all obsolete arms in museums, etc. He had a sense of humor and throughout the conference made remarks of this kind, evidently intended to show the absurdity of some of the matters under discussion.

The German delegate was Dr. von Schmidt, who is well known in the United States as being the German Minister to Mexico to whom the German Foreign Secretary, Herr Zimmermann, sent a note on January 19, 1917, stating that Germany intended to begin submarine warfare unrestrictedly and that, if the United States did not remain neutral, Germany proposed an

alliance with Mexico upon the basis that they should make war together and together make peace. It was stated that Germany would give financial support to Mexico, and Mexico was to reconquer her lost territory in New Mexico, Texas and Arizona. This note also suggested that the President of Mexico on his own initiative should communicate with Japan suggesting adherence of that nation to the plan outlined and also offering to mediate between Germany and Japan. This note was intercepted by the British Naval Intelligence Office and published by President Wilson in the United States at the time. The principal thing that impressed me about the attitude toward Germany and her delegates to this conference was the trivial consideration given to anything said by the Germans. The German delegate rarely said anything, and apparently the members of the conference regarded Germany with less consideration than even the minor South American powers. I presume they considered Germany thoroughly disarmed for the present at any rate and therefore her opinion was not important.

Brazil was represented by a most active delegate, Admiral de Souza e Silva. The principal object of the Brazilian delegate seemed to be to bring his country into prominence. He was very anxious, among other things, that his country be named as one of those whose signatures to the Convention should be required before it would be binding on any one. He was very

active in trying to persuade members of the committee to agree to this. Later it was decided that, while a certain number of states must ratify the Convention in order to make it binding on any one, no states should be specifically mentioned by name. I notice that the Brazilian delegate is now actively trying to have his country made a permanent member of the Council of the League of Nations.

It was very evident from the first that most of the delegates attached considerable importance to this conference, but it was also quite evident that each of them had some particular gain to his country in mind. There were a few exceptions to this general attitude. The military and naval members of the United States delegation, at any rate, considered that the conference was not of great importance to the United States, their main object was to see that it did not harm the United States.

The Italian delegation, at least the military members, frankly considered the Conference as unimportant and something of a trouble. They were always lined up on any proposition to limit the restrictions of the Convention and the class of arms covered by it. The Italian delegates struck me as very practical people.

The British were particularly interested in the

conference because it afforded them a means of keeping arms away from the natives of India. They told me that the number of arms en route to inhabitants of India which were captured each year by the British government was most astonishing, running up into the tens of thousands of rifles and a corresponding amount of ammunition.

The particular object of the French I could not determine, but it was generally considered that their views were entirely dictated by the Socialistic government then in power and by a desire to cater to public opinion. They did not seem to have any particular ax to grind, except that they favored any proposition that they thought would be advantageous to Poland and the member states of the Little Entente.

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The smaller countries of Europe, excepting Belgium, Holland, Denmark, Norway and Sweden,- and the Central and South American countries were much interested in the conference because all of them were very much afraid of arms getting into the hands of individuals or bodies not in sympathy with the existing government. They were so insistent upon this that there was at first very great opposition to a proposition by the United States that the shipment of military arms to rifle clubs for rifle practice be permitted. This proposition was the subject of many unofficial conferences outside the meeting of the main conference and finally, after many days' consideration

it was agreed to with the restriction that such arms and ammunition must be sent direct to the government of the importing country for transmission by such government to the associations for which they were intended.

The military members of the United States delegation were principally interested in minimizing the effect of the treaty on the private manufacture of arms in this country. We objected to the requirement proposed that arms in Category I should be exported only under license. It was found that most countries were very insistent on this and we had to compromise,- the compromise being a substitution for the license of an export declaration filed with and approved by competent authorities of the exporting country. This export declaration has many of the features of a license, but can be issued locally and approved by the collector of the port, therefore minimizing the amount of time required to obtain it. In view of the great opposition to unlicensed shipments of arms in Category I, and as developed later in Category II, this was the best that could be done and is not considered serious. The United States also objected to a license in the case of arms in Category II,- that is, arms not made for military purposes, but capable of being used therefor though perhaps not to the best advantage. We had to be satisfied with an export declaration in this

category also.

On the whole, however, the United States was very successful in putting over its ideas that nothing must be done to hamper legitimate trade. For example, it secured such a wording of Category I, which is the most restricted category, as to limit it to arms, munitions and implements exclusively designed and intended for land, sea or aerial warfare. This precluded the shutting off of the export of a sporting arm which might be adopted by some little country as an armament for all or part of their military forces. We also had pistols and revolvers removed from Category I and placed in Category II. We had an article incorporated in the proposed treaty permitting samples of articles covered by Category I to be exported for demonstration purposes direct to a trade representative of an exporting manufacturer; but we had to agree to such representative being duly authorized to receive these articles by the government of the importing country. We were anxious that articles such as explosives made for commercial purposes should have no limitation put upon their export. After much discussion in conference, gun powders and explosives, except common black gun powder, were removed from Category II and placed in Category V with arms and ammunition not covered by Categories I and II. These arms and ammunition were originally covered

in Category III and classified as being of no military value.

The United States delegation was very much in favor of removing gun powder and explosives from Category II to Category III (later Category V) because it was evident that either a license or an export declaration would be required for articles in Category II. A number of delegations objected to removing gun powder and explosives from Category II and the British were inclined to insist upon the retention of these articles in Category II. However, at one time it looked as if gun powder and explosives might be excluded entirely from the treaty, and I remember one of the British delegates who sat next to me getting quite excited about this and saying to me, "Why, they are going to exclude them entirely?" I suggested to him, "Well, why don't you vote for having them put into Category III?" (Category III later became Category V.) Much to my surprise he got up at once and recommended that these two items be put in Category III. This was just what I desired, but I did not think he would do it so promptly. Finally the British delegation recommended that black gun powder be excluded entirely from the treaty. The United States delegation was agreeable to this, but in view of the general desire of the British to keep even the most inefficient arms out of certain territories, we could not understand why they should place no

restriction whatever on black gun powder.

The question of warships and airplanes was discussed at great length and there was much difference of opinion upon it. The original draft placed warships and airplanes designed exclusively for war in Category I. The British moved that they be excluded from the treaty entirely and were supported by the Italians and Japanese. The French bitterly opposed the proposition. The United States also supported the British. I did not understand why the French opposed the British wishes in regard to warships, but had a feeling that it was due to some bitterness that the French felt in connection with the action taken on submarines at the Washington Conference. The question of warships and airplanes got so acute at one time as to threaten to wreck the conference. I believe that the British action was largely a matter of sentiment. They laid great stress on the indignity of having an agent of a foreign government come on board a warship and demand to see the license authorizing the shipping of the vessel and the inventory of her armament and ammunition. Finally, after many days and even weeks, a compromise was agreed upon whereby vessels of war and their armament were put in a new category - Category III - and aircraft and aircraft engines in Category IV, removing arms of no military value and gun powder and explosives to Category V. A special agreement was made in regard to

Category III, covering warships and their armament, by which they were not required to be covered by license or export declaration but which did require certain information to be given regarding each vessel of war under construction, this information being practically the same as that covered in the Washington Treaty on the Limitation of Armament. The only condition placed upon the export of aircraft and aircraft engines was that the high contracting parties undertake to publish within six months of the close of each quarter a return for that quarter of the export of this material.

The original draft submitted to the conference required statistical returns to be published covering export of all arms under license. This related originally only to arms in Category I, but the conference decided to require this publicity to be given also to arms covered by Category II. Great stress was laid on the publication of the export of arms and implements of war, as it would enable the public to know whether any state was accumulating them to an unusual degree. They considered this most advisable, because it would give the public throughout the world information as to the possibility of any state contemplating a war and enable some pressure to be brought against such a state. A number of the smaller countries, however, opposed this provision, pointing out that,

since they were not producers of arms and implements of war, their procurement of armament would be published to the world in complete detail, while the producing countries were under no obligation whatever to make public the accumulation of armament manufactured by them. This was quite a serious question for a long while, and the states bordering on Russia were particularly concerned in the matter, stating that Russia, not being a party to the conference was under no obligation to publish her increase of armament, while the neighboring states would be required to publish theirs for the benefit of Russia and to their own detriment. This objection on the part of states bordering on Russia was finally overcome by a special article exempting Esthonia, Finland, Latvia, Poland and Roumania from the provisions as to publicity for armament exported to and imported into these countries until the accession of Russia to the present Convention.

I talked with a number of people regarding conditions in Russia, among them some expatriated Russians and officers in the states that have recently acquired their independence of Russia. They all agreed that there was a relatively small number in the Communist Party - probably not over 400,000. I asked, in view of the large number (several million) of expatriated Russians, and the small number of Communists, why

the former could not invade the country and overthrow the present Communist Regime. Of course I knew that this had been attempted several times in the past. The answer was that the Russian peasants, forming now the bulk of the population, were extremely patriotic, although extremely ignorant, and that they would rally to any government which was resisting an attack from the outside. I was told that the expatriated Russians could do nothing and that the only hope of regeneration for Russia was through the peasants. My informants did not know how many years would lapse before such a regeneration would occur, because of the extreme ignorance of the peasants and the fact that the Bolsheviets were doing practically nothing to overcome this ignorance; but all were certain that the regeneration of Russia would occur and that it would come through the peasants. This seemed to be the unanimous opinion of all who were in a position to know anything as to the real conditions in Russia.

The Convention also provided special zones, the export of arms and implements of war to which and the import of like articles into which should be prohibited except by special license issued by the government exercising sovereignty therein. These special zones covered the whole of the continent of Africa, with the exception of Egypt, Lybia, Tunisia, Algeria, the Spanish possessions in North Africa, Abyssinia, the Union

delegate, although tiresome, were really correct. It undoubtedly is an invasion of the sovereignty of Persia to search her vessels on the high seas without her consent, but it was well understood that Persian native vessels are among the most flagrant offenders in the smuggling of arms into India.

One thing that came up in the conference continuously was the representation of the smaller countries that the proposed treaty placed them at considerable disadvantage. One point has been mentioned above,- that is, the publicity given to armaments of non-producing countries and the omission of producing countries from the necessity for publishing their manufacture of armament.

Another point which was brought out was that nothing must be done to prohibit the freedom of non-producing countries to import arms and munitions necessary for their national defense. A number of our people seem to have the idea that the private manufacture of weapons of war is almost a criminal act since the only object of manufacturing them apparently is that they may be used for destructive purposes. If these people had heard the continued insistence of the smaller non-producing nations on their right to import weapons of war for their national defense, they ought to be convinced that the private manufacture of weapons of war is almost a humanitarian act. Certainly it is not a business that should be

would desire to see the League of Nations abolished. I was not impressed with the enthusiasm of the Italians for the League, but the British and French seemed to think it was worth while. The Chairman of the United States delegation was at great pains to see that everything in the Convention referring to the League of Nations was stricken out, so as not to involve the United States in the League of Nations in any way. In this respect practically all the nations present were perfectly willing to accommodate the United States.

Before leaving the subject of the Geneva Conference I think I ought to mention the efficiency with which the records of the meetings were handled by the Secretariat of the League of Nations. In the first place, it had most excellent recorders: the delegates were allowed to speak either in French or in English, and whichever of these two languages was used, the remarks of the speaker were taken down in shorthand by a recorder and immediately read off by him to the assembled delegates in the other language. It was the rule that, if a man was speaking in French, a recorder whose native language was English took the notes and read them off in his own language, whereas a Frenchman took the notes when the remarks were spoken in English and read them off in French. Occasionally when there was a shortage of recorders

a Frenchman would take French notes and read them in English, or vice versa, but the best results were gotten when a man read his notes in his native language. These men were most expert; they spoke English and French fluently and made practically no mistakes. The accuracy of the translations and the records were really amazing; no matter how voluminous the minutes of any meeting, they were all delivered to each delegate in mimeographed form and bound, before nine o'clock the next morning. Some members of the Secretariat had to work practically all night to do this.

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IMPRESSIONS ON HALF THROUGH EUROPE.

After the conclusion of the conference in Geneva, I proceeded to visit certain countries in Europe for the purpose of ascertaining the trend of development in anti-aircraft defense. Upon my return I submitted a report on this trip to the Chief of Ordnance and a copy thereof may be found in the Ordnance Library. I will therefore touch upon the information obtained only in a general way.

In the first place, I found that the lines of development in Europe are the same as those in this country and I felt assured after my investigations that, except perhaps

in the matter of computing instruments, we were well abreast of other major powers in the design of anti-aircraft materiel. I think there is no doubt that our guns and gun carriages are superior to those in Europe and our listening devices are fully as advanced as any constructed abroad.

All countries desire to increase the muzzle velocities of anti-aircraft cannon, but they practically all have had the same experience as we have and are being forced to limit the muzzle velocity to about 2500 to 2700 ft. per sec. As a matter of fact, the guns having this velocity are new types under design by the manufacturers rather than in service. The French and Italians are still using the old war guns and the British are about to introduce guns having a muzzle velocity of about 2480 ft. per sec. The Vickers people, however, are designing anti-aircraft guns to have a muzzle velocity of 2700 to 2800 ft. per sec.

Very little has been accomplished in the line of development of anti-aircraft fuzes. The French appear to be doing little or nothing in this connection and seem fairly well satisfied with their powder train fuze. The Italians are very anxious to obtain a mechanical fuze but are not willing to pay more than about $2.00 for it. I was informed by Colonel Ruffi and Colonel Guerrieri of the Italian Army that the

"Officine Galileo" at Florence, Italy, is developing a mechanical fuze which will have no springs, not even a spring in the plunger. The fuze is to be operated by centrifugal force. Our Ordnance representative at Paris and the Military Attache' in Rome have been asked to follow up this development. The English and others have been trying to perfect the Krupp fuze, but so far as I could find out, have had very little success with it; in fact, not much more success than we have had with the Chelsea fuze. I did not hear of the Junghans fuze while in Europe. Apparently the Junghans people have not been exploiting that fuze there. From all I learned abroad of mechanical fuzes, I believe the Junghans fuze is the most promising one in sight, though, as we know, it needs considerable further development before it will be satisfactory.

There seemed to be, on the whole, very little progress in listening devices. The French and Italians are using old war time devices, and the British and Dutch use a simply type designed in their own services. I do not believe there is any listening device in actual use in Europe which is as satisfactory as the device we have recently developed and which we tried out last summer. However, I heard of a promising device which was under development; I was told by a representative of the Vickers Company that that firm was in touch with the designer of a listening device which gave great promise. The

Vickers Company would not state what this device was or who was designing it because they expected to purchase the manufacturing rights in case it proved as successful as was hoped. It was stated that, if this device turned out as well as was expected, it could be connected to the Vickers Case III instrument and the firing data computed, not by observing the plane with telescopes on the instrument, but by observing pointers on dials, the pointers being actuated by the listening device. This would permit the firing at planes that could not be seen by reason of fog or otherwise, when searchlights could not be used. In fact it was thought that searchlights could be dispensed with under these conditions. The Italians also prophesied that listening devices would be developed which would be sufficiently accurate, in connection with a compensation for lag of sound, to permit guns to be laid from data furnished by the listening device, thus doing away with the need for searchlights at night.

A promising listening device is under development by the Geers Company, but when I was at that company's office, it had not been completed and I was unable to see it. I saw, however, a rough model of the device. It consists of the usual two systems at right angles to each other. Each system receives the sound waves on a paraboloid receiver and reflects them into an ellipsoid receiver which carries them to the ear

or to a microphone. The receivers are so located with respect to each other that, if the sound waves are coming from the right of the axis of the system they are all taken to the right ear, but practically none come to the left ear, as the waves impinging on the left paraboloid are reflected without passing into theleft ellipsoid receiver which leads to the left ear. By this device the company hopes to determine the direction of the plane within about one-half degree. It also claims very good results as to intensifying the sound. This company is also developing a system for reading by the eye the direction of the plane when it cannot be heard. This will be done by transmitting the vibrations of the microphone of the listening device through an electric relay to a mirror on which a ray of light is projected. If the reflection from the mirror is a straight narrow line, the instrument is pointed toward the source of the sound; if an ellipse or circle results, it is not correctly pointed. The company says it hopes for excellent results from this device, but it is too early to be positive about what may be expected. Without this device the company expects that planes may be located up to a distance of 10,000 meters. It does not consider the French listening devices satisfactory. The company expects to have this listening device ready for test at the same time as the fire control

Leary, Assistant Naval Attaché in London, to whom the instrument had been described by M. Boutin, agreed that the instrument was really impracticable, having all the deficiencies of the original Brocq instrument increased by a very poor system of electrical transmission.

Data computing instruments with electrical transmission to the gun were under development in Italy by Colonel Buffi and Commander Pittoni; by the Goerz Company in Czecho-Slovakia; by Captain Van den Bergh in Holland; and by the Vickers Company in England. The Vickers Company's instrument was the only one that had progressed well beyond the development state and it is, in my opinion, the most promising of all. We have been so fortunate recently as to have the Vickers Company accept an order for their latest instrument adapted for the Case XII system of fire control. Our Ordnance representative in Paris has been requested to follow the development of the other instruments mentioned, and the designers thereof have all indicated a willingness to permit Colonel Westervelt to witness the tests of the instruments when the time arrives. Apparently all of them are willing to sell us an instrument for trial when it is completed. All the instruments so far completed have been based on the principle that the airplane continues at the same altitude and flies in the same direction

the feeling was general that in the future bombing planes could not afford to fly over modern anti-aircraft guns, at least during the day time. The Italians were even more positive than the others on this question and pointed out that anti-aircraft methods of fire had been in use only a few years and that, during the war, time was not available for great scientific development along those lines and since the war all countries had been more or less handicapped in the development by lack of funds. They spoke of the many years during which the development of ordinary artillery methods of fire had been going on and said that it would not be long before bombing planes would hesitate to fly over anti-aircraft guns in the same way that modern battleships hesitate to attack modern seacoast batteries. In a number of cases I asked the question, if only a limited amount of money were available for aircraft and anti-aircraft guns, would all that money be spent on aircraft,- and the invariable answer was that a reasonable amount should always be spent on anti-aircraft guns.

Our relations with the French War Department appear to be quite formal. Although I had requested before my arrival in Paris that appointments be made with the French General Staff and other persons in the French War Department with whom I could talk on anti-aircraft matters, I found that no engagements of

this kind had been made for me and the explanation was that the French did not care to discuss official matters informally but required that everything of that kind be presented in writing in the form of a questionnaire. I therefore prepared such a questionnaire for submission to the French General Staff through the office of the Military Attache' in Paris, but no answer to this questionnaire has yet been received. I was told that it might take a long time before it was answered. Most of the information regarding the French point of view was obtained from articles of leading officers in the French Army and by interviews with leading Americans, such as Mr. Laurence V. Benet, Managing Director of the Hotchkiss Company; Colonel Taylor, representative of the du Pont Company in Paris, and particularly Major Glassburn who was just completing a course of two years at the French Ecole Superieure de Guerre. I also heard a good deal as to the French ideas from other sources outside of France.

The relations between the Military Attache' at Rome and the Italian War Department were most cordial. The War Department arranged interviews for me with two of the leading men on anti-aircraft matters in Italy: Colonel Guerrotori and Colonel Duffi. It was explained to me at the time by the Italian War Department that the Italians did not mind at all discussing military developments with Americans, but they would

hesitate to do it with representatives of some of the major countries in Europe. They were very cordial indeed. Colonel Duffi was a very intelligent man but apparently very much of an inventor. The computing instrument under development for the Italian Army is his design and he told me that he would soon undertake the development of a very fine listening device. It did not seem to me that the Italians were as far along in the design of new instruments for anti-aircraft fire as some others.

An interesting situation developed in Holland with respect to the purchase of munitions by the Dutch government. This government formerly purchased munitions from Krupp and, since Krupp is now prevented from engaging in the manufacture of munitions, it has attempted to purchase munitions from Schneider & Cie. in France, but Schneider has been obstinate in regard to its materiel. The specifications of the Dutch government are different from those under which Schneider is manufacturing materiel and that company insists upon the Dutch using the Schneider designs, which the Dutch government is not willing to do. The Dutch government has considered the Bofors plant in Sweden, which has bought practically all of the Krupp designs, but it does not consider that the Bofors plant has sufficient capacity to supply its needs together with those

of other non-producing countries in Europe. It therefore would like to see an adequate private munitions industry developed in the United States to take the place vacated by Krupp, and it has shown much encouragement to the Bethlehem Steel Company and to the du Pont Company. This information was obtained from other sources than the Dutch officials, but I believe that it is correct. It also applies, I understand, largely to Poland and others of the new countries bordering Russia, and to some extent to Roumania. I heard that the Schneider Company has not given satisfaction in many of the sales made to the newer countries of Europe,- old types of materiel having been furnished. These countries now have a large amount of war materiel to procure and desire that it be of the latest types. Apparently the Schneider Company feels that it has a monopoly and is somewhat arbitrary. Whether this action is to a degree dictated by the French government is not known.

The visit of Colonel Van Ewsum of the Dutch Army to the United States about two years ago resulted in the Dutch government taking a great interest in munitions as developed by the United States. This government is apparently anxious to keep in touch with the United States along these lines.

I was very cordially received by the Italian and the Dutch War Departments, as mentioned above, but I think

on the whole the reception I received in England was the most gratifying. I think this was due in part to the extremely cordial relations established by the Military Attache' in London, but also to the fact that the English and Americans speak the same language. It seems that the British Ordnance Department has been rather secretive when we asked for information of a technical character and it was explained to me by the Master General of Ordnance that this was largely because of the policy of the United States, which was to practice little or no secrecy in new developments. As a consequence, while they were perfectly willing to give us any military information of a technical nature that we requested, if we could keep it confidential, they were afraid we might not be able to do so, and that other countries whom they did not desire to have the information might get it through the United States. However, as my interview proceeded, I found that there was no reluctance to answering any questions I put to them, and finally I was told that the British War Office was considering the proposition of a free exchange of technical military information with the United States, provided the United States could give some assurance that the information furnished by the British could be held reasonably confidential. They also stated that they considered it better to have some arrangement whereby the technical officers of the two countries might meet and not

confine ourselves to exchange of information by correspondence.

As a result of this interview the question of the degree of secrecy which we can maintain on information furnished by the British has been taken up with us by the American Military Attache' in London and the following reply transmitted:

> "The within letter has been carefully noted and its significance is fully appreciated. While the nature of the information given to the public through our military journals is no doubt considered confidential in foreign countries, there are many phases of Ordnance development which have not been given any degree of publicity. There are details of our development program about which information could be furnished to the G-2 Section of the War Department for use by military attaches abroad in exchange for information from foreign sources. The confidential nature of information received from foreign sources can be respected up to the time of release of ordnance materiel to the using branches of our service." (Confidential file O.O.350.05/730)

As you all know, we have now arranged to station an Ordnance Officer in London as Assistant Military Attache' for Ordnance.

A number of the British officers were very enthusiastic over the new Vickers instrument; in fact they did not hesitate to say that it was undoubtedly the best data computing instrument for anti-aircraft fire yet devised. Some of them also said it was a great pity that they had permitted the instrument to be sold to other countries than Great Britain. I asked a representative of the Vickers Company if there was a law which permitted the British War Department to prevent the sale of instruments

to other countries by the Vickers Company, and was told there was none, but that there was a law requiring the shipment of all articles of warfare to be licensed before they could be exported and the British War Department merely arranged with the government to refuse licenses for articles of a military nature which they did not want to have shipped out of the country. In this connection I remembered that the representatives of Great Britain at the Geneva Conference were very keen for the requirement that licenses be issued for all exports of military materiel and explained that the licensing system was a great advantage to their country and they would use it whether it was required or not, for the reason that it gave them a very good control over what articles of a military nature were being shipped from their country.