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by
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Colonel Miles, Gentlemen

Being one of the oldest living graduates of this institution does have its compensations after all, and conferring with you this morning is certainly one of them to which I have long aspired.

My text this morning is "Speed", and in a recent conference with a group of Coast Artillery officers at Fort Monroe we reviewed the past three decades of defense history from that viewpoint. In that review, I recalled the often-repeated remark of one of my earliest Field Artillery acquaintances that "Speed" and "Accuracy" were the two outstanding characteristics of Field Artillery. I told my Coast Artillery friends that association with them had led me to add the third and equally important characteristic of "Range". Anyone of these three is a good text, but it is with "Speed" in mind that I ask you to skip through these thirty years and see how our ideas of speed have changed and what the effect of these changes has been on defense.

The primitive two and a half miles per hour of foot troops, and five miles per hour of mounted troops, were the "speeds" of those good old days of thirty years ago and they did not put any great strain on the mental machinery of the Command and Staff, as the solutions of most of their problems involved time units of days and space units of tens of miles. As a profession, we in the Army could be deliberate and I believe that for the most part we were not only deliberate but content, and possibly complacent.

Everything moved along at a comfortable pace and there were only a few "balls of fire" who were crying out for improvements such as motor cars, motor trucks and airplanes. These exceptions to the rule were effectively suppressed and we drifted along with little attention being paid to "Speed" developments of any kind. Even the first two years of a world war in Europe did not stir us up, but eventually a bold bandit named Villa invaded U. S. soil and brought on the Punitive Expedition. This gave a radical Quartermaster an opportunity to step up and put motor cars and motor trucks into the army picture. Even that bunch of quacker birds grouped in the Aviation Section of the Signal Corps had a chance to try their wings in active operations. That use of motor cars and trucks doubled the old speeds and we came out of that campaign with our ideas of speed up to ten miles per hour.

Our World War experience with the good roads of the rear areas in France doubled speeds again, and we came out of that

war with our speed ideas up to twenty miles an hour. Meanwhile, the Corps of "speed demons" had not only increased tremendously in size, but had even been segregated in a Tank Corps, a Motorized Artillery, a Motor Transport Corps and an Air Service.

Progress - yes - but only temporary, because after the war came reaction, the Tank Corps was made part of the Infantry, the Quartermaster Corps absorbed the Motor Transport Corps, and Motorized Artillery was allowed to wither and die on the vine, leaving the Air Service as the only member of the "Speed Family" to survive the reaction, and the mass of World War aircraft on hand almost stopped development in that Service.

The first signs of revival came about fifteen years ago when the Coast Artillery began its demand for high speed trucks for use as prime movers for mobile anti-aircraft. About the same time the Cavalry down in the great open spaces began to motorize, mechanize and modernize with the result that some of the Command and Staff thinking had to be adjusted to time units of hours and space units of hundreds of miles.

It remained for a progressive and aggressive Chief of the National Guard Bureau to give the motorization of the Field Artillery the needed push for its accomplishment.

The organization of a mechanized Cavalry force called for new speeds, new weapons and new service auxiliaries, and I once overheard those demands of the mechanized forces being countered by the argument that if we had equipment with the speeds being asked for the agencies of command, particularly the brain of the commander, could not function fast enough to employ them efficiently. Of course, such a point of view was futile, as it is obvious that given the equipment the brains can be found to command it and win.

While on this subject of brains, or whatever it takes to make progress, let me venture an observation that during the twenty years we have been reviewing it was quite apparent that as we speeded up our weapons we created a demand for speeded up thinking ability on the part of our personnel in order to exploit to the full the advantages of our equipment.

To get a bit closer to our tire let us see what the "Speed Corps" has been doing during the three years preceding Munich. That now famous date in military history. Certainly the ground forces of the Army as a whole had again doubled their rates of speed and were thinking in terms of forty miles an hour.

As you all know, the Air Corps underwent a radical reorganization in 1935 and Major General Frank M. Andrews was given command of all combat aviation except observation within the continental limits of the United States. General Andrews was a very effective "speeder-upper" who got results. Airplane types, especially bombardment, were developing very rapidly and we saw the Martin bomber of 1936 with its speed of 180 miles per hour, one ton of bombs, and gasoline for a range of 1000 miles, replaced in 1937 by the Douglas bomber with a speed of 200 miles, two tons of bombs, and 2000 miles range, and then in turn the Douglas gave way to the Boeing, with 220 miles per hour, three tons of bombs and 3000 miles range. To keep pace with these speed developments Command and Staff thinking in the G.H.Q. Air Force had to be stepped up to deal with time units of minutes and space units of thousands of miles.

Regardless of what went on within the G.H.Q. Air Force, the War Department seemed disposed to give its new child a chance to grow up to its share of the Baker Board air strength of 2320 airplanes and then in due course evaluate the results and begin a replacement program about 1941. There was no apparent need for hurry and most of the G.H.Q. Air Force contact with the War Department had to do with discussions of airplane types, that is, quality rather than quantity, and academic arguments on organization. Then along came the jolt of Munich, and even our far-away War Department felt the impact of that new turn in world affairs and by October 25, 1938, it was apparent that the Army's air strength as well as the quality of its equipment were in for serious overhaul.

Following a feverish period of planning and counterplanning, the President released a special national defense message on January 12, 1939. And since that date the Army and the Congress have been busily engaged in meeting the requirements outlined in that message, not only for the expansion of aviation but for modernizing the weapons for our ground forces.

Measured in dollars, the Air Corps and the Ordnance Department are to have the opportunity to spend within the three fiscal years 1939, 1940 and 1941 total amounts at least equal to the totals for the preceding fifteen years. In other words, the President's January 12th project is speeding up our defense preparations by multiplying by five.

An important phase of this intensive effort is the Educational Order program which, after being discussed for some twenty years, is now actually being executed. But that program is a subject deserving a conference of its own.

The prospect of expansion of the Aviation Arm of our National Defense forces has caused no little concern as to the adequacy of mechanically trained personnel for aircraft production and maintenance, and as a result of that concern the President has appointed an Inter-departmental Committee to make a survey of the requirements and the available means for training additional mechanics. Under the leadership of a member of the Civil Aeronautics Authority, and aided by representatives of labor and industry, the Committee is making progress toward a better understanding of the problem.

It is now appreciated that the ever increasing mechanization of our defense forces calls for a new emphasis on the development of mechanical skill in our manpower. The man in uniform as well as the man in the factory is confronted with a machine and one that he must learn how to manufacture, maintain and use.

So much for the military side of the picture, now let us examine what, if any, "speeding-up" is taking place in industrial circles. It is obvious to me that you gentlemen here in this College have such splendid opportunities for study of what has been accomplished by the planning agencies of the War Department, including the Office of the Assistant Secretary of War, the chiefs of the procurement arms and services, the procurement districts and the industry itself, that it would be presumptuous of me to attempt to discuss those results with you. However, one of my friends in industry has kept me informed of the plans being perfected by his particular industry to speed up the production of very highly technical items of military equipment in time of war.

Perhaps the most effective step taken by the particular industry is the preparation of detailed and specific plans for the "farming out" of components to a large number, some three hundred, small shops and factories widely distributed over the country in such a way as not to interfere with allocations of other war industries.

A second and perhaps equally effective practice is the continued effort of the company to improve the designs of its product to save time as well as cost of production.

A third important feature is a well established policy relating to personnel under which an exceptionally high standard of personnel is employed with a view to having a personnel of such calibre that it will permit dilution to meet the exceptional requirements of a war effort.

At the suggestion of your Director, I am going to conclude my discussion this morning with a brief exposition of action which I personally believe to be urgently necessary to speed up one particular phase of our national defense which has great possibilities but which is receiving only casual attention.

It is my belief that the airplane as a weapon has a great future, and that the opportunity for its development as a weapon is now knocking at our door. However, only a few Air officers and engineers are concerning themselves with armament, and an even smaller number of Ordnance officers and engineers are giving aviation more than a passing thought. What we need is a crusade of gigantic proportions to put what I call "Aviation-Ordnance" on its feet, because the difference between an "air vehicle" and an "air weapon" is its ordnance.

Without seeming to criticize any service or any individual, I am forced to the conclusion that the main effort of the Air Corps up to date has gone into the "vehicle" characteristics of airplanes, with the result that very little Ordnance effort is applied exclusively to aviation problems. Perhaps this undeveloped state of "Aviation-Ordnance" is but natural in view of the comparative novelty of the airplane as a weapon.

Rather than waiting for a war to disclose these deficiencies, it is my belief that we must attack this problem now from the four angles of organization, facilities, equipment and research.

In the field of organization let us over-organize for the sake of emphasis, and beginning at the top, glorify our objective by the assignment of a Major General with a suitable staff to report directly to the Chief of Staff of the Army with completely delegated authority to coordinate all War Department General Staff activities having to do with the development and use of the airplane as a weapon. Such a General and his aids must supplement and not replace any of the existing machinery of the War Department, and he must be armed with an oil can and not a monkey wrench. Let me emphasize that I am not suggesting a Super-Chief of the Air Corps in any sense of the word, but a General Staff officer of high rank, who can devote his entire time and energy to the one subject - "air weapons", their characteristics, their development and their use.

Looking beyond the War Department General Staff, our "Air Weapons Officer" naturally will look in five directions - the Chief of the Air Corps, the G.H.Q. Air Force, the Chief of Ordnance, the Chief of Chemical Warfare Service and the industry engaged in the manufacture of armament for airplanes. What should he see when he looks?

In the Office of the Chief of the Air Corps, he should find no less than a Brigadier General, Assistant to the Chief of the Air Corps, responsible for coordination of development and the

initiation and follow-up of procurement, supply and maintenance of all items of armament used by Air Corps units. Such an officer must of necessity maintain close liaison with the War Department General Staff, the G.H.Q. Air Force, the Air Corps Board, the Materiel Division of the Air Corps, the Aircraft Industry, the Chief of Ordnance and the Chief of Chemical Warfare Service. Armament problems must have first priority on his schedule and he must devote his every effort toward making the Air Corps armament-conscious, and the Chief of Ordnance and the Chief of Chemical Warfare Service "aviation-conscious".

Within the Air Corps, additional units of organization are required to "speed up" appreciation of weapons. An active Air Corps Board, charged with responsibility for statistical studies and research looking toward revision of the "military characteristics" of airplanes as weapons, and the supervision of proving ground and service tests of development types, is clearly indicated as one of the requirements. The membership of the Board should include an Ordnance Officer and Chemical Officer.

The armament nucleus now provided in the Materiel Division organization must be expanded and an armament unit provided in each of the major sub-divisions of the division to specialize on the development, procurement, supply and maintenance of the armament items for which the Air Corps is responsible. The division should include Ordnance and Chemical units responsible for the establishment and maintenance of technical liaison with each of the armament units of the division. Ordnance and Chemical Warfare Laboratories are required at Wright Field.

Similarly, each of the Air Corps Depot organizations must provide for units to handle responsibilities and interests of Air Corps armament, and the Ordnance and Chemical services. The nebulous Air Corps Proving Ground must become a reality, so that airplanes of all types, both "development" and "adopted" may be adequately tested as weapons and their powers and limitations scientifically determined. Such a proving ground should include Ordnance and Chemical Sections.

There must be an Air Corps School created to develop and teach a technique of bombing, gunnery and use of chemicals and pyrotechnics. It is my sincere belief that within five years such a unit can multiply the number of hits on the target by three and at the same time give our Air Forces a standard technique upon which to build uniform tactics which in turn can be used as a basis for a doctrine of tactical employment of Air Forces.

Within the G.H.Q. Air Force and the Overseas Air Wings the work of the past four years should be continued and the organizations of Ordnance and Chemical Service units given a chance to mature, especially along the lines of equipment of troops and facilities of air bases.

I do not want to give the impression that the Ordnance Department is all that it should be in the matter of organization, because it, too, lacks the machinery and personnel to give aviation projects prompt and adequate attention.

Each of the principal subdivisions of the Office of the Chief of Ordnance needs an aviation unit to give proper emphasis, and a third Brigadier General Assistant Chief of Ordnance would certainly be useful to coordinate all the aviation Ordnance interests and responsibilities.

The Ordnance arsenals and the Proving Ground require Laboratories for development, test and research, including the acquisition of ballistic data for the preparation of bombing and gunnery tables. The development laboratory list is a long one, including one for Bombs and Pyrotechnics at Picatinny, Equipment for Aviation Ordnance troop units at Rock Island, Fire Control systems at Frankfort, and Machine Guns at Springfield.

The aircraft industry with few exceptions is not giving any great amount of attention to armament problems and as a rule is poorly located and inadequately equipped and manned to do so. Again we have vehicle interests rather than weapon interests predominating.

While the list of Air and Ordnance items now under development is a formidable one, there are a few deserving special attention at this time. Fire Control systems head my priority list, as little has been done to keep pace with the increases in speed of airplanes. The gun sighting systems now in use are certainly very primitive and except at short ranges, hits are a matter of luck. A project for mounting, aiming and firing a cannon big enough to take time fuzed projectiles is obviously one of the most urgent, and from such a project we can hope to get much valuable data for guns of all sizes.

Bombs and bomb fuzes are still rather crude items of Ordnance capable of much improvement, and flares for use in night bombing are far from meeting the requirements. New and more powerful explosives and higher ratios of explosive to metal in bombs are hopes yet to be realized.

research on which I would like to see our scientific world turned loose is the search for a solution to the problem of "indirect" bombing. Such a solution should permit bombing during periods of darkness and overcast which at present are insurmountable obstacles.

In this brief summary I have covered only a few of the many points which my proposed crusade must encompass, but I trust that I have aroused your interest sufficiently for you to explore this field for yourself and then join the crusade.

In closing, let me repeat our text "Speed", and suggest that perhaps the "evolution" of the "weapons" of our army is now "speeded-up" to the point that we are actually in the midst of a "revolution" of unknown proportions and duration.

May I express the hope that when your turn comes to decide whether you will add your individual weight to the "go-aheads" or the "hold backs" that your decision will be to "go ahead" and that your contribution will be such that our Army can lead rather than follow the armies of the world in "high speed" equipment and leadership, that will insure success in any trial of strength that may confront us.