Contribution of an Indiana Manufacturing Plant to the War Effort*

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The military emergency in which we now find ourselves is of course interfering with formal education from many angles, but I do not feel that there is any question about the fact that it is increasing the importance of and stimulating the interest in scientific subjects, which is all to the good. Our peacetime life had become a life of science. Modern warfare is even more dependent upon you gentlemen.

While I have this opportunity to speak to you as educators, as well as scientists, there are a couple of points regarding our national polity which I would like to present. I cannot feel that there is any incongruity in asking your consideration of these broader aspects of education. There has of course been a constant divergence between the arts and the sciences. With the great increase in the sum total of human knowledge, brought to us by science, a high degree of specialization has become necessary. However, I feel that a rapprochement between science and philosophy has set in. The very methods of teaching a philosophical or arts subject in themselves constitute a science.

The fathers of our country were scientists as well as philosophers. Benjamin Franklin was a physicist of no mean ability. During the framing of the Declaration of Independence Thomas Jefferson carried in his handbag some fossilized bones of the Megalonyx, which now bears his name.

Seriously, I should like to invite your thought to the situation which confronts our nation. The general state of physical and psychological unpreparedness in which we found ourselves on the seventh of last December should serve as a lesson to us. Following the first World War we allowed ourselves to become physically and mentally soft. For a period of twenty-two years we have been a nation of international lotus eaters. Beginning now, let us face realities, let us steel ourselves to the part we have to play, not only for the duration, but for the peace to come. This, the most charitable and altruistic nation on earth, should not again lapse into indifference and impotence.

The educational institutions of the nation should devote more time to teaching the American Way of Life, as such. Every student should learn to know our constitution better and to respect it more. To back up our way of life and our constitution, units of the R.O.T.C. should be established in every high school and college. I also feel that during the last two years of high school and for four years in college, compulsory, rigorous physical training programs should be adopted. What we really need is a course of strenuous physical development for every student,

* Presented before the general meeting.

which will harden him for the future problems he must face, be they personal or those of his nation.

In his introduction to a new edition of Tolstoy's "War and Peace," Clifton Fadiman observes that the German military mind seems to be incapable of making any mistakes except the very biggest ones.

In World War I, the biggest mistake of the German military mind was its underestimation of America's strength. Even when it appeared certain that the United States would become one of the Allied Nations, the meticulous planners of the Imperial German High Command remained positive that America's part in the war would not change the balance. That the great weakness in America's armor lurked in this nation's total dependence upon Germany's chemical industry, the Germans well knew. In one of his last reports to Berlin, a German envoy commented on this weakness and confidently predicted our defeat as a result.

"Americans," he said, "can never establish such an industry. The conflicting selfishness of American business renders it impossible."

But American scientists responded to the nation's need and, pushing aside the "conflicting selfishness" in which the enemy placed his trust, built in the United States the world's greatest chemical industry.

The big mistake of the thorough German mind was then, the same as it is now. Once more our enemies have overlooked the potential power of America's secret weapon.

This weapon is, of course, that *voluntary cooperation of free people* which converted the American wilderness into a giant among nations. It has been overlooked by the Axis because it could neither be known, nor understood, nor used in totalitarian countries.

Americans have always recognized the power of this weapon. The pioneers in the wilderness used it in their log rollings (and I don't mean political), in their barn raisings, their corn-husking bees, and in the organization of their wagon trains when they penetrated farther across the existing frontier.

Although mutual helpfulness is the basis of many American traditions, we tend to forget how powerful an instrument this practice can be until we stand in great peril.

In 1940, after the fall of the Low Countries and France, it first became evident to many Americans that such a time of great peril was impending.

All of the nations conquered by Hitler had gone down crying "Give us airplanes."

In Washington, at that time, General Arnold was insisting that our air forces should be equipped with fleets of heavy bombers. Many of the military leaders of the world were skeptical. But General Arnold stuck to his guns and convinced enough people to get his proposal authorized.

To those working on the program, then termed the National Defense Program, it was plain that the American aircraft industry would have to have help—especially if we were to expect heavy bombers on time and in big enough quantities to mean anything. That help, national leaders felt, would have to come from the automobile industry.

So, on October 25, 1940, just two years ago last Sunday, Mr. Knudsen went to Detroit to ask the automobile and truck and parts manufacturers for their help.

The result of that meeting was the organization of the Automotive Committee for Air Defense, in which the so-called "conflicting selfishness of American business" was set aside to give way to mutual helpfulness in building bombers. The aircraft manufacturers opened their doors wide to the engineers and master mechanics of the automotive industry, and, in due time, the lessons were mastered and production started.

By March of 1941 it was possible to disband the Automotive Committee for Air Defense. In the production of aircraft, America's secret weapon—voluntary cooperation—was unsheathed.

Then, last December, came the Pearl Harbor attack, followed by our imperilled nation's demands for more and ever more of all kinds of weapons.

On the day after Christmas a letter from an Army Air Corps officer was received by the directors of the Automobile Manufacturers Association. It pointed out how well mutual helpfulness of former competitors was working in the production of aircraft, and suggested that the idea might now be expanded to embrace all arms manufacture in the automotive industry.

A few hours before the year 1941 ended, they had set up the machinery for this voluntary cooperation. They called it the **Automotive Council for War Production.**

That Council has now come to embrace more than 400 manufacturers who are pulling together in teamwork for victory. Their cooperation has become the pattern of other industries.

The greatest strength of this secret weapon is that it generates power progressively—the more we draw upon it for strength, the more powerful it becomes.

Just as many of the horrors of modern warfare are the unwanted children of science and research, the modern blitzkrieg is the lineal descendant of the horseless carriage. It is therefore quite fitting that the automotive industry should thus be called upon to strain every sinew toward the production of airplanes, military vehicles and combat tanks, as well as to contribute a considerable proportion of the other necessary articles of ordnance.

The average person little realized that this is a war of horsepower. In 1918 the average infantry division was equipped with 3,300 horsepower. Today's armored division musters 400,000 horsepower.

Horsepower on wheels and wings is what the United Nations need most. It is also what the United States can produce best and fastest.

"When Adolf Hitler put his army on wheels," says General Somervell, chief of the U. S. Army Services of Supply, "he drove right down our alley."

It is estimated that the horsepower potential of internal combustion engines produced by one automotive manufacturer alone in 1941 is 100 times the 2,400,000 horsepower generated by the Grand Coulee Dam.

The cavalry no longer rides horses, but armored cars. The infantry no longer walks, but rides. In the artillery, guns, limbers and crews are hauled by trucks, not horses. And so on down the line. In addition to the cars and trucks for the transportation of personnel and material, numberless highly specialized vehicles have been designed to meet specific needs, and play minor, but significant roles in military movement.

There are, for example, the big trucks, "mobile class-rooms" used for training army officers in truck mechanics at various camps across the nation. Each truck contains various types of engines, transmissions, axle assemblies and other vital parts of motor trucks.

Another valuable development is the rolling lubratorium. Built to travel up to 50 miles an hour over hard-surfaced roads, it can perform in the field any lubricating job that can be done in the shop.

Since glasses are now worn by about 15 per cent of the men in the armed forces, the army recently produced a motorized solution to the problem of what do do when glasses are broken. It is a truck-borne optical shop which carries $20,000 worth of lenses, frames, blanks, grinders, etc. It can repair the spectacles of an army of 300,000 on the battlefield.

The first field office trailer to be used in the army was created last year. It boasts a build-in desk, work table, map board, and typewriter stand. Electric lights and telephone facilities can be had by plugging in on the service lines covering the maneuver area. It can be packed and on the move in less than five minutes when a division is suddenly forced to change its position.

A special service truck has been built to carry bombs from arsenal to plane. Rigged with derrick and windlass, it hauls a trailer loaded with bombs which weigh as much as 1,200 pounds each.

A portable laundry unit able to take care of the weekly laundry of about 1,500 soldiers has been developed by the Quartermaster Corps. Mounted on a four-wheel semi-trailer, it contains all the machinery required to do field laundering. Laundry companies to operate these units consist of 153 enlisted men and five officers. Each company has 10 units to operate, and is thus able to serve about 15,000 soldiers in the field.

Also accompanying troops into the field is a new mobile sales commissary or post exchange to sell cigarettes, candy, razor blades and about 60 other articles. Mounted on a 2½-ton truck, the unit carries a driver, four clerks and a stock of goods sufficient to supply about 8,000 men.

The army's recruiting service has also taken to wheels. Trucks and trailers—18 in number—were put into operation to reach localities where there are no established recruiting stations. From its complete equipment and information service, it can give the prospective recruit all he needs to know of the army he is about to join, its opportunities and classifications.

Of all the new and unusual vehicles which have been developed by the automotive industry to increase the effectiveness of our armed forces, the one which has completely captured the public fancy and has added

a new word to our language is the "Jeep." Technically, it is a quarter ton, 4 x 4, open bodied, four passenger, personnel carrier or towing unit.

Practically it is the pullingest vehicle for its size ever invented. The soldier's pride and the sophomores' envy.

It will pull through desert sand, wade through mud up to its axles, or literally climb the side of a mountain, as surefooted and tough and dependable as a pack mule.

The real secret of the jeep's performance is the fact that the motive power is applied through all four wheels.

All-wheel-drive, or the application of motive power to all wheels, is not new. It antedates the first World War, and our Army in France had different makes of trucks which were thus propelled and they gave a good account of themselves, though their number was relatively small and they had their faults of design and construction.

The transportation problems which confronted our army in the first World War were manifold and Mr. A. W. Herrington, chairman of the board of our company, who was a captain in the Motor Transport Corps, had ample opportunity to observe them from the seamy side. He is one of those rare, gruff personalities who combine something of the genius with bulldog tenacity and an entrepreneurial instinct. He came back from the A.E.F. with the idea that something ought to be done about it.

For ten or twelve years he worked with various truck companies and as consulting engineer with the U. S. Army and the U. S. Marine Corps.

In 1931 with Mr. Walter C. Marmon he formed the Marmon-Herrington Company. If America can rightly claim to be the Arsenal of Democracy, the Marmon-Herrington Company can well claim to be the laboratory of that arsenal.

From the inception of the company until the present time our engineers have designed, on our own responsibility, all manners and types of military vehicles which are now being produced in quantities by the mass production manufacturers. Armored cars, scout cars, aviation crash trucks, artillery tractors, balloon winches, prime movers. The prototypes of a large percentage of current American military vehicles were designed and built in the Marmon-Herrington plant.

These past years have been an interesting period with our company. America had not been preparedness minded and while the various using services have been interested in our developments, appropriations for purchases in commercial quantities have been lacking. Up until the beginning of the war, our revenue has accordingly been largely from the adaptation of these same all-wheel-drive, all-terrain vehicles to highly specialized commercial uses.

The basic precept of all of our truck engineering is all-wheel-drive. Of course we adapt the wheel and tire equipment to the type of terrain and work involved. We supply additional speeds or gear ratios to increase the available torque, but the chief secret of performance is the additional traction due to having power applied through all wheels.

Early in the company's history, Marmon-Herrington equipment made

a name for itself in hauling pipe for the Iraq Petroleum Company in the construction of the oil line from Kirkuk to Haifa and Beyrouth across the Syrian Desert. In difficult transportation problems throughout the world our equipment is cutting time and saving money. Logging in California, in the oil fields of Louisiana, Colombia or Arabia, mining in Bolivia, plowing snow in North Dakota, or fighting mosquitoes in the marshes of northern Illinois.

From the human interest side, this breadth of distribution in the commercial end of our business, as well as our dealings with most of the United Nations on military equipment, has brought a kaleidoscopic parade of interesting nationalities to our factory door.

To us as prospects, customers, inspectors, or students, have come Latin Americans, Chinese, Persians, Siamese, all manner of Europeans and Britishers from such widely scattered parts of the empire that we have had to learn to say not only tomātoes and tomätoes, but also tomătoes.

At least partly for linguistic reasons, somewhat the same sort of an interesting succession of personalities has crossed the threshold of my own home. As a result my fourteen-year-old son not only does not know a stranger, but hardly recognizes the fact that there is such a thing as a foreigner. He is an average high school student, but to watch the development of his global (to use a word of recent popularity) perspective has been interesting.

When he was three years old we had a little girl two years old next door who chattered incessantly, but no one could distinguish a word she was saying. One day Mrs. Campbell saw him talking to the little girl across the low hedge, for a long time. She wondered if he really could make anything out of what the little neighbor was saying. When he came in she asked if they had had a good visit and he said yes. Then she asked what Marylinda had to say, and he said, "I don't know, she speaks Spanish."

Our commercial export business led to nice orders for foreign military equipment. More recently we have had contracts from our own country for considerable quantities of war materials. However, we are still relatively small producers and our total amount of finished material, impressive as it is, is but a minor fraction of our government's needs.

Our big contribution to the war effort is in the ideas and pilot models which we have developed on our own initiative and delivered to the government. Our units have served for the experimental tests and as patterns for the mass producers.

One of our proudest claims to distinction is that the almost phenomenal "Jeep" is the recognizable lineal descendant of our Marmon-Herrington All-Wheel-Drive Converted Ford Pickup.

Gentlemen, I wish to thank you for this opportunity to be with you. I hope that you have enjoyed this little glimpse over our back fence as much as I have. And now just one more thought. The winning of the war and the orderly development of the peace to come lie to a large extent in the lap of you men of science.