Liberty
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THE BATTLE OF DETROIT

News!—A first-hand report to America and the world on the greatest campaign of the war

BY

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Swarms of "blitz buggies" on the production line at the Ford Rouge plant.

☆ THE Battle of the Pacific has been added to the Battle of the Atlantic. Battles are so big these days that we do not call them after harbors or capes or fields or towns, as we did in the legendary days of Trafalgar and Hampton Roads, Gettysburg and Waterloo. We call them after oceans or countries.

The Battle of France. That shook the world. The Battle of Britain. That seemed like the end of that shaken world. The Battle of Russia. Who knows how that may turn out?

But when history is written—and it *will* be written in spite of Nazi edicts against free speech, free writing, and free brains—none of these conflicts will be hailed "the greatest battle of the greatest war."

The greatest battle, because it must inevitably be the decisive battle, is the Battle of Detroit.

Detroit, as no American needs to be told, is a generic term for Flint and Lansing, Dearborn and Ypsilanti, Indianapolis and South Bend, Dayton and Toledo, Bridgeport and Hartford, San Diego and Inglewood—wherever America is arming.

And why is it the greatest battle? That's easy. What did Gort say before Dunkirk, Gort, the heroic commander of the ill-fated B. E. F.?

"Don't send me men. Send me equipment!"

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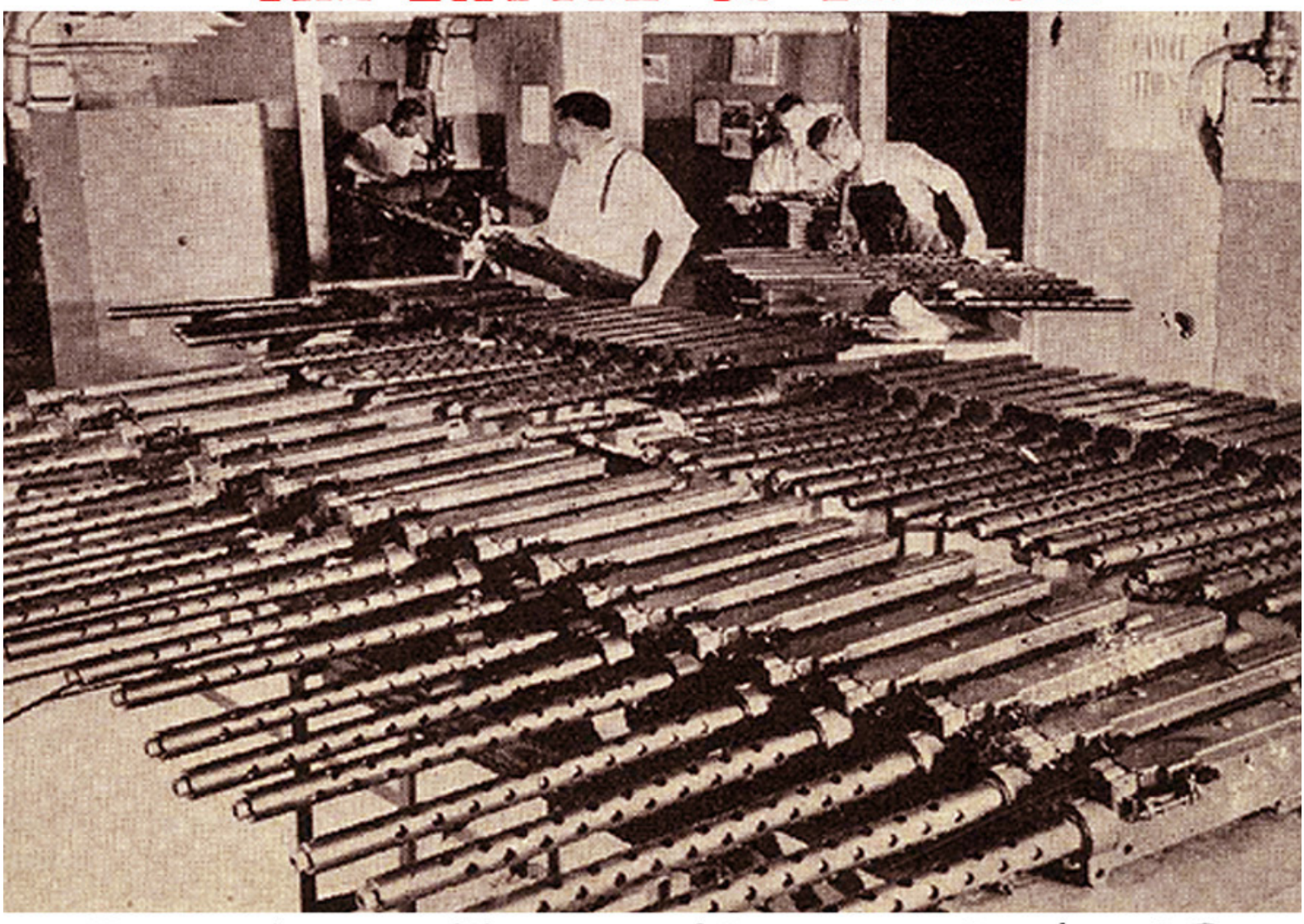

Testing .50 caliber machine guns in the AC Spark Plug Division in Flint.

What did poor little bewildered Paul Reynaud say when he appealed to the President in France's extremity?

"Send us clouds of planes."

Of course Britain didn't have the equipment to send Gort, America didn't have the clouds of planes to send Reynaud—so there was Dunkirk and there was France. But that does not alter the fact that man power on the field of battle is the least of our worries in the fight against Hitler.

In World War I, it took an average of two and a half to three men behind the lines to keep one combat soldier supplied. In World War II, the ratio is something like seventeen or eighteen to one.

Construction and production go forward together in this five-acre General Motors machine-gun at Saginaw.

This is the war of the invisible man. Thousands of Frenchmen defending the Maginot Line never saw a German soldier. All they saw were bomber planes and tanks. Men used to carry weapons; now weapons carry men.

In short, this war must be won, as we still so quaintly say, "at the lathe."

But if all this is true—and it is true—and if those in authority realize it—and they do—why has it taken so long to get that lathe to turning?

Why aren't we getting results?

Why aren't we producing clouds of planes, fleets of tanks?

Or are we?

I don't know any question more important to you, Mr. and Mrs. Reader.

You are buying guns, shells, tanks, bombers—forty to sixty billion dol-

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Willow Run, Michigan: An air view of progress in the Ford Motor Company's construction of a vast bomber plant.

lars' worth of them. You'll probably buy a hundred billion dollars' worth before long. You are entitled to know whether the defense drive is really a drive or just a putt.

To change the figure and to put the case more specifically, you are entitled to know why the defense program has been, so far, a trickle instead of a flood, and when, if ever, it is going to be a flood.

☆ ANSWERING the first part of that question first, there are many explanations, of which you have heard plenty and then some. True, too, so far as they go:

Headline-hunting senatorial Neros fiddling with syntax while freedom burned.

Brass-hat brass-hattedness—which is another phrase for mental inflexibility—taking six months to make up its mind about a problem which the average American executive would have decided before lunch.

Labor troubles. A twenty-eight-day soft-coal strike, translated into terms of lost steel production, cost the United States fourteen first-class battleships. No naval engagement in history has inflicted such devastation on a patriotic people.

Sure, all that stuff is true. At times it has been important. Perhaps it is nothing more than we should expect from a non-war-minded nation forced suddenly to get war-minded. But we are fed up with these explanations. They are, we say, Washington stuff—all wrapped up in SPABS, OEMS, OMPS, OPAS, and what have you—Washington, where not much can be done, and where, apparently, so disappointingly little is being done.

We have heard too much from Washington. We have heard too little from Detroit.

And that is why I pulled on my old World War I pants—without all those silly leather gaiters, of course—and went out as roving war correspondent to cover the American front. And I have covered it. Not all of it, of course, for it is as long as the nation is wide, but plenty.

I have seen America arming.

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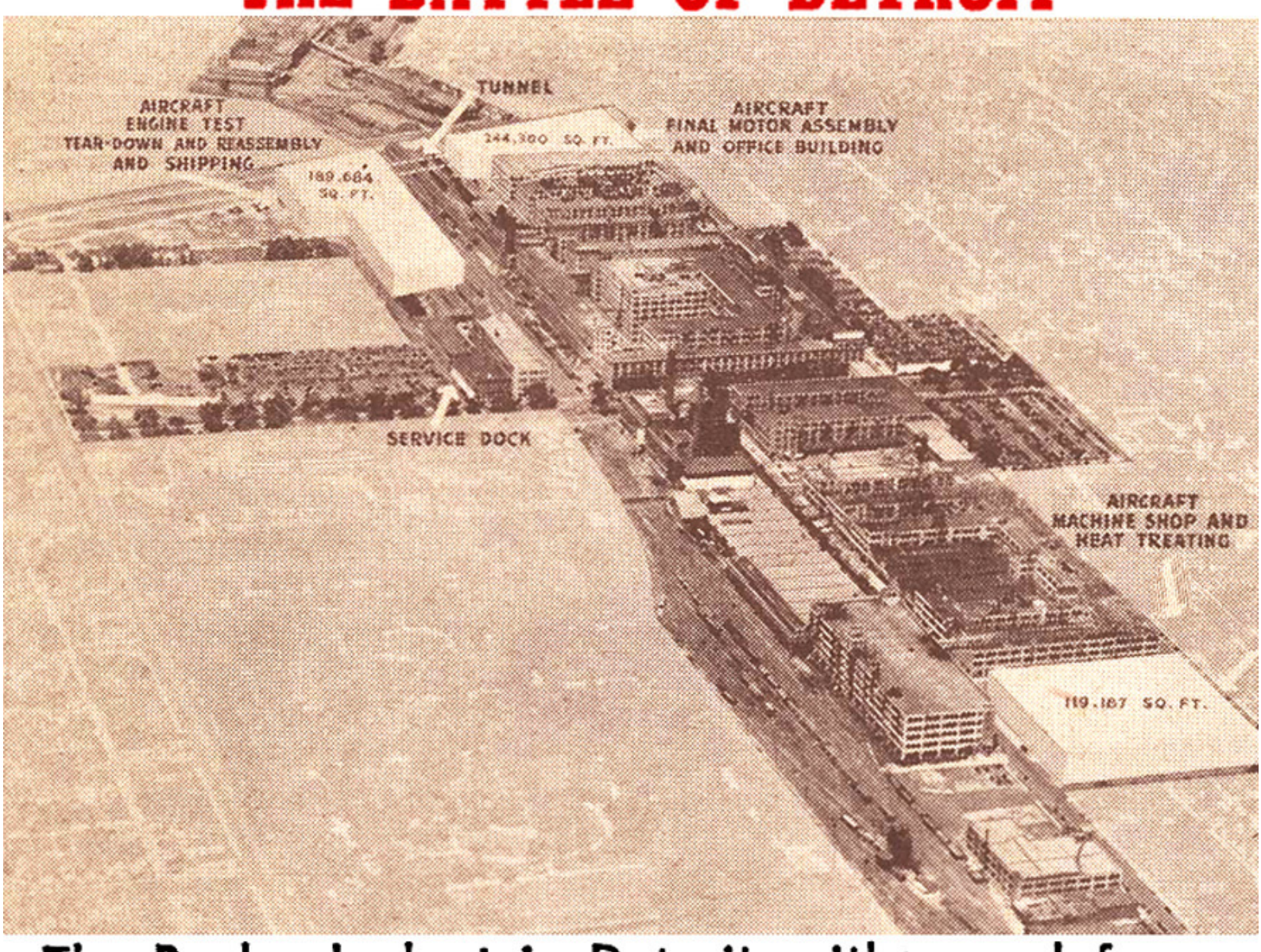


The Packard plant in Detroit, with new defense factories shown in white.

I have seen great automobile factories turning out 75-millimeter and 105-millimeter shells by mass production at a rate never dreamed of by Mars or Vulcan, Hitler or Göring; great spark-plug factories, twelve months ahead of schedule, turning out machine guns that fire faster and farther than any such gun before known.

I have seen 12,000 men—who were a few months ago unemployed preachers, barbers, farm hands, and haberdashers—working in a giant factory—which only a few months ago was a wind-swept cornfield—making 1,000 airplane engines a month for an exclusively American model which weighs less and generates more horsepower per pound than any airplane engine Hitler even dreamed about.

I have seen twenty-eight-ton tanks rolling off assembly lines the way tin Lizzies used to roll—only they are *not* tin, but tougher steel than Nazi Germany knows how to make; and the first Nazi German that runs up against them will find out they are not Lizzies—that is, he will find out if he can catch up with them, because these American tanks travel three times as fast as Hitler's fastest tank.

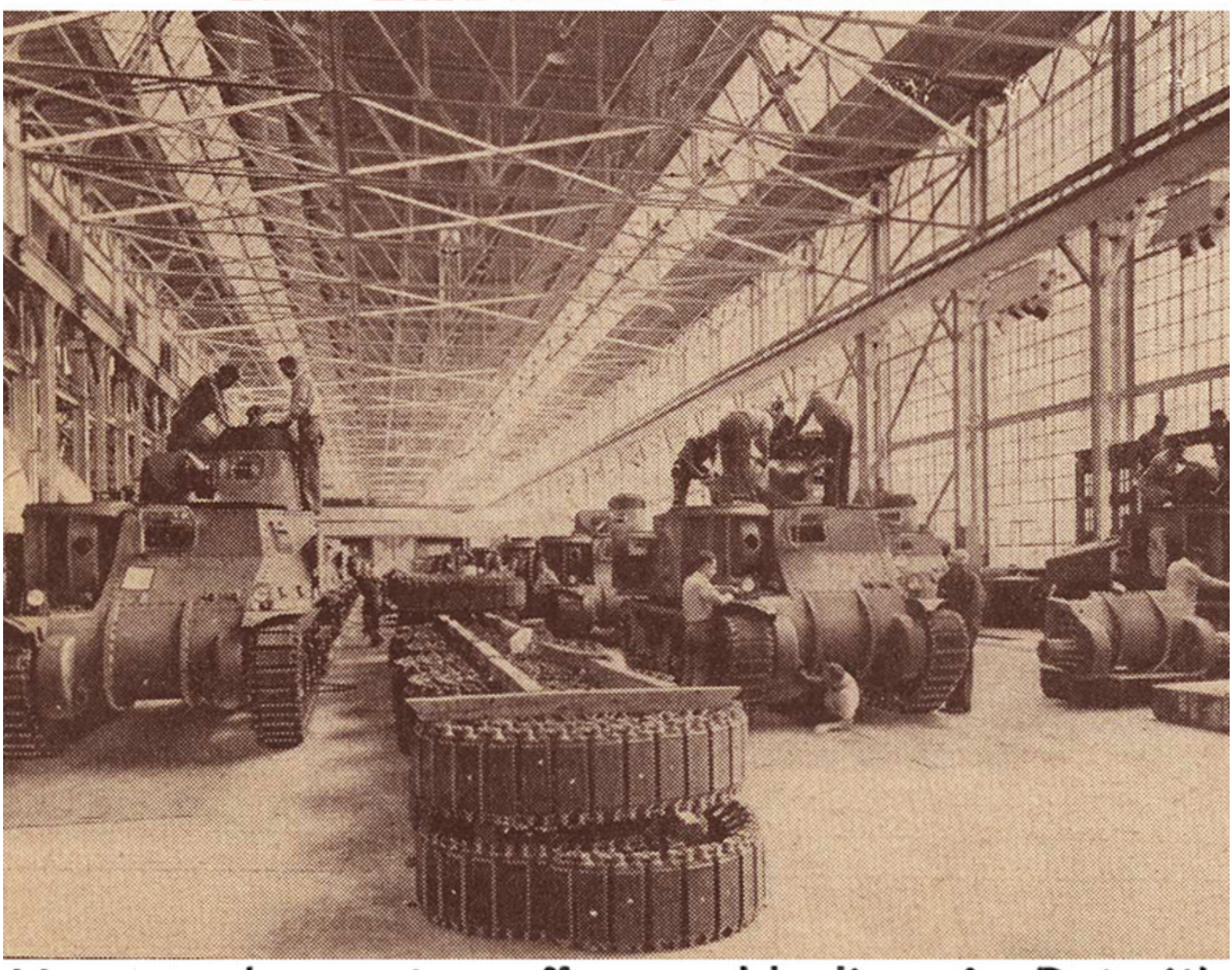
I have seen the largest bomber factory in the world rising on a thousand acres—which a few months ago was an age-old forest—into which thousands of small pieces of steel and aluminum and magnesium are now pouring, and out of which, at the far end of the world's longest assembly line, will shortly pour complete air fortresses, giant tanks of the air, which will streak down a mile-long runway and hop off for Europe.

I have seen—but what's the use? You can't put a nation's greatest effort, a world's biggest business, into a paragraph. And, besides, I can hear you saying:

"If all this is possible now, why wasn't it possible six months ago?"

☆ IT was.

Not all, but most of the defense material which is being shipped today could have been shipped in the same quantity six months ago. Guns, for



Huge tanks coming off assembly lines in Detroit's Chrysler tank arsenal.

example, could have been made on the old-fashioned small-production basis, using machinery already in possession of the government, some of it twenty-five years old, some of it seventy years old.

By sticking to these methods, playing safe, and dodging criticism, defense industries could have gotten about as far as they have gotten—in actual production, I mean—and gotten there a whole lot sooner. But that is as far as they could have gotten, substantially as far as they ever would get, by such outdated procedure—and that wouldn't be far enough to lick Hitler or even annoy him.

To adopt such a course would have been to admit at the start that we could not hope to match the speed of Nazi production, to say nothing of topping it. And that admission, as we have seen, would be fatal. For victory in this war, to paraphrase the remarks of a famous American general, goes to the side that has the "mostest" equipment and gets there "fustest."

One of our greatest American motor makers, now involuntarily turned munitions maker, sums it up more grammatically in a sentence: "It is a race in tonnage 'produced' and tonnage 'delivered' on the heads of the enemy."

Obviously it would be impossible to win that race by employing production methods which the enemy had himself long since abandoned!

The alternative—which the men who are fighting the Battle of Detroit courageously took, although they knew full well that it would subject them in the beginning to harshest criticism—was to go about the laborious business of designing tools, manufacturing machinery, and constructing plants which would ultimately put the manufacture of guns and shells and tanks and bombers on the same mass-production basis on which the manufacture of automobiles has been these many years.

☆ THAT took time.

As one motor maker put it:

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"The heart of mass production is co-ordination and exactness, reaching back through a thousand preparatory steps. Even though the automobile industry has over four decades of experience in making annual model changes, a full year's intensive work is essential between the development of new designs and the production of new models."

And these aren't just new models of automobiles that are now pouring off America's assembly lines. They aren't merely alteration of existing things. They are new things, in many cases things the present makers never saw before, and, until a few months ago, couldn't have called by name, let alone build and train others to build.

"More than 70 per cent of the $1,200,000,000 in defense obligations assumed or under negotiation by General Motors," said Chairman Alfred P. Sloan, Jr., "are for products other than those normally manufactured by the corporation's divisions, and only about 10 per cent are within the normal area of the automotive industry. To produce these highly specialized types of defense materials requires, of course, special facilities, including specifically designed machines and tools and in many instances completely new plants. In this connection, General Motors has under construction or already completed fourteen such new plants, as well as thirteen important plant expansions. In addition, twenty-six existing buildings have been re-equipped with machinery for defense production."

When Packard took on the big job of producing 9,000 Rolls-Royce liquid-cooled engines, it was found that only 3 per cent of its regular automotive equipment could be adapted and re-tooled to make aircraft engines. Consequently Packard was forced to order more than 3,000 new tools and to wait for these and for the manufacture of other equipment before starting actual production.

This was only half the Packard problem. Seventeen thousand workers had to be recruited and trained to operate the new machines. In fact, here and everywhere throughout the defense effort the training of the seventeen or eighteen industrial soldiers needed to keep one combat soldier in action has been the biggest problem the new munitions makers have had.

Take the AC spark-plug factory in Flint: The day before the management was told that henceforth they would be machine-gun manufacturers, only two men in the entire plant had ever seen a machine gun closer than a Warner Brothers movie. AC, therefore, had to begin its training system from scratch, with a nucleus of eight experienced foremen from its regular

staff, who undertook to learn, and did learn, how to make the guns themselves. Then each of these eight took on ten other candidates for foremen's jobs and taught them what they had just learned. In this way a staff of some eighty foremen and assistant foremen was assembled.

The next step was to obtain from the Flint public schools—which had meantime set up two shifts of night courses in machine-shop work—partially trained boys and young men who could be developed into operators capable of running such machines as require a considerable amount of manual skill. Having built strongly from the top down, the AC people then took on unskilled laborers, about 40 per cent of them girls, who could be taught a few simple movements of routine production work. By this painstaking method, together with many revolutionary improvements worked out by its engineers, AC was able to go into production one year before the date it had promised and is still one year ahead of schedule.

I have talked with these men—the bosses, the foremen, the men on the assembly line—not just in Flint but all around the circuit, and I have to report that the spirit, without which these miracles would not be possible, is uniformly fine. Especially is this true of the men who have entered defense service from other lines of work. Here are three typical expressions gathered, as it happens, from the Olds Forge plant in Lansing:

"I ran a grocery store in Diamondale. Still got an interest in it, as a matter of fact. But here I've learned to run a machine which notches the end of the shell, and believe me it's mighty important, 'cause that's where the cap is fastened on. I can tell you there's much less grief in this job than in running a grocery store!"

"I'm twenty-nine and I've got three kids. I drove a cab in Lansing for nearly five years and I used to work twelve hours a day and six days a week doing it. I've learned to operate a vertical lathe on this job. I like it swell and I haven't missed a day yet."

"I was a barber for thirteen years and ran a tailor shop on the side. In the three months I've been here I've learned to run this hydraulic-press banding machine. And I've sure found out that the saying 'as fine as a hair' doesn't mean a thing compared with the measurements we've got to keep to on these shells. This beats barbering and tailoring all out!"

No matter how good the spirit, however, no matter how resourceful the management, and no matter how ingenious the engineering, we must not lose sight of the fact that these defense workers, from top to bottom, are doing new jobs about which most

of them had never even heard twelve months ago. They must be given time to master those jobs.

In other words, machine guns aren't spark plugs, bombers aren't automobiles. Tools that will make one won't make the other. New tools must be designed, new machines manufactured, new processes evolved. Most important of all, men must be trained to new jobs. All this is necessary before mass production on a super-Hitler basis is begun.

Perhaps you know all this. But I didn't—until I went out where the work begins—and I think there are a lot of other good American citizens just as dumb as I was about these things. They should be told. They are counting on the Battle of Detroit as a main line of defense in today's war. They should know.

I put this phase of the matter up to one of the big generals on the Detroit front, a top production man, and this is what he said:

"There is a lack of national understanding (and it exists in fairly high places) of what it takes to bridge the difference between material 'on order' and material 'on hand.' There are weeks', months', often many months', difference between the two. With the exception of military trucks, all defense material differs radically, more or less—mostly more—from the materials used currently in mass production. These materials for defense are more highly stressed and must be much more accurately made. Broadly speaking, they have not been designed with mass production in view at all."

President C. E. Wilson of General Motors backed up that statement with a graphic example when he pointed out that the cost of automobiles at wholesale is less than twenty-five cents a pound, whereas the cost of airplanes and aviation engines is five to ten dollars a pound.

"Generally speaking," continued my production man, "the public thinks there is little difference between an automobile engine and an aircraft engine, and this is not difficult to understand. They are both gasoline engines, aren't they? If you are set up to build large quantities of the automobile engine, you should be able to switch to quantity production of the airplane engine immediately. Well, both are engines, both use gasoline, both are four-cycle; but when this has been said you are well on the way to exhausting the points of similarity."

As a matter of fact, if an aviation engine were to be made of the same materials and in the same manner as an automobile engine, it would weigh more than the whole airplane!

I emphasize this matter of the difference between an automobile engine and an aviation engine, because so

many really intelligent people still cling to the notion that planes are driven by the same kinds of mechanism that automobiles are, and should be turned out by the same machinery and at the same rate.

Well enough meaning labor leaders, who rush into print with statements that the defense program has lagged because all machines in automobile factories aren't working full time, suffer from this delusion. Regulation automobile machines are idle half the time, it is true, but that is because the government, in the interest of preserving necessary materials for national defense, has cut down the production of automobiles by approximately 50 per cent.

If there is *one* idle machine in the automobile industry that *can* make defense material and *isn't*, finder will please notify Messrs. Ford, Keller, Sloan, *et al.*, and receive reward!

No, defense is not a part-time, by-product, warmed-over job. It is brand new: something Americans didn't know anything about, weren't prepared to do, had to learn, like a trade.

And it isn't as if there was just one new trade to be learned.

General Motors, for example, is working on several hundred different war products in sixty plants scattered over thirty-five cities. I won't burden you with the list, but if I were to do so, you would see at once that getting ready to deliver on these new and widely different products is like starting new businesses, very complicated businesses, much bigger businesses than even the automobile industry has ever envisaged.

It's big business—the biggest ever attempted in the history of man.

And in addition to all the special factors we have enumerated, which make it necessary for defense industries to go slow at first in order to be able to go fast later, there is the usual tedious period which precedes any major change in mass production. This period is known in the automobile business as "tooling up."

Moreover, this tooling-up process is not confined to the big concerns with which the government has contracted for mass production. No automobile manufacturer, not even Mr. Ford, makes all the parts which enter into the finished automobile. General Motors, for example, does business with some 10,000 "suppliers" scattered all over the country, on whom they know they can rely for special skills in the making of certain parts. For example, one item that a big company requires consists of 125 parts, 122 of which are made outside the company's own plants.

So the process of alteration and replacement and training which we have seen going on in the big plants on a

large scale must also occur in these hundreds of small plants—and is occurring, but with much travail, because it is harder for the little fellow, with fewer engineering and management resources, to change over.

Several times in these paragraphs we have had occasion to mention machine tools, a subject with which most of us are very little familiar. We all know about the assembly lines, the finished product, but we have given little thought to how the pieces of metal which are fitted on the assembly into their proper places get the way they are: cut, drilled, bored, ground, made to fit. That is the work of the machine tools.

Now, in switching from peacetime work to wartime work, the making of every machine tool becomes a custom job, and a big one, too. Don't be misled by the word "tool." The ones I am referring to are no hammers or

How the "change-minded" adaptability of America's automobile manufacturers works miracles in the mass production of shells and machine guns, Mr. Collins will show you next week!

screw drivers. A riveter with a squeezing pressure of 100,000 pounds to the square inch is a tool, and it may weigh at least four tons.

Before manufacture on these giants can begin, reams of blueprint paper must be consumed by designers and engineers. Did I say reams? The story in Detroit is that it took 186 pounds of blueprints to produce the first American tank!

That may be an exaggeration, but this I know to be true: in one factory alone, 62,000 man hours of work were required to turn out 8,000 tool drawings, and another 231,000 man hours of work went into the making of these tools—jigs, fixtures, and gauges; then all this new machinery had to be installed and men taught to operate it before work on actual defense material could begin.

This, I submit, is the kind of job which requires expert treatment, and it is getting it fr... the men who are the very best of their very good kind. But not even the greatest engineering and manufacturing geniuses can eliminate altogether the element of time. As Mr. Knudsen points out, although we have the greatest doctors in the world and the finest hospitals, it still takes nine months to make a baby.

All of which is by way of answering the first question on everybody's lips: "Why has it taken so long?" Now the time has come to answer the next question: "What have we got, now that we've got it?"

That's easy. The nine months of defense gestation have passed.

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Come out with me to Detroit and see the baby!

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