

IV

NEW ARMS FOR OLD ONES

§ 1

SUCH are the landscapes and method of modern war. It is more different in its nature from war as it was waged in the nineteenth century than that was from the nature of the phalanx or the legion. The nucleus fact—when I talked to General Joffre he was very insistent upon this point—is still as ever the ordinary fighting man, but all the accessories and conditions of his personal encounter with the fighting man of the other side have been revolutionised in a quarter of a century. The fighting together in a close disciplined order, shoulder to shoulder, which has held good for thousands of years as the best and most successful fighting, has been destroyed; the idea of *breaking* infantry formation as the chief offensive operation has disappeared, the cavalry charge and the cavalry pursuit are as obsolete as the cross-bow. The modern fighting man is as individualised as a half back or a centre forward in a football team.

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Personal fighting has become "scrapping" again, an individual adventure with knife, club, bomb, revolver or bayonet. In this war we are working out things instead of thinking them out, and these enormous changes are still but imperfectly apprehended. The trained and specialised military man probably apprehends them as feebly as anyone.

This is a thing that I want to state as emphatically as possible. It is the pith of the lesson I have learnt at the front. The whole method of war has been so altered in the past five and twenty years as to make it a new and different process altogether. Much the larger part of this alteration has only become effective in the last two years. Everyone is a beginner at this new game; everyone is experimenting and learning.

The idea has been put admirably by *Punch*. That excellent picture of the old-fashioned sergeant who complains to his officer of the new recruit; "'E's all right in the trenches, Sir; 'e's all right at a scrap; but 'e won't never make a soldier," is the quintessence of everything I am saying here. And were there not the very gravest doubts about General Smuts in British military circles because he had "had no military training"? A Canadian expressed the new view very neatly on being

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asked, in consequence of a deficient salute, whether he wanted to be a soldier, by saying, "Not I! I want to be a fighter!"

The professional officer of the old dispensation was a man specialised in relation to some one of the established "arms." He was an infantryman, a cavalryman, a gunner or an engineer. It will be interesting to trace the changes that have happened to all these arms.

Before this war began speculative writers had argued that infantry drill in close formation had now no fighting value whatever, that it was no doubt extremely necessary for the handling, packing, forwarding and distribution of men, but that the ideal infantry fighter was now a highly individualised and self-reliant man put into a pit with a machine gun, and supported by a string of other men bringing him up supplies and ready to assist him in any forward rush that might be necessary.

The opening phases of the war seemed to contradict this. It did not at first suit the German game to fight on this most modern theory, and isolated individual action is uncongenial to the ordinary German temperament and opposed to the organised social tendencies of German life. To this day the Germans attack only in close order; they are unable to produce a real modern infantry for aggressive

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purposes, and it is a matter of astonishment to military minds on the English side that our hastily trained new armies should turn out to be just as good at the new fighting as the most "seasoned troops." But there is no reason whatever why they should not be. "Leading," in the sense of going ahead of the men and making them move about mechanically at the word of command, has ceased. On the British side our magnificent new subalterns and our equally magnificent new non-commissioned officers play the part of captains of football teams; they talk their men individually into an understanding of the job before them; they criticise style and performance. On the French side things have gone even farther. Every man in certain attacks has been given a large scale map of the ground over which he has to go, and has had his own individual job clearly marked and explained to him. All the Allied infantrymen tend to become specialised, as bombers, as machine-gun men, and so on. The unspecialised common soldier, the infantryman who has stood and marched and moved in ranks and ranks, the "serried lines of men," who are the main substance of every battle story for the last three thousand years, are as obsolete as the dodo. The rifle and bayonet very probably are becoming obsolete too. Knives

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and clubs and revolvers serve better in the trenches. The krees and the Roman sword would be as useful. The fine flourish of the bayonet is only possible in the rare infrequent open. Even then the Zulu assegai would serve as well.

The two operations of the infantry attack now are the rush and the "scrap." These come after the artillery preparation. Against the rush, the machine gun is pitted. The machine gun becomes lighter and more and more controllable by one man; as it does so the days of the rifle draw to a close. Against the machine gun we are now directing the "Tank," which goes ahead and puts out the machine gun as soon as it begins to sting the infantry rush. We are also using the swooping aeroplane with a machine gun. Both these devices are of British origin, and they promise very well.

After the rush and the scrap comes the organisation of the captured trench. "Digging in" completes the cycle of modern infantry fighting. You may consider this the first or the last phase of an infantry operation. It is probably at present the least worked-out part of the entire cycle. Here lies the sole German superiority; they bunch and crowd in the rush, they are inferior at the scrap, but they do dig like moles. The weakness of the British

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is their failure to settle down. They like the rush and the scrap; they press on too far, they get outflanked and lost "in the blue"; they are not naturally clever at the excavating part of the work, and they are not as yet well trained in making dug-outs and shelter-pits rapidly and intelligently. They display most of the faults that were supposed to be most distinctively French before this war came to revolutionise all our conceptions of French character.

§ 2

Now the operations of this modern infantry, which unlike any preceding infantry in the history of war does not fight in disciplined formations but as highly individualised specialists, are determined almost completely by the artillery preparation. Artillery is now the most essential instrument of war. You may still get along with rather bad infantry; you may still hold out even after the loss of the aerial ascendancy, but so soon as your guns fail you approach defeat. The backbone process of the whole art of war is the manufacture in overwhelming quantities, the carriage and delivery of shell upon the vulnerable points of the enemy's positions. That is, so to speak, the essential blow. Even the infantryman is now hardly

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more than the residuary legatee after the guns have taken their toll.

I have now followed nearly every phase in the life history of a shell from the moment when it is a segment of steel bar just cut off, to the moment when it is no more than a few dispersed and rusting rags and fragments of steel—pressed upon the stray visitor to the battlefield as souvenirs. All good factories are intensely interesting places to visit, but a good munition factory is romantically satisfactory. It is as nearly free from the antagonism of employer and employed as any factory can be. The busy sheds I visited near Paris struck me as being the most living and active things in the entire war machine. Everywhere else I saw fitful activity, or men waiting. I have seen more men sitting about and standing about, more bored inactivity, during my tour than I have ever seen before in my life. Even the front line trenches seem to slumber; the Angel of Death drowns over them, and moves in his sleep to crush out men's lives. The gunfire has an indolent intermittence. But the munition factories grind on night and day, grinding against the factories in Central Europe, grinding out the slow and costly and necessary victory that should end aggressive warfare in the world for ever.

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It would be very interesting if one could arrange a meeting between any typical Allied munition maker on the one hand, and the Kaiser and Hindenburg, those two dominant effigies in the German nationalists' dream of "world might." Or failing that, Mr. Dyson might draw the encounter. You imagine these two heroic figures got up for the interview, very magnificent in shining helms and flowing cloaks, decorations, splendid swords, spurs. "Here," one would say, "is the power that has held you. You were bolstered up very loyally by the Krupp firm and so forth, you piled up shell, guns, war material, you hoped to snatch your victory before the industrialism and invention of the world could turn upon you. But you failed. You were not rapid enough. The battle of the Marne was your misfortune. And Ypres. You lost some chances at Ypres. Two can play at destructive industrialism, and now we out-gun you. We are piling up munitions now faster than you. The essentials of this Game of the War Lord are idiotically simple, but it was not of our choosing. It is now merely a question of months before you make your inevitable admission. This is no war to any great commander's glory. This gentleman in the bowler hat is the victor, Sire; not you. Assisted, Sire,

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by these disrespectful-looking factory girls in overalls."

For example, there is M. Citroen. Before the war I understand he made automobiles; after the war he wants to turn to and make automobiles again. For the duration of the war he makes shell. He has been temporarily diverted from constructive to destructive industrialism. He did me the honours of his factory. He is a compact, active man in dark clothes and a bowler hat, with a pencil and notebook conveniently at hand. He talked to me in carefully easy French, and watched my face with an intelligent eye through his pince-nez for the signs of comprehension. Then he went on to the next point.

He took me through every stage of his process. In his office he showed me the general story. Here were photographs of certain vacant fields and old sheds—"this place"—he indicated the altered prospect from the window—"at the outbreak of the war." He showed me a plan of the first undertaking. "Now we have rather over nine thousand workpeople."

He showed me a little row of specimens. "These we make for Italy. These go to Russia. These are the Rumanian pattern."

Thence to the first stage, the chopping up of the iron bars, the furnace, the punching out

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of the first shape of the shell ; all this is men's work. I had seen this sort of thing before in peace ironworks, but I saw it again with the same astonishment, the absolute precision of movement on the part of the half-naked sweating men, the calculated efficiency of each worker, the apparent heedlessness, the real certitude, with which the blazing hot cylinder is put here, dropped there, rolls to its next appointed spot, is chopped up and handed on, the swift passage to the cooling crude, pinkish-purple shell shape. Down a long line one sees in perspective a practical symmetry, of furnace and machine group and the shells marching on from this first series of phases to undergo the long succession of operations, machine after machine, across the great width of the shed in which eighty per cent. of the workers are women. There is a thick dust of sounds in the air, a rumble of shafting, sudden thuddings, clankings, and M. Citroen has to raise his voice. He points out where he has made little changes in procedure, cut out some wasteful movement. . . . He has an idea and makes a note in the ever-ready notebook.

There is beauty about all these women, there is extraordinary grace in their finely adjusted movements. I have come from an after-lunch coffee upon the boulevards and

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from watching the ugly fashion of our time; it is a relief to be reminded that most women can after all be beautiful—if only they would not “dress.” These women wear simple overalls and caps. In the cap is a rosette. Each shed has its own colour of rosette.

“There is much esprit de corps here,” says M. Citroen.

“And also,” he adds, showing obverse as well as reverse of the world’s problem of employment and discipline, “we can see at once if a woman is not in her proper shed.”

Across the great sheds under the shafting—how fine it must look at night!—the shells march, are shaped, cut, fitted with copper bands, calibrated, polished, varnished. . . .

Then we go on to another system of machines in which lead is reduced to plastic ribbons and cut into shrapnel bullets as the sweetstuff makers pull out and cut up sweetstuff. And thence into a warren of hot underground passages in which run the power cables. There is not a cable in the place that is not immediately accessible to the electricians. We visit the dynamos and a vast organisation of switchboards. . . .

These things are more familiar to M. Citroen than they are to me. He wants me to understand, but he does not realise that I would like

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a little leisure to wonder. What is interesting him just now, because it is the newest thing, is his method of paying his workers. He lifts a hand very gravely: "I said, what we must do is to abolish altogether the counting of change."

At a certain hour, he explained, came pay-time. The people had done; it was to his interest and theirs that they should get out of the works as quickly as possible and rest and amuse themselves. He watched them standing in queues at the wickets while inside someone counted; so many francs, so many centimes. It bored him to see this useless, tiresome waiting. It is abolished. Now at the end of each week the worker goes to a window under the initial of his name, and is handed a card on which these items have been entered:

Balance from last week.

So many hours at so much.

Premiums.

The total is so many francs, so many centimes. This is divided into the nearest round number, 100, 120, 80 francs as the case may be, and a balance of the odd francs and centimes. The latter is carried forward to the next week's account. At the bottom of the card is a tear-off coupon with a stamp, coloured to indicate

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the round sum, green, let us say, for 100, blue for 130 francs. This is taken to a wicket marked 100 or 130 as the case may be, and there stands a cashier with his money in piles of 100 or 130 francs counted ready to hand; he sweeps in the coupon, sweeps out the cash. "*Next!*"

I became interested in the worker's side of this organisation. I insist on seeing the entrances, the clothes-changing places, the lavatories, and so forth of the organisation. As we go about we pass a string of electric trolleys steered by important-looking girls, and loaded with shell, finished as far as these works are concerned and on their way to the railway siding. We visit the hospital, for these works demand a medical staff. It is not only that men and women faint or fall ill, but there are accidents, burns, crushings, and the like. The war casualties begin already here, and they fall chiefly among the women. I saw a wounded woman with a bandaged face sitting very quietly in the corner.

The women here face danger, perhaps not quite such obvious danger as the women who, at the next stage in the shell's career, make and pack the explosives in their silk casing, but quite considerable risk. And they work with a real enthusiasm. They know they are fighting the Boches as well as any men. Cer-

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tain of them wear Russian decorations. The women of this particular factory have been thanked by the Tsar, and a number of decorations were sent by him for distribution among them.

§ 3

The shell factory and the explosives shed stand level with the drill yard as the real first stage in one of the two essential *punches* in modern war. When one meets the shell again it is being unloaded from the railway truck into an ammunition dump. And here the work of control is much more the work of a good traffic manager than of the old-fashioned soldier.

The dump I best remember I visited on a wet and windy day. Over a great space of ground the sidings of the rail-head spread, the normal gauge rail-head spread out like a fan and interdigitated with the narrow gauge lines that go up practically to the guns. And also at the sides camions were loading, and an officer from the Midi in charge of one of these was being dramatically indignant at five minutes' delay. Between these two sets of lines, shells were piled of all sizes, I should think some hundreds of thousands of shells altogether, wet and shining in the rain. French reservists,

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soldiers from Madagascar, and some Senegalese were busy at different points loading and unloading the precious freights. A little way from me were despondent-looking German prisoners handling timber. All this dump was no more than an eddy as it were in the path of the shell from its birth from the steel bars near Paris to the accomplishment of its destiny in the destruction or capture of more Germans.

And next the visitor meets the shell coming up upon a little trolley to the gun. He sees the gunners, as drilled and precise as the men he saw at the forges, swing out the breech block and run the shell, which has met and combined with its detonators and various other industrial products since it left the main dump, into the gun. The breech closes like a safe door, and hides the shell from the visitor. It is "good-bye." He receives exaggerated warnings of the danger to his ears, stuffs his fingers into them and opens his mouth as instructed, hears a loud but by no means deafening report, and sees a spit of flame near the breech. Regulations of a severe character prevent his watching from an aeroplane the delivery of the goods upon the customers opposite.

I have already described the method of locating enemy guns and so forth by photography. Many of the men at this work are

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like dentists rather than soldiers; they are busy in carefully lit rooms, they wear white overalls, they have clean hands and laboratory manners. The only really romantic figure in the whole of this process, the only figure that has anything of the old soldierly swagger about him still, is the aviator. And, as one friend remarked to me when I visited the work of the British flying corps, "The real essential strength of this arm is the organisation of its repairs. Here is one of the repair vans through which our machine guns go. It is a motor workshop on wheels. But at any time all this park, everything, can pack up and move forward like Barnum and Bailey's Circus. The machine guns come through this shop in rotation; they go out again, cleaned, repaired, made new again. Since we got that working we have heard nothing of a machine gun jamming in any air fight at all." . . .

The rest of the career of the shell after it has left the gun one must imagine chiefly from the incoming shell from the enemy. You see suddenly a flying up of earth and stones and anything else that is movable in the neighbourhood of the shell-burst, the instantaneous unfolding of a dark cloud of dust and reddish smoke, which comes very quickly to a certain size and then begins slowly to fray out and

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blow away. Then after seeing the cloud of the burst you hear the hiss of the shell's approach, and finally you are hit by the sound of the explosion. This is the climax and end of the life history of any shell that is not a dud shell. Afterwards the battered fuse may serve as some journalist's paper-weight. The rest is scrap iron.

Such is, so to speak, the primary process of modern warfare. I will not draw the obvious pacifist moral of the intense folly of human concentration upon such a process. The Germans willed it. We Allies have but obeyed the German will for warfare because we could not do otherwise, we have taken up this simple game of shell delivery, and we are teaching them that we can play it better, in the hope that so we and the world may be freed from the German will-to-power and all its humiliating and disgusting consequences henceforth for ever. Europe now is no more than a household engaged in holding up and if possible overpowering a monomaniac member.

§ 4

Now the whole of this process of the making and delivery of a shell, which is the main process of modern warfare, is one that can be far

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better conducted by a man accustomed to industrial organisation or transit work than by the old type of soldier.] This is a thing that cannot be too plainly stated or too often repeated. Germany nearly won this war because of her tremendously modern industrial resources; but she blundered into it and she is losing it because she has too many men in military uniform and because their tradition and interests were too powerful with her. All the state and glories of soldiering, the bright uniforms, the feathers and spurs, the flags, the march-past, the disciplined massed advance, the charge; all these are as needless and obsolete now in war as the masks and shields of an old-time Chinese brave. Liberal-minded people talk of the coming dangers of militarism in the face of events that prove conclusively that professional militarism is already as dead as Julius Cæsar. What is coming is not so much the conversion of men into soldiers as the socialisation of the economic organisation of the country with a view to both national and international necessities. We do not want to turn a chemist or a photographer into a little figure like a lead soldier, moving mechanically at the word of command, but we do want to make his chemistry or photography swiftly available if the national organisation is called upon to fight.

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We have discovered that the modern economic organisation is in itself a fighting machine. It is so much so that it is capable of taking on and defeating quite easily any merely warrior people that is so rash as to pit itself against it. Within the last sixteen years methods of fighting have been elaborated that have made war an absolutely hopeless adventure for any barbaric or non-industrialised people. In the rush of larger events few people have realised the significance of the rapid squashing of the Senussi in western Egypt, and the collapse of De Wet's rebellion in South Africa. Both these struggles would have been long, tedious and uncertain even in A.D. 1900. This time they have been, so to speak, child's play.

Occasionally into the writer's study there come to hand drifting fragments of the American literature upon the question of "preparedness," and American papers discussing the Mexican situation. In none of these is there evident any very clear realisation of the fundamental revolution that has occurred in military methods during the last two years. It looks as if a Mexican war, for example, was thought of as an affair of rather imperfectly trained young men with rifles and horses and old-fashioned things like that. A Mexican war on that level might be as tedious as the South

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African war. But if the United States preferred to go into Mexican affairs with what I may perhaps call a 1916 autumn outfit instead of the small 1900 outfit she seems to possess at present, there is no reason why America should not clear up any and every Mexican guerilla force she wanted to in a few weeks.

To do that she would need a plant of a few hundred aeroplanes, for the most part armed with machine guns, and the motor repair vans and so forth needed to go with the aeroplanes; she would need a comparatively small army of infantry armed with machine guns, with motor transport, and a few small land iron-clads. Such a force could locate, overtake, destroy and disperse any possible force that a country in the present industrial condition of Mexico could put into the field. No sort of entrenchment or fortification possible in Mexico could stand against it. It could go from one end of the country to the other without serious loss, and hunt down and capture anyone it wished. . . .

The practical political consequence of the present development of warfare, of the complete revolution in the conditions of warfare since this century began, is to make war absolutely hopeless for any peoples not able either to manufacture or procure the very complicated

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appliances and munitions now needed for its prosecution. Countries like Mexico, Bulgaria, Serbia, Afghanistan or Abyssinia are no more capable of going to war without the connivance and help of manufacturing states than horses are capable of flying. And this makes possible such a complete control of war by the few great states which are at the necessary level of industrial development as not the most Utopian of us have hitherto dared to imagine.

§ 5

Infantrymen with automobile transport, plentiful machine guns, Tanks and such-like accessories; that is the first Arm in modern war. The factory hand and all the material of the shell route from the factory to the gun constitute the second Arm. Thirdly comes the artillery, the guns and the photographic aeroplanes working with the guns. Next I suppose we must count sappers and miners as a fourth Arm of greatly increased importance. The fifth and last combatant Arm is the modern substitute for cavalry; and that also is essentially a force of aeroplanes supported by automobiles. Several of the French leaders with whom I talked seemed to be convinced that the horse is absolutely done with in modern warfare.

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There is nothing, they declared, that cavalry ever did that cannot now be done better by aeroplane.

This is something to break the hearts of the Prussian junkers and of old-fashioned British army people. The hunt across the English countryside, the preservation of the fox as a sacred animal, the race meeting, the stimulation of betting in all classes of the public; all these things depend ultimately upon the proposition that the "breed of horses" is of vital importance to the military strength of Great Britain. But if the arguments of these able French soldiers are sound, the cult of the horse ceases to be of any more value to England than the elegant activities of the Toxophilite Society. Moreover, there has been a colossal buying of horses for the British army, a tremendous organisation for the purchase and supply of fodder, then employment of tens of thousands of men as grooms, minders and the like, who would otherwise have been in the munition factories or the trenches.

To what possible use can cavalry be put? Can it be used in attack? Not against trenches; that is better done by infantrymen following up gunfire. Can it be used against broken infantry in the open? Not if the enemy has one or two machine guns cover-

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ing their retreat. Against exposed infantry the swooping aeroplane with a machine gun is far more deadly and more difficult to hit. Behind it your infantry can follow to receive surrenders ; in most circumstances they can come up on cycles if it is a case of getting up quickly across a wide space. Similarly for pursuit the use of wire and use of the machine gun have abolished the possibility of a pouring cavalry charge. The swooping aeroplane does everything that cavalry can do in the way of disorganising the enemy, and far more than it can do in the way of silencing machine guns. It can capture guns in retreat much more easily by bombing traction engines and coming down low and shooting horses and men. An ideal modern pursuit would be an advance of guns, automobiles full of infantry, motor cyclists and cyclists, behind a high screen of observation aeroplanes and a low screen of bombing and fighting aeroplanes. Cavalry *might* advance across fields and so forth, but only as a very accessory part of the general advance. . . .

And what else is there for the cavalry to do ?

It may be argued that horses can go over country that is impossible for automobiles. That is to ignore altogether what has been done in this war by such devices as caterpillar wheels.

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So far from cavalry being able to negotiate country where machines would stick and fail, mechanism can now ride over places where any horse would flounder.

I submit these considerations to the horse-lover. They are not my original observations ; they have been put to me and they have convinced me. Except perhaps as a parent of transport mules I see no further part henceforth for the horse to play in war.

§ 6

The form and texture of the coming warfare—if there is still warfare to come—are not yet to be seen in their completeness upon the modern battlefield. One swallow does not make a summer, nor a handful of aeroplanes, a “ Tank ” or so, a few acres of shell craters, and a village here and there, pounded out of recognition, do more than foreshadow the spectacle of modernised war on land. War by these developments has become the monopoly of the five great industrial powers ; it is their alternative to end or evolve it, and if they continue to disagree, then it must needs become a spectacle of majestic horror such as no man can yet conceive. It has been wise of Mr. Pennell therefore, who has recently been drawing his

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impressions of the war upon stone, to make his pictures not upon the battlefield, but among the huge industrial apparatus that is thrusting behind and thrusting up through the war of the gentlemen in spurs. He gives us the splendours and immensities of forge and gun pit, furnace and mine shaft. He shows you how great they are and how terrible. Among them go the little figures of men, robbed of all dominance, robbed of all individual quality. He leaves it for you to draw the obvious conclusion that presently, if we cannot contrive to put an end to war, blacknesses like these, enormities and flares and towering threats, will follow in the track of the Tanks and come trampling over the bickering confusion of mankind.

There is something very striking in these insignificant and incidental men that Mr. Pennell shows us. Nowhere does a man dominate in all these wonderful pictures. You may argue perhaps that that is untrue to the essential realities; all this array of machine and workshop, all this marshalled power and purpose, has been the creation of inventor and business organiser. But are we not a little too free with that word "*creation*"? Falstaff was a "*creation*" perhaps, or the Sistine sibyls; there we have indubitably an end conceived and sought and achieved; but did these inventors

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and business organisers do more than heed certain unavoidable imperatives? Seeking coal they were obliged to mine in a certain way; seeking steel they had to do this and this and not that and that; seeking profit they had to obey the imperative of economy. So little did they plan their ends that most of these manufacturers speak with a kind of astonishment of the deadly use to which their works are put. They find themselves making the new war as a man might wake out of some drugged condition to find himself strangling his mother.

So that Mr. Pennell's sketchy and transient human figures seem altogether right to me. He sees these forges, workshops, cranes and the like, as inhuman and as wonderful as cliffs or great caves or icebergs or the stars. They are a new aspect of the logic of physical necessity that made all these older things, and he seizes upon the majesty and beauty of their dimensions with an entire impartiality. And they are as impartial. Through all these lithographs runs one present motif, the motif of the supreme effort of western civilisation to save itself and the world from the dominance of the reactionary German Imperialism that has seized the weapons and resources of modern science. The pictures are arranged to shape out the life of a shell, from the mine to the great gun;

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nothing remains of their history to show except the ammunition dump, the gun in action and the shell-burst. Upon this theme all these great appearances are strung to-day. But to-morrow they may be strung upon some other and nobler purpose. These gigantic beings of which the engineer is the master and slave, are neither benevolent nor malignant. To-day they produce destruction, they are the slaves of the spur; to-morrow we hope they will bridge and carry and house and help again.

For that peace we struggle against the dull inflexibility of the German Will-to-Power.

V

TANKS

§ 1

It is the British who have produced the "land ironclad" since I returned from France, and used it apparently with very good effect. I felt no little chagrin at not seeing them there, because I have a peculiar interest in these contrivances. It would be more than human not to claim a little in this matter. I described one in a story in *The Strand Magazine* in 1903, and my story could stand in parallel columns beside the first account of these monsters in action given by Mr. Beach Thomas or Mr. Philip Gibbs. My friend M. Joseph Reinach has successfully passed off long extracts from my story as descriptions of the Tanks upon British officers who had just seen them. The filiation was indeed quite traceable. They were my grandchildren—I felt a little like King Lear when first I read about them. Yet let me state at once that I was certainly not their prime originator. I took up an idea, manipu-

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lated it slightly, and handed it on. The idea was suggested to me by the contrivances of a certain Mr. Diplock, whose "ped-rail" notion, the notion of a wheel that was something more than a wheel, a wheel that would take locomotives up hill-sides and over ploughed fields, was public property nearly twenty years ago. Possibly there were others before Diplock. To the Ped-rail also Commander Murray Sueter, one of the many experimentalists upon the early tanks, admits his indebtedness, and it would seem that Mr. Diplock was actually concerned in the earlier stage of the tanks.

Since my return I have been able to see the Tank at home, through the courtesy of the Ministry of Munitions. They have progressed far beyond any recognisable resemblance to the initiatives of Mr. Diplock; they have approximated rather to the American caterpillar. As I suspected when first I heard of these devices, the War Office and the old army people had practically nothing to do with their development. They took to it very reluctantly—as they have taken to every novelty in this war. One brilliant general scrawled over an early proposal the entirely characteristic comment that it was a pity the inventor could not use his imagination to better purpose. (That foolish British trick of sneering at "imagination" has

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cost us hundreds of thousands of useless casualties, and may yet lose us the war.) Tanks were first mooted at the front about a year and a half ago; Mr. Winston Churchill was then asking questions about their practicability; he filled many simple souls with terror; they thought him a most dangerous lunatic. The actual making of the Tanks arose as an irregular side development of the armoured-car branch of the Royal Naval Air Service work. The names most closely associated with the work are (I quote a reply of Dr. Macnamara's in the House of Commons) Mr. d'Eyncourt, the Director of Naval Construction, Mr. W. O. Tritton, Lieut. Wilson, R.N.A.S., Mr. Bussell, Lieut. Stern, R.N.A.S., who is now Colonel Stern, Captain Symes, and Mr. F. Skeens. There are many other claims too numerous to mention in detail.

But however much the Tanks may disconcert the gallant Colonel Newcomes who throw an air of restraint over our victorious front, there can be no doubt that they are an important as well as a novel development of the modern offensive. Of course neither the Tanks nor their very obvious next developments are going to wrest the decisive pre-eminence from the aeroplane. The aeroplane remains now more than ever the instrument of victory upon

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the western front. Aerial ascendancy, properly utilised, is victory. But the mobile armoured big gun and the Tank as a machine-gun silencer must enormously facilitate an advance against the blinded enemy. Neither of them can advance against properly aimed big gun fire. That has to be disposed of before they make their entrance. It remains the function of the aeroplane to locate the hostile big guns and to direct the *tir de démolition* upon them before the advance begins—possibly even to bomb them out. But hitherto, after the destruction or driving back of the defender's big guns has been effected, the dug-out and machine gun have still inflicted heavy losses upon the advancing infantry until the fight is won. So soon as the big guns are out, the tanks will advance, destroying machine guns, completing the destruction of the wire, and holding prisoners immobile. Then the infantry will follow to gather in the sheaves. Multitudinously produced and—I write it with a defiant eye on Colonel Newcome—*properly handled*, these land ironclads are going to do very great things in shortening the war, in pursuit, in breaking up the retreating enemy. Given the air ascendancy, and I am utterly unable to imagine any way of conclusively stopping or even greatly delaying an offensive thus equipped.

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§ 2

The young of even the most horrible beasts have something piquant and engaging about them, and so I suppose it is in the way of things that the land ironclad which opens a new and more dreadful and destructive phase in the human folly of warfare, should appear first as if it were a joke. Never has any such thing so completely masked its wickedness under an appearance of genial silliness. The Tank is a creature to which one naturally flings a pet name; the five or six I was shown wandering, rooting and climbing over obstacles, round a large field near X, were as amusing and disarming as a litter of lively young pigs.

At first the War Office prevented the publication of any pictures or descriptions of these contrivances except abroad; then abruptly the embargo was relaxed, and the press was flooded with photographs. The reader will be familiar now with their appearance. They resemble large slugs with an underside a little like the flattened rockers of a rocking-horse, slugs between 20 and 40 feet long. They are like flat-sided slugs, slugs of spirit, who raise an enquiring snout, like the snout of a dogfish, into the air. They crawl upon their bellies in a way that would be tedious to describe to the general reader

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and unnecessary to describe to the enquiring specialist. They go over the ground with the sliding speed of active snails. Behind them trail two wheels, supporting a flimsy tail, wheels that strike one as incongruous as if a monster began kangaroo and ended doll's perambulator. (These wheels annoy me.) They are not steely monsters; they are painted the drab and unassuming colours that are fashionable in modern warfare, so that the armour seems rather like the integument of a rhinoceros. At the sides of the head project armoured cheeks, and from above these stick out guns that look like stalked eyes. That is the general appearance of the contemporary tank.

It slides on the ground; the silly little wheels that so detract from the genial bestiality of its appearance dandle and bump behind it. It swings round about its axis. It comes to an obstacle, a low wall let us say, or a heap of bricks, and sets to work to climb with its snout. It rears over the obstacle, it raises its straining belly, it overhangs more and more, and at last topples forward; it sways upon the heap and then goes plunging downwards, sticking out the weak counterpoise of its wheeled tail. If it comes to a house or a tree or a wall or such-like obstruction it rams against it so as to

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bring all its weight to bear upon it—it weighs *some* tons—and then climbs over the debris. I saw it, and incredulous soldiers of experience watched it at the same time, cross trenches and wallow amazingly through muddy exaggerations of shell holes. Then I repeated the tour inside.

Again the Tank is like the slug. The slug, as every biological student knows, is unexpectedly complicated inside. The Tank is as crowded with inward parts as a battleship. It is filled with engines, guns and ammunition, and in the interstices men.

“You will smash your hat,” said Colonel Stern. “No; keep it on, or else you will smash your head.”

Only Mr. C. R. W. Nevinson could do justice to the interior of a Tank. You see a hand gripping something; you see the eyes and forehead of an engineer’s face; you perceive that an overall bluishness beyond the engine is the back of another man. “Don’t hold that,” says someone; “it is too hot. Hold on to that.” The engines roar, so loudly that I doubt whether one could hear guns without; the floor begins to slope and slopes until one seems to be at forty-five degrees or thereabouts; then the whole concern swings up and sways and slants the other way. You have

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crossed a bank. You heel sideways. Through the door which has been left open you see the little group of engineers, staff officers and naval men receding and falling away behind you. You straighten up and go up hill. You halt and begin to rotate. Through the open door, the green field, with its red walls, rows of workshops and forests of chimneys in the background, begins a steady processional movement. The group of engineers and officers and naval men appears at the other side of the door and farther off. Then comes a sprint down hill. You descend and stretch your legs.

About the field other Tanks are doing their stunts. One is struggling in an apoplectic way in the mud pit with a cheek half buried. It noses its way out and on with an air of animal relief.

They are like jokes by Heath Robinson. One forgets that these things have already saved the lives of many hundreds of our soldiers and smashed and defeated thousands of Germans.

Said one soldier to me : " In the old attacks you used to see the British dead lying outside the machine-gun emplacements like birds outside a butt with a good shot inside. *Now*, these things walk through."

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§ 3

I saw other things that day at X. The Tank is only a beginning in a new phase of warfare. Of these other things I may only write in the most general terms.

But though Tanks and their collaterals are being made upon a very considerable scale in X, already I realised as I walked through gigantic forges as high and marvellous as cathedrals, and from workshed to workshed where gun carriages, ammunition carts and a hundred such things were flowing into existence with the swelling abundance of a river that flows out of a gorge, that as the demand for the new developments grows clear and strong, the resources of Britain are capable still of a tremendous response. *If only we do not rob these great factories and works of their men.*

Upon this question certain things need to be said very plainly. The decisive factor in the sort of war we are now waging is the production and right use of mechanical material; victory in this war depends now upon three things: the aeroplane, the gun, and the Tank developments. These—and not crowds of men—are the prime necessity for a successful offensive. Every man we draw from munition making to the ranks brings our western condition

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nearer to the military condition of Russia. In these things we may be easily misled by military "experts." We have to remember that the military "expert" is a man who learnt his business before 1914, and that the business of war has been absolutely revolutionised since 1914; the military expert is a man trained to think of war as essentially an affair of cavalry, infantry in formation, and field guns, whereas cavalry is entirely obsolete, infantry no longer fights in formation, and the methods of gunnery have been entirely changed. The military man I observe still runs about the world in spurs, he travels in trains in spurs, he walks in spurs, he thinks in terms of spurs. He has still to discover that it is about as ridiculous for a soldier to go about in spurs to-day as if he were to carry a crossbow. I take it these spurs are only the outward and visible sign of an inward obsolescence. The disposition of the military "expert" is still to think too little of machinery and to demand too much of the men. He makes irrational demands for men and for the wrong sort of men. Behind our front at the time of my visit there were, for example, many thousands of cavalry, men tending horses, men engaged in transporting bulky fodder for horses and the like. These men were doing about as much in this war as

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if they had been at Timbuctoo. Every man who is taken from munition making at X to spur-worshipping in khaki, is a dead loss to the military efficiency of the country. Every man that is needed or is likely to be needed for the actual operations of modern warfare can be got by combing out the cavalry, the brewing and distilling industries, the theatres and music halls, and the like unproductive occupations. The understaffing of munition works, the diminution of their efficiency by the use of aged and female labour, is the straight course to failure in this war.

In X, in the forges and machine shops, I saw already too large a proportion of boys and grey heads.

War is a thing that changes very rapidly, and we have in the Tanks only the first of a great series of offensive developments. They are bound to be improved, at a great pace. The method of using them will change very rapidly. Any added invention will necessitate the scrapping of old types and the production of the new patterns in quantity. It is of supreme necessity to the Allies if they are to win this war outright that the lead in inventions and enterprise which the British have won over the Germans in this matter should be retained. It is our game now to press the advantage for all it is worth. We have to keep ahead to

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win. We cannot do so unless we have unstinted men and unstinted material to produce each new development as its use is realised.

Given that much, the Tank will enormously enhance the advantage of the new offensive method on the French front; the method that is of gun demolition after aerial photography, followed by an advance; it is a huge addition to our prospect of decisive victory. What does it do? It solves two problems. The existing Tank affords a means of advancing against machine-gun fire and of destroying wire and machine guns without much risk of loss, so soon as the big guns have done their duty by the enemy guns. And also behind the Tank itself, it is useless to conceal, lies the possibility of bringing up big guns and big gun ammunition, across nearly any sort of country, as fast as the advance can press forward. Hitherto every advance has paid a heavy toll to the machine gun, and every advance has had to halt after a couple of miles or so while the big guns (taking five or six days for the job) toiled up to the new positions.

§ 4

It is impossible to restrain a note of sharp urgency from what one has to say about these developments. The Tanks remove the last

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technical difficulties in our way to decisive victory and a permanent peace; they also afford a reason for straining every nerve to bring about a decision and peace soon. At the risk of seeming an imaginative alarmist I would like to point out the reasons these things disclose for hurrying this war to a decision and doing our utmost to arrange the world's affairs so as to make another war improbable. Already these serio-comic Tanks, weighing something over twenty tons or so, have gone slithering and sliding over dead and wounded men. That is not an incident for sensitive minds to dwell upon, but it is a mere little child's play anticipation of what the big land ironclads *that are bound to come if there is no world pacification*, are going to do.

What lies behind the Tank depends upon this fact; there is no definable upward limit of mass. Upon that I would lay all the stress possible, because everything turns upon that.

You cannot make a land ironclad so big and heavy but that you cannot make a caterpillar track wide enough and strong enough to carry it forward. Tanks are quite possible that will carry twenty-inch or twenty-five inch guns, besides minor armament. Such Tanks may be undesirable; the production may exceed the industrial resources of any empire

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to produce ; but there is no inherent impossibility in such things. There are not even the same limitations as to draught and docking accommodation that set bounds to the size of battleships. It follows, therefore, as a necessary deduction that if the world's affairs are so left at the end of the war that the race of armaments continues, the Tank will develop steadily into a tremendous instrument of warfare, driven by engines of scores of thousands of horse-power, tracking on a track scores of hundreds of yards wide and weighing hundreds or thousands of tons. Nothing but a world agreement not to do so can prevent this logical development of the land ironclad. Such a structure will make wheel-ruts scores of feet deep ; it will plough up, devastate and destroy the country it passes over altogether.

For my own part I never imagined the land ironclad idea would get loose into war. I thought that the military intelligence was essentially unimaginative and that such an aggressive military power as Germany, dominated by military people, would never produce anything of the sort. I thought that this war would be fought out without Tanks and that then war would come to an end. For of course it is mere stupidity that makes people doubt the ultimate ending of war. I have been so far

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justified in these expectations of mine, that it is not from military sources that these things have come. They have been thrust upon the soldiers from without. But now that they are loose, now that they are in war, we have to face their full possibilities, to use our advantage in them and press on to the end of the war. In support of a photo-aero directed artillery, even our present Tanks can be used to complete an invincible offensive. We shall not so much push as ram. It is doubtful if the Germans can get anything of the sort into action before six months are out. We ought to get the war on to German soil before the Tanks have grown to more than three or four times their present size. Then it will not matter so much how much bigger they grow. It will be the German landscape that will suffer.

After one has seen the actual Tanks it is not very difficult to close one's eyes and figure the sort of Tank that may be arguing with Germany in a few months' time about the restoration of Belgium and Serbia and France, the restoration of the sunken tonnage, the penalties of the various Zeppelin and submarine murders, the freedom of seas and land alike from piracy, the evacuation of all Poland including Posen and Cracow, and the guarantees for the future peace of Europe.

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The machine will be perhaps as big as a destroyer and more heavily armed and equipped. It will swim over and through the soil at a pace of ten or twelve miles an hour. In front of it will be corn land, neat woods, orchards, pasture, gardens, villages and towns. It will advance upon its belly with a swaying motion, devouring the ground beneath it. Behind it masses of soil and rock, lumps of turf, splintered wood, bits of houses, occasional streaks of red, will drop from its track, and it will leave a wake, six or seven times as wide as a high road, from which all soil, all cultivation, all semblance to cultivated or cultivatable land will have disappeared. It will not even be a track of soil. It will be a track of subsoil laid bare. It will be a flayed strip of nature. In the course of its fighting the monster may have to turn about. It will then halt and spin slowly round, grinding out an arena of desolation with a diameter equal to its length. If it has to retreat and advance again these streaks and holes of destruction will increase and multiply. Behind the fighting line these monsters will manœuvre to and fro, destroying the land for all ordinary agricultural purposes for ages to come. The first imaginative account of the land ironclad that was ever written concluded with the words, "They are the *reductio*

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ad absurdum of war." They are, and it is to the engineers, the ironmasters, the workers and the inventive talent of Great Britain and France that we must look to ensure that it is in Germany, the great teacher of war, that this demonstration of war's ultimate absurdity is completed.

For forty years Frankenstein Germany invoked war, turned every development of material and social science to aggressive ends, and at last when she felt the time was ripe she let loose the new monster that she had made of war to cow the spirit of mankind. She set the thing trampling through Belgium. She cannot grumble if at last it comes home, stranger and more dreadful even than she made it, trampling the German towns and fields with German blood upon it and its eyes towards Berlin.

This logical development of the Tank idea may seem a gloomy prospect for mankind. But it is open to question whether the tremendous development of warfare that has gone on in the last two years does after all open a prospect of unmitigated gloom. There has been a good deal of cheap and despondent sneering recently at the phrase, "The war that will end war." It is still possible to maintain that that may be a correct description of this war.

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It has to be remembered that war, as the aeroplane and the Tank have made it, has already become an impossible luxury for any barbaric or uncivilised people. War on the grade that has been achieved on the Somme predicates an immense industrialism behind it. Of all the States in the world only four can certainly be said to be fully capable of sustaining war at the level to which it has now been brought upon the western front. These are Britain, France, Germany, and the United States of America. Less certainly equal to the effort are Italy, Japan, Russia, and Austria. These eight powers are the only powers in the world *capable of warfare under modern conditions*. Five are already Allies and one is incurably pacific. There is no other power or people in the world that can go to war now without the consent and connivance of these great powers. If we consider their alliances, we may count it that the matter rests now between two groups of Allies and one neutral power. So that while on the one hand the development of modern warfare of which the Tank is the present symbol opens a prospect of limitless senseless destruction, it opens on the other hand a prospect of organised world control. This Tank development must ultimately bring the need of a real permanent settlement within the com-

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pass of the meanest of diplomatic intelligences. A peace that will restore competitive armaments has now become a less desirable prospect for everyone than a continuation of the war. Things were bad enough before, when the land forces were still in a primitive phase of infantry, cavalry and artillery, and when the only real race to develop monsters and destructors was for sea power. But the race for sea power before 1914 was mere child's play to the breeding of engineering monstrosities for land warfare that must now follow any indeterminate peace settlement. I am no blind believer in the wisdom of mankind, but I cannot believe that men are so insensate and headstrong as to miss the plain omens of the present situation.

So that after all the cheerful amusement the sight of a Tank causes may not be so very unreasonable. These things may be no more than one of these penetrating flashes of wit that will sometimes light up and dispel the contentions of an angry man. If they are not that, then they are the grimmest jest that ever set men grinning. Wait and see, if you do not believe me.