"THE AEROPLANE," JULY 3, 1942.

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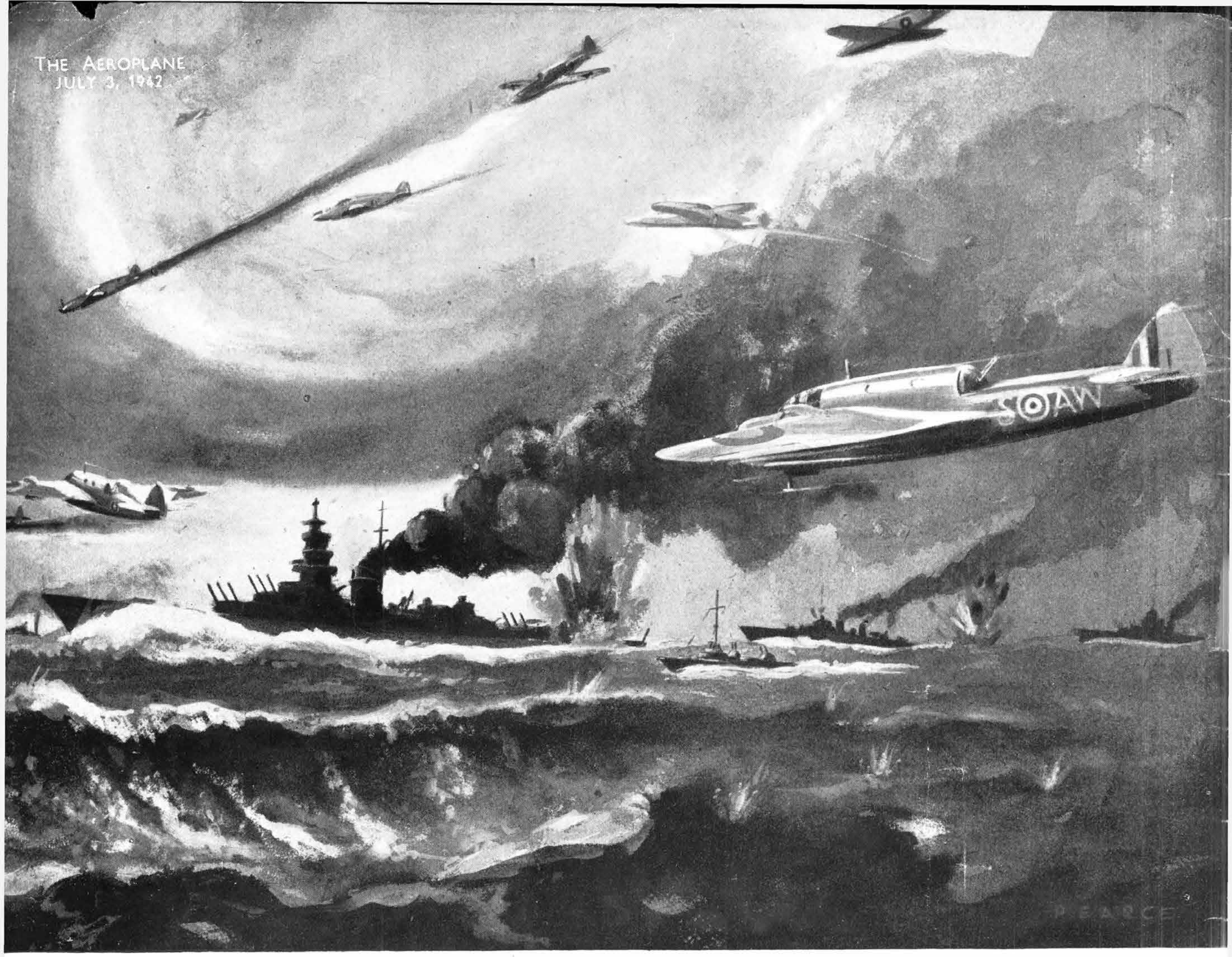

"Bristol" Beaufort

TORPEDO-CARRYING AIRCRAFT

have struck many successful blows against the enemy at sea. None was more gallant than the attacks against the German battleships "Scharnhorst" and "Gneisenau," and the cruiser "Prinz Eugen," in the Channel, on February 12th. It was carried out against great odds and inflicted serious damage on the enemy.

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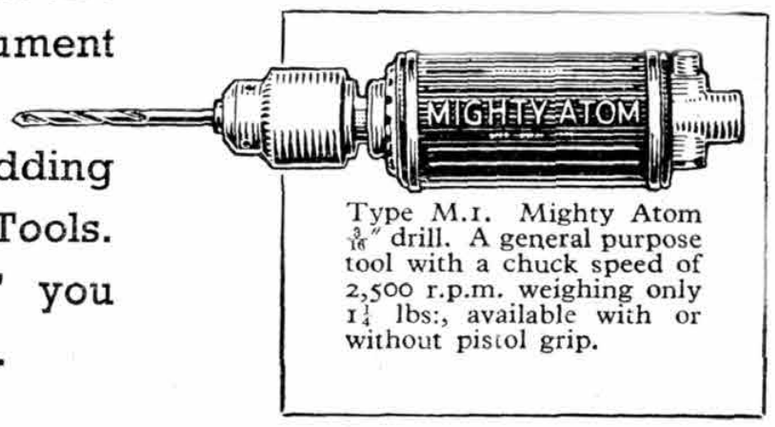

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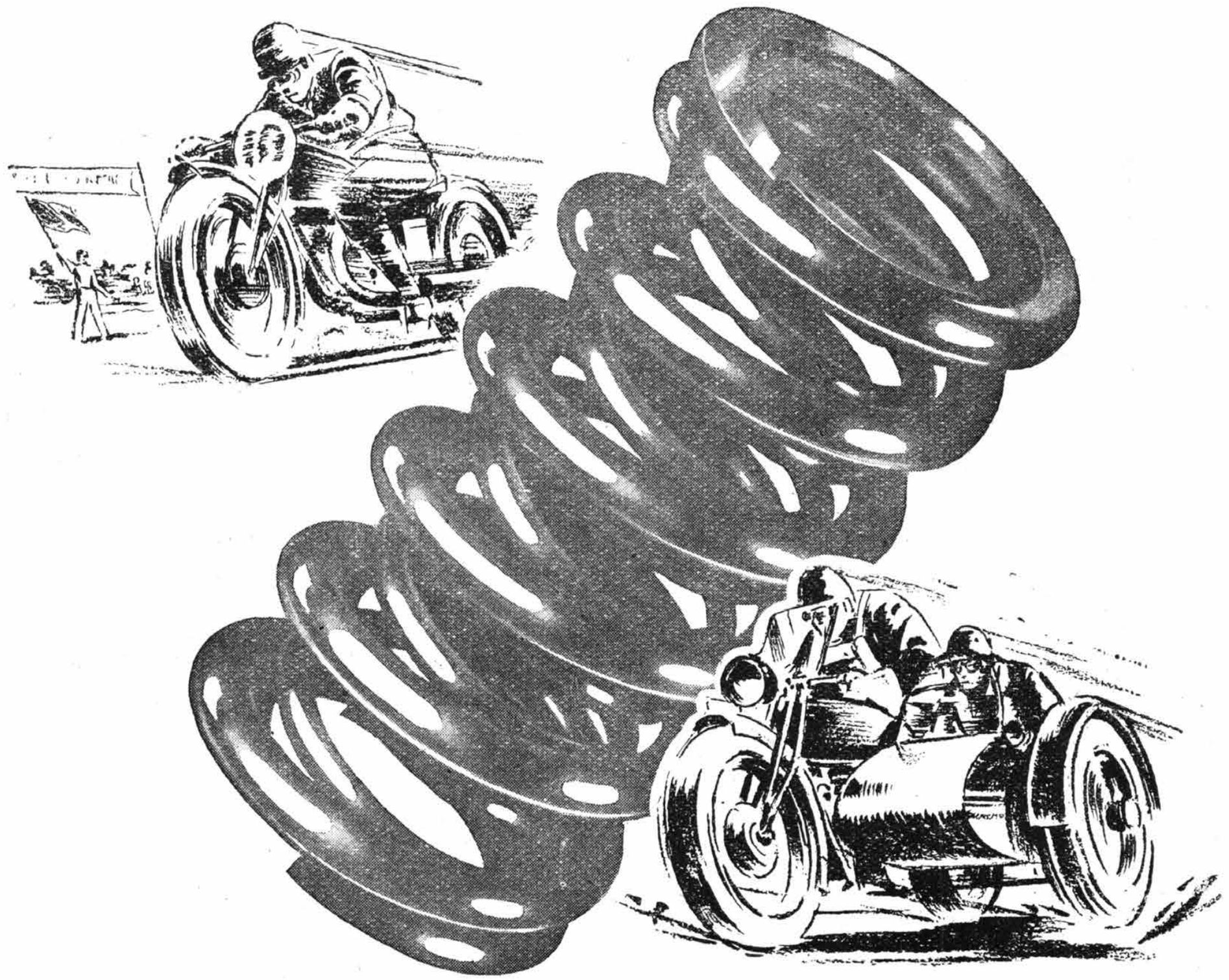

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MATTERS OF MOMENT

The Hammer and the Anvil

NOTHING COULD BE SIMPLER than to prove either of two contradictory propositions in relation to the British defeat in Libya and to implicate Air Power in both. If the defeat was the result of an unequal weight of armour, then the Air Arm is accused of failing to secure control of the Mediterranean. If the defeat is explained by lack of military skill in the use of armour, then the Air Arm is indicted for failing to destroy the tanks on land. The implied argument is that if the Navy had had the Air Arm in its control, the first cause would have been removed and that if the Army had had its own Air Arm the second failure would not have occurred.

Taken together, the two accusations represent a charge of strategical and tactical inadequacy against the Air Force in the Mediterranean area. They have led already to a demand for greater bombing strength in Egypt and they have revived the old clamour for dive bombers. They ignore the reverse side of the picture. The Germans won the decisive battle in Libya without making heavy use of their bombing strength for tactical purposes. Bir Hakeim was not lost to the bombers. British tanks were not lost to bombers. The Tobruk defences were paralysed by bombers only when the Eighth Army had been thrown so far back that British fighters could no longer cover Tobruk.

Tactical Profits of Strategic Bombing

In the main, the Germans used their bombers on the strategical duty of keeping their sea communications open. They pounded Malta as the base from which their sea routes could be harassed and they bombed the convoys bound for Malta with supplies. They could do little apart from that to injure British lines of communication because the R.A.F. held air superiority in Egypt and Libya. For the same reason they could not rely on their bombers for much tactical help until the main battle had been won. In other words, the tactical employment of the Air Arm depended on a military success and that military success depended on the satisfactory strategical use of the Air Arm.

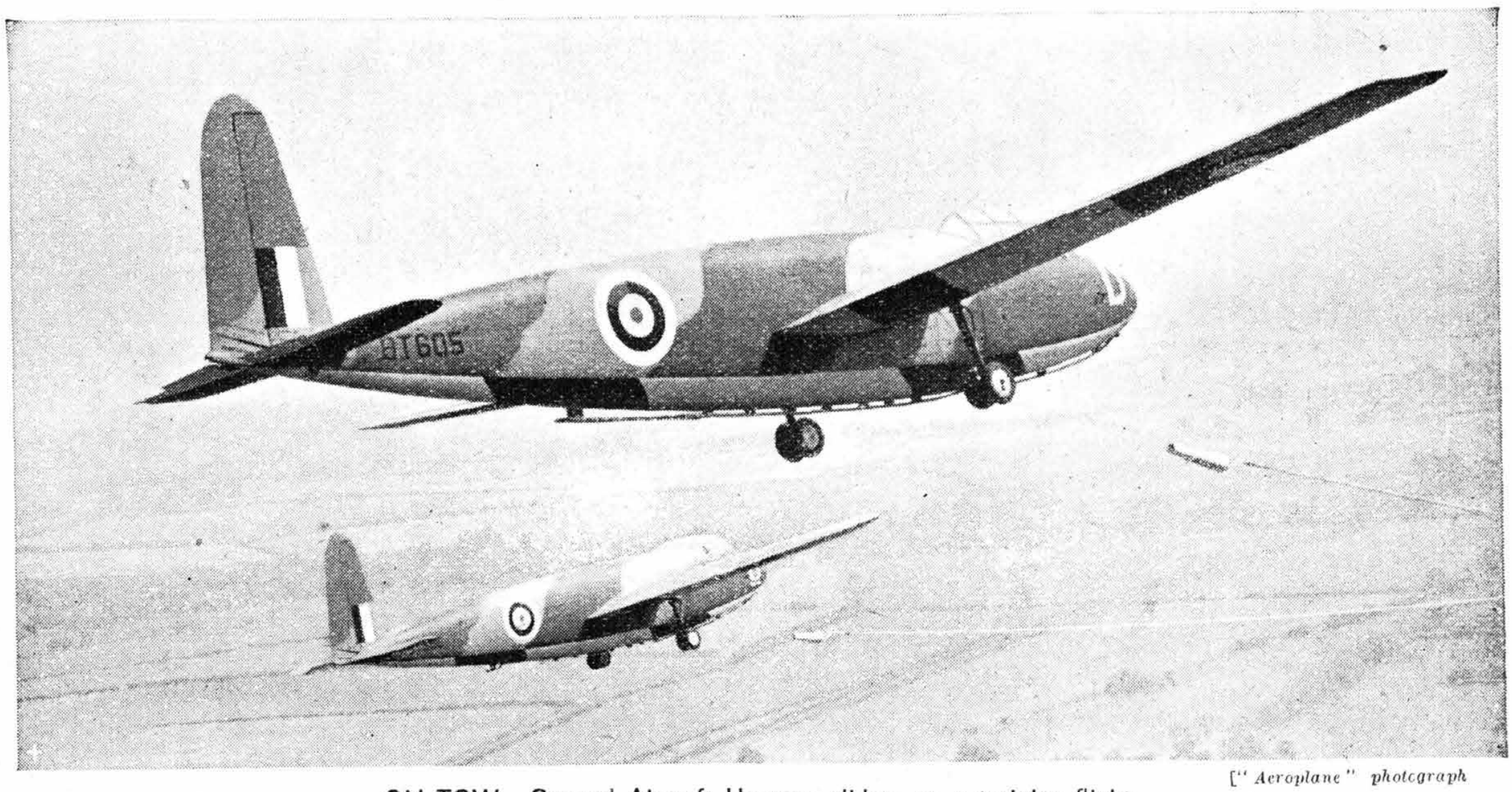
From that fact there emerges a strong case for the full development of strategical bombing. Hence the quite natural agitation for more heavy bombers in Egypt, which ignores the dilemma introduced by the transport question. The big bombers could have been flown to Egypt, but the ground crews, spares, bombs and the like would have had to go by sea; and the shipping space they occupied could not have been devoted to tanks and guns. We have felt that the emanicipation of the Air Arm from dependence on land and sea transport has advanced too slowly. The attitude of mind which has neglected and despised commercial air transport throughout the War has prevented the Air Force from becoming fully mobile. Egypt may prove a blessing to it in this respect, even if the Air Staff should have to ask for American transport aeroplanes for its carrying service.

Air Transport For Air Power

In making this criticism we acknowledge the limitations of production which the Air Staff has had to accept. Sir Kingsley Wood once crushed the champions of air transport with the phrase "first things first." Until there were bombers there could be no urgent problem of organising their strategical mobility. If the Air Staff had taken the same view about bombs as it did about transport aeroplanes, there would have been a certain ineffectiveness about the big raids when the bombers became numerous enough to make them. In failing to prepare for the rapid switching of bomber strength from one theatre to another, the Air Staff, possibly under Government compulsion, missed one of the finest opportunities to demonstrate the dominating influence of Air Power on military and naval situations.

The demonstration will yet be made, belatedly as is the traditional British way, and the Egyptian reverse will prove perhaps to be no more than a providential shaping of the rough-hewn. Strategical bombing of harbours in Italy, Sicily and Libya and of ships on their way to Libya, was quite heavy before the battle but was evidently not heavy enough to prevent the Germans from making their attack. It could not have been made heavy enough without diminishing the weight of assault on those places in Germany which feed the Atlantic submarine fleet. The whole sequence of misfortunes, affecting Egypt as much as other scenes of activity, which might have proceeded from that, are easy to imagine. For one thing, the Eighth Army would have been short of the British tanks which would have had to give way to the R.A.F. equipment in the ships. For another thing, a great many of the American tanks would probably never have arrived.

Lacking a truly mobile Air Force, the Government has been forced to compromise in despatching forces to Egypt. Taking the long view strategically, it decided



["Aeroplane" photograph

ON TOW.—General Aircraft Hotspur gliders on a training flight.

to build its main bomber force within range of Germany, the source and spring of all the evil which manifests itself in Russia and Libya and the Atlantic. In the long run it will be proved to have been right in that. At the moment Egypt and the Canal hold public attention to the exclusion of more important developments elsewhere. Air Power cannot be detached from that campaign. More Air Power will probably have to be applied to it, and the main bombing effort will be temporarily reduced because of it, but the deductions to be drawn are so startlingly favourable to the policy of the heavy air offensive that they contain the assurance of victory.

One admission which must first be made is that Air Power in tactical use cannot at present stop an armoured force by frontal attack. Given sufficient time, it should be able to halt the tanks by destroying their supply columns. In the deeper parts of the strategical field it can defy attacks on an army's communications provided that it can be concentrated on a small number of objectives. If that conclusion is turned inside out it must mean that heavy bombing can ruin a set of communications if the vital points are few enough to allow of real concentration.

Concentration, then, is the important qualification. Diffusion of effort in this, as in most warlike affairs, means wasted effort. If mobility could be given now to a large part of the British bombing force it should be used not to spread it widely but to concentrate it swiftly on a limited set of targets to meet the particular need of the moment. When the special local danger had passed it should be grouped again at once on the bases from which its main strategical attack is directed. This is the ideal at which a strong bomber force should aim. The Libyan defeat has driven home the point and, in doing so, has revealed the weakness of the case for splitting up air strength into small packets to be attached continuously to a military and a naval arm.

Precisely what was responsible for the British defeat in Libya has yet to be declared. The share which the Air Force took in opposing the enemy's advance will be seen, when the story is told, to have been magnificent. Its inability to keep Malta in full commission was a severe handicap on air control at sea and the enemy took every advantage of his success. He applied the rule of concentration and it paid him handsomely. The British will reap a similar reward when they come to invade provided they resist temptations to spread themselves too thinly and too widely over the field of operations. When they can choose their own anvil, they must make sure that the hammer is big enough.

A Bull's-eye for Air Gunners

SEARCHLIGHTS have been highly regarded by the Germans since the War began. The raid on Bremen by "more than 1,000 bombers" on the night of June 25-26 revealed that the Germans are using searchlights in the noses of some of their night fighters. The revelation was incidental to the account of how a Stirling's rear gunner shot down a two-motor fighter on the way home. The gunner may have been modestly making light of his success by hinting that a night fighter which labelled itself with a searchlight must prove easy meat. The view of the R.A.F. on most occasions when fighter searchlights have been mentioned was that more would be given away than would be gained.

Plenty of evidence of the German way of using searchlights is available. It would suggest that these aids would not be fitted in night fighters unless they could do more than illumine the quarry. Many times the Germans have used their ground searchlights as an impediment to the British bombers. Quite early in the War when the R.A.F. made some fairly heavy attacks on the island of Sylt, the Germans lined up searchlights all along that side of the island where the air bases were situated and used them to create a wall of slanting light through which the bomber pilots had great difficulty in distinguishing their targets.

More recently, during a bomber raid on the Leuna synthetic oil works near Leipzig, the Germans used cones of searchlights in an attempt to fog the vision of R.A.F. pilots and bomb-aimers. When British fighters have made low attacks by night on German aerodromes in France, the searchlights have generally done their best by united action to prevent the pilots from seeing the objects on the ground which they had come to "shoot up." The function of

the searchlight as an aid to detection has appeared more often to be secondary than primary. The object has been to give direct protection to the threatened targets rather than to help A.A. gunners and fighter pilots to bring down the raiders.

If, as all this indicates, the German opinion is that the searchlight should be used more to blind the raiders than to light them up as targets, the fitting of searchlights in fighters represents a change in policy. The success of the Stirling's rear gunner in shooting down the fighter shows that he, at all events, was not blinded by the glare. Whether or not the dimensions of the Stirling account for that we have not been told. A searchlight directed on to some of the more vital parts of a Stirling at close range might leave the tail turret still in darkness. If that were the explanation, the fighter pilot must have wished he had intercepted something smaller and less formidable. If it is not the explanation, the Germans must by now have been reinforced in their belief that the way to work searchlights is in groups; and they need not have wasted a night fighter in testing the efficacy of the searchlight in isolation.

Gunners in bomber turrets have frequently fired down searchlight beams. The only fighter searchlight which could possibly be valuable is one of such power that the gunners could not train their guns in the face of its glare. Anything else in a night fighter is simply a bull's-eye for the gunners to aim at.

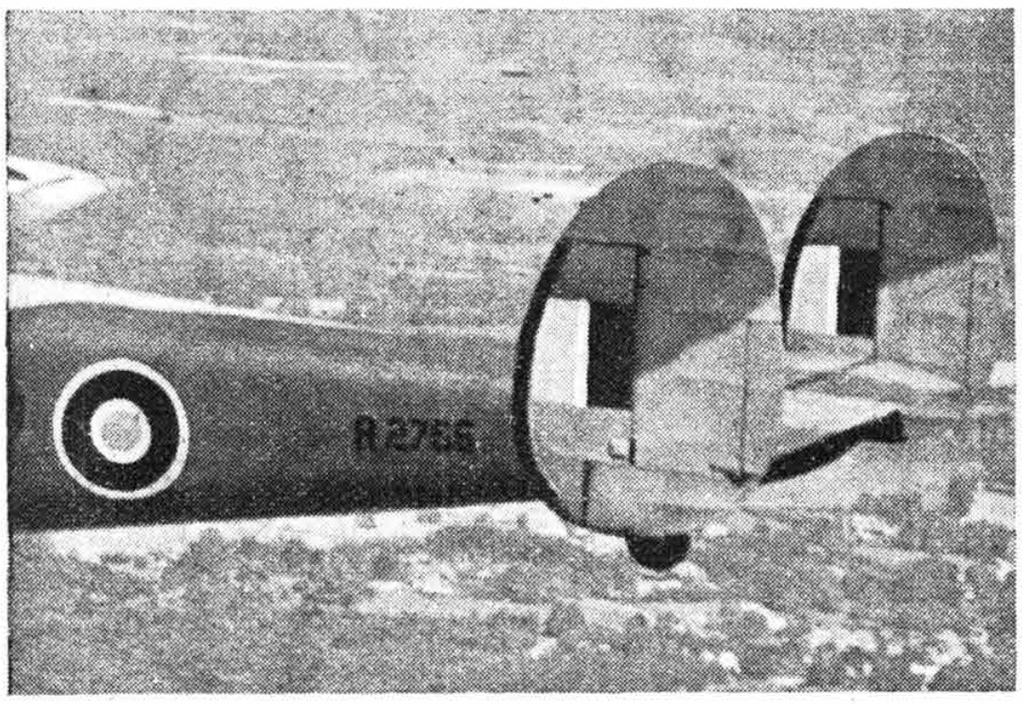
Staniland—Test Pilot

C. S. STANILAND, who has been killed in a flying accident, was one of the small band of British test pilots who could show off the wares of their firms as cleverly as they helped to bring them to perfection. He was only 36 at the time of his death, but for years before the War he had been an invaluable member of the development staff of the Fairey Aviation Company and almost as indispensable an auxiliary of the sales department. Staniland loved trying things to their limit and on one occasion he made a parachute descent in consequence; but having satisfied himself of the quality of the aeroplanes he flew, he was always ready to use them in ways which made the sensitive onlooker shudder for him.

Habitually at flying displays and demonstrations, he began making an upward roll in the Firefly as soon as it was off the deck and he kept the roll going until the last possible moment. He was ready likewise to slow-roll a Firefly or a Fox across the limits of the aerodrome at 300 ft. or 400 ft., or to show the control qualities of a Battle by rocking it and wagging its tail at something like stalling speed. His judgment of speed, height and distance was perfect and his exhibitions always looked so much more daring because he could trim his approach at the end of a dive to what seemed to be inches.

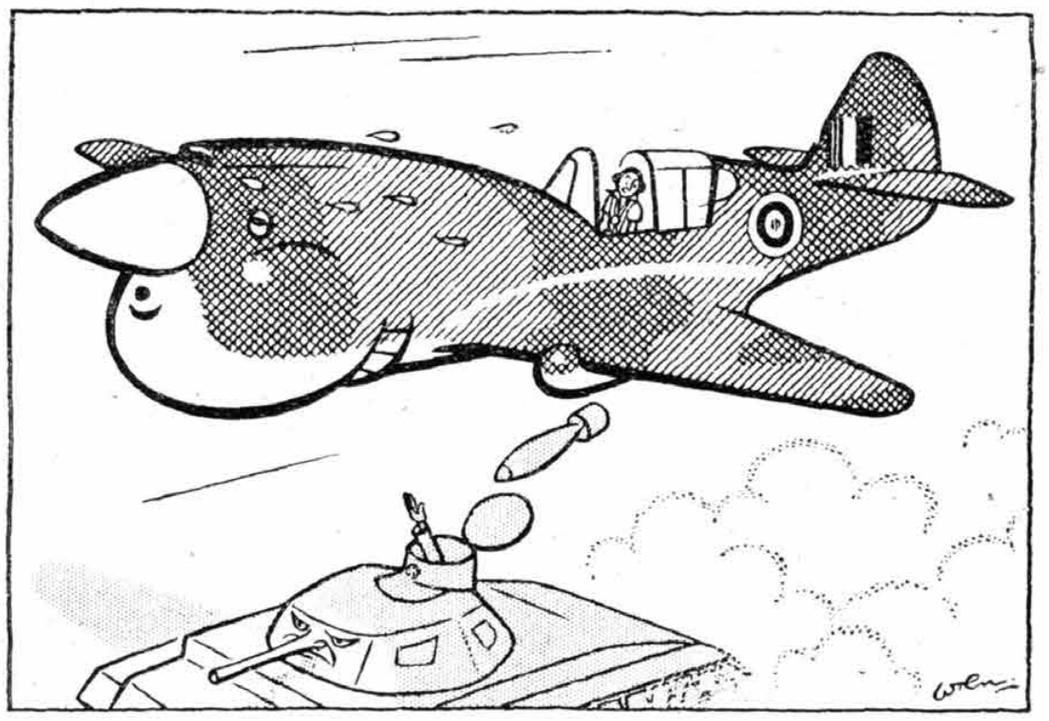
He made a great name for himself as a display pilot, but this was in no sense a separate part of his character. He did more startling things as routine work than he ever did before the big crowds. Terminal velocity dives were at one time part of his duty and he came near doing one before a Belgian purchasing commission at the time when his Company was in process of obtaining an order from the Belgian Government. A French firm was in competition for the order and seemed to be making headway until Mr. C. R. Fairey, after a brief question to Staniland, suggested to the Belgian representatives that they invite the French to dive their fighter until it reached a speed of 480 m.p.h. That was the terminal velocity of the Firefly, and "Chris" Staniland, confident of its strength, had been willing to dive it to its limit—a terrific speed for those days. The mere suggestion was enough for the French.

Staniland will be missed by his Company when peace comes. He will be missed, too, by a large circle of friends. He was a modest man and a loyal companion. What he did he did simply and without fuss. He had a passion for speed and that seemed to accentuate his youthful spirit, but his skill was that of the devotee whose love, by the fortune of fate, was also his vocation.



THE NEW MARKINGS.—The new R.A.F. markings on the fuselage and tail unit of a de Havilland Flamingo. The yellow ring round the roundel and the vertical white stripe on the tail are reduced in width.

ODDENTIFICATION—LXVI



Heat and sand, a thirsty land.
Sweat in the Kittyhawk's eye.
Foodstuffs canned, the bare legs tanned.
Strafing the Hun from on high.
Six guns for the road and a bomb for the pa...,
And a thousand-horse roar to chill the heart's spark.

Libyan Courtesy

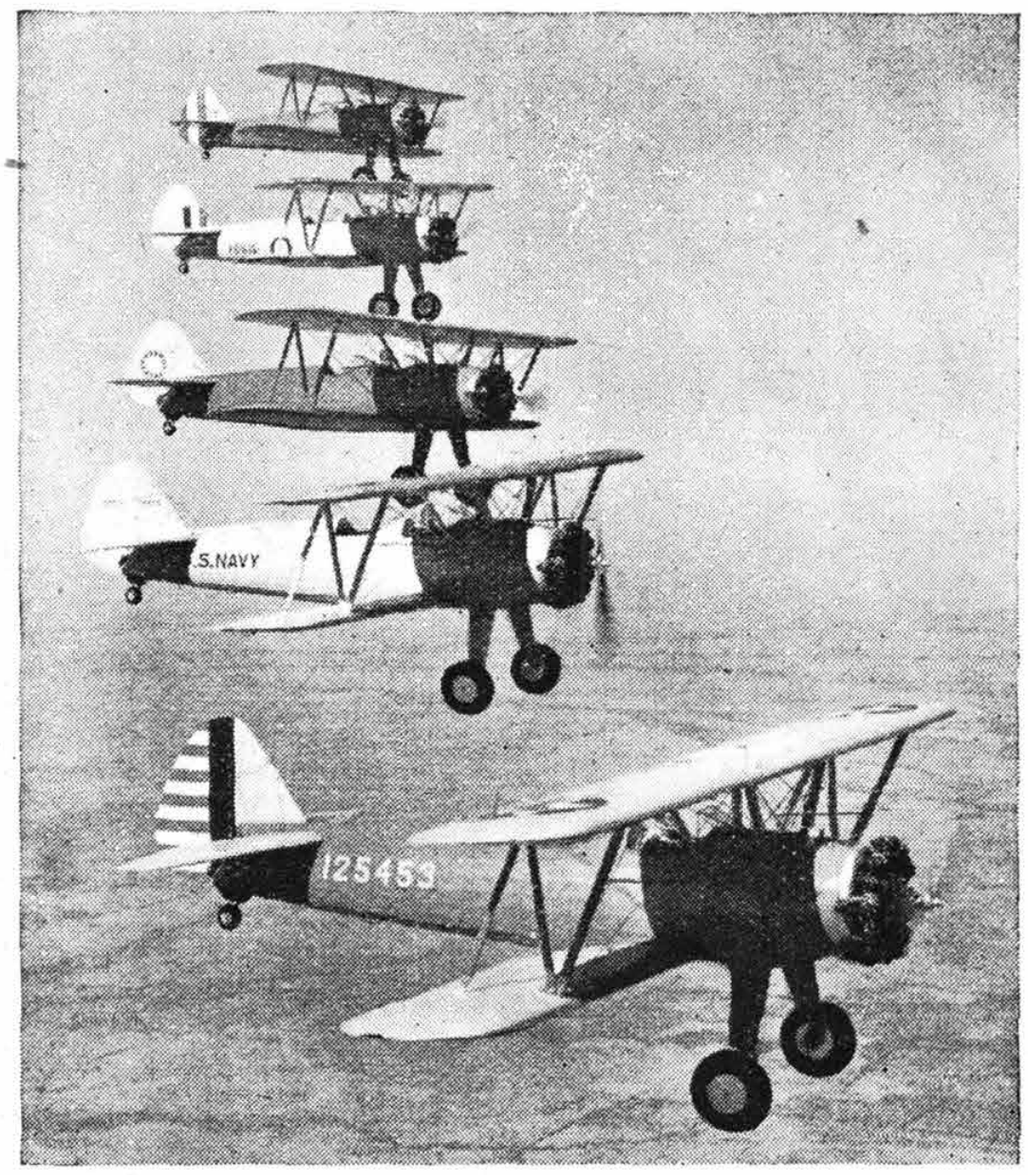
SPECULATION as to the lot of the unfortunate Libyans is invited by the latest advance of the enemy. These swarthy little men, who have been estimated to number 70,000 in the great tract of land between Alexandria and Tripoli, learned to appreciate in full pax Britannica. They became, in small numbers, volunteer labour corps workers on some of the more unpleasant camp duties, and at desert aerodromes dug slit trenches and run-in shelters for aeroplanes and motor transport.

They suffered from—or enjoyed—incurable laziness, and of the several mad types of foreigner in their arid land they unquestionably liked the British best of all because they drove them the least. When the Italians held sway the practice instituted by the notoriously inhuman Marshal Graziani was to select one of the pressed labour Libyans for flogging each morning. That ceremony was to encourage the others.

The British advanced and, having little use for them at that stage, the Libyans, as camp followers, succeeded in scrounging quantities of odds and ends that nobody worried about, so that it was a common sight to see a dusky local dressed in British forage cap, Italian greatcoat, and, say, a pair of international football boots. Sandhurst stockings and an R.A.F. tie completed the outfit.

The Germans came through Libya next, and the régime of flogging at sunrise was resumed. Under compulsion these nomads performed menial tasks for the bare minimum of subsistence. Their lot was worse than when the Italians came, and then it was bad enough.

The second British advance, on a bigger and wider scale than the first trip to Benghazi, enabled them to come in on our side as a labour corps. They did not want to work and were agreeably frank in their laziness. At one point 44 Libyans were observed nominally at work on an aerodrome's improvements, for which they were paid 5 piastres the day. No fewer than 42 of these were squatting around, already



TRAINERS FOR THE UNITED NATIONS.—Boeing-Stearman A-75N3 elementary trainers built in the works of the Boeing Airplane Co., at Wichita, Kansas, flying in formation with the markings of Peru, Great Britain, China, the U.S. Navy and the U.S. Army Air Forces. These trainers are known in the U.S. Army Air Forces as the PT-13E and in the U.S. Navy as the N2S-3.

exhausted by breakfast time with the idea of work; while one picked finically at stubborn ground and a comrade leant on his spade for him.

The Squadron C.O. came storming up. "Why the hell don't you get on with the job? You've been four days digging a hole which I could dig myself in two hours."

"Ah" came the retort courteous. "That is you. But we are Libyans."

"The Old Order Changeth"

THE CENTRAL FLYING SCHOOL of the R.A.F., known throughout the World as "C.F.S.," is in future to be known as the Empire C.F.S. It will be an airmen's university and will be attended by experienced instructors from Great Britain, Canada, South Africa, Australia, New Zealand and, eventually, from the U.S.A., who will pool and expand their knowledge at the Empire C.F.S.

The C.F.S. was founded in 1912 on Salisbury Plain, and the first course was attended by Army and Navy officers and a few civilians, including Marshal of the R.A.F. Lord Trenchard, then a Major in the Army. Representatives of more than 20 nations have been sent to the C.F.S., and in 1920 it became the acknowledged Flying Instructors' School. The C.F.S. has been closely associated with Salisbury Plain, except for the nine years that it was at Wittering, and the Empire C.F.S. has been established not far away from the C.F.S. birthplace. Many of the trophies of the C.F.S. have been inherited by the Empire C.F.S., which will carry on the tradition of the old C.F.S.

More American-built Merlins

A LARGE additional order for Rolls-Royce Merlin motors has been received by the Packard Motor Car Company. The new order is said to supplement other orders received some time ago from both the British and American Governments.

Telling the World

AN AVERAGE of 160 shipments of film is being sent to more than 50 territories each week by bomber aeroplanes, air mail and surface craft by the Ministry of Information to tell the World what Great Britain is doing in the War.

SAVE YOUR PAPER

A Blohm Und Voss Flight

A BLOHM UND VOSS factory engaged in the construction of the Bv 141 is no longer at Hamburg but in the Stettin area on the banks of the River Oder.

U.S. Army Air Forces

OFFICIAL COMMUNIQUES on American air units in the Middle East and in Great Britain invariably speak of them as "units of the U.S. Army Air Corps." This shows that those who compose the communiqués are out of touch with latest American practice.

The U.S. Army Air Corps is now a separate branch of the U.S. Army Air Forces. The Air Corps is responsible for the training of pilots and mechanics, the "procurement" of aeroplanes, for intelligence, ferrying and works and buildings. It is not an operational command. Operational formations are grouped under the Air Force Combat Command which, like the Air Corps, is part of the U.S. Army Air Forces. Both are under Major-General Henry Arnold, Chief of U.S. Army Air Forces.

Production in Australia

PRODUCTION of Bristol Beauforts in Australia is spread over 400 factories and five assembly factories in three States. About 8,000 workmen are employed. Each Beaufort costs £A40,000, and Great Britain is paying for 75 per cent. of the Australian output.

The production rate at the Commonwealth Aircraft Corporation factory is two aeroplanes a day, including Wirraways and Wackett trainers. This factory employs about 5,000 people.

Production in India

INDIA'S aircraft factory, Hindustan Aircraft, Ltd., the capital of which has been held jointly by the Government of India, the Mysore Government and Mr. Walchand Hirachand and his associates, has been taken over completely by the Indian Government, at least for the duration of the War. The Government has bought out the interests held by Mr. Hirachand and his associates, and although the Mysore Government retains a financial interest in the Company, it has agreed to waive the right to share in its management for the duration of the War and for a year or two afterwards.

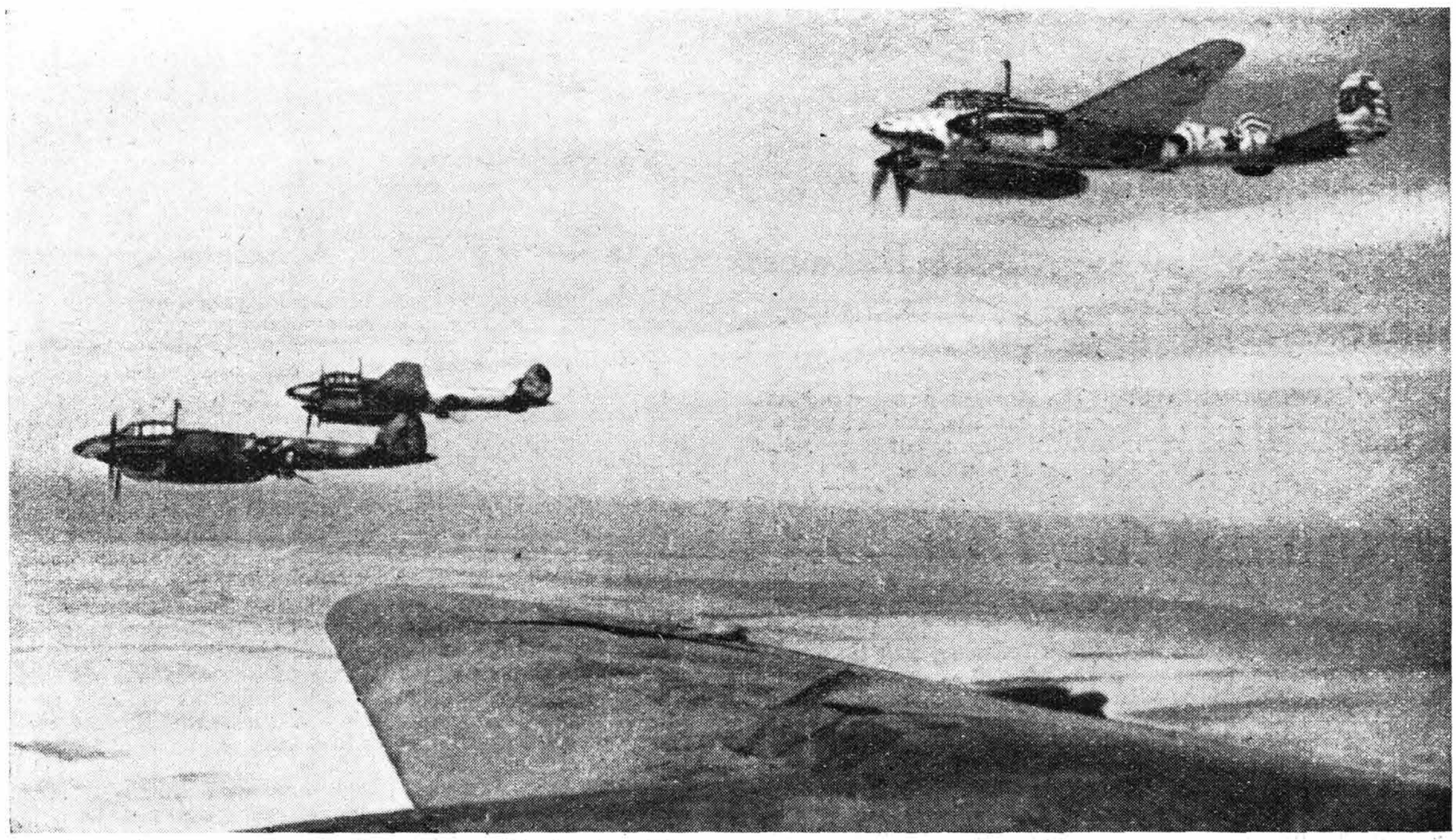
American types, the Harlow Trainer and the Curtiss P-36 Hawk fighter are being assembled at Hindustan Aircraft, Ltd., but instead of importing the component parts from the United States almost everything is being made now in India, except the engines and instruments. Plans have also been made to build American Vultee bombers.

AIRDENTITIES—VIII

Lieut.-General George Brett, U.S. Army Chief of the Allied Air Forces in Australia.

The 147th Week of

THE WAR IN THE AIR



RUSSIAN ATTACK.—PE-2 two-motor light bombers of the Red Air Fleet off on a raid against the enemy in their land.

EVERY WEEK, as the climax of the War approaches, the demands on Air Power become greater. These demands are chiefly for more aeroplanes of every purpose on all the battle fronts. With them must go requests for more equipment on the ground and more ground crews so that the machines can be maintained adequately in flying condition.

For these reasons the concentration of Air Power in Great Britain seems inevitable as well as strategically important. Here we have the runways which the big bombers have to have so that they can take off with heavy loads. We have also the vast store of bombs they need. We have the repair shops, the maintenance units, the store parks and the rest. Besides that we are bound to maintain in Great Britain a great fighter force to preserve the air mastery over our shores which is vital to our success.

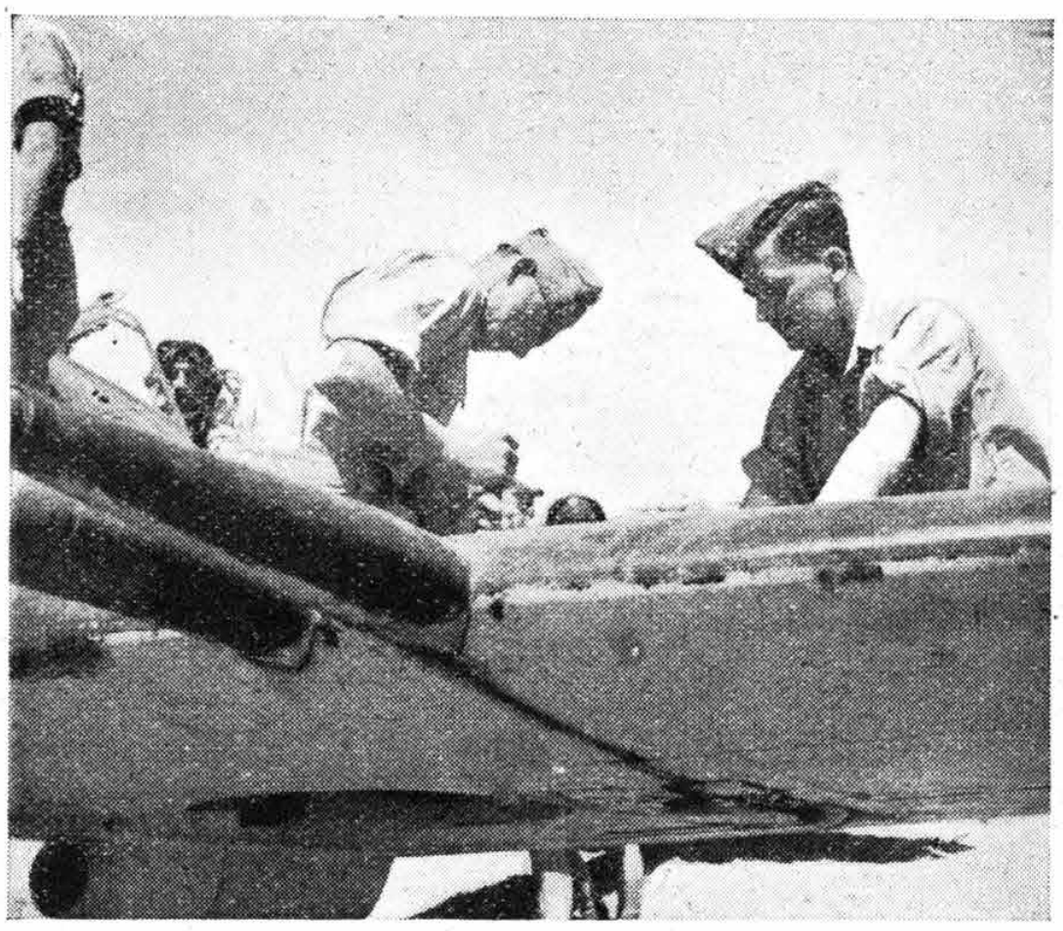
There ie another point. Great Britain is a main base for our forces in the Battle of the Atlantic. Coastal Command, flying from British aerodromes and British harbours, sweeps far over the Atlantic in search of enemy submarines. It has, in fact, together with the Royal Navy, driven the German U-boats to hunt chiefly in the Caribbean area, where the protection above our ships is at present less effective.

So many necessities account for the essential concentration of Air Power in Great Britain—Fighter Command must be here for defence of the main base, Coastal Command must be here to cover the Atlantic, Bomber Command must be here because from nowhere else in the World can it operate in force, Army Co-operation Command must be here to give support to the assembled troops, and the operational section of Training Command must be here to give the final polish to air crews in service conditions. Now we are able to welcome also the first units of the United States Army Air Forces which have arrived to strike against the enemy at the side of the Royal Air Force.

The results of this need to concentrate our Air Forces here are shown well by the 1,000-bomber raids on Germany. In the great raid against Bremen on June 25 all the operational home Commands of the R.A.F. took part. More than a thousand aeroplanes of Bomber, Coastal and Army Co-operation Command dropped the bombs, while aeroplanes of Fighter, Coastal and Army Co-operation Commands beat-up the enemy aerodromes in France, Holland and Belgium to create a diversion.

There can be no doubt that these great raids on German targets are having a very material effect on German war industry. There are just over 50 German cities with more than 100,000 inhabitants, of which Cologne, Essen and Bremen are three. Each has suffered an attack by more than 1,000 bombers. Each centre must be out of action for many weeks. If we can complete the round of the 50 great cities and be able to come back to Cologne, Essen and Bremen before the repairs are complete, then the War will have been won from the air. That time is not yet, but the weight of our attack is growing steadily and will go up fast when American forces arrive in numbers.

Meanwhile, in North Africa, although we still have local air superiority over our own forces, we have not the air mastery which can dominate the ground. Nor have we much hope of being able to cut Rommel's sea route across the Mediterranean. In the absence of any effective anti-tank weapon from the air in any numbers the decision in the Battle for Egypt must remain to be made on the ground. Our inferiority in equipment—for which the War Office must take the responsibility—is partly offset by the geographical conditions. The battle is certain to be as desperate as it is important to the whole future course of the War.



FOUR-CANNON SPITFIRE.—The Army is giving the R.A.F. a helping hand on the aerodromes in Malta, and here soldiers and R.A.F. ground staff are seen working together to refuel and reload a four cannon Spitfire.

Manning the Last Ditch

THE HARD-PRESSED Eighth Army found no respite in the frontier positions it took up after its retreat from Knightsbridge. Tobruk fell within 24 hours, and Rommel was soon in pursuit again. He threatened to sweep round the southern flank of the new British line as, earlier, he had swept round Bir Hakeim to open his offensive. To have made a stand at the frontier would have heaped disaster on disaster, and the Eighth Army moved back into Egypt and prepared to resist in the Mersa Matruh area (130 miles from the Libyan border) and along a line running to the Siwa Oasis, 200 miles to the South-East.

This part of the desert lends itself most readily to military fortification and forms the last natural barrier to the invasion of Egypt from the West. It includes the Qattara depression, an almost impassable tract formed by the bed of a dried-up inland sea.

Rommel followed on the heels of the retreating Eighth Army. He kept most of his forces to the coastal areas, but detached one column in the direction of the Siwa Oasis. On the evening of June 26, he was only 10 miles from Mersa Matruh, and on the afternoon of next day the two main forces met, both sides seeking battle. Fierce fighting went on for the rest of the day, but at nightfall neither side had claimed a victory or admitted a defeat.

Reports from Egypt earlier in the week told of the arrival of strong reinforcements for the Eighth Army, and of the prevailing optimism in the British ranks. At the same time the gravity of the threat to Egypt was not denied.

Throughout the retreat, British mobile forces had fought delaying actions and had inflicted casualties—sometimes heavy—on the advancing Axis forces. But the stiffest opposition came from the air. Bombers and fighter-bombers incessantly attacked the enemy's columns and, as they drew nearer, all the available resources of the Royal Air Force, the South African Air Force and of the United States Army Air Forces were thrown against them. Even two-motor Wellington bombers and four-motor Liberators were used to intensify the daylight assaults—proof of continuing British air superiority.

The total number of enemy vehicles destroyed by low-level attacks between the start of the battle and June 17, according to Reuter, exceeded 1,100.

At night, the big bombers went farther afield to bomb landing grounds and aerodromes in the neighbourhood of Gazala, Tmimi and Sidi Barrani, and to make heavy raids on Benghazi and Tobruk and on objectives in Greece and Crete.

Enemy air activity over Egypt seemed to fluctuate. On some days fighter opposition in the forward areas was keen, on others desultory. But when the clash came, big air battles were fought. On the previous day (June 26) the enemy had tried to use dive bombers, but the conditions were not favourable and losses were high. Five were shot down within a few minutes. Heavy bombers of the Luftwaffe and Regia Aeronautica made several raids on aerodromes and other objectives East of Mersa Matruh, but official communiqués reported the damage done as "small." At least one of the raiders was shot down.

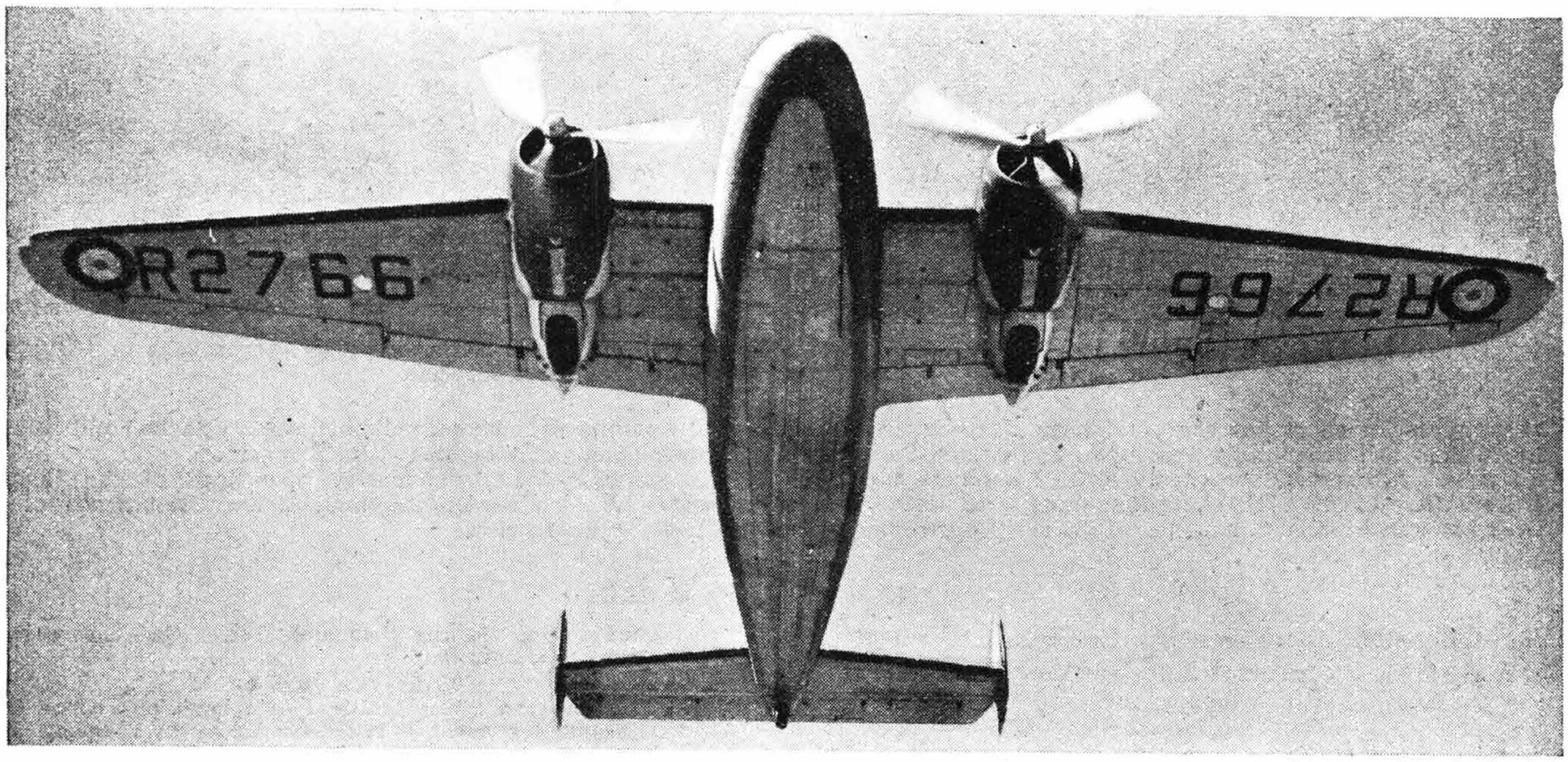
Malta, made fit again after its four months of air bombardment, once more served as a base for offensive air operations. Bombers and torpedo-bombers of the Royal Air Force constantly harassed enemy convoys bound for Africa. They sank one merchant ship for certain and probably sank others. Hits were also scored with torpedoes and bombs on escorting destroyers, and several escorting aircraft were shot down by fighters which accompanied the bombers.

The Island appears now to be defended largely by Supermarine Spitfire fighters, which claimed all but two of the seven bombers shot down and all of the 12 fighters. All the bombers were shot down at night. None of the raids was heavy, but the tendency of the scale of attack to increase as the week wore on reflected the rising anxiety of the Axis Powers for the safety of their ships. With the bulk of their Air Forces in the Mediterranean theatre tied to Rommel's tanks, they are doubtless hard put to find weapons with which to belabour Malta again. The presence of more Spitfires means that they must find better weapons than they used before, or be prepared to suffer still heavier losses—a prospect that must be anything but alluring.

The Epic of Sevastopol

The swift fall of Tobruk had no echo in the Crimea. Sevastopol endured another week of furious onslaughts from the air, from artillery and from tanks, but did not surrender. Ground was lost but it was yielded inch by inch. Wedges were driven into the defenders' lines, but as often as not the enemy was thrown out again. With only one aerodrome left, and that under constant fire, Red Air Fleet units fighting in defence of the Black Sea naval base continued to put fighters and bombers into the air against the enemy, and the Black Sea Fleet continued to bring in reinforcements. Aeroplanes of the Black Sea Fleet Air Arm also had an active part in the Crimean operations. On one occasion they destroyed 13 German aeroplanes on the ground in attacks on aerodromes and another three in air combats.

CATALINA AMPHIBIAN.—Consolidated 28-5A tricycle amphibian flying-boats are now in service with the R.A.F. and are reported from Canada to have been named the Cansos. The tricycle undercarriage makes the Cansos equally easy to operate from land or sea stations. It is in service in the U.S. Army under the designation 0A-10.



A MILITARY TRANSPORT.—De Havilland Flamingoes, well known on the British civil air routes, are now being used for transport by the R.A.F.

Little remained of the buildings of Sevastopol and the people were obliged to spend most of their time underground. Guns of the biggest calibre were brought into action to pound the strongholds of the defenders, but when the enemy's infantry went forward after intense air and artillery bombardments, Russian soldiers leapt from the ruins of their forts and took heavy toll of the attackers. In one fight alone the Germans lost 2,000 men. So heavy were casualties and so sustained the fighting that thousands of German dead lay unburied for days in the No Man's Land dividing the Russian and Axis positions.

Nor could the Germans find easy victories on the mainland. At Kharkov they drove the Russians back after prodigious efforts, but the speed of their advance bore no resemblance to their rapid progress of a year ago. They captured Kupiansk (about 60 miles South-east of Kharkov), but it needed 400,000 men and a great weight of tanks and artillery, and strong air support, to accomplish it. The loss of Kupiansk was a serious blow to the Russians, but the Red Army's retirement was orderly, and von Bock failed to follow up his success with a break-through. An attempt to encircle some Russian positions also failed.

A force of 100 bombers and Stormoviks attacked shipping and harbour installations in Finland on the night of June 23-24. Enemy opposition was encountered, but only one of the raiders failed to return. A few nights later, another force from the Leningrad sector raided a German Baltic port. Both raids caused fires and widespread damage. In the most northerly sector of the front, which includes Murmansk, German dive bombers were active and were shot down at the rate of 10 a day.

The air losses, as reported by the Russians, were German 384, Russian 171.

Sparring in the South-West Pacific

Unsuitable weather probably accounted for the lull which occurred in air activities in the South-West Pacific. Both the Japanese and the Allied Air Forces confined themselves mainly to reconnaissance; each made only one bombing raid. That by the Allies was against Salamaua and Lae (New Guinea) and caused damage to buildings and equipment; that by the Japanese was on Port Moresby. It was made by 18 bombers escorted by a large force of fighters. Its main objective was the aerodrome. Between six and 10 of the raiders were known to have been damaged by intercepting Allied fighters, but no confirmed losses were reported. Four of the Allied fighters were lost, but two of the pilots were saved.

Earlier in the week an Allied reconnaissance machine over Timor was intercepted, but shot down the interceptor. Seven Japanese fighters caught another Allied reconnaissance machine over Rabaul, but were eluded. Three enemy fighters unsuccessfully intercepted an Allied reconnaissance machine which was flying over Kendari, in Staring Bay, some 800 miles from Darwin.

In Burma, Bristol Blenheims of the Royal Air Force, operating from India, resumed their bombing of Akyab. Objectives in the town and at the aerodrome were attacked with bombs and machine-gun fire. The aerodrome at Magw was also raided.

Pilots of the American Volunteer Group serving with the Chinese forces made several raids on important objectives in occupied China. Fighters and " converted bombers " visited Hankow, the chief Japanese base for the bombing of Chungking. They also sank a Japanese warship and three river transports, and shot down one intercepting enemy fighter. Three more Japanese fighters were shot down over Hengyang, in the province of Hunan, and another three were probably destroyed.

Chinese forces recaptured Kweiki, in Kiangsi, and at the week-end were preparing to make an assault on Nancheng, also in Kiangsi. The Japanese made a number of advances and among the places they took was Tsinyun. Extensive Japanese reconnaissance flights over Hunan were reported, presaging the invasion of this province when operations in Kiangsi come to an end.

The Branding of Bremen

Bremen, the famous German seaport, shipbuilding and industrial centre, proved to be the third city of the Reich to receive the imprint of the R.A.F.'s formidable bomber strength. On the night of June 25 a force of bombers numbering more than 1,000 dropped a great weight of bombs in a raid which lasted no more than 75 minutes. In that brief space of time fires and explosions destroyed large areas of the industrial districts which had contributed so much valuable material to the enemy's war machine, and fires were still burning the next day. The following night another raid added to the destruction.

All four operational Commands based on this country shared in the Bremen raid, and for the first time American aeroplanes —Lockheed Hudsons of Coastal Command—bombed German targets by night. Previously, only British types had been used.

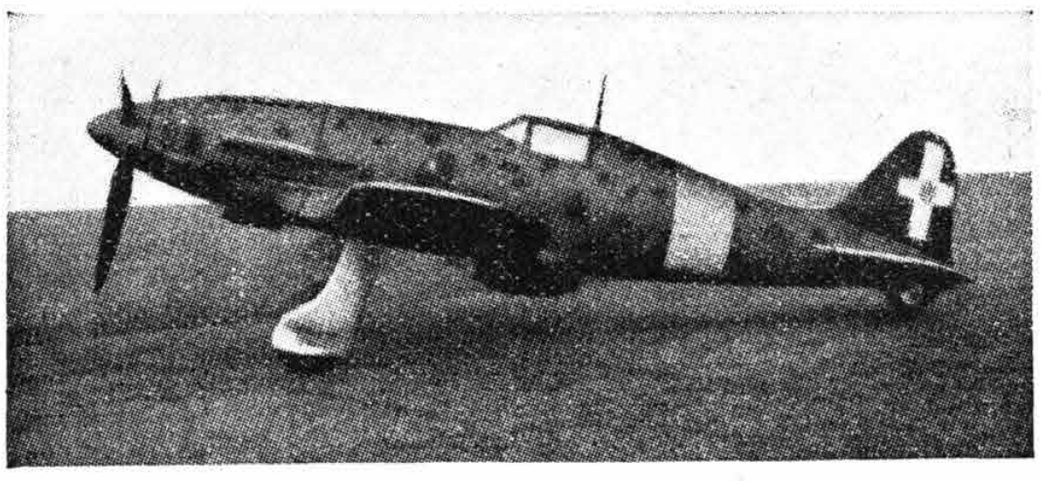
The losses were given as " 52 aircraft." This figure included the casualties suffered by all the Commands concerned, but, contrary to normal practice, the Air Ministry did not specify the losses of each—doubtless for security reasons. Even had the losses been all bombers, they would have represented less than five per cent. of the total engaged.

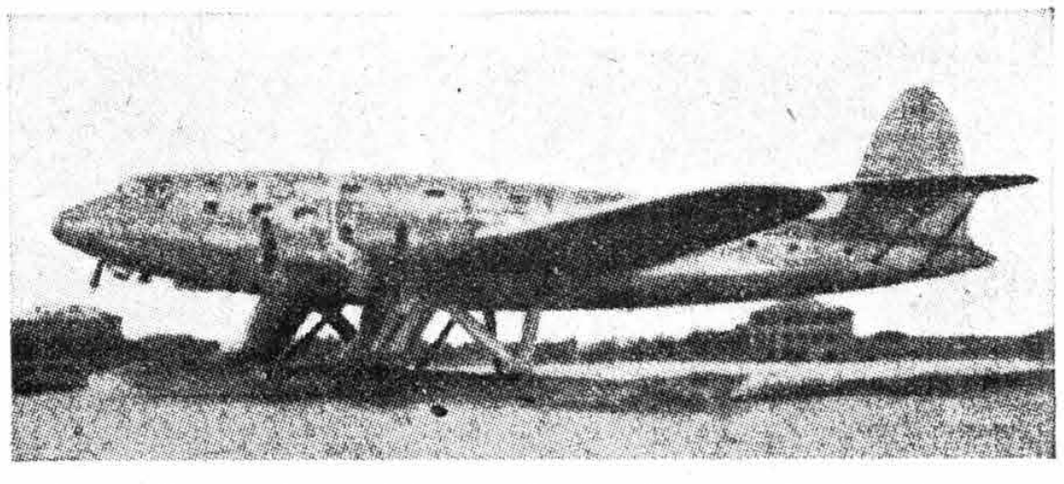
Three enemy night fighters were destroyed during the raid, all by a Short Stirling.

Earlier in the week there had been a heavy raid on Emden. This was described as highly successful, and photographs taken during reconnaissance confirmed air crew reports of the extent of the damage.

Losses among fighters in daylight sweeps and bombing raids on Northern France were unusually light. Air combats were frequent and enemy opposition was determined, but the defenders could not exploit their advantages. No bombers were lost from any cause. Most of the German fighters now operating in France and the Low Countries appear to be Focke-Wulf Fw 190s. The Messerschmitt Me 109F was not mentioned in any Air Ministry communiqués describing operations in Northern Europe.

Southampton, Norwich and a town in the Midlands were





ITALIAN LINES.—(Left) The Macchi C.202, the latest Italian fighter, in service with the Regia Aeronautica in Libya, and (right) the big Cant Z.511 four-motor transport seaplane.

the targets for short but sharp raids on this country by the Luftwaffe. All other raids were small and confined to coastal districts. Altogether, the enemy lost 12 bombers over Great Britain (five in one night) and four more were destroyed over their bases in Fighter Command "intruder" operations. One raider caught over its base climbed when attacked and collided with a companion bomber. Both crashed.

A summary of the offensive operations of the Fighter, Coastal, Army Co-operation and Bomber Commands of the R.A.F. appears below.

Diary of the Week

Offensive Operations by the Fighter, Coastal, Army Co-operation and Bomber Commands of the R.A.F. From June 21 to 27, 1942.

Sunday, June 21

DAY .. Escorted Bostons bombed docks at Dunkirk. One R.A.F. fighter lost. One Messerschmitt Me 110 shot down off the South-west coast of England.

NIGHT .. Mines laid in enemy waters. Fighter Command intruders attacked aerodromes and railway targets in France and the Low Countries, and destroyed two enemy bombers. One aeroplane of Bomber Command lost. Two enemy raiders destroyed over Great Britain.

Monday, June 22

DAY .. Spitfires of Fighter Command on convoy patrol shot down Junkers Ju 88 off the East Coast of England.

NIGHT .. Main target: Emden, in a concentrated raid. Aerodromes in the Low Countries bombed. Aerodromes and other objectives in Northern France attacked in Fighter Command intruder operations. Six R.A.F. bombers lost.

Tuesday, June 23

DAY .. Escorted Bostons bombed Dunkirk Docks and, later, enemy aerodrome in Brittany. Two enemy fighters shot down in second operation. One R.A.F. fighter lost.

NIGHT .. Mines laid in enemy waters. Aeroplanes of Fighter Command attacked enemy aerodromes and railway targets in Holland and Northern France and destroyed two enemy bombers. Two aeroplanes of Bomber Command lost. One enemy raider destroyed over Great Britain.

Wednesday, June 24

NIGHT .. Main target: St. Nazaire. Aeroplanes of Fighter Command conducted intruder operations over enemy aerodromes. Five enemy raiders destroyed over Great Britain.

Thursday, June 25

DAY .. Fighters attacked enemy shipping off the coast of Brittany. Two fighters lost.

NIGHT .. Main target: Bremen (by a force of more than 1,000 bombers, including some of Coastal Command); intruder operations by aeroplanes of Fighter and Army Co-operation Commands; 52 aeroplanes of all types lost. Three enemy night fighters destroyed by a Stirling

Friday, June 26

DAY .. Escorted Bostons attacked targets at Le Havre. One enemy fighter destroyed. One R.A.F. fighter lost. Another lost from a morning patrol.

Saturday, June 27

DAY .. Enemy bomber shot down by a Beaufighter off the East Coast.

NIGHT .. Main target: Bremen. Other targets in North-West Germany also bombed. Aerodromes and other targets in Northern France, and shipping off the French coast attacked by Fighter Command. Nine bombers and two fighters lost. One raider destroyed off the South-west coast of England.

GERMAN, ITALIAN AND BRITISH LOSSES—JUNE 21-27, 1942

Date	Axis (N. Europe)		Axis (Near East)		R.A.F. (N. Europe)		R.A.F. (Near East)	
	Machines	Personnel	Machines	Personnel	Machines	Personnel	Machines	Personnel
21-6-42	5	22	7	20	2	7	8	13
22-6-42	1	4	2	5	6	38	2	1
23-6-42	5	14	3	6	3	14	4	7
24-6-42	5	23	7	22	—	—	4	3
25-6-42	3	8	3	6	54	302	4	7
26-6-42	4	16	21	36	2	3	12	19
27-6-42	2	9	2	2	11	61	5	10
Totals	25	96	45	97	78	425	39	60

TOTAL LOSSES IN THE AIR WAR* (To dawn, June 28).

	Axis Air Forces	Imperial Air Forces
Machines destroyed in combat or by A.A. gunfire	8,989	5,397
Personnel	24,222	16,189

***Excluding Russia, the Far East and U.S. losses. The totals include losses on both sides in the Mediterranean sea and air battles between June 13 and 17, as reported in the House of Commons last week.**

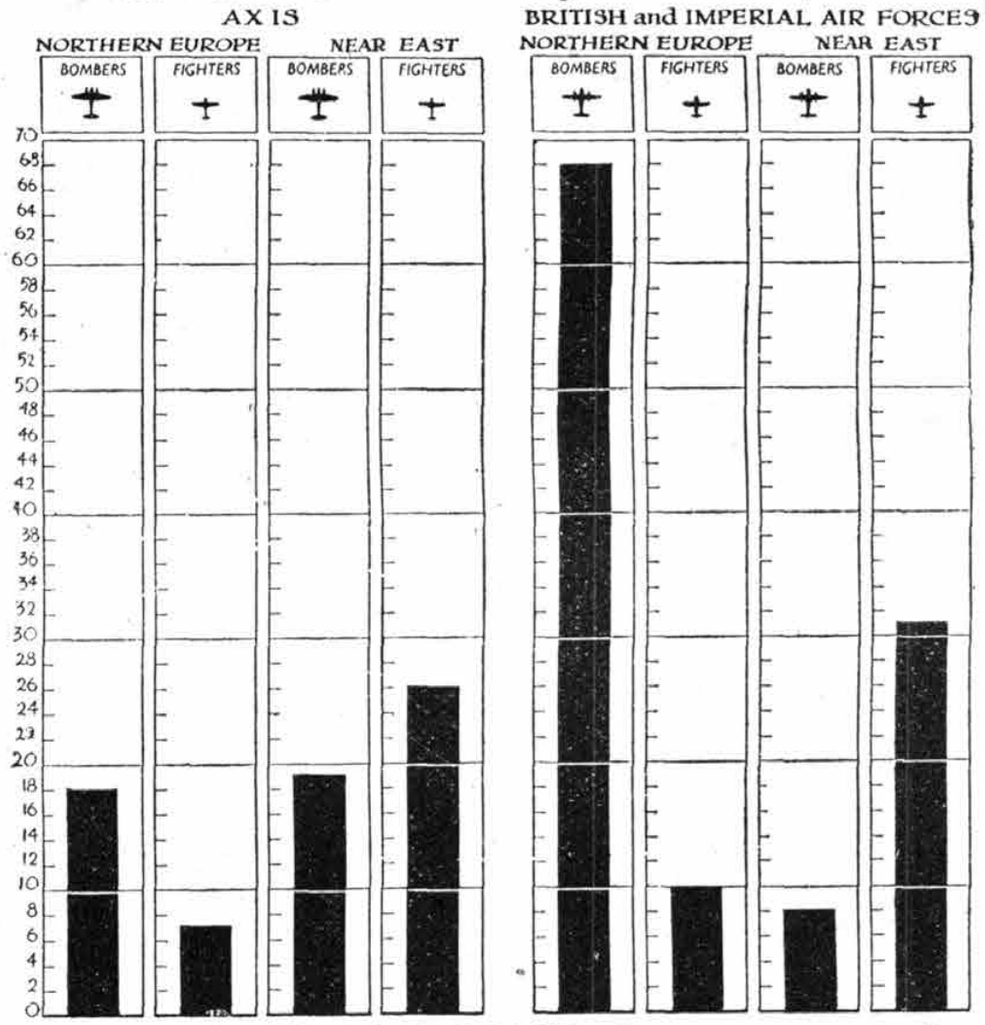
ADDITIONAL AXIS LOSS

A further enemy fighter was destroyed during R.A.F. offensive operations over Northern France on June 20, bringing the total shot down that day to five.

MEDITERRANEAN SEA-AIR BATTLE

In Parliament, Mr. Attlee announced that in the sea and air battles fought in the Central Mediterranean from June 13 to 17 the Axis lost at least 65 aeroplanes. The R.A.F. and the Fleet Air Arm lost 30, but no mention was made of any losses among the machines of the United States Army Air Forces which took part.

THE WEEK'S LOSSES—June 21 to 27, 1942



THE WEEK'S LOSSES AT A GLANCE.—Comparative losses in the Air War for the week June 21 to 27, 1942, inclusive. The chart does not include aeroplanes destroyed in Russia and the Far East, or those destroyed on the ground. Nor does it include U.S. Army Air Forces losses. The figures are: Northern Europe: Axis (daylight offensive) 2 bombers and 1 fighter; (night offensive) 16 bombers; (defence by day) 3 fighters; (defence by night) 3 fighters; British (daylight offensive) 5 fighters; (night offensive) 68 bombers and 5 fighters (approximate). The losses in the Near East were: Axis, 19 bombers and 26 fighters; British, 8 bombers and 31 fighters. Estimated personnel losses suffered by the respective Air Forces were: Northern Europe; Axis, 96; British, 425; Near East; Axis, 97; British, 60.

Goodrich Castle . . .

on the Wye, was built early in the 12th century and remains to-day in fairly perfect condition, showing some fine walls and towers. A most notable feature in the external defences is the finishing off of corner towers with projecting triangular buttresses to give extra strength to the most exposed angles. Goodrich withstood many assaults and saw the glitter and colour of grand pageantry in times of peace, but its greatest days were its last—when it resisted the Parliamentarians in the Civil Wars 1642-46.

There are new trials for strength in buildings to-day—traffic vibrations, and the endless throb of fast-held massive machinery, to mention but two—and the modern architect's translation of feet thick walls and buttresses is a framework of *steel*.

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STRUCTURAL ENGINEERS

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NEWS OF THE WEEK

MR. CHURCHILL arrived back in England on June 27. He flew to the U.S.A. and returned in the Boeing 314-A flying-boat, the Bristol, of British Overseas Airways. The Bristol was commanded by Captn. J. C. Kelly Rogers, O.B.E.

Battle was joined with the enemy West of Mersa Matruh on June 27.

The third raid of more than 1,000 bombers of the R.A.F. was made on Bremen on June 25. The attack was concentrated in 1¼ hours. A total of 52 aircraft were missing from the night's operations, the highest R.A.F. casualties for any single night. All the Home Commands of the R.A.F. were in operation. British, Allied and Dominion squadrons took part, including, with Coastal Command, aeroplanes of the Royal Netherlands Naval Air Service, Polish and Czech squadrons and the "Demon" Squadron of the R.C.A.F.

Pilots and ground crews of the U.S. Army Air Forces (not the U.S. Army Air Corps) were stated on June 28 to be in Great Britain. They are the advance units of the U.S. Army Air Forces and some are already installed on the aerodromes from which they will operate.

Major-General George Stratmeyer has been appointed Chief of Staff of the U.S. Army Air Forces in succession to Major-General M. F. Harmon, who is stated to have been assigned to another important post.

Mr. Alexander Dunbar, formerly Director in charge of Aviation interests of Vickers-Armstrongs, Ltd., has been appointed to succeed Sir Charles Craven as Controller-General of the Ministry of Aircraft Production. He has been Deputy Controller since Sept., 1941. His new appointment was announced on June 26. Major R. H. Kilner, M.C., has been Director in charge of the Aviation Section of Vickers-Armstrongs, Ltd., since June, 1941.

Mr. Oliver Lyttelton, Minister of Production, who returned from the U.S.A. on June 21, said, on June 24, that the aircraft production of the U.S.A. and Great Britain now exceeded by a substantial margin the total production of the Axis, including Japan. Speaking of American production, he said that bombers were particularly suited to mass production, and he hoped the Americans would put their greatest emphasis on bombers, leaving fighters, which went out of fashion more quickly, to Great Britain.

The Egyptian frontier was crossed by Field-Marshal Rommel's forces on June 24, and by that night they had reached a point South-west of Sidi Barrani. British forces withdrew from Sollum and Sidi Omar.

Nearly 4,000 aeroplanes were built in the U.S.A. during May, according to figures given by President Roosevelt on June 26.

Major-General D. D. Eisenhower, until recently Assistant Chief of Staff, Operations Division, War Department General Staff, was stated on June 26 to have been appointed Commander, European theatre, for the U.S. Forces.

More than 100 new aerodromes have been built in Australia for the Allied Air Forces during the past three months and many more are being built, according to a statement made by an American officer in Australia on June 24.

Liberator bombers of the U.S. Army Air Forces were reported, on June 23, to be co-operating with the R.A.F. in the Middle East.

Flight Lieut. C. S. Staniland, R.A.F.O., chief Test Pilot of the Fairey Aviation Company, Ltd., was killed in a flying accident on June 28.

The new Japanese fighter which was reported on June 19 to be in service and which was referred to as "Type 1" is the Mitsubishi S-01, a development of the S-00.

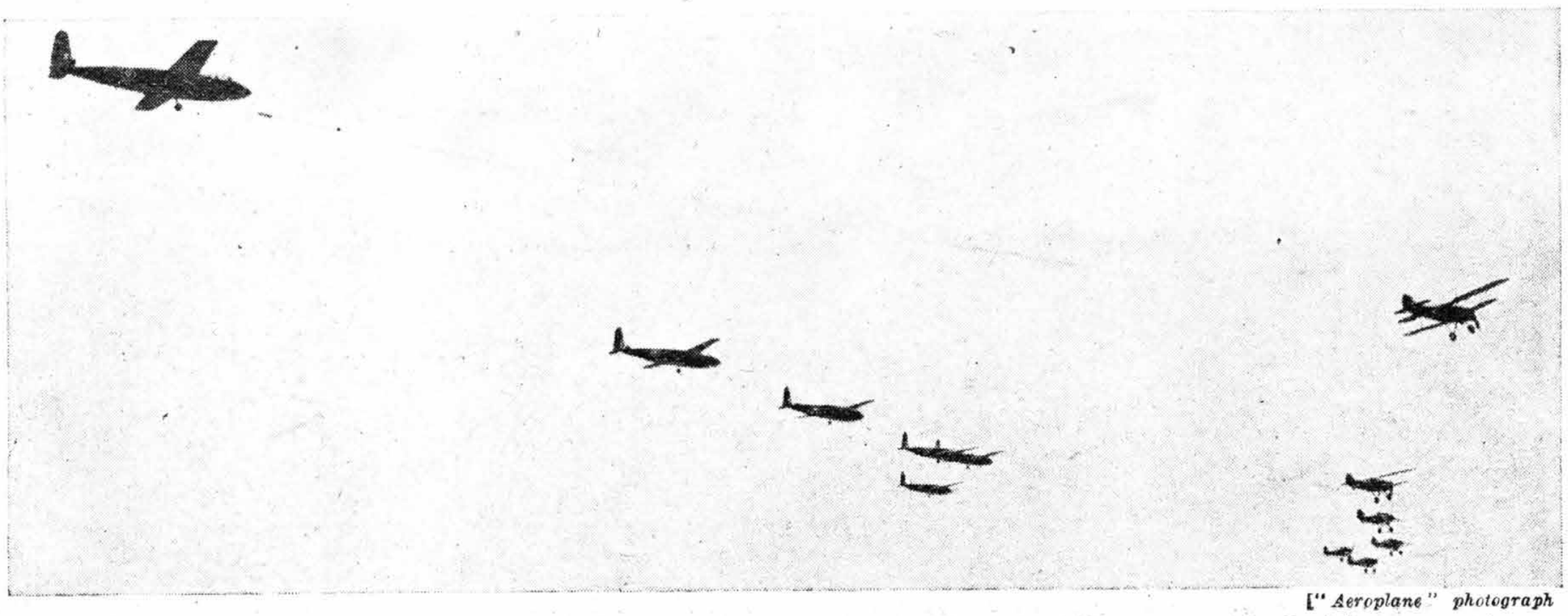
Service

THE W.A.A.F. celebrated its third anniversary on June 28. There are now more than 100,000 members and the original five trades have increased to 50, with 16 branches for officers. Special messages of congratulation were sent to Air Commandant K. J. Trefusis Forbes, C.B.E., Director of the W.A.A.F., by Air Chief Marshal Sir Charles Portal, Chief of the Air Staff, and by Air Marshal Sir Sholto Douglas, C.-in-C., Fighter Command.

Lieut.-General George Brett, C.-in-C., Allied Air Forces in Australia, has been awarded the Distinguished Service Medal for "exceptionally meritorious service" in England, Egypt, Burma, China, Java, and Australia.

An All-French Canadian Squadron of the R.C.A.F. overseas is being formed in Great Britain. It will be a bomber squadron and will be commanded by Squadron Leader J. W. Saint-Pierre.

The Air Force Employment Association is to resume some of its functions on a limited scale. It will not find employment but will give guidance to officers and N.C.O. members of air crews who leave the Service and are looking for civil employment. Applications should be made to the Secretary, Air Force Employment Association, Air Ministry (E.S.4), Kingsway, W.C.2.



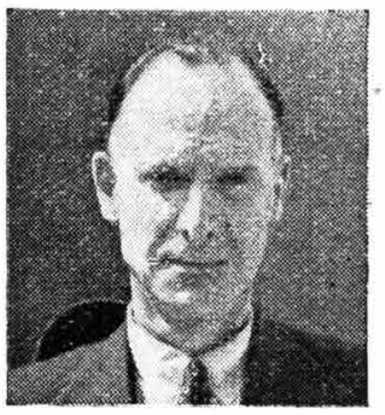
["Aeroplane" photograph

OFF THE SECRET LIST.—A formation of General Aircraft Hotspur gliders on tow behind Hectors over the English countryside.

"I AM AN AIRCRAFT DESIGNER"—VIII

By Capt. Geoffrey de Havilland

A Talk given on the Forces Programme of the B.B.C. on June 15.



Capt. Geoffrey de Havilland, C.B.E., F.R.Ae.S., Technical Director of the de Havilland Aircraft Co., Ltd.

AEROPLANE DESIGN is now a highly organised branch of engineering. Thirty-three years ago, when I built my first machine, it was a rather risky experiment, but I shall always feel grateful to a generous grandfather who made the experiment possible. In these days of vast expenditure it is difficult to believe how far that money went. Just under £1,000 provided for a new design of aero-engine, a complete aroplane, workshop equipment and a shed on the flying ground.

I had an overwhelming desire to fly, and that was why I left my job in the Drawing Office of a motor firm and started designing a 50 h.p. aeroplane engine. That was in 1908.

My theoretical knowledge about flying was very small, so, having designed and ordered the engine, it seemed best to make some kind of aeroplane as quickly as possible and learn from the results.

In the same house where I worked on the drawings there was a young man named Frank Hearle, and I asked him to join me. He did so, and we have been together ever since, and he is, to-day, the Managing Director of our Company. When we were installed in a small workshop in South London, my wife made a third member of the Company, and did all the sewing of wing fabric and made the tea and generally helped.

We found a suitable flying ground in Hampshire, and on it was an aeroplane shed, not in use, which I bought from the owner, who is now Lord Brabazon. The day came for the first taxi-ing. Never having learned to fly, and this being a new and untried aeroplane made the immediate happenings a bit uncertain. Well, for some weeks the machine was taxied about without showing the slightest wish to do anything else, and then one day the surprising thing happened and it left the ground suddenly, and came down almost at once and pretty hard. There was not much left except the engine, but we had learned a lot, so we took the remains back to town and started on a less ambitious machine which had a single propeller and was generally more conventional.

After a few weeks I had learned to fly on this machine, and when our money was nearly all gone and I thought it meant going back to motorcar work, Hearle and I, fortunately, got jobs at the Government Balloon Factory at Farnborough, and they bought the aeroplane as well. That was in 1910.

At Farnborough it was possible to continue designing and also flying, and let me say here that in those days if a designer could also be his own test pilot it was a big advantage, as he learnt first-hand all about his new designs. Amongst many other types at Farnborough we built a small, fast single-seater, the S.E.1, and on it I had the only rather bad crash in more than 30 years of flying. It was a single-seat biplane with 100 h.p. Gnôme engine, and had a monocoque fuselage and other quite modern features, but there was still little known about stability and control surface areas, and the rudder of this new machine looked extremely small.

However, it flew all right for a few circuits and then, in making a rather flatter turn, the machine took charge and went into a real flat spin and went on till it hit the ground. When some of the figure experts visited me in hospital they told me enthusiastically that they had worked things out and found the machine behaved exactly right, and ought to have spun owing to the too small rudder. Unfortunately, a broken jaw prevented my comment, and they went away quite pleased.

Early in 1914 I left Farnborough and joined the pioneer in aviation, Mr. Holt Thomas, who had formed Airco at Hendon. We turned out many new designs of military machines which were used in large numbers in the last war as bombers and fighters. The better-known of these designs were the D.H.4, D.H.9 and D.H.9A. War always greatly accelerates the design of war equipment, and from 1914 to 1918 there was rapid development in aircraft and engine design, but it was not until after 1920 that the design of commercial air transport machines started seriously.

After the war a little group of us who had been at Airco at Hendon decided to start a new company at Edgware, and it was here in 1920 that the present de Havilland Aircraft Company started in two small sheds and a canvas hangar. With a few exceptions, this little group of people are still working together in the same company to-day.

We soon turned all our efforts to commercial and private aircraft. The civil side of design and construction was less harassed by regulations and red tape, but it was hard going to exist on civil work, because official support was meagre.

The first transport machines we turned out were used on the Paris—London service, and from then on till 1938 we made a long series of commercial types, including the Hercules, the Dragon, Dragon Rapide, the Albatross and the Flamingo.

About 1924 there were Government competitions for light aeroplanes, but the rules made the machines too light to be of real use, and in an effort to find a practical answer we produced the Moth light aeroplane, which has had a long life and considerable development.

A really suitable engine was badly needed for this and similar machines, and so I discussed the problem with Major Halford, who had designed some of the engines for our war machines, and the outcome of our talk was the Gipsy engine. Thus the Gipsy Moth was created, and I think I can say it was a sort of milestone in our progress. It was later developed into the Tiger Moth, and is still the principal machine used in primary training in the Royal Air Force and the Dominion Air Forces.

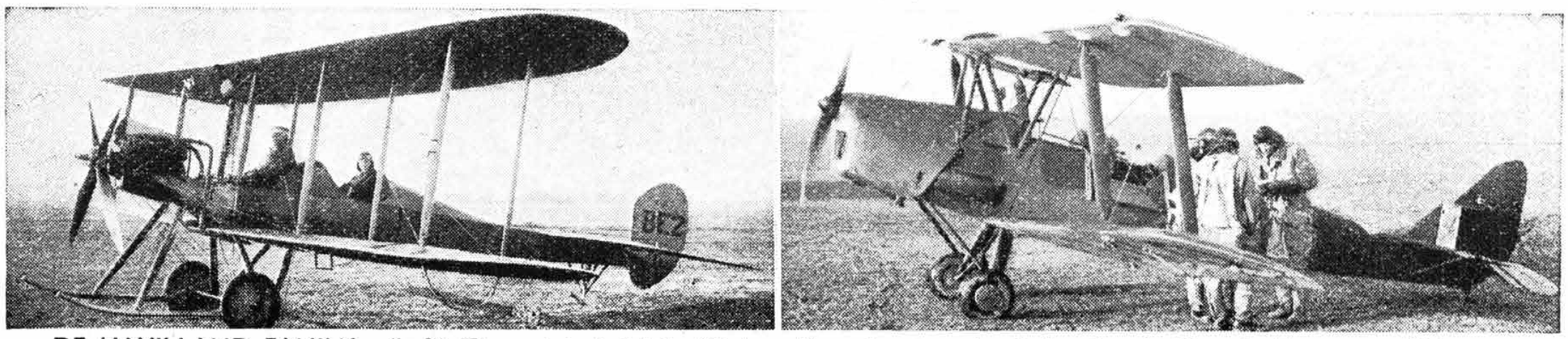
The various kinds of Moths did numerous record flights in the hands of well-known pilots, notably a South Atlantic crossing by Hinkler, the North Atlantic by Mollison, Amy Johnson's long flights to Tokyo, Capetown, etc., and Lady Bailey's flights to Africa.

In 1934 we designed the Comet specially for the Australia Race, which it won in the record time of 2½ days. The design of the Comet was interesting, because it was almost the first machine, if not the first, in this country to embody all the essential features now found in a modern machine, namely, clean design with minimum resistance, variable-pitch propellers, retractable undercarriage and tapered monoplane wings with a fairly high loading.

Successful aircraft design is a matter of stage-by-stage development, the use of much accumulated experience and data applied by people who have long worked together as a team, who have pride and enthusiasm in their work, and have a sort of tradition, so that each successive design in some way resembles its predecessor, but is more highly developed.

To-day, in place of the one-man drawing office of 30 years ago, we have a Design Office, an Aerodynamics Department, a Stressing Office and a Production Drawing Office, and these people are making use of all the experience collected over those 30 years, and adding to it every day.

They are amplifying and improving on my earlier efforts, and let me here thank them for their co-operation and congratulate them on their success.



DE HAVILLAND FAMILY.—(Left) The original B.E.2, (70 h.p. Renault motor) of the Royal Aircraft Factory, which was designed by Geoffrey de Havilland, who is seen sitting in the pilot's seat at the back. (Right) The D.H. 82A (130 h.p. D.H. Gipsy Major motor), the Tiger Moth. The B.E.2, as an officially designed aeroplane was not entered in the Government's Military Trials of 1912, but flying hors-de-concours proved itself the best type of that year. The prototype was produced in January, 1912, and had about the same performance as the first de Havilland Moth.

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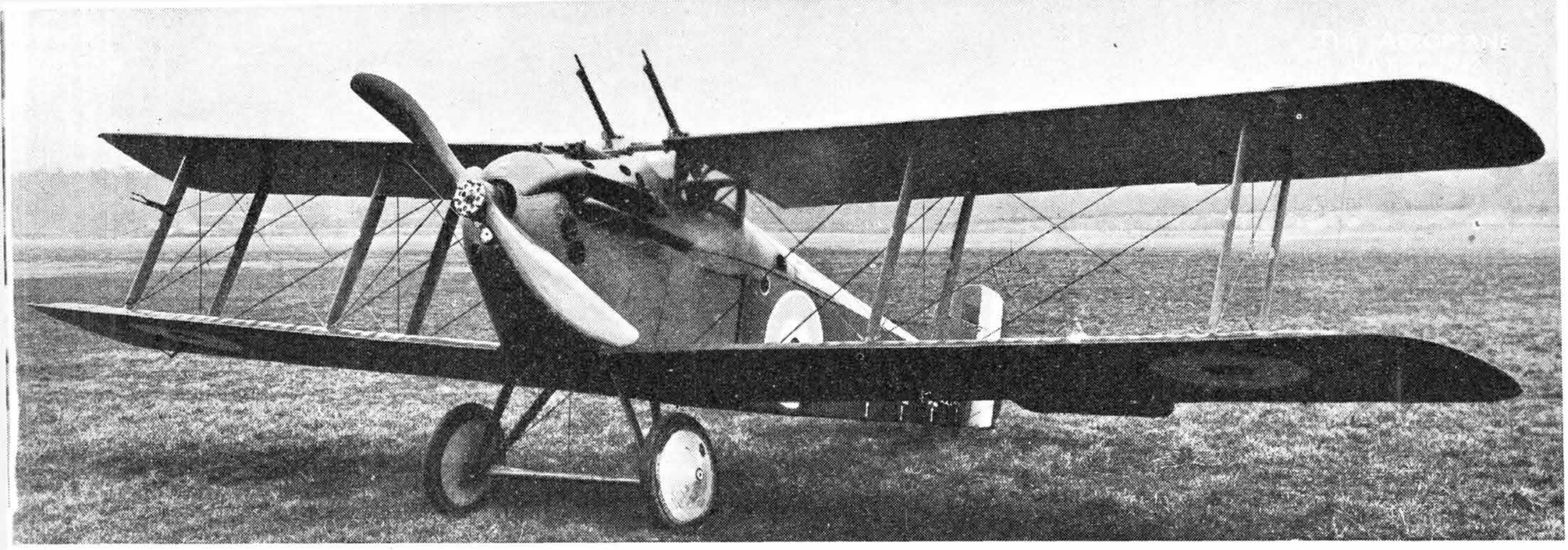


SUPERIOR FIRE POWER.—One of the production fighters which finished the last War, the Sopwith Dolphin (200 h.p. Hispano-Suiza motor). Two fixed Vickers guns fired through the airscrew and two stripped Lewis guns were movable, as shown.

THE WEAPONS OF AIR WARFARE—V

By Peter Brooks

WE CAN now go back to 1916 and trace the evolution of the fixed gun—particularly as mounted on the single-seat fighter. The Sopwith Company followed the two-seat 1½-Strutter with the single-seat Pup which had a single Vickers synchronised gun firing through the airscrew. This fired at a maximum rate of 800 rounds a minute and gave the Pup a fire power approaching 20 lb. per min. The weight of fire varied with the speed of the motor. The Pup was a natural development of the Naval Tabloid fitted with the deflector plates already mentioned, and was the first British tractor single-seat fighter to be used in large numbers It gave great satisfaction.

After the Pup came the Sopwith Camel which marked another important advance in that it had twin Vickers guns firing forward and therefore had twice the fire power of its predecessor. The Camel was even more successful than the Pup. It was followed by other types too numerous to mention, but none had improved armament. Indeed, the twin Vickers of the Camel were adopted in the majority of its successors practically unchanged until the beginning of this War.

Nevertheless, two trends which were beginning to show themselves in the closing months of the war must be noted. These were later submerged for many years, but when they eventually came to the surface again they formed the basis of two conflicting schools of thought on the arming of the single-seat fighter.

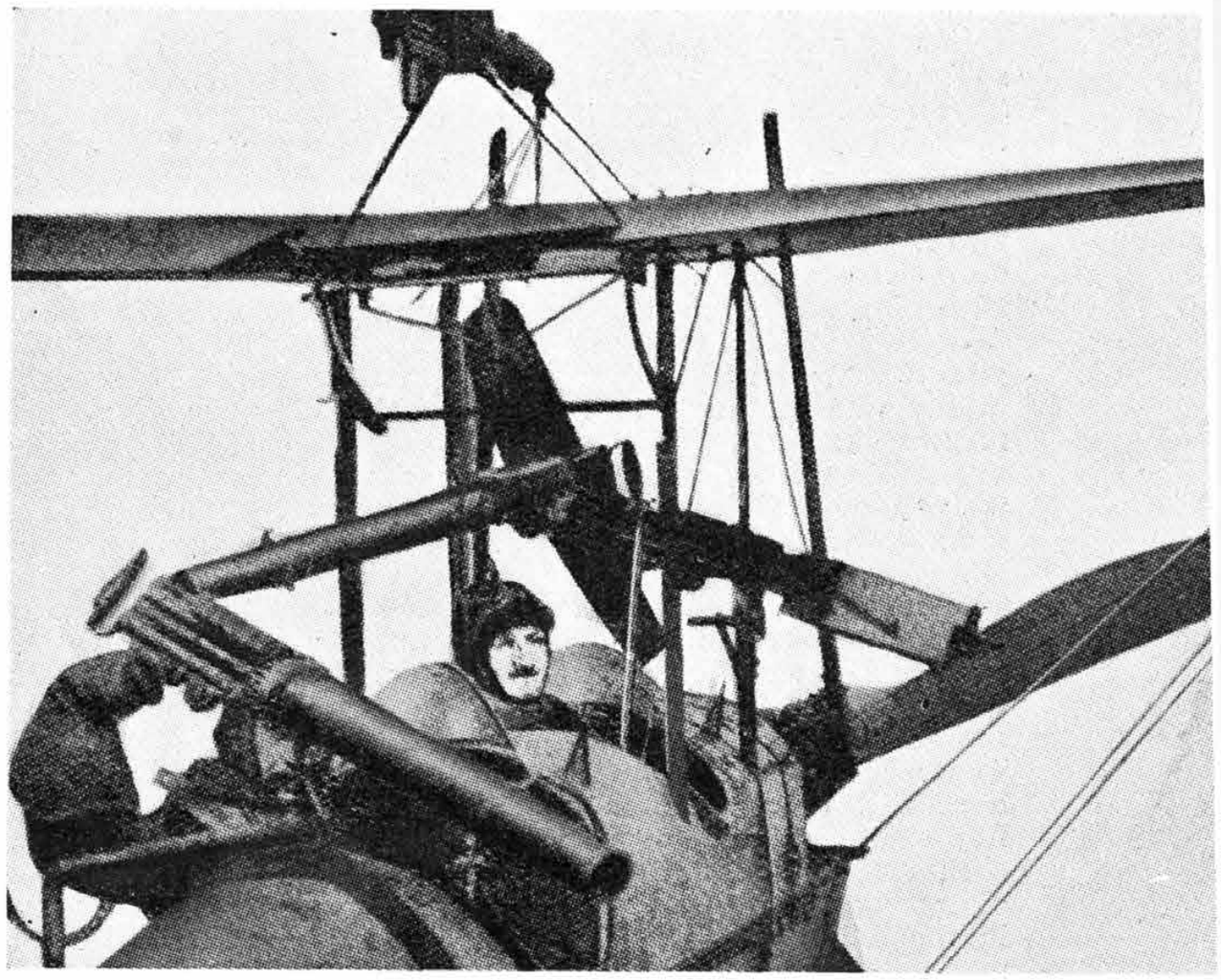
The first—a tendency to multiply the number of standard calibre machine-guns—actually got beyond the design stage and multi-gun installations were tried in action to a limited extent. For instance, the Sopwith Dolphin was tried with four guns—two synchronised Vickers and two Lewis guns on the top centre section, firing above the airscrew. The two Lewis guns were sometimes mounted on the lower plane instead, where they also fired clear of the airscrew. This armament gave the Dolphin a fire power of 75 lb. per minute, but it was largely experimental as this fighter was more often used with just two Vickers guns. Although two Vickers guns remained the usual fighter installation, the S.E.5—one of the most successful fighters of the 1914-18 conflict—had a gun combination consisting of one synchronised Vickers and one Lewis on the top plane firing clear of the airscrew. This arrangement gave the S.E.5 a fire power of 37.5 lb. per minute.

In 1918 the Sopwith Company had on the design board a new triplane which was to have six guns. It was not built because the war ended.

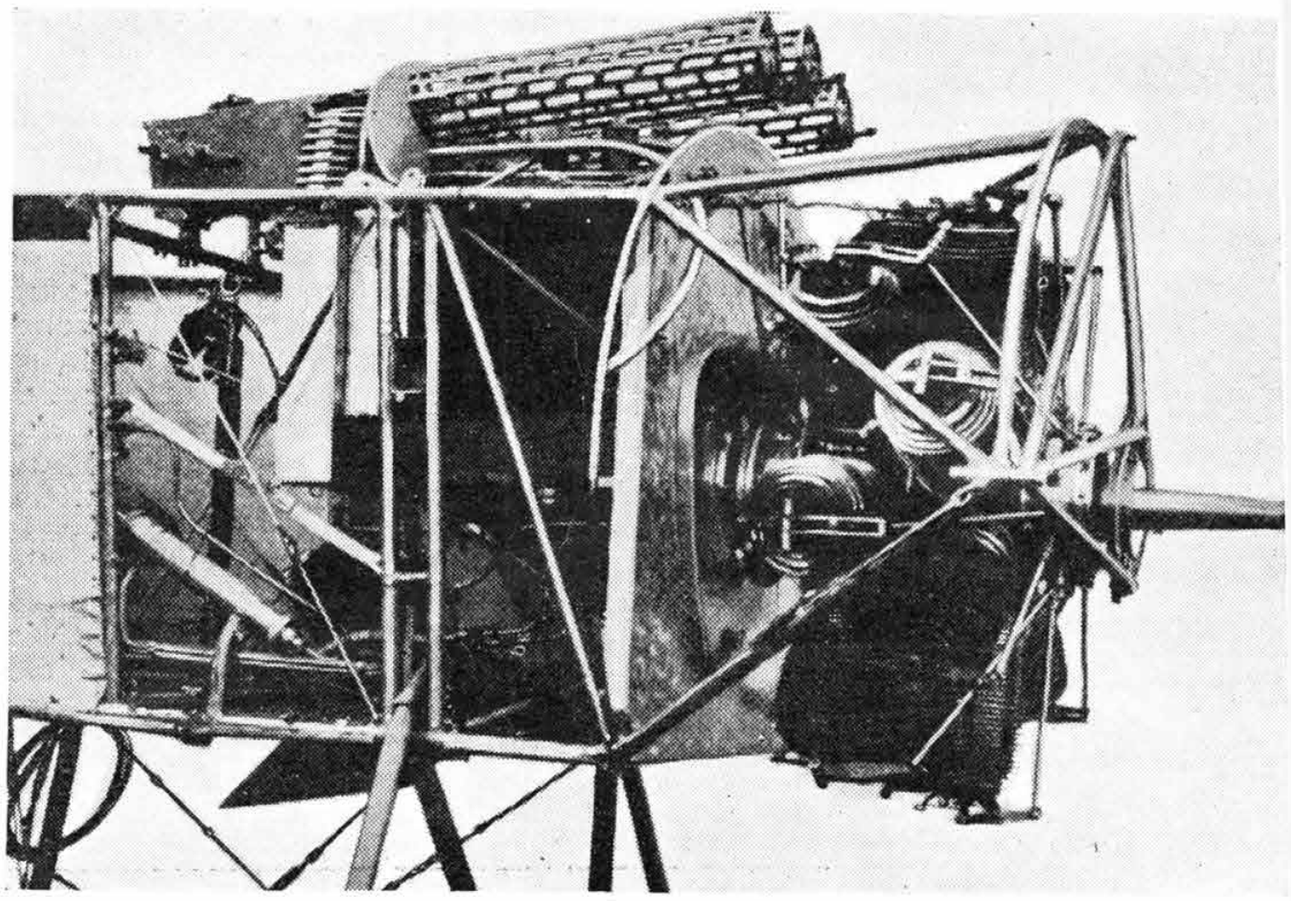
For ground attack purposes, aeroplanes mounting large batteries of machine-guns were developed but never much used. A Junkers monoplane built for this purpose carried as many as 16 machine-guns in its fuselage firing downwards at an angle to the line of flight.

The second tendency which was showing itself towards the end of the War was that which involved the use of shell-firing guns instead of machine-guns of rifle calibre as the fixed armament of the fighter. Semi-automatic and then automatic shell-firing guns on movable mountings had been experimented with from the earliest days for use against ground targets.

Parallel with these experiments, attempts were made to use shell guns on either movable or fixed mountings against airships. One of the experiments involved the mounting of the 1½-pounder "C.O.W.," already referred to, in a D.H.4 so that it was fixed to fire upwards at an acute angle. Other, earlier, installations included the mounting of the Davis non-



FESTOONED.—A B.E.2c before the days of the interrupter gear. The crew of two were doubtless kept busy with the four machine-guns.



EARLY FIRE POWER.—Three machine-guns were tried by the Germans on a version of the Fokker E.1 with the 160 h.p. Oberursel double-row rotary motor. In addition to trouble with the interrupter gear any slight motor defect caused excessive vibration.

recoil gun on such types as the Supermarine Nighthawk and the Grain P.V.2. But none of these experiments aimed at producing a fixed forward-firing gun suitable for use in air combat.

Nevertheless, in 1917 several French pilots, notably the famous "aces" Guynemer and Fonck, had achieved some successes with fixed forward-firing *canon*, as they called them. These guns were not automatic and had to be reloaded by hand after each shot.

These *canon* were mounted in the Vee formed by the cylinders of the Hispano Suiza motor of the French Spad single-seat fighter, and fired through the airscrew boss. In 1918 a 37 mm. Hispano "*Canon Puteaux*" was installed in the experimental Beardmore W.B.5 single-seat fighter which was the first British aeroplane to be so armed. That was the limit of shell-gun development during the War period.

After the War, the further evolution of the single-seat fighter stopped for several years and even when at last new designs began to appear again they retained the old twin Vickers installation. The Constantinesco synchronising gear also remained in use, although the Bristol Aeroplane Company, after an interval of some years, introduced a modification of this gear for use with its radial motors.

In the 1920s a few experimental gun installations were tried, including one or two fighters fitted with cannon. Of these the designs produced by Westlands and by Vickers to take C.O.W. guns were the most notable.

Increasing Fire Power

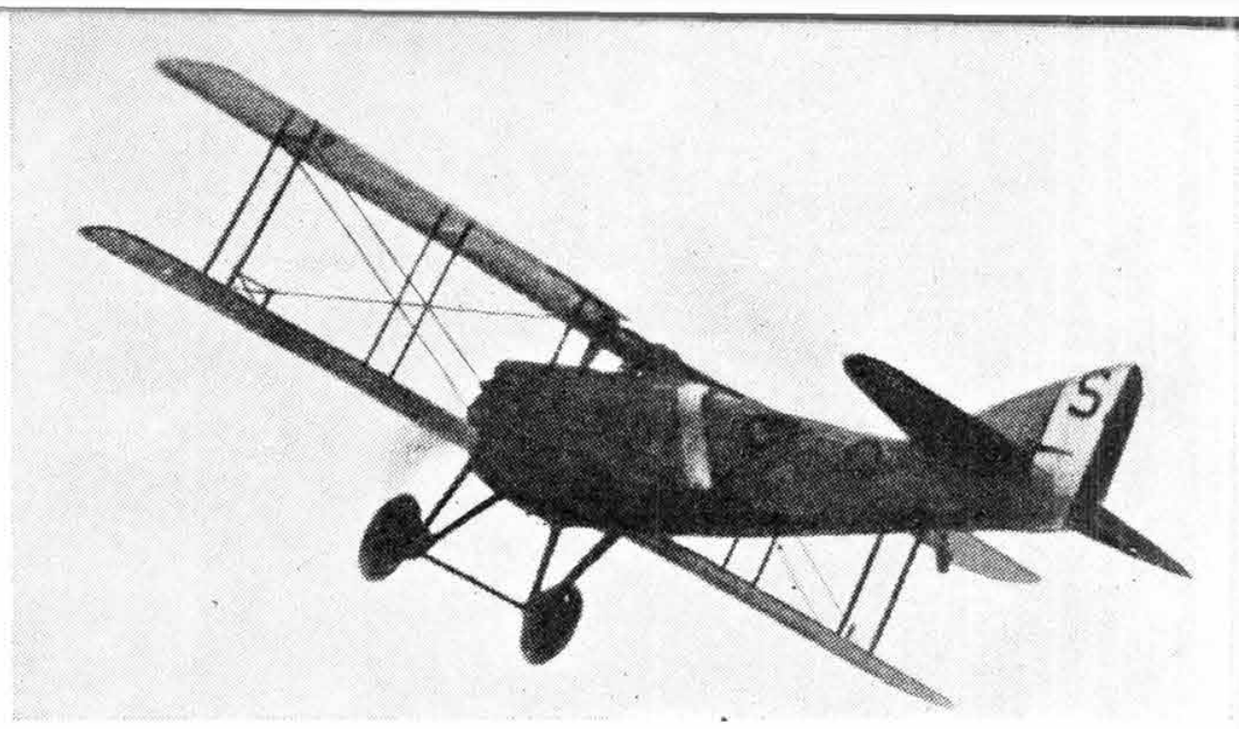
It was not until 1930 that the next step in development was taken. In that year the Gloster S.S.19 biplane fighter appeared fitted with six guns—two synchronised Vickers in the fuselage and four Lewis guns on the wings firing outside the airscrew disc. From the S.S.19 came the Gladiator which at first had two synchronised Brownings in the fuselage and two more clear of the airscrew in the lower wings. Later two more were added to the upper wings and in this form the Browning was extensively used early in the present War. The Gladiator in its first form had a fire power of 110 lb. per minute and carried 2,000 rounds of ammunition. The weight of fire was increased to 165 lb. by the addition of the two further guns.

The Browning, which is of American design, was a new weapon when it appeared in this country in 1932. It was soon destined to become the most widely used gun in the R.A.F. and not only replaced the Vickers as the standard fixed gun but, as we shall see later, was adopted for use in our power-operated turrets. At about the same time as the belt-fed Browning replaced the Vickers the Lewis gun, which had been used for so long as a free weapon in conjunction with the Scarff ring mounting, was superseded by the Vickers K. Those British aeroplanes that still use free guns now usually have this weapon which may be regarded as a modernised Lewis with the same type of drum feed.

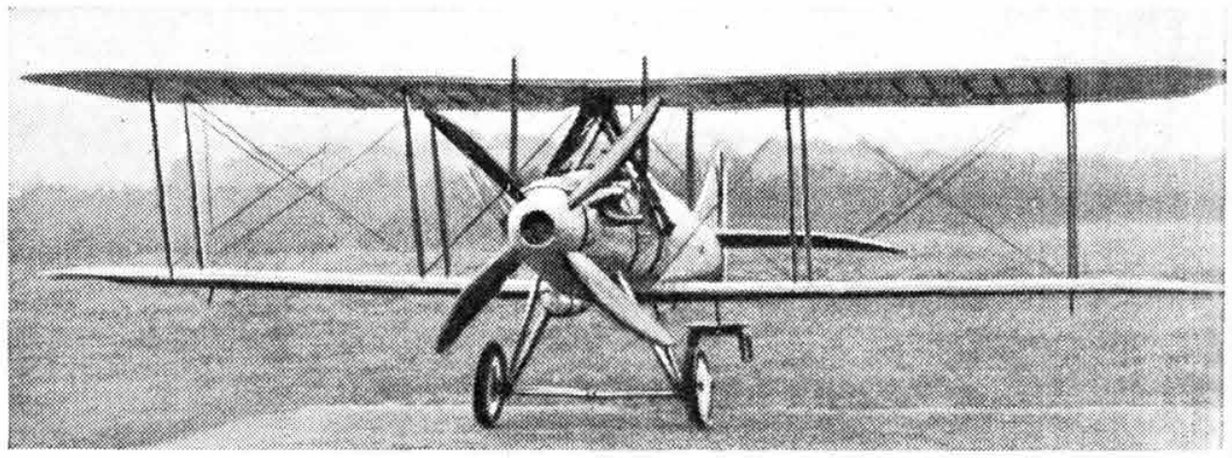
In 1933, the Air Ministry began to investigate the problem of increasing the fire power of our fighters still further and in the following year, when a specification was issued for a monoplane fighter, a battery of eight Browning machine-guns was decided on. The Hurricane and Spitfire, originally designed to take fewer guns, were re-designed to meet these requirements and appeared in 1935 and 1936, respectively, afterwards going into production. Four years later, armed with eight guns giving a fire power of 220 lb. per minute for 18 seconds of firing, they saved Great Britain from defeat.

While we were building the eight-gun fighter Germany and, to a lesser extent, France, pinned their hopes on a combination of one cannon and usually two machine-guns. This gave a much lower fire power than that of our fighters but allowed more ammunition to be carried. Much was also expected of the cannon but at that time, when aeroplanes had little or no armour, it showed slight advantage over the machine-gun, and its lower rate of fire and greater weight told against it. The soundness of the Air Ministry's decision, criticised in so many quarters, was vindicated in the Battle of Britain. Since then the greater use of armour in aeroplanes has introduced new factors and to-day a battery of cannon or, alternatively, a combination of several cannon and a battery of machine-guns is essential. The fire power of the single-seat fighter has risen enormously in the past two years and is still increasing. The 575 lb. of high explosive shell per minute from the four Hispano cannon of the Hurricane IIc make an amazing contrast with the 20 lb. per minute of the old Sopwith Pup of 1915.

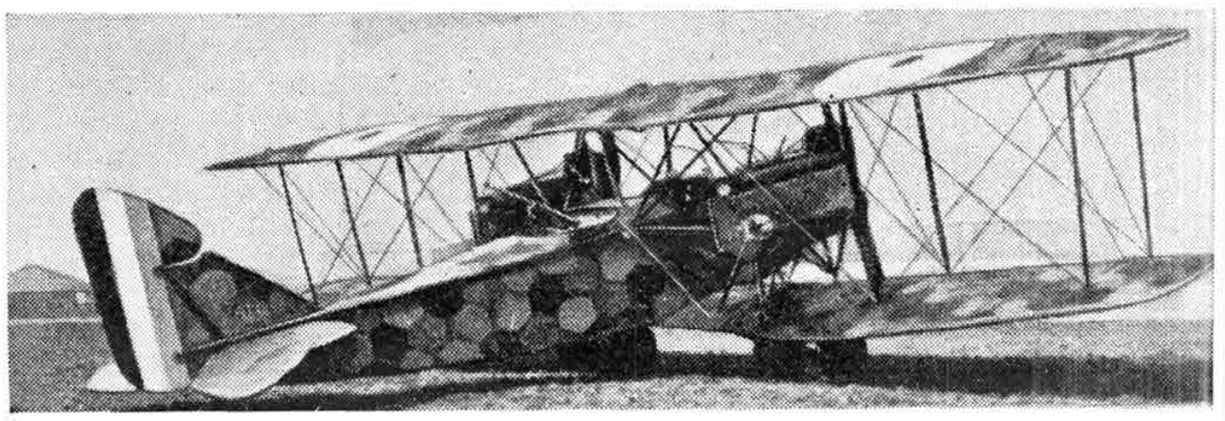
In the concluding instalment of this article next week, the later development of the weapons of air warfare will be traced and the transition from the hand-operated gun to the power-operated gun turret will be examined.



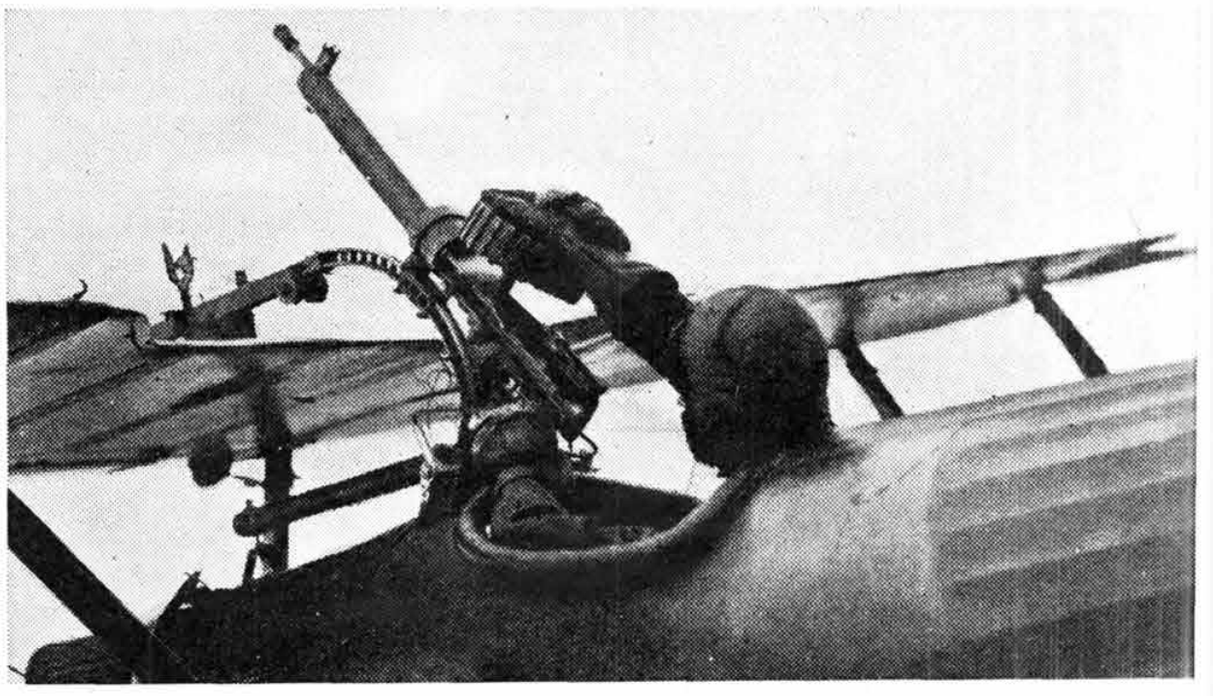
FRENCH PROGRESS.—The Spad biplane with the Hispano-Suiza motor was the outstanding French fighter of the last War. A 37 mm. cannon was used experimentally in combat firing through the airscrew hub.



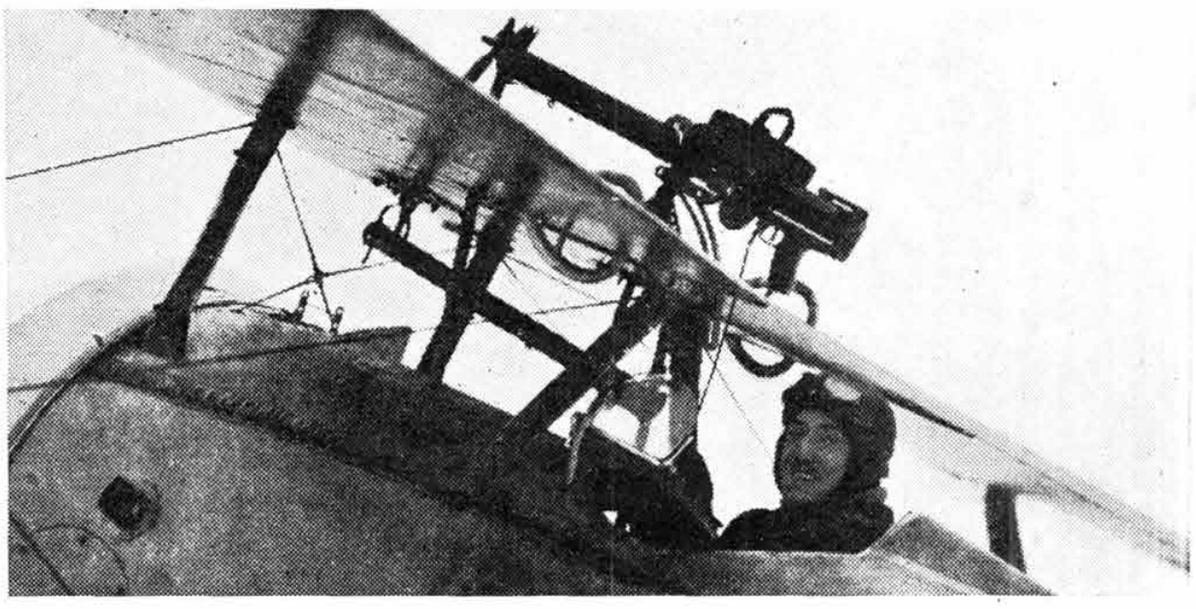
CANNON EXPERIMENTS IN 1918.—The Beardmore single-seat fighter which was designed around a 37 mm. cannon.



GUN RINGS.—A captured German A.E.G. bomber, 1918 type, on test at Farnborough in that year. It was fitted with a gun ring fore and aft.



DRUM LOADING.—A pilot re-loading the Lewis on the Foster gu mounting of an S.E.5a, a British fighter of note in 1917-18.



OVER THE AIRSCREW.—A Lewis gun on the top mainplane of a French Nieuport XXIII Scout in British service. The tube is an Aldis sight (right).

GALLAY

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We have received an interim report from a leading aircraft firm, and the following are extracts from same:—

"I should like to say that we are very gratified with the results obtained with your radiator and oil cooler (Aerodynamic), both these units showing remarkably good efficiency."

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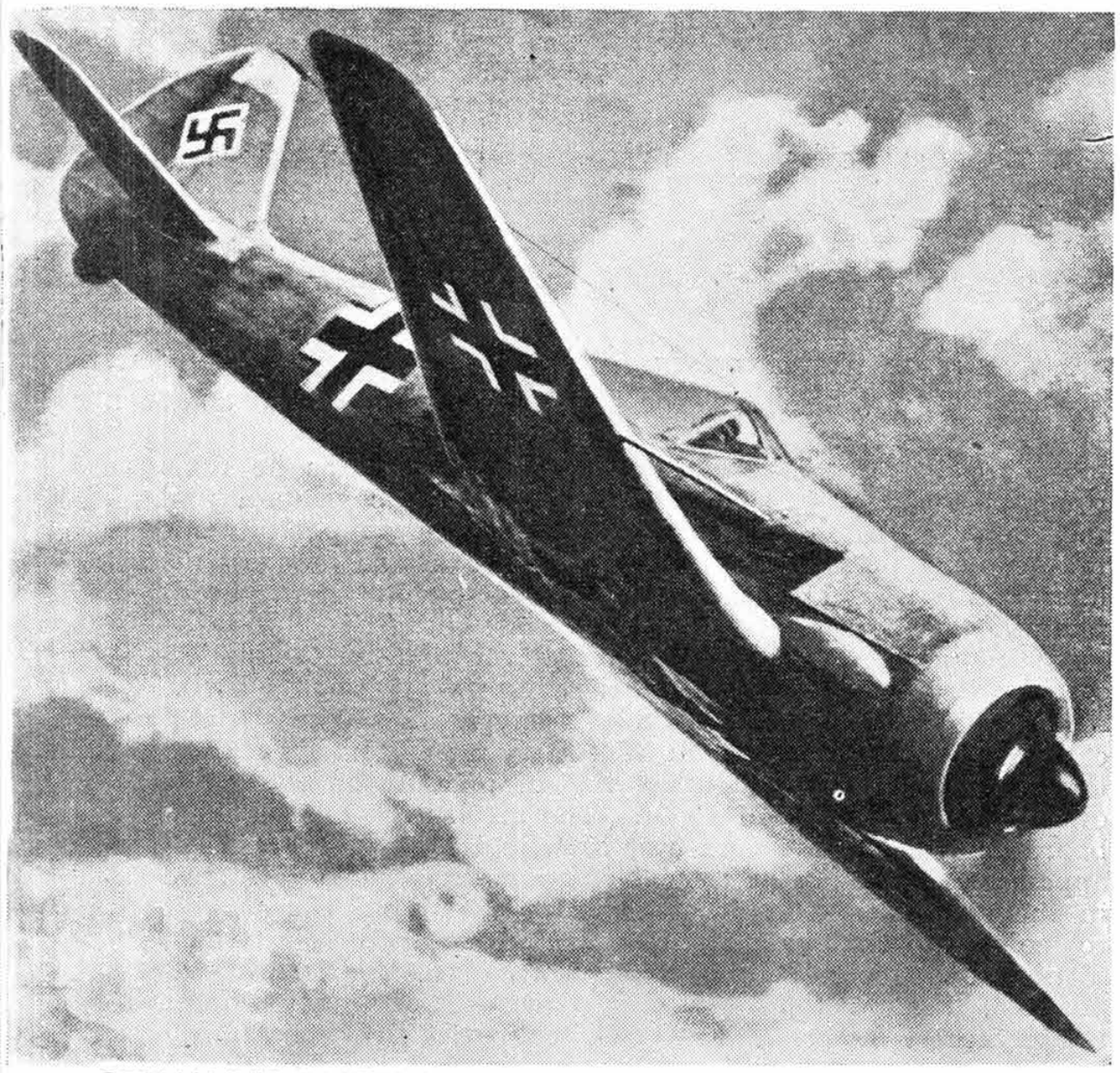


GERMANY'S FASTEST.—The Focke-Wulf Fw 190H single-seat fighter (one 1,580 h.p. BMW 801 motor), first reported in action in September, 1941, and now in service in some numbers. Its top speed is about 370 m.p.h. at 18,500 ft.

News from Germany

German A.A. Statistics

PRAISE for the anti-aircraft defences of the Reich often appears in German newspapers after the heavy R.A.F. raids. After the Lübeck raid more eulogy became necessary. Criticisms of the easy life and inefficiency of the anti-aircraft artillery units was so widespread that the Inspector of Flak in the German Air Ministry had to get one of his publicity officers to describe the achievements of his Command since the outbreak of the War. Some of the facts and figures which the officer produced includes claims that 5,645 enemy aircraft had been shot down, 1,254 captured, and 55,866 officers and men made prisoner. During the raid on Lübeck, German anti-aircraft gunners suffered heavy losses.

A Nazi Definition

AFTER the recent heavy raids on Germany, a Swedish correspondent in Berlin asked a spokesman of the German Government for an explanation of the term " military objective." The official replied that military objectives were establishments occupied by the military authorities, whereas armament or aircraft factories not managed by the German military authorities ranked as non-military objectives.

The Desert War Reviewed

DOCTOR TH. SEIBERT, a former correspondent of " The Völkischer Beobachter," who had to leave this country before the War because of his non-journalistic activities, reviewed the air war in North Africa, using official information. He stated that the Middle East Command of the Royal Air Force had, at the beginning of the second Libyan battle, a strength equal to half a year's output of the British and American Industries.

The success of the German Afrika Korps rested on the solution of two problems: that of keeping up a continuous flow of men and materials to the front, and overcoming technical difficulties caused by the climatic and geographical conditions of this theatre of war.

So long as Malta's offensive power was unbroken, nearly all the supplies of the Afrika Korps had to be brought by air from Italy in the beginning of the battle. While Marshal Kesselring's units kept up an incessant bombing of the Island, sea convoys were able to carry the bulk of the supplies, in particular heavy weapons like tanks and guns. At the same time, transport aircraft were used for bringing supplies to the fighting units. This campaign was helped by the untiring efforts of the crews of the Ju 52/3ms, who took great risks when flying ammunition or fuel straight through the " fire-curtains " of British anti-aircraft batteries.

The second problem was the protection of the aircraft against heat and sand; this was solved by the Luftwaffe's Corps of Engineers. Portable cooling devices were issued to even the smallest units; filters protected the motor against damage by sand. Special oil filters were designed and manufactured in great numbers, with the result that German aeroplanes were ready for action at any moment.

Finally, Seibert praised the administrative staffs of the Luftwaffe who planned and built the aerodromes and supplied the airmen with uniforms and equipment, and looked after the civilian mechanics who were responsible for major repairs and overhauls.

Aircraft Identification in Germany

MEMBERS of the Observer Corps of the Luftwaffe must be able to identify about 80 different aeroplanes. First, they must know all German types, then British and, finally, all Italian fighters. No pupil is allowed to begin the study of a new group until he has mastered the German types. Aircraft recognition is to be a compulsory subject for every member of the German armed forces, and members of the Hitler Youth organisation are to be taught its fundamentals in an attempt to improve the standard.

These facts were given by Hauptman Voigt, an officer of the Aircraft Identification Department of the German Air Ministry, the author of the popular recognition booklet from which THE AEROPLANE took silhouettes and the performance figures of the Westland Whirlwind.

The Asymmetrical Aeroplane

DR.-ING. R. VOGT, of the Blohm und Voss Company, spent many years on the design of the new asymmetrical Bv 141 multi-purpose aeroplane. As far back as the beginning of 1939 he obtained a patent for a unilateral tail unit which, according to the patent specification, was designed to improve the longitudinal stability of the aeroplane. This type of tail unit can also be used on two-motor aeroplanes.

Steam in the Air

DOCTOR FRIEDRICH MUNZINGER, of the Allgemeine Elektrizitäts Gesellschaft, Berlin, Germany's second largest manufacturer of electrical equipment, is in charge of the development of steam engines for aircraft. He is studying the problem of improving the starting properties of steam engines.

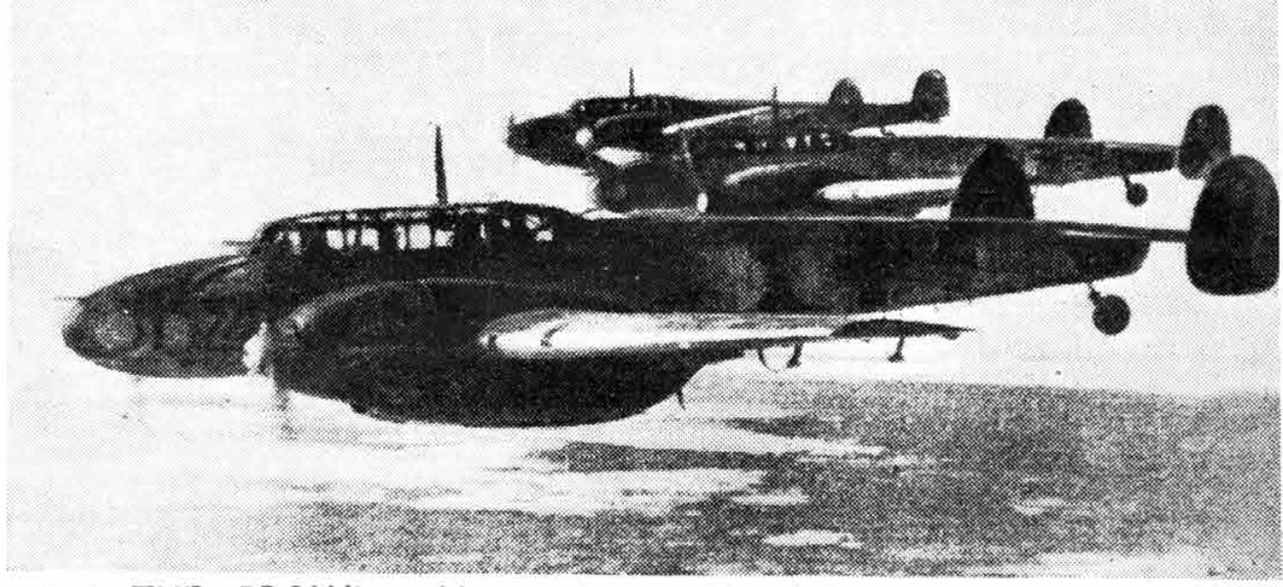
News from Aero-motor Works

THE KLÖCKNER-HUMBOLDT-DEUTZ A.G. factory at Oberursel Taunus was recently enlarged and, to-day, is reported to be working at full capacity. In the last war, this factory built rotary motors for Fokker and other fighters. There are reports that a new factory in the Taunus mountains, owned by this Company, will shortly begin production. An associated company, the Klöckner Flugmotoren G.m.b.H., of Hamburg and Duisburg, was, until recently, building air-cooled BMWs.

Flugmotorenwerke Ostmark G.m.b.H., which has its headquarters in Vienna, is a subsidiary of the Junkers Motor Works, and has set up factories in Austria and in the Protectorate of Bohemia and Moravia. In the past it has concentrated largely on Jumo 211 motors, but seems now to have taken up the production of a new liquid-cooled aero-motor. Existing factories are being expanded and others built in this part of Europe—one of the few which still enjoys freedom from R.A.F. raids.

The BMW combine, which is sponsored by Göring and Milch, has almost finished the construction of a new factory, also in the neighbourhood of Munich. It will probably be devoted to the production of a new aero-motor—possibly the eighteen-cylinder, double-row BMW 802, of which a few details have appeared in the German Press. The BMW 802 will become the standard motor of the Fw 190 fighter.

The Suddeutsche Bremsen A.G. of Munich now makes only aero-motor parts.



ON THE PROWL. — Messerschmitt Me 110C5 two-seat long-range fighters (two 1,200 h.p. Mecedes-Benz DB 601N motors), a type in service with the Luftwaffe on many fronts. The Me 110 is said to be superseded in production by the Me 210, a development of the same design with single fin and rudder and shorter nose.

CHANNEL SWEEP

A talk broadcast in the Home Service of the B.B.C. as a postscript on Sunday, May 31, 1942, by a Squadron Leader who has commanded many operational flights over France.

I BELIEVE that before "ops" everybody gets that funny feeling in the pit of the tummy. There isn't much outward sign of it, except perhaps a little extra laughter at some of the very weak jokes which are cracked on these occasions.

Let's imagine we are in the dispersal hut, waiting to be briefed for a cross-Channel sweep. As soon as the Wing Commander Flying—he's the fellow who leads our Wing—enters the hut, all chatter ceases. We are getting accustomed to seeing him each day sit on one of the tables and say with a smile: "An easy one to-day, chaps; just a 'quickie' over St. Omer and back via Calais," or something like that. But to-day it isn't quite such a "quickie," as we are flying somewhat farther; the target for the bombers is Lille.

The Wing Commander is now reading out to us the particulars of the sweep. We are to take off at two minutes past three, climb up and rendezvous with the rest of the party at 3.17 over Blank-on-Sea, then fly with the bombers to Lille and stick to them. Good enough. We discuss the order of take-off, and the order and position in which we should fly; that's a most important detail, otherwise every one of us might start milling round and the sky would be full of Spitfires looking for each other.

It's exactly a quarter to three when we leave the dispersal hut, just ample time to finish a cigarette, put on my scarf and "Mae West," and then saunter out to my aeroplane where one of the crew is holding my parachute ready. It's a lovely day, sunny, with a few cumulus clouds a couple of thousand feet up. Mentally, I note that the wind is blowing gently from the South and that visibility's good. As always, my aeroplane looks as clean as a new pin. The fitter who's standing on the wing helps me into the cockpit, and hands me my helmet and gauntlets and a map. Long ago, I learned that it is essential to be comfortable in an aeroplane; and, you know, a Spitfire is small enough to sit in, even without all the impedimenta which a fighter pilot has to carry with him on these occasions. I plug in my telephone jack and oxygen tube, then I strap myself in tightly, and put the map in the pocket provided for it. I know that it's quite unnecessary to ask whether the aeroplane has been refuelled, the guns loaded, the oxygen bottle charged, or the clock synchronised. Like every other pilot, I know that I can rely implicitly on my ground crew to see that all this was done as soon as I landed from my last flight.

As I look round the aerodrome I can see other pilots climbing into their aircraft and settling themselves comfortably. Over on the far side of the field one of the other squadrons in our Wing is also getting ready to take off; I can see airmen running about. This squadron is due to leave shortly after us and to form up on us as soon as we are airborne. Hello! The Wing Commander's aeroplane has burst into life: that's the signal for all of us to start up. I unscrew the doping cock and give a few pumps to enrich the mixture in the cylinders. As I press the self-starter button and turn on the magneto switches my airscrew begins to revolve, and some sheets of flame belch out from the exhaust ports; I can feel the heat of them on my face. Suddenly, with a deep roar, the engine picks up and I throttle back until it ticks over regularly. Next, I wave the airmen away from my wing-tips and follow the Wing Commander as he taxis round the side of the field. We jolt over the ground, and just before turning into wind and getting into position for taking off, I press the switch on my R/T set; a few seconds later I hear that familiar wave and faint crackle in my headphones. Then a few bumps and we are airborne.

With my right hand I move the lever to raise the undercarriage, and after pulling back the airscrew pitch control with my left hand, I close the hood over my head. The vacuum caused by shutting myself in affects my hearing momentarily, but I swallow once to equalise the air pressure on the inside of my ears, and then all's well. The green light on the dashboard in front of me vanishes, and, in its place, a red light appears which indicates that the undercarriage is fully locked in the up position. Now a quick glance round the cockpit to make sure that everything is working properly, and then, settling back comfortably in my seat, or as comfortably as possible, I start the long climb ahead. But my engine temperature is rather high. Well, it did tick over for a fairly long spell on the ground, so I open the radiator flap to the cool air outside and I make a mental note that I must close it again when we get higher up, or my engine will cool off too much.

Slowly we climb up along the coast. That peculiar feeling inside me has disappeared now and I feel fine and ready for anything. I can see the other Spitfires both on my right and left—their pilots look expressionless and rather grotesque with their faces covered by their oxygen masks. At 12,000 ft. I turn on my oxygen, but apart from noticing the flicker of the needles registering the flow, I can't detect any other sign. Oxygen as oxygen isn't noticeable so long as the feed is all right, and there's plenty of it; it's when there's a lack of it one feels uncomfortable. And it doesn't give you any warning either. On one occasion, I remember, I was caught with an oxygen failure at 22,000 ft.; at one moment I was flying along merrily, but at the next, or when I came to, I found myself spinning down to earth with my altimeter marking 5,000 ft.

Well, here we are at 18,000 ft. and approaching Blank-on-Sea. I close the radiator flap, and although I'm only wearing a sweater over my shirt and trousers, I feel quite warm with the hood shut. My clock shows that, according to schedule, we should be sighting the bombers with their escort of Spitfires provided by a neighbouring Wing within the next minute or so. There they are, approaching from inland; they are quite easily recognisable by their shape, and by the close formation in which they fly. We allow them to pass us, and then we climb up above, always keeping them in full view.

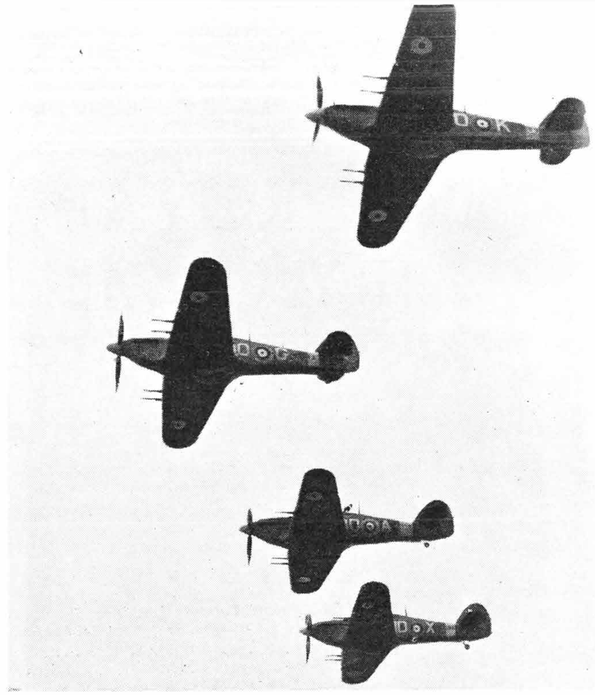
Taking Up Battle Positions

Half-way over the Channel, we take up our battle positions by increasing the distance between aircraft; that's so that each individual pilot may watch over his friend's tail. At the same time, we keep the bombers in view, and watch the sky all round them. Slowly—it seems slowly, because by now we are high up, but actually our speed is well over 280 miles an hour—we approach the French coast, and cross it near Boulogne. I can see one or two puffs of black cotton-wool near the bombers: anti-aircraft fire from the Boulogne defences has started up. As I watch, more and more puffs appear all round us. Above the noise of my engine I can't hear any sound of explosion. The puffs remain quite innocuous until one bursts about 20 ft. from my starboard wing and very close to the aeroplane on my right. I hear the faint "crump," and can see the vicious orange centre as it explodes. The aeroplane next to mine rocks slightly. I look round quickly; all's well—the pilot has put his thumbs up.

Now the silence has been broken by the controller back at our base; he tells us that there are enemy aircraft climbing up towards us from the South-East, a message acknowledged from the Wing Leader by a curt "O.K." Hearing voices is always a comfort; and these are crystal clear in my headphones. Suddenly from the Wing Leader: "There they are—right—three o'clock," and as I look in that direction I can just see them as flies in the distance against the white cloud. I try to count them, but at present the specks are still too far away. Anyhow, as they are still below us they won't attack, but they will keep on climbing into the sun and choose their own time and position—if they do attack, which isn't at all certain.

We are passing over St. Omer and approaching Lille. Although I haven't yet had time to examine the ground, I can already recognise certain landmarks, for I'm daily becoming more and more familiar with them. I spot the aerodrome near St. Omer; it's just visible as a small square. Two narrow strips cutting across it are the runways. Just behind me is a large green patch; that would be the Forêt de Nieppe, and immediately below us is the canal which runs from Dunkirk to Béthune. We are almost on top of Lille now, and the bombers are flying in close formation in front of us. As I'm looking at them, their bombs leave in a shower and flash towards the ground. If only I could follow them down and watch them explode on their target! But I've been on too many of these shows to do that sort of thing, for I know that at any minute we are likely to be attacked by odd Huns who will dive down and try to break up our formation. All the way from the coast there's been spasmodic ack-ack, but now we are over Lille it's very much thicker. Still, nobody's hit. The bombers have launched their second salvo of eggs and they fly through as if there were nothing to hamper them, and then start to turn through 180 degrees. We turn with them—steeply in order to afford protection if they are attacked at this moment when they are more vulnerable. I squint up continually into the sun because I know that if an attack is made it will come from that direction.

"Hello! Clinker Leader, Ratter Blue one here. Two 109s at nine o'clock above. Watch 'em." I look up to the left. Yes, there are—two black brutes with slightly longer fuselage and blunter wing-tips than ours. I wonder, will they dive on to us or on to the bombers? Neither. Just then two Spitfires from another squadron above come tearing down; one of them is already firing, for I can see some red tracers coming from his cannon. Good show! One of the 109s reels kind of drunkenly on his back with white and black smoke pouring out of him. The other one? No, the other has done a flick half-roll and dives down towards the ground; he seems to have got away all right. But the first 109 is now a blazing mass of wreckage and leaves behind a trail of thick black oily smoke.



"All Our Bombers Returned Safely"

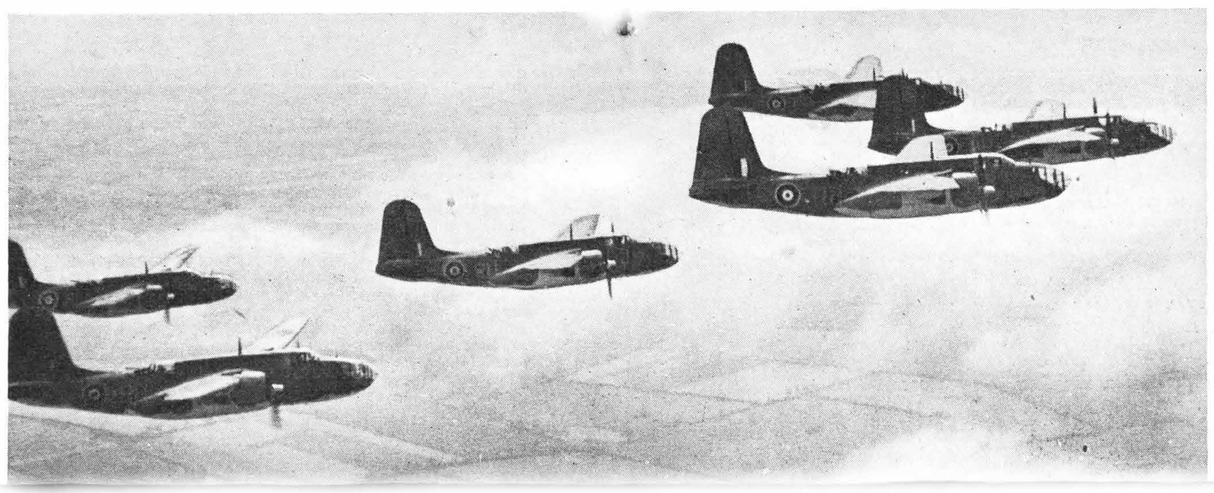
I can't watch any longer because our own Squadron's being threatened, and the Wing Leader has ordered us to turn to the right—into the attackers. I do a steep turn, holding the stick well back into my tummy until a kind of red mist begins to form in front of my eyes; that's a warning that if I turn any tighter I shall just "black out." So gently I ease the stick forward and look all round me. As I'm banked vertically, so I look up instead of to the right where the ground appears to be spinning round. Two more black 109s flash by at terrific speed and disappear before I get a chance to open fire on them. I let them go, a lesson I've learned since doing these sweeps: never follow a Hun down. You see, our job is to watch the bombers and prevent them from being attacked. It doesn't matter if we don't shoot down any enemy aircraft; other squadrons on our flanks and above us are there for that job. So long as the bombers get back safely to their base we shall have done our stuff.

We are straightening up again now. A further warning comes along that two more enemy aircraft are diving towards the bombers. But they don't get very far because a couple of Spitfires detach themselves from the section on my right, turn towards the Huns and head off their attack. As ours open fire I can see a piece of a 109's tail drop off whilst he turns away in a dive.

Now I can also see small formations of Huns above and on the flanks of our Wing. They don't attack, but now and again they make feints in the hope that some of our fighters will draw off to attack them and become stragglers. We have had so many warnings of these tactics that nobody buys and we just stick together. We approach Dunkirk; every moment the ack-ack becomes fiercer and fiercer. It seems quite inconceivable that the bombers can fly through all that dirt and get neither separated nor shot down. One of them is hit and lags behind the rest of the formation. Immediately six Spitfires leave our Wing and stay with him to ward off any attack by any of those enemy aircraft still flying along with us and waiting for such a victim. But as far as I can see our bomber hasn't been badly hit, and one engine's working, anyway. We are in gliding distance of Dover from a height of 20,000 ft., so I'm sure he will reach base all right.

A few minutes later and we are crossing the balloon barrage at Dover. The bombers fly straight on towards their base whilst we turn to the right and make our own way home. We are losing height more quickly now, and I regulate my flow of oxygen so that the needle of the gauge coincides with the height marked on my altimeter. Well, although I haven't even fired once, I'm quite pleased with myself, for, after all, I've done a small job of work. I know all the other pilots feel the same whether they have fired their guns or not, because, you see, "all our bombers returned safely." That's all we really worry about.

THE HUB OF THE SWEEP.—Douglas Bostons on the job.



THE ROYAL AIR FORCE

The Roll of Honour

THE ONE HUNDRED-AND-THIRTY-NINTH Casualty List was published by the Air Ministry on June 30. It contains 259 names of R.A.F. personnel, including those of 112 previously reported. Of those, one missing believed killed in action and two missing are now prisoners, 106 missing believed killed in action or missing are now reported or presumed killed, and three missing believed killed on active service or missing are now presumed killed.

The List includes 17 killed in action, seven wounded, two died of wounds, 23 missing believed killed and 55 missing. On active service 30 have been killed, four wounded, two have died of wounds, and seven have died.

The total of R.A.F. casualties officially reported since the War began is now 25,717.

The One Hundred-and-Thirty-ninth Casualty List is:—

Killed in Action

103004 P/O W. A. Frampton.
932152 Sgt. N. Holman.
116904 P/O F. J. Jemmett.
1060255 Sgt. H. M. Murdo.
112442 P/O K. W. Pawson.
86338 F/O D. J. Renvoize.
72011 F/L D. F. O. Shelford.

Previously Reported Missing Believed Killed in Action. Now Presumed Killed in Action

931537 Sgt. A. R. Bell.
566869 F/Sgt. G. J. Bishop.
1254035 Sgt. D. W. Buck.
102975 P/O N. A. C. Cathles.
911216 Sgt. B. J. Child.
956948 Sgt. D. A. D. Hoare.
740053 F/Sgt. B. D. Lyon.
43694 Act. S/L W. C. McArthur.
88700 P/O S. G. Newborough.
1380919 Sgt. P. G. Sanders.
85275 P/O R. E. Sellar.
61475 P/O J. G. Shepherd.
1113931 Sgt. F. Thompson.

Previously Reported Missing, Now Presumed Killed in Action

100045 P/O R. H. Batten.
102081 P/O A. W. Black.
985882 Sgt. W. Black.
1255817 Sgt. J. W. Bradley.
1173959 Sgt. N. Bradley.
64305 P/O L. W. Brown.
951888 Sgt. S. Burgess.
648868 F/Sgt. J. A. A. Cox.
1154126 Sgt. H. E. Dance.
944253 Sgt. D. R. Davis.
759151 F/Sgt. J. Flannigan.
748046 Sgt. C. J. Fletcher.
618116 Sgt. C. W. Fulbeck.
42377 F/O R. A. Greenhill.
1325194 Sgt. J. Halsall.
1280935 Sgt. J. Haney.
60137 Act. F/L T. B. Herd.
1259894 Sgt. W. H. Jeffries.
1377632 Sgt. P. Kay.
43295 P/O R. E. Kerr.
919901 Sgt. F. V. Lane.
1304325 Sgt. J. T. Leitch.
1181380 Sgt. P. L. E. Le Queux.
625523 F/Sgt. K. F. Lewis.
1253866 Sgt. G. J. Linegar.
100618 P/O R. Lisle.
615966 Sgt. E. A. Main.
1380346 Sgt. G. H. Marshall.
1174896 Sgt. P. R. Martin.
987680 Sgt. J. A. McDonough.
575079 Sgt. H. T. McQuigg.
912232 Sgt. A. A. Miles.
43977 P/O A. P. Mitchell.
1051250 Sgt. J. K. Mitchell.
921870 Sgt. T. P. Mowan.
516218 W.O. A. N. Mowlam.
580522 F/Sgt. F. B. Mulford.
1378898 Sgt. J. Mycock.
754624 Sgt. C. G. E. Newton.
984421 Sgt. D. M. Philp.
1023027 Sgt. R. Pinkerton.
36093 S/L F. C. Phipps.
754015 Sgt. H. D. Poole.
927081 Sgt. P. A. G. Ragg.
1325233 Sgt. E. J. Roger.
966861 F/Sgt. J. J. Rogers.
968129 Sgt. W. A. Ross.
921994 Sgt. L. R. E. Sciville.
749499 Sgt. A. C. Scrivens.
1357695 Sgt. H. Sell.
751350 Sgt. K. R. Sewell.
923998 Sgt. V. F. W. Slade.
65557 P/O R. A. Stratton.
964647 Sgt. C. J. Stringer.
912133 Sgt. E. A. R. Thomson.
964895 F/Sgt. F. A. Titcomb.
1109112 Sgt. E. D. Tovey.
901747 Sgt. W. Virgo.
1065792 Sgt. R. Wade.
751990 F/Sgt. R. R. Walker.
918480 Sgt. G. O. Williams.
568343 Sgt. C. E. Wood.

Previously Reported Missing, Now Reported Killed in Action

78272 S/L A. P. Burdett.

Wounded or Injured in Action

946703 Sgt H. Carey.
103048 P/O A. D. Englefield.
80028 Act. S/L P. C. Fletcher.

Missing Believed Killed in Action

106537 P/O R. W. Barlow.
1166172 Sgt. T. H. Beament.
1259335 Sgt. B. N. Burnett.
1376202 Sgt. A. E. Holder.
1317897 Sgt. A. W. Holman.
1191011 Sgt. J. H. Hunt.
910036 Sgt. J. H. Ives.
1283289 Sgt. A. R. Langston.
1167454 Sgt. G. T. Leather.
42510 F/O A. McFadden.
1255402 Sgt. H. J. McHutchinson.
1058530 Sgt. G. P. Murray.
107995 P/O N. E. Myring.
1064494 Sgt. J. F. Nesbitt.
110128 P/O O. O. Ormrod, D.F.C.
573395 Sgt. K. W. Smith.
621311 Sgt. C. W. Valder.
952261 Sgt. H. J. Whale.

Missing

1261123 Sgt. R. G. Allen.
47734 P/O C. B. Barber.
101023 P/O. G. R. Bland.
1308006 Sgt. J. E. Burcher.
1057442 F/Sgt. J. B. Bushby.
G/C H. W. Corner, A.F.C.
924154 Sgt. W. L. Cox.
917809 Sgt. T. R. Cross.
115687 P/O H. Dickinson, D.F.M.
996657 Sgt. J. H. Dixon.
111214 P/O R. J. Dyer.
926804 Sgt. E. A. Fitchett.
61956 F/O J. Flynn.
113982 P/O R. P. Frahm.
60764 F/O P. G. C. Gimson.
81400 F/O D. Goodman.
80143 P/O F. S. Haslett.
1150584 Sgt. J. W. Hinton.
61284 F/O T. A. Lumb.
36143 Act. S/L R. Miller.
1376547 Sgt. J. Neary.
62286 F/O A. Palmer-Tomkinson.
1268062 Sgt. A. J. Peach.
977631 Sgt. T. J. Phillips.
917597 Sgt. D. G. Porter.
922976 Sgt. G. N. E. Powell.
1151893 Sgt. K. J. Raiswell.
1064638 Sgt. J. H. Roberts.
1006965 Sgt. A. W. McF. Robertson.
1359687 Sgt. J. Rooney.
621697 Sgt. T. Ryan.
111539 P/O M. L. Simon.
941095 Sgt. E. Thomas.
64868 Act. F/L V. E. Watkins.
1063594 Sgt. J. S. Weaver.
62289 F/O R. Wheldon.
901160 Sgt. J. A. Wood.
1251279 Sgt. S. T. Woodbridge.
102073 P/O R. S. Woolass.

Killed on Active Service

80112 P/O N. N. Allen.
1330697 Sgt. L. L. Bennett.
111785 P/O R. Bloor.
1323220 A.C.2 H. W. C. Bond.
1236711 Sgt. S. Capewell.
101360 P/O W. R. Christine.
1283606 Sgt. S. W. C. Culmer.
104628 P/O F. Darycott.
78780 F/O D. J. A. Fletcher.
944034 L.A.C. H. E. Hartley.
110649 P/O J. H. Horrell.
951362 Sgt. J. A. Hutchison.
1078148 Sgt. G. D. Linsday.
80210 P/O A. S. R. Mackenzie.
1112428 Sgt. D. Manning.
1126135 Sgt. J. M. Millar.
115394 P/O G. H. Morrice.
925007 Sgt. R. E. G. Nation.
1315063 L.A.C. J. Payne.
68158 P/O B. W. J. Peatheyjohns.
47878 P/O J. W. B. Phillips, D.F.M.
81020 F/O P. H. S. Simmonds.

ARMY CO-OPERATION.—R.A.F. and Army personnel refuelling and re-arming a Supermarine Spitfire at Malta. Soldiers at Malta have been working with the R.A.F. on aerodrome work, servicing the aeroplanes and doing some repair jobs.

560485 F/Sgt. J. Smith.
67587 P/O E. E. Streets.
41626 Sgt. T. V. Yde.

Previously Reported Missing Believed Killed on Active Service, Now Presumed Killed on Active Service

100615 P/O E. T. Bradford.

Previously Reported Missing, Now Presumed Killed on Active Service

964959 Sgt. A. E. Belasco.
1177679 Sgt. D. G. McG. Mayo.

Wounded or Injured on Active Service

1067688 Sgt. G. E. Metcalfe.

Died of Wounds or Injuries Received on Active Service

904439 Sgt. R. V. Mount.
742749 Sgt. J. C. Shaw.

Died on Active Service

101748 P/O H. C. English.
110584 P/O D. V. Fordham.
963796 L.A.C. W. Maguire.
973617 Cpl. J. Parsons.
43309 F/O S. F. Trimm.

Previously Reported Missing Believed Killed in Action, Now Reported Prisoner of War

1252723 Sgt. A. L. Pepper.

Previously Reported Missing, Now Reported Prisoner of War

41784 F/L P. T. Dowding.
742275 F/Sgt. G. L. Wincote.

W.A.A.F.
Died on Active Service

2026146 A.C.2 P. D. Shelvin.

ROYAL AUSTRALIAN AIR FORCE
Killed in Action

Aus.400516 Sgt. A. J. Browne.
Aus.404509 Sgt. R. M. H. Jennings.
Aus..404255 P/O R. N. Neill.

Previously Reported Missing Believed Killed in Action, Now Presumed Killed in Action

Aus.406032 Sgt. W. A. Hopkinson.
Aus.404118 Sgt. R. Secomb.

Previously Reported Missing, Now Presumed Killed in Action

Aus.402014 P/O J. Dodds.
Aus.402085 Sgt. K. I. Duffin.
Aus.402349 Sgt. C. A. Guan.
Aus.402355 P/O J. R. Horn.
Aus.400230 Sgt. C. F. R. Manning.
Aus.402279 Sgt. H. A. A. North.
Aus.400182 Sgt. J. Pender.
Aus.404045 Sgt. L. C. Rhodes.

Wounded or Injured in Action

Aus.406244 Sgt. W. J. Halliday.
Aus.401451 P/O M. S. Mainprize.
Aus.401356 P/O H. E. Winstanley.

Missing Believed Killed in Action

Aus.404876 Sgt. E. E. Due.
Aus.403170 Sgt. R. E. Greenwell.

Missing

Aus.400526 Sgt. L. W. Conner.

Killed on Active Service

Aus.404025 Sgt. H. A. Clements.

Wounded or Injured on Active Service

Aus.408603 Act. Sgt. Vialls.

ROYAL CANADIAN AIR FORCE
Killed in Action

J. 15319 P/O J. W. S. Fletcher.
R.65174 F/Sgt. G. R. Graves.
J. 4285 P/O R. P. Hughes.
J. 15079 P/O H. A. Putnam.
J. 15189 P/O G. B. Whitney.

Previously Reported Missing Believed Killed in Action, Now Presumed Killed in Action

R.70069 F/Sgt. D. C. Newsome.

Previously Reported Missing, Now Presumed Killed in Action

R.54033 F/Sgt. A. T. Bradly.
R.51905 F/Sgt. F. C. Brooke.
J 763 F/L C. Bushell.
R.62406 Sgt. H. L. Elliot.
R.65812 Sgt. H. Hale.
R.69040 Sgt. J. I. Henderson.
J. 4569 P/O W. J. Hoover.
R.56089 Sgt. J. R. Johnson.
J. 3596 F/O B. G. McIver.
R.68081 Sgt. J. M. Osborne.
J. 5048 P/O T. C. Patterson.
R.77269 Sgt. W. C. Picher.
R.58168 F/Sgt. O. F. Pickell.
R.10199 Sgt. C. C. Topping.

Wounded or Injured in Action

J. 4768 P/O M. W. McGregor.

Died of Wounds or Injuries Received in Action

J. 5806 P/O W. E. Cripps.

Missing Believed Killed in Action

R.80234 Sgt. H. T. M. Cooper.
J. 7232 P/O G. Murray.

Missing

22050 F/Sgt. F. D. Barbour.
J. 15129 P/O D. Y. Claxton.
R.56446 F/Sgt. H. F. S. Darley.
J. 4258 P/O R. E. Hardy.
R.55403 Sgt. L. M. Langlois.
J. 15053 P/O E. N. MacDonell.
R.76601 F/Sgt. A. McMullan.
R.69125 F/Sgt. J. R. Norris.
R.75183 Sgt. P. C. Walsh.
J.6719 P/O W. Zoochkan.

Killed on Active Service

R.67316 F/Sgt. D. M. Atkinson.
R.83056 F/Sgt. L. W. Sheffler.
J. 15121 P/O A. P. L. Smith.

Died of Wounds or Injuries Received on Active Service

J. 7428 P/O J. McFarlane.

ROYAL NEW ZEALAND AIR FORCE
Killed in Action

NZ.41981 P/O C. N. Fountain.

Previously Reported Missing Believed Killed in Action, Now Presumed Killed in Action

NZ.401413 Sgt. R. A. Scragg.

Previously Reported Missing, Now Presumed Killed in Action

NZ.401806 Sgt. W. D. Hamer.
NZ.401349 Sgt. E. C. McDonald.
NZ.40923 Sgt. D. M. McKinnon.

Missing Believed Killed in Action

NZ.404994 Sgt. N. H. Blair.
NZ.405350 P/O D. O. Waters.

Missing

NZ.404882 P/O M. P. Bell.
NZ.405237 Sgt. F. B. Cran.
NZ.404028 Sgt. C. J. Harris.

SOUTH AFRICAN AIR FORCE
Killed in Action

47313 Lt. H. F. Howard.

Died of Wounds or Injuries Received in Action

103341 Lt. J. H. Booth.

Missing

95777 Lt. F. J. Ball.
13703 Lt. Ross.

Killed on Active Service

103373 2nd Lt. J. D. Laing.

Wounded or Injured on Active Service

2nd Lt. W. Butler.
102352 2nd Lt. N. M. Russell.

HERE IS THE RANALAH WHEELING MACHINE—

which, like the Deep Throated Riveter, we supply with particular confidence since we use batteries of these machines in carrying out the finest kinds of sheet metal work. With these machines we can work out the most complex shapes—such as cowlings, wing-root fillets, fin and tail plane fairings—with an easy precision and in a minimum of time.

Ranalah Limited

OVER THE HURDLES.—A Vickers-Armstrongs Wellington on a test flight taking off in the company of barrage balloons.

Royal Air Force Awards

HIS MAJESTY THE KING has approved the following awards for gallantry in flying operations against the enemy, including fighter operations and sweeps over Northern France and the occupied countries, night fighter sorties and intruder sorties, raids on Essen, and the attack on the cruiser Prinz Eugen on May 17:—

Bar to the Distinguished Flying Cross

Act. Squadron Leader G. K. Gilroy, D.F.C., A.A.F.—No. 609 Squadron.

Distinguished Flying Cross

Act. Wing Commander P. H. Woodruff, R.A.F.O.—No. 404 Squadron.
Squadron Leader C. E. Malfroy, A.A.F.—No. 66 Squadron.
Act. Squadron Leader J. S. Dinsdale—No. 42 Squadron.
Act. Flight Lieut. V. H. Ekins, R.A.F.V.R.—No. 501 Squadron.
Act. Flight Lieut. R. A. Newbery, R.A.F.V.R.—No. 118 Squadron.
Act. Flight Lieut. D. A. Parkins, R.A.F.V.R.—No. 15 Squadron.
Act. Flight Lieut. W. J. Rosser, R.A.F.V.R.—No. 130 Squadron.
Act. Flying Officer H. W. W. Berridge, R.A.F.V.R.—No. 219 Squadron.
Act. Flying Officer E. W. Seabourne, R.A.F.V.R.—No. 276 Squadron.

Distinguished Flying Medal

Flight Sergeant G. C. D. Bell, R.C.A.F.—No. 404 Squadron.
Flight Sergeant R. C. Sherrington, R.A.F.V.R.—No. 23 Squadron.
Sergeant W. C. Ferguson—No. 101 Squadron.
Sergeant R. S. Gibbons—No. 86 Squadron.

THE BIRTHDAY HONOURS LIST

THE following is a continuation from last week of the names of Air Force personnel included in the Birthday Honours List under the heading "Mentioned in Despatches":—

Flight Lieuts.:—I. S. Findlay (Act.), R.A.F.V.R., L. B. Fletcher (Act.), R.A.F.V.R., J. D. R. Forbes (Act.), J. C. Ford (Act.), F. Forrest (Act.), R.A.F.V.R., M. K. Forsyth (Act.), R.A.F.V.R., W. J. Gale (Act.), F. J. Garwood (Act.), C. P. J. Gilroy (Act.), R.A.F.V.R., G. J. Goldstone (Act.), A. C. Greenwood (Act.), R.A.F.V.R., C. McL. C. Gurney (Act.), R.A.F.V.R., H. C. Haley (Act.), P. S. Hall (Act.), E. S. Harman (Act.), R.A.F.V.R., E. A. Harrop (Act.), W. C. Hart (Act.), W. R. Haskell, D.F.C. (Act.), A. W. Hayes (Act.), E. L. Hayward (Act.), R.A.F.V.R., T. Herbert (Act.), R.A.F.O., A. J. Hereford, M.B.E. (Act.), R. Hicks (Act.) (since Missing), L. G. Hind (Act.), R.A.F.V.R., A. L. Hiscock (Act.), R.A.F.V.R., E. W. Howles (Act.), R.A.F.V.R., A. G. Huggins (Act.), L. A. Huxford (Act.), I. L. Ingram (Act.), R.A.F.V.R., R. A. Jell (Act.), R.A.F.V.R., A. Jennings (Act.), R.A.F.V.R., E. E. Jones (Act.), R.A.F.V.R., J. M. Jones (Act.), R.A.F.V.R., C. A. Judd (Act.), E. W. Kinchin (Act.), R.A.F.V.R., H. S. King (Act.), R. R. Knight (Act.), R.A.F.V.R., T. R. Laws (Act.), H. Lee (Act.), A. G. McAdam (Act.), E. T. McCabe (Act.), M. McGougan (Act.), R.A.F.V.R., V. D. MacLachlan (Act.), R.A.F.V.R., M. G. McNama (Act.), G. Manger (Act.), R.A.F.V.R., D. A. Marten (Act.), R.A.F.V.R., C. A. Martin (Act.), H. G. Matheson (Act.), R.A.F.V.R., A. Mellor (Act.), G. Mewburn (Act.), R.A.F.V.R., H. H. J. Miller, D.F.C. (Act.), L. F. Miller (Act.), R.A.F.V.R., W. J. Mitchell (Act.), R.A.F.V.R., S. S. Moore (Act.), R.A.F.V.R., F. Morton-Smith (Act.), R.A.F.V.R., O. R. Moseley, M.B.E. (Act.), H. G. Mugridge (Act.), R.A.F.V.R., L. A. Naylor (Act.), R.A.F.V.R., H. Newell (Act.), R.A.F.V.R., I. F. Newman (Act.), R.A.F.V.R., T. G. Nicholl (Act.), V. A. Nicholls (Act.) (Deceased), J. D. S. Nowell (Act.), R.A.F.V.R., W. T. Page (Act.), R.A.F.V.R., W. G. R. Paice (Act.), J. G. Parkin (Act.), R.A.F.V.R., N. R. Parry (Act.), R.A.F.V.R., D. J. Passadoro (Act.), R.A.F.V.R., C. R. Payne (Act.), R.A.F.V.R., W. R. Peake (Act.), R. J. B. Pearse (Act.), R.A.F.V.R., J. F. Percival, J. Perrin, M.C. (Act.) R.A.F.V.R., F. C. Pope (Act.), R. Y. Powell (Act.), M. C. Raban (Act.), G. P. Reese (Act.), A. J. Ritson (Act.), R.A.F.V.R., F. J. Robinson (Act.), R.A.F.V.R., J. H. Robinson (Act.), R.A.F.V.R., L. R. Robinson (Act.), A. F. A. Rossi (Act.), R.A.F.V.R., A. Rossner (Act.), F. J. Rowe (Act.), A. R. Rowers (Act.), K. F. Rowson (Act.), R.A.F.V.R., J. D. Royal (Act.), R.A.F.V.R. (Since died), G. Ryall (Act.), D. Salwey, D.F.C. (Act.), C. K. Saxelby (Act.), R. S. Scholefield (Act.), A. H. C. Score (Act.), R.A.F.V.R., S. W. Searle (Act.), C. Sephton (Act.), R.A.F.V.R., A. C. Shay (Act.), R.A.F.V.R., W. J. R. Shepherd (Act.), R.A.F.V.R., R. T. Sheppard (Act.), R.A.F.V.R., E. H. Sillince (Act.), N. P. Simmons (Act.), R. E. Skelley (Act.) R.A.F.V.R., B. B. Smith (Act.), R.A.F.V.R., E. S. Smith (Act.), K. S. Smith (Act.), P. R. Smith (Act.), E. C. Spencer (Act.), R.A.F.V.R., C. K. Stansfield (Act.), R.A.F.V.R., H. W. Taylor (Act.), M. C. Tebitt (Act.), R.A.F.V.R., L. H. Thomas (Act.), R.A.F.V.R., O. D. Thomas (Act.), E. V. Todd (Act.), R.A.F.V.R., A. C. Torry (Act.), R.A.F.V.R., E. F. W. Truscott (Act.), R.A.F.V.R., P. R. Turgel, D.F.C. (Act.), V. Udall (Act.), R.A.F.V.R., F. C. Webber (Act.), R.A.F.V.R., W. Whittle (Act.), R.A.F.V.R., J. Wicks (Act.), R.A.F.V.R., D. M. Wiggins (Act.), R.A.F.V.R., S. Williams (Act.), W. Wilson (Act.), A. R. G. Woolfrey (Act.), L. T. Wright (Act.), P. C. Wright (Act.), T. C. Wright, M.C. (Act.), R.A.F.V.R., H. G. Havyatt, R.A.A.F., V. A. Hodgkinson, R.A.A.F., J. G. MacDonald, R.A.A.F., C. D. O'Dea (Act.), R.A.A.F., W. B. Cooper (Act.), R.A.A.F., P. H. Creswell, R.N.Z.A.F. (Deceased), G. R. Simich, D.F.C., R.N.Z.A.F.

Captains, S.A.A.F.:—K. Acutt, J. F. Barry, P. J. Carroll, S. F. du Toit, C. M. S. Gardner, D.F.C., G. A. Macintosh, D. U. Nel, J. D. M. Ryder, L. D. Sheedy, D. N. Thorne, G. B. Treadwell.

Flying Officers:—P. Blandford, R.A.F.V.R., N. Bowker, R.A.F.V.R., W. Bradshaw, H. P. Brancker, R.A.F.V.R. (Missing), C. A. Briggs, R.A.F.V.R., J. B. Collier, R.A.F.V.R., E Cotton, A J. Crook, R.A.F.V.R., J. G Dalziel, R.A.F.V.R., H. N. M. Daston, H. F. Davis, A. H. Derbyshire, R.A.F.V.R., W. E. Dowling, R.A.F.V.R., S. H. Dowse, R.A.F.V.R., F. Ellis, R.A.F.V.R., R. Ellis-Brown, R.A.F.V.R., P. R. M. Ellison, R.A.F.V.R., T M. Gay, R.A.F.V.R., T. D. Griffin, R.A.F.V.R., H. J. Horne, R.A.F.V.R., M. J. Horsey, R.A.F.V.R., A. B. Howe, R.A.F.V.R., R. H. Laver, R.A.F.V.R., T. H. A. Leaver, G. C. Lillicrap, R.A.F.V.R., F. P. Loftus, R.A.F.V.R., D. M. McCarthy, J. E. McDonald, R.A.F.V.R., M. R. Mandviwalla, R.A.F.V.R., O. N. Massey, R.A.F.V.R., G. H. Melville-Jackson, R.A.F.V.R., J. Morgan, R.A.F.V.R., L. Morgan, R. C. Nesbit, R.A.F.V.R., T. C. Parker, M. Paterson, R.A.F.V.R., J. B. Rose, R.A.F.V.R., A. M. Rusk, R.A.F.V.R., H. L. Sammels, E. J. Saunderson, R.A.F.V.R., H. M. Smith, R.A.F.V.R., M. F. Suckling (since died), W. W. Swinnerton, R.A.F.V.R., J. A. Temperley, C. W. H. Thomson, E. H. Tidswell, R.A.F.V.R., G. W. Trayler, R.A.F.V.R., G. C. Turner, R.A.F.V.R., I. A. St. C. Watson, R.A.F.V.R., D. F. Westenra, D.F.C., R.A.F.V.R., S. G. Whiting, A. E. Whittaker, R.A.F.V.R., J. Wilson, T. K. Wyles, R.A.F.V.R., P. A. F. Belton (Act.), R.A.F.V.R., C. F. Bensted (Act.), W. Chrighton-Brown (Act.), R.A.F.V.R., C. W. Crimmin (Act.), A. M. Crow (Act.), R.A.F.V.R., A. W. Day (Act.), R.A.F.V.R., R. E. F. Gardner (Act.), R.A.F.V.R., W. N. P. Hill (Act.), R.A.F.V.R., W. E. Keill (Act.), R.A.F.V.R., G. H. Lambert (Act.), C. H. Lang (Act.), R. H. Nightingale (Act.), W. G. Nelson (Act.), T. W. Newberry (Act.), T. G. F. Paget (Act.), R.A.F.V.R., T. G. Parker (Act.), C. Pattison (Act.), G. A. Pearson (Act.), E. V. A. Scorer (Act.), R.A.F.V.R., C. W. Slatter (Act.), R.A.F.V.R., W. Stirling (Act.), R.A.F.V.R., E D. Strain (Act.), R.A.F.V.R., F. B. Sykes (Act.), G. T. Wadoux (Act.), R.A.F.V.R., L. W. N. Walker (Act.), R. Woodhouse (Act.), R. T. Holt, R.A.A.F., L. Cowperthwaite (Act.), R.C.A.F. (Missing), J. E. Lister (Act.), R.C.A.F. (Missing).

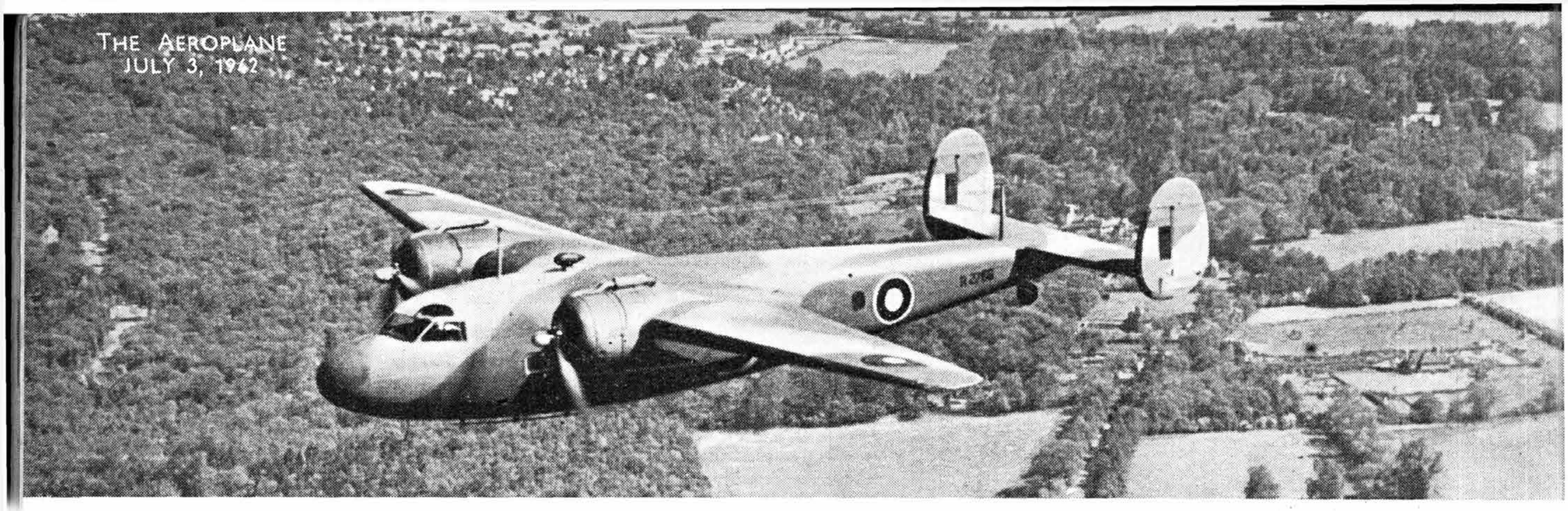
Lieuts. S.A.A.F.:—M. E. Draper, O. Galgut, L. E. O. Lownds, M. A. Oberholzer (Missing), H. G. Stevenson, D. R. Thompson, D. P. Young.

Pilot Officers:—C. M. Adams, R.A.F.V.R., C. A. M. Anderson, R.A.F.V.R., E. R. Bishop, R.A.F.V.R., F. C. Blackmore, R.A.F.V.R., J. H. Braybrooke (Since died), J. L. Breadner, R.A.F.V.R., G. Buckle, R.A.F.V.R., C. F. Butler, R.A.F.V.R., H. P Duval, R.A.F.V.R., F. J. Edwards, R.A.F.V.R., W. T. G. Gabriel, R.A.F.V.R., P. F. W. Gales, R.A.F.V.R., C. H. Gladwell, R.A.F.V.R., W. M. R. Griffin, R.A.F.V.R., T. Griffiths, A. D. M. Gunn, P. L. Hanson-Lester, R.A.F.V.R., W. H. Hill, J. M. Hoskins, R.A.F.V.R., C. A. Hughes, D.F.M., R.A.F.V.R., E. E. Jones, A. E. Kilsby, R.A.F.V.R., S. L. Lean, H. F. R. Lillywhite, W. C. Mackintosh, R.A.F.V.R., D. H. A. Moore, D.F.M., B H. Morgans, R.A.F.V.R., G. P. H. Munro, R.A.F.V.R., H. C. Pearce (Missing), F. A. Rabagliati, J. Rogers, R.A.F.V.R., W. Stringer, P. Sutehall, R.A.F.V.R., G. N. Taylor, E. A. Tett, L. G. Turner, R.A.F.V.R., J. Turpin, W. C. Van Wyck, R.A.F.V.R., E. J. Watts, W. H. MacWilliam (Act.), R.A.F.V.R., R. Travers (Act.), R.A.F.V.R., R. T. Hudson, R.A.A.F., E. E. Kirkham, R.A.A.F., C. W. Robertson, R.A.A.F., R. G Mullen, R.C.A.F., W. S. M. Shankland, R.C.A.F.

Warrant Officers:—G. Andrews, S. J. Andrews, R. G. Ash, E. F. C. Bailey, S. T. Beck, C. W. Bell, H. E. Benton, C. R. K. Bools, F. W. Boyles, W. H. C. Brain, N. B. Buckley, C. H. Burchett, W. T. Burt, G. Chandler, A. Chatt, F. G. Clifford, R.A.F.V.R., R. Coleby, G. S. Copping, D. B. Crabtree, R.A.F.V.R., P. Cremmins, A. D. Cromer, S. P. Cunningham, H. Dann, M. S. Davenport, E. Deares, H. E. Drew, F. E. Dye, M. I. Easterling, C. S. Evans, E. B. Field, J. W. Foster, P. M. French, D.F.M., T. H. Frewin, G. A. Fricker, A. Friend, J. H. Fripp, R.A.F.V.R, C E. Gates, G. A. Graham, H. Green, A. Greenwood, L. E. Gregory, G. G. L. Hanford, C. Hanmer, R. C. Henderson, R.A.F.V.R., L. H. Herbert, G. A. Heywood, P. A. Higgins, G. A. Hughes, R. Hughes, W. J. Hulton, J. Jackson, L. G. Jackson, A. W. Jimes, A. R. Jukes, H. Keenan, W. Kelly, W. Kenyon, J. S. Kettle, J. D. Kilgour, G. W. Knopp, D. W. Lambert, J. T. Leslie, V. H. Linthune, A. J. Lovell, F. Lupton, G. N. McGuinness, W. C. McKittrick, S. G. Maher, H. Marriott, H. F. V. Marshall, C. Morgan, E. A. Murden, W. J. Neep, E. J. New, J. K. Newman, B. B. Noble, R. Obee, J. J. Packenham, B. T. Parsons, A. Paton, C. H. Patrick, P. E. Peddie, T. J. Peerless, W. Percy, A. H. Perkins, P. A. Plastow, W. Poynor, J. Prentice, G. D. Rankin, A. P. Reen, D.F.M., F. W. Rixon, W. M. Robertson, H. W. Rolph, F. J. Rose, H. Rudham, A. J. Sabine, H. H. Sales, G. F. H. Sayers, J. Sayers, A. A. Simmonds, G. M. Smith, J. E. Smith, S. G. Smith, G. J. Spradbury, J. J. Steele, E. Stevenson, R. W. Stewart, R. Stride, C. W. Strong, R. G. Symonds, A. E. Thompson, B. C. Thorne, C. L. Tillier, H. Townroe, R. G. Tribe, W. W. Tyler, F. W. Walker, M. E. Walsh, R.A.F.V.R., R. W. Watkins, C. A. Waugh, R. A. M. Weedon, W. J. White, G. M. Wiles, R. Willis, R. J. Winsborrow, R. Wood, R. E. Wood, A. L. Woods, C. A. Wright, H. W. Banks (Act.), J. S. Blakey (Act.), D. P. Caryer (Act.), C. Cramp (Act.), M. J. M. Kelly (Act.), W. McDonald (Act.), M. C. Maddock (Act.), R. J. Matthews (Act.), H. A. Oldfield (Act.), A. Shepheard (Act.), A. H. Streeter (Act.), W. A. Cartledge, R.A.A.F., T. A. Egerton, R.A.A.F.

Warrant Officers, Second Class, S.A.A.F.:—C. A. Bond, J. Friedmann.

Flight Sergeants:—H. P. Abbott, J. L. Anderson, R. Andrew, I. G. Applin, H. G. Arthur, J. R. Astridge, L. R. Aust, J. A. Bailey, J. A. E. Baird, D. H. Banks, P. S. Barnes, D. Barnett, R.A.F.V.R, G. E. Barrett, J. H. Bartholomew, S. L. Beamont, G. E. Beesley, P. W. Beldam, A. Bickerstaff, D. Blackmore, H. Bleazerd, W. E. Bordman, R.A.F.V.R., J. G. Y. Boyle, T. J. Bradley, N. R. Brannen, E. J. Brett, R.A.F.V.R., L. J. Bright, B. Brown, W. T. Brown, N. J. Brundle, J. E. Brunt, B. H. J. Cable, F. H. Callingham, G. de L. Carver, E. L. Christieson, E. A. Christopher, F. W. Church, R. J. Clark, W. H. Clark, A. E. Clarke, R. C. Cole, R. A. Coleman, J. Colton, H. Constable, A. W. Cooper, N. J. M. Cooper, N. D. Copeland, V. J. Copperwaite, R.A.F.V.R., R. J. Couchman, R.A.F.V.R., O. Cromwell, C. H. Crowley, B. F. Cull, R.A.F.V.R. (Missing), G. R. Curry, R.A.F.V.R., G. Davidson, S. M. Davies, F. C. Davis, F. S. Deakin, H. Dean, B. de Burton, P. B. Delap, A. A. G. Dent, J. L. Dowdeswell, N. S. Dower, J. W. Dowling, J. S. Dugan, T. F. Duncan, R. A. Dust, W. H. Dykes, A. E. Edgar, W. Ennels, E. R. R. Evans, J. A. S. Evans, R. Evans, P. J. Fitz-Gibbon, A.A.F., B. R. W. Forster, F. G. Gadd, R. G. Gain, B. J. Gale, J. F. Garbutt, D. Gauntlett, R.A.F.V.R., G. Gee, D. F. H. Gibbard, F. J. Gibney, T. G. Gigg, W. T. Glazier, A. E. Golding, C. W. Green, W. E. Gregory, H. T. Haggar, T. Hall, D. M. Hamar, H. C Hardy, W. A. Hawkes, A. F. Hindell, J. W. H. Hipwell, W. R. Hiscock, C. F. Hollomby, T. Horsfall, P. F. Hudson, H. D. Ingram, P. W. Johnson, S. Johnston, R.A.F.V.R.,



COMMUNICATIONS.—A de Havilland D.H. 95 which was produced in 1939 as the Flamingo and Great Britain's only modern civil transport aeroplane. Since the War it has been adopted by the R.A.F. for communications and transport work. The new R.A.F. side and tail markings can be seen in this photograph. The yellow and white bands are reduced.

C. L. Jones, M. Jones, N. J. Jones, A.A.F., G. Kettley, E. Langford, G. V. Latimer, A. R. Lawes, L. C. Lee, R.A.F.V.R., R. Lee, B. H. Lees, C. B. Lewis, W. R. Lewis, E. J. Lines, G. C. Littlewood, A. L. F. Lloyd, J. A. M. MacBean, D. MacCullum, D.F.M., A.A.F., E. McGinty, J. D. McKay, D. McKenzie, A.A.F., N. G. Mackinnon, R. M. Macrae, W. S. Maddock, J. G. A. Maguire, A. J. R. Mallett, F. B. Marsh, W. H. Martin, R.A.F.V.R., A. E. Massey, R. T. A. Medway, H. A. Meecham, W. Middlemiss, R. S. Miles, R.A.F.V.R., H. Miller, J. Moir, K. C. Moody, T. Moore, W. J. Morris, L. Moss, V. Mullis, F. P. Neil, A. H. Newstead, C. Newton, S. R. Nicholson, E. O'Donnell, L. J. Palk, T. J. Partridge, J. S. Pennington, S. C. Phillips, A. H. Phipps, J. Pinder, R.A.F.V.R., R. H. Pitman, R.A.F.V.R., E. W. Pope, R.A.F.V.R., C. J. Porter, J. H. Porter, S. L. Powell, A. W. Prangnell, G. Purvis, J. Quinn, S. A. Ralph, D. W. Reid, W. S. Richmond, A. A. Rickaby, J. J. Rickard, D. Robertson, H. E. Robertson, T. B. Robinson, L. C. Rogers, R. J. Rogers, T. A. Rothwell, B. A. Rowe, M. Rowlands, G. W. Rowsell, F. A. Rymills, A. Sampson, F. Sayer, J. W. Sedgley, J. T. Seeley, H. G. Shaw, H. R. Shawyer, A. W. Simmonds, D. E. Simons, C. G. Smith, H. Smith, H. Smith, M. Smith, P. W. Smith, S. J. Smith, S. S. Smith, J. R. Southern, G. Spoors, G. Steadman, S. J. T. Steer, T. G. Stidwill, E. Stone, A. A. Studd, W. D. T. Sutcliffe, R. F. Swift, A. Taylor, J. Taylor, R. D. Telling (deceased), A. V. Thomas, E. F. Thorne, W. J. Tizard, W. J. S. Towner, G. Townsend, I. J. Tracy, H. S. Turner, A. L. Tyler, W. R. Venables, H. S. Virgin, V. Wall, J. E. Walton, D. J. Watts, H. Webb, C. W. H. Weedon, V. G. Wells, H. F. Welsh, J. B. White, G. Whitfield, R.A.F.V.R., P. G. Wishart, F. J. H. Wood, D. P. Worth, R.A.F.V.R., J. C. Wrangham, J. F. M. Wright, A.A.F., T. J. W. Wright, J. H. Wyatt, R.A.F.V.R., G. H. Yockney, F. H. Alderson (Act.), J. H. Bains (Act.), S. Berger (Act.), W. Boughton (Act.), A. E. Bowes (Act.), A. Castledine (Act.), F. B. Cross (Act.), E. W. Formby (Act.), R. S. Greer (Act.), H. A. W. Hill (Act.), T. H. Hutchinson (Act.), A.A.F., A. Kelly (Act.), G. Lofthouse (Act.), F. C. Maddison (Act.), W. A. Massey (Act.), A. Moore (Act.), P. Nannery (Act.), E. Parker (Act.), E. G. Redington (Act.), A.A.F., A. C. Thomas (Act.), A. G. Wright (Act.), A.A.F., G. S. Halley, R.C.A.F., R. J. Majeau, R.C.A.F., P. A. Rogers, R.C.A.F., R. A. Schoales, R.C.A.F., P. H. Ferreira, S.A.A.F., V. T. Kilburn, S.A.A.F., H. G. Kruger, S.A.A.F., M. O. Wilsenach, S.A.A.F.

Sergeants:—W. S. Alexander, K. W. Allison, A. J. Aust, L. D. Bache, K. H. G. Bacon, E. O. Baldwin, D. Bennett, H. Berry, K. Benyon, C. F. Blanshard, L. W. A. Bonner, G. W. Booth, G. T. Botterill, A.A.F., S. Bower, G. F. Brett, D. E. Bromilow, A. H. Brown, R.A.F.V.R., W. H. Burns, D. H. Burwood, E. G. Campbell, N. P. Carter, A. H. Chase, D. E. Clarke, C. W. Cleverly, S. E. Cole, H. B. Cooper, M. J. Cowley, A. E. Cox, A. D. Critchley, T. Crowe, T. Crowther, E. J. A. Curtis, E. Dashwood, D. T. Davies, C. H. Dawes, R. B. Dawson, E. A. Denyer, J. W. Dines, P. Docherty, E. Dodgson, D. Dunford, G. V. Dutton, G. H. Easton, P. E. Ellis, G. A. Elston, K. B. Evans, S. Eyre, R.A.F.V.R., A. G. Findlay, A.A.F., J. F. Floyd, L. R. Foulkes, D. S. Fowler, D. A. Gallagher, W. W. Garrett, R. G. Gent, J. Gibson, J. E. Gill, E. B. R. Goldsmith, K. S. Goode, W. H. Goodridge, E. Goodwill, J. Greaves, G. E. J. Greeves, E. Griffiths, J. Grimshaw, E. E. Grindle, J. P. Grundy, C. H. Gunn, A. Haigh, A. Hale, A. V. Hallett, C. W. S. Hansard, H. Hesketh, J. C. W. Hewetson, E. D. Hills, E. G. Hillyard, R.A.F.V.R., K. D. Howard, J. R. Howd, W. F. Howgego, E. Hudson, J. S. Hurry, M. G. Ingledew, J. Jackson, G. T. James, W. A. James, K. P. Jarman, A. G. E. Jarvis, H. C. Johnson, C. L. Jones, L. W. Jones, W. G. Kavanagh, T. C. Keynes, G. V. Kingett, F. P. Kirkby (Missing), W. R. Kitchener, W. J. Laidlaw, H. J. Langley (Missing), S. B. Law, W. Laws, A. Lawton, J. W. Lines, W. G. Lockhart, R.A.F.V.R., K. O. Lockyear, F. Lomas, C. E. Lowes, R. J. F. Lunn, H. B. F. Lymna, T. W. McCourt, A. S. MacDonald, T. McGreevy, C. B. H. McNiven, J. MacQueen, J. H. Maguire, A. G. Mann, R.A.F.V.R., T. W. Mann, S. R. Marshall, E. Maude, K. L. May, W. T. May, L. G. Mays, J. Middlehurst, A. J. Milton, D. C. Mondey, G. P. Moore, E. G. Moynihan, C. F. Moxon, A.A.F., W. J. Mulhern, T. Neale, N. T. Nice, A. Osterbery, G. E. R. Parr, E. L. Parry, R. J. Pearce, F. H. Perry, A. R. T. Phillips, D. V. Phipps, R.A.F.V.R., R. E. Pilgrim, J. Priestley, C. J. Prior, H. J. L. Pugh, K. B. Read, R. L. Reid, N. Reidy, F. G. Richardson, T. Richardson, S. Roberts, H. J. Roe, J. A. Rossiter, N. F. Rouse, S. J. Rout, F. G. Rowe, R. W. Rule, S. J. G. Rutherford, P. M. Salter, A. McA. Sargent, J. B. Score, D. M. M. Scott, G. J. W. Scott, A.A.F., I. Scott, R. D. Shackleton, G. E. Sheaff, P. G. Sim, A. G. Simpson, J. R. Skene, J. Small, C. E. Smith, V. J. H. Staff, G. McD. Stewart, A. L. Stimson, W. A. Tait, A. H. Taylor, H. A. Taylor, J. R. Tector, H. M. Terry, A. L. Thornton, J. R. Todd, H. W. G. Treherne, H. G. Tunbridge, A. W. Waite, R. W. Walsh, W. S. T. Wardrope, E. H. Warren, F. D. Watson, J. W. Weir, H. White, H. W. White, J. C. White, R. W. White, T. E. Wilkins, K. Williams, S. H. Williams, B. Wilson, R. J. Winstanley, A.A.F., M. G. Wood, T. C. Wood, B. Yarnell, W. Yates, R. D. Collins (Act.), C. L. Middleton (Act.), G. H. Patrick (Act.), F. D'O. Barnett, R.A.A.F., J. L. Burnham, R.A.A.F., S. G. Dale, R.A.A.F., H. T. Freeman, R.A.A.F., P. C. Hayes, R.A.A.F., V. H. Semler, R.A.A.F., D. S. Shannon, R.A.A.F., R. G. Spencer, R.A.A.F., C. A. J. Westbrook, R.A.A.F., G. F. Cook, R.C.A.F., A. D. Day, R.C.A.F., J. B. Dicks, R.C.A.F., A. F. Dodds, R.C.A.F., M. J. Laderoute, R.C.A.F., J. A. Richard, R.C.A.F., L. F. Shervill, R.C.A.F., J. B. Starkey, R.N.Z.A.F., R. A. Turton, R.N.Z.A.F.

Air Sergeants, S.A.A.F.:—C. J. Heuff, R. P. Hill, R. Karlin, J. H. Maritz, B. H. Meek, G. H. Patrick, D. G. Raine, J. B. Van Diggelen (Act.).

Corporals:—F. K. Alcock, L. J. Algar, R. M. Allan, J. H. G. Allenby, Q. D. Arkinstall, B. G. Ashby, C. Atkin, W. H. Atkins, H. Bennett, T. S. Betts, I. A. Black, W. J. Bolwell, R.A.F.V.R., H. W. Bradford, T. B. Brinkworth, W. F. Brockfield, F. W. Brown, R. O. C. Broyden, R. J. Burkitt, P. Burns, A. Cardwell, E. E. Carpenter, J. E. Cassere, J. R. Clapham, T. H. Clark, F. L. Collier, P. H. Collins, R. Congreve, J. J. Cooper, T. M. Cox, J. T. Crawford, D. Crellin, J. Crossfield, J. Cunningham, B. Davies, V. W. Dawson, W. H. Dodson, W. J. Dowd, H. G. Dowding, P. E. Downes, R. G. Dyke, E. R. Edwards, D. J. Ellis, H. A. Esterbrook, W. M. Farquhar, H. Farrell, J. N. Fayle, J. H. Fleming, J. E. Franklin, A. Gale, R.A.F.V.R., S. Gerring, G. L. Gilbey, F. Glue, D. O. F. Gwyther, J. J. Hackett, R.A.F.V.R., S. T. Haffenden, M. F. Harding, H. P. Harper, J. C. Harris-Ward, A. G. Hedges, H. J. Heuston, A. B. Hill, R. A. C. Hillier, H. Hirscheimer, J. R. Hodder, D. Y. Hogg, G. V. Holt, D. J. Hoskins, J. T. Howarth, T. J. P. Hughes, R. A. Hurst, R. W. Jackson, D. E. Jones, J. Jones, F. G. Kay, A. J. Keefe, A. L. Kelsall, A. Kirkland, R. C. Lawrence, C. A. Lea, D. Levine, T. W. Lipscomb, N. Littlehales, F. G. Lockley, J. D. Longbottom, M. M. Loughlin, O. T. Lucas, W. F. Lynn, H. K. Lyttle, J. McCreary, W. J. E. McFarlane, A. McLuckie, L. D. McRaye, A. J. Machin, R. Mack, N. Marriott, S. Maughan, G. W. Moore, R. C. Moore, N. E. Morgan, T. J. Mullan, S. G. H. Newman, W. C. Nobbs, H. O'Day, J. K. Paterson, G. D. Peacock, T. J. Percy, J. D. Pollard, F. F. Potter, R. Pounder, T. Powley, A. W. Pratt, W. Radford, W. H. Railton, W. M. Reid, A. F. Robinson, R. Robinson, F. S. Salter, R. G. Sams, S. Scorer, A. J. Scott, G. Sellers, R. G. Sharp, C. G. Shepherd, W. B. Shore, B. O. Smith, D. J. Smith, H. T. Smith, N. Smith, G. F. Spensley, E. W. Spicer, H. A. Spindler, R. A. Stelp, J. Stewart, J. C. Stubbs, A. Sutton, R. K. Tasker, W. F. Thomas, A. G. Thomason, K. Thornton, G. D. Upton, G. Vaughan, T. Wain, J. F. A. Waters, L. F. Whitby, J. Williams, K. T. Wilson, F. G. Wisbey, J. Wolstenholme, S. R. Woollett, A. Berry (Act), R. J. Campbell (Act.), A. Dixon (Act.), W. C. B. Duncan (Act.), A. R. Sandoe (Act.), A. Lee, R.A.A.F., C. O. Mann, R.A.A.F., E. V. Mather, R.A.A.F., J. Payne, R.A.A.F.

Air Corporals, S.A.A.F.:—R. C. Bate, N. R. Emmett, R. J. Heaven, R. M. Helsop, L. C. Jeffery, A. L. Smith, P. van der Merwe, E. N. Verity, H. E. Fuchs (Act.).

Leading Aircraftmen:—T. L. Adams, F. Alker, M. Allan, C. J. Baker, R.A.F.V.R., G. J. Baker, L. Baker, T. G. Baker, R.A.F.V.R., G. Barnes, F. G. Barnett, W. J. Berry, E. A. Betts, J. L. Biggs, R.A.F.V.R., A. G. Bingham, R.A.F.V.R., G. F. Blackemore, H. Booth, F. J. Boyes, H. M. Bradley, R.A.F.V.R., W. Bradshaw, G. F. Brandt, H. E. Brautigam, T. E. Brett, R.A.F.V.R., A. M. Brown, A. W. Burns, W. Challender, E. A. Chilvers, T. L. Clifford, A. Cowperthwaite, H. Crook, K. Davenport, C. E. Delavigne, A.A.F., M. Demetris, R. Dickson, W. J. Duff, P. Dunn, W. Elliot, S. W. Elvin, K. R. Eustice, A. Fielding, R. E. G. Filby, R. M. Fraser, J. Gallagher, R. E. J. Gambrill, M. M. Garven, H. E. Gibson, S. W. Gray, J. Hampson, J. W. Hart, R. D. Hart, G. R. Hatswell, S. G. Henson, F. H. Hobbs, G. W. Howard, A. V. Howe, W. S. Hurst, F. W. M. Langley, J. G. S. Lyles, J. G. Miller, A. Moran, F. Needham, J. Nichols, R. L. Norgrove, J. E. Nuttall, P. H. Oxenburgh, R. V. Palmer, A. Parkinson, H. L. Pashley, G. Pearson, A. G. Postill, E. G. Powell, D. W. Price, J. Pryde, W. Reeve, F. W. Ruff, W. J. Rush, E. E. Salkeld, T. R. Sargison, A. H. Shelley, M. J. Spiegelhalter, W. M. M. Stein, M. Teich, A. J. Tickner, H. J. Tiller, W. Tinlin, H. Toft, K. J. Towl, L. C. Trembath, B. Tropman, J. G. Walker, J. L. Walsh, T. A. Walshe, D. McN. B. Ward, W. S. Washington, L. G. H. Weaving, G. S. White, D. Wilkins, H. Wilson, J. Wilson, N. H. Winterburn, J. K. Woollard, H. C. Wright, J. Zimerman, J. A. Innes, R.A.A.F., R. B. Korn, R.A.A.F., A. Mathews, R.A.A.F., B. F. Vincent, R.A.A.F.

Aircraftmen, 1st Class:—A. E. Baker, A. K. Bell, G. Breading, R. G. Carmichael, F. E. Coller, T. A. Davies, H. Eyre, C. Giordano, N. Guthrie, I. V. Harris, F. L. Home, A. B. Langdon, J. C. Lewis, J. A. Lintott, J. Lowe, A. C. McDivitt, J. L. Owen, J. P. Perry, J. P. Robertson, E. R. Russell, E. C. Simkins, A. Trusler, R. Vines, T. Woodhead.

Aircraftmen, 2nd Class:—P. E. Croft, C. E. Haylock, S. V. Linscott, C. T. H. Parcell, L. F. Phillips, H. Poynton, R. F. T. Saunders, C. E. Trimmer.

Air Mechanics, S.A.A.F.:—G. S. Blake, W. P. Goodwin, C. W. Greve, D. Moodie, J. D. Pietersen, J. M. Rae, E. W. Rafferty, A. G. Ruth.

Private S.A.A.F.:—F. W. P. Grove.

Wing Officers, W.A.A.F.:—C. J. Rowley (Act.), S. V. Williamson (Act.).

Squadron Officers, W.A.A.F.:—Y. J. Gough, D. I. Smith.

Flight Officers, W.A.A.F.:—O. Cooke, R. M. Holliday, M. J. Llewellyn, J. S. Stratton, M. H. H. Workman, J. A. Bannatyne (Act.), I. M. Bryan (Act.), P. S. Clark (Act.), M. E. A. Cobb (Act.), E. N. U. Cottrill (Act.), M. Fish (Act.), C. I. M. Fuller (Act.), S. M. McCall (Act.), E. B. Murray (Act.), I. J. Rossborough (Act.), V. Rowson (Act.), M. S. Somerville (Act.), A. E. Weightman (Act.).

Section Officers, W.A.A.F.:—A. P. T. Carson, M. I. Brown (Act.), M. Caudwell (Act.), R. M. Simonds (Act.).

Asst. Section Officers, W.A.A.F.:—E. M. Goddard, Z. E. Lamb, E. M. Robertson.

Flight Sergeants, W.A.A.F.:—M. E. Bourhill, E. S. Moody I. E. M. Shepherd.

Sergeants, W.A.A.F.:—K. R. Bradshaw, E. M. M. Brooks, C. M. Conington, M. M. Drummond, E. M. Dyer, L. King, E. Rix, A. B. Vigar, F. M. Would, M. Spoor (Act.).

Corporals, W.A.A.F.:—D. C. Born, B. M. Bowie, E. Culley, B. Graham, B. M. Griffie-Williams, C. E. Haddock, S. O. Hamilton, F. J. McGrath, V. M. Oliver, P. T. Salt, E. Sears.

Leading Aircraftwomen, W.A.A.F.:—J. B. Dell, P. M. Cockran, P. B. Mount, B. M. Neville-Weaver, V. Nichol, M. G. Peake-Anderson, D. Perrin.

Aircraftwoman, 1st Class, W.A.A.F.:—G. G. Edmunds.

Commended for Brave Conduct

Squadron Leader:—A. B. Holloway, R.A.F.V.R.

Flight Lieut.:—L. F. Weston (Act.), R.A.F.V.R.

Pilot Officer:—S. I. Baird, R.N.Z.A.F.

Flight Sergeant:—G. E. Long, R.A.F.V.R.

Sergeants:—A. T. Dix, A. Lippa, R.C.A.F.

Corporals:—D. McPherson, J. Ray.

Leading Aircraftmen:—R. H. Harcourt, T. J. Haynes, R. Robinson.

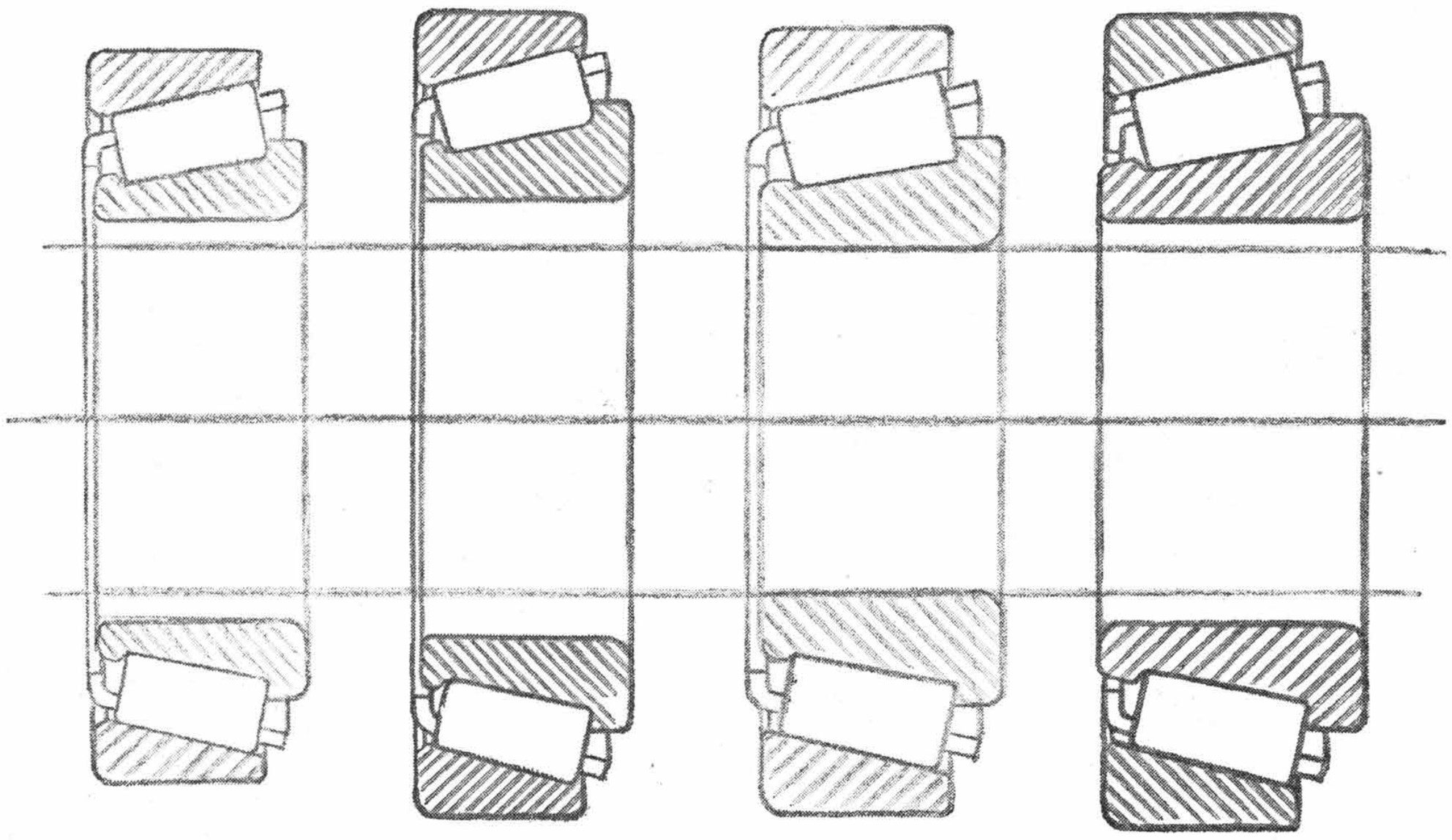
Aircraftmen, 1st Class:—P. J. Bray, E. E. Wrixon.

Aircraftman 2nd Class:—J. G. Scott.

For Valuable Services in the Air

Squadron Leader:—J. H. Saffery (Act.).

Flight Lieut.:—A. B. Wilkinson, R.A.F.V.R.



Some are, some aren't

We are making more efficient use of our manufacturing plant by eliminating time-wasting short runs of odd sizes and specials.

We therefore request that every user should consult us in the early stages of his design (as so often advocated by us). There are plenty of Timken tapered roller bearings in the high-production list, but there are some sizes that aren't—until after the war.

The extensive experience and advice of this organisation is, as always, at your service.

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Extracts from the London Gazette

Air Ministry, June 2.

ROYAL AIR FORCE

ADMINISTRATIVE AND SPECIAL DUTIES BRANCH.—To be Plt. Off. on prob. (emergency):—Actg. Wt. Off. Apr.: R. T. Lester (Sen. Mar. 18).

To be Act. Plt. Offs. on prob. (emergency):—Flt. Sgts.: Apr.: G. W. Hillery-Collings (Sen. Feb. 2), L. R. Flower, M.M., A. J. T. Bridgland (Sen. Feb 16). Sgts.: Apr.: Ralph Greasley (Sen. Sept. 29), B. W. Ahern (Sen. Jan. 7).

Plt. Off. (prob.) W. H. Emmett confmd. in appt. and to be Flg. Off. (war subs.) May. (Sen. Feb. 27).

Plt. Off. (prob.) R. W. D. Hier confmd. in appt. Jan. and to be Flg. Off. (war subs.) Mar (Sen. Feb. 13).

Plt. Off. (prob.) C. F. Edwards confmd. in appt. Mar. and to be Flg. Off. (war subs.). Apr. (Sen. Mar 17).

Plt. Off. (prob.) A. Wood confmd. in appt. Apr. and to be Flg. Off. (war subs.) May (Sen. Apr. 2).

Plt. Off. (prob.) L. A. Popham confmd. in appt. Apr. and to be Flg. Off. (war subs.) May (Sen. Apr. 6).

Plt. Off (prob.) J. H. Turner confmd. in appt. May and to be Flg. Off. (war subs.) May (Sen. Mar. 25).

Act. Plt. Offs. (prob.) to be Plt. Offs. (prob.):—Dec.: L. F. Smith (Sen. Aug. 5). Jan.: R. Graham (Sen. May 31), C. L. Harris (Sen. Nov. 16).

The notifn. of Mar. 24 concern. Plt. Off. P. J. Pope should have appeared under the Admin. and Spec. Duties Br. and not Tech. Br.

The notifn. of Apr. 28 concern. Act. Plt. Off. A. E. Cliffe is cancelled.

EQUIPMENT BRANCH.—Plt. Off. (prob.) A. Leeming to be Flg. Off. on prob. (war subs.) May and confmd. in appt. Apr. (Subs. for notifn. Oct. 7.)

Flg. Off. H. C. Muggeridge to be Flt. Lt. (temp.). Dec

Plt. Off. (prob.) F. Bridger to be Flg. Off. on prob. (war subs.). May.

ACCOUNTANT BRANCH.—Plt. Off. (prob.) W. E. Palmer to be Flg. Off. on prob. (war subs.). Dec.

The commn. of Act. Plt. Off. (prob.) W. H. Osborne is terminated. May 21.

MEDICAL BRANCH.—Mrs. M. C. Haran, L.R.C.P. & S., L.M., medical officer with the relative rank of Flg. Off, resigns her commn. May 31.

RESERVE OF AIR FORCE OFFICERS.

GENERAL DUTIES BRANCH.—W. J. F. Wellard to be Wg. Cdr. in class CC. Apr.

To be Sqn. Ldrs. in class CC:—Apr.: P. A. V. Smith. May: F. W. M. Eglinton.

A. B. Logan to be Plt. Off. in class CC. May.

Flg. Off. R. A. Whitehead to be Flt. Lt. (war subs.). Feb.

Sqn. Ldr. R. E. Hall is transf. to the Admin. and Spec. Duties Branch. May 16.

Air Cdre. J. G. Murray relinquishes his commn. in class CC on appt. to a commn. in the R.A.F.V.R. Nov. 15.

ADMINISTRATIVE AND SPECIAL DUTIES BRANCH.—Flt. Lt. E. E. Ellison to be Sqn. Ldr. (temp.). Apr. (Sen. Dec. 1.)

Plt. Off. S. W. Rowland to be Flg. Off. (war subs.). Mar., 1940. (Subs. for notifn. of Jan., 1941, which appeared under Tech. Br.)

Flg. Off. J. F. A. Baker resigns his commn. May 15.

ROYAL AIR FORCE VOLUNTEER RESERVE

GENERAL DUTIES BRANCH.—To be Plt. Offs. on prob. (emergency):—Nov.: W. G. Cooil, B. F. G. Darby, J. G. S. Houdret, W. H. Irving, J. H. T. Metcalf, D. G. J. Smith, R. A. Squibbs, J. L. Steele, D. K. Thorburn. Feb.: R. C. M. Marston. May: T. A. Jennings. Flt. Sgts.: Apr.: Thomas Trotter, R. J. Webb. May: R. G. Elvin. K. E. S. Muggleton, H. G. Cannon, R. A. J. Goode, D.F.M., Maurice Morgan, Percy Parnham, F. G. Davy, Ronald Kirby, D. L. Lewis, D.F.M., T. W. Sutton. Temp. Flt. Sgts.: Apr.: H. J. Archer. May: R. F. Spears, R. B. Thompson, J. C. Harrold, D. S. Gallimore, Norman Jackson. Sgts.: May: M. F. White. July: R. MacK. Watson, B. C. Dennis, J. L. Leigh-Pemberton. Aug.: G. T. Harman, L. T. Cobbledick, O. W. Kingdon, A. T. Willis. Sept.: Leslie Noble, A. H. Henderson. Nov.: Geoffrey Morrell, K. R. P. Painter, C. McA. Forbes, R. W. Tait, G. P. Stanton, J. A. Bruce, P. J. Harding, Arthur Hodgson, D. J. Speares, H. J. Buddle, H. B. Caldwell, H. J. Luck, R. F. Monger, L. E. Pallot, C. W. Rendell. Dec.: W. N. Macgillivray, F. G. Reed, D. L. C. Thomas, J. M. Bryce, I. G. T. Roberts, W. N. Ramage, Geoffrey Bailey, J. R. Brew, G. L. Blackshaw, W. R. Donaghue, T. A. Ord, D. F. J. Thom, John Hamilton, H. J. R. Tickle, Edward Whitmore, C. H. S. Cant, A. G. Edwards, Alfred Fuller, P. V. Hewitt, Stanley Howlett, J. S. McLaughlan, P. R. V. Myers, P. W. Carr, Jan.: E. J. Lambarth, D. E. Lumsden, J. F. Pistorius, S. J. Thomas, K. M. Kopperud, R. M. McCall, J. A. S. Wood, C. R. Morgan, Nathan Cohen, H. G. Slaughter, H. A. Clarke, N. H. Cain, P. J. R. Lee, F. H. Taylor, G. A. Corbin, K. F. B. Balcon, A. L. Gaskin, A. A. Doggett, M. R. Ashman, L. J. A. Graham, R. W. Lawes, G. E. Johns, S. H. Chant, T. C. Graham, W. T. Burnett, J. A. Burcham, R. O. Trapp, M. J. Ahearne, L. J. P. Dunlop, E. A. Grant, Thomas Knight, Ronald Molyneux, L. G. Stirling, A. H. Surridge, John Taplin, D. W. Wheeler, H. M. Armstrong, J. C. H. Cole, R. A. Curle, D. McL. Forbes, David Giles, C. G. Grey, C. A. Hobson, G. D. Ingleton, D. W. Jones, D. E. Kenyon, D. S. Kirkland, F. W. Ladbrook, G. R. Mayhew, Frank Wilkerson, W. G. Barrett, Rowland Hemingway, F. G. Hill, J. C. Lanyon, D. H. Organ, D. W. Pallett, T. C. Sack, E. G. Ward, W. E. Broadfield, E. E. Button, E. F. A. Jones, R. A. Lord, A. J. Mayhook. Feb.: W. G. Apps, R. C. Hansell, A. J. Bartram, K. G. Tice, D. W. F. Ridgway, P. S. Rivington, F. E. Townsend, B. D. Young, H. R. P. Pertwee, W. T. J. Rhys, M. T. S. Rumbold, Hugh Scott, William Shearman, J. M. Sullivan, R. M. Taylor, P. E. Tickner, J. L. Haggerty, A. K. Higham, W. R. B. McMurray, S. H. Nicholson, F. A. Harper, K. A. Kemp, P. W. P. Lewis, Norman Macleod, N. R. Macqueen, N. P. Michie, J. E. Morriss, Raymond Payne, J. B. Thornton, William McCafferty, Peter Bown, A. H. Love, R. H. Pugh, H. C. Grice, W. E. Coleman, J. W. Scott, W. C. Waterson, V. N. Giri, A. J. Dowling, S. G. Goodier, D. E. Hall, Thomas Lawlor, Harold Shaw, W. C. Blair, A. S. Boyes, F. J. Roder. Mar.: A. P. C. Dunlop, A. F. Giles, W. E. Pickup. Apr.: I. W. H. T. Whiteside. May.: T. N. W. Bisset, C. E. A. Crouch, John Wyatt, B. G. Galloway-Wilson, W. F. Caldwell, J. P. D. Clarke, Harry Cobb, R. H. P. Humphris, J. S. Hustler, C. J. Murphy, E. L. Wilde. Temp. Sgt.: J. S. Clay. Cpls.: Dec.: G. D. Wright, J. N. Mackenzie. Feb.: T. W. Redfern. Ldg. Acm.: Aug.: D. O. Brown. Oct.: W. J. McFetridge. Nov.: C. E. Sturdy, J. G. Baxter, W. F. Dredge. Dec.: M. E. Russell, R. R. Sargent, R. C. Thompson, E. B. Williams, W. D. Hollis, J. R. Brain, G. G. Judd, F. H. Down, Sydney Smith, L. J. Hosier, G. I. Mallet, C. G. Richards, J. D. Cousins, R. W. Hepworth, T. C. Lowe, A. C. Monahan. Jan.: Stanley Pearson, W. G. J. Symonds, R. G. Ashby, Terence Prendergast, R. E. Skitch, J. E. B. Jefferson. Feb.: G. G. Edwards, L. C. Wheeker, P. C. Beresford, H. A Gass, D. C. Hunt, J. E. Morris, T. W. Price, G. J. Cribb, H. T. Begg, B. W. Sharpe, L. K. Brownson, R. W. Griffiths, S. J. Moss, Brian Perkin, P. W. H. F. Wood, N. A. Wright, J. D. Compton, Douglas Edyvean, Kenneth Fox, G. M. Gray, B. K. Harper, Alfred Martin, D. G. Pearson, I. A. Waugh, N. L. Casely, C. W. Fowler, G. B. Hunter, D. V. G. Rees, J. W. Robb, Fred Sandy, Fred Walsh, W. D. St. C. Weeks. Mar.: J. M. Gilchrist, H. T. John, M. D Cohen, John Mills, J. H. Milne, K. S. Norton, R. H. Pike, G. W. Ross.

J. C. T. R. Weeks to be Act. Plt. Off. on prob. (emergency). Apr. 15.

Plt. Offs. (prob.) confmd. in appts. and to be Flg. Offs. on prob. (war subs.):—Oct.: J. M. Wyley. Dec.: R. Edge, A. W. Ruffhead (Sen. Dec. 1), R. T. Saunders. Jan.: C. H. Duncan, J. Edmond, V. H. Surplice (Sen. Jan. 14), T. Treby. Feb.: W. E. Thomas (Sen. Jan. 26), F. W. Bailey, P. J. Kydd, G. H. T. Eades, M. G. Williams. Mar.: A. H. Comfort, E. J. Pullen, E. G. K. Beadman. Apr.: R. D. Luckwell, H. T. E. Dagseth, L. Whiteside, N. H. Carfoot, A. Elliott, C. H. L. James, A. E. Odle, N. L. Shove, J. M. Ayshford, R. D. Bell, R. O. Curtis, G. J. Haines, B. P. T. Horsley, A. V. Plowright, D. H. Wood-Samman, P. C. Marjoram, A. B. E. de Jong, D. E. Dixon, P. R. Gaskell, B. D. Hanafin, J. W. Lovatt-Davies, D. L. Porter, T. B. Stoney, W. J. J. Welch, H. K. Crook (Sen. Apr. 9), E. P. G. Moyna, D. F. Dennis, D.F.C. (Sen. Apr. 9), A. J. Reeves, J. A. Lishman, S. W. Turner, S. R. Whipple, F. C. Blackmore (Sen. Apr. 9), J. D. Bridge, R. Frowde, J. S. M. Helme, J. G. Stephenson, F. K. Bainbridge (Sen. Apr. 9), R. W. Brown, C. W. Harris, J. F. Lown, A. J. Price, W. G. Potter, J. R. Watson. May: P. S. Huggins, R. J. Urquhart, H. E. H. Gillett, R. W. Bartlett, T. H. Webber.

Plt. Off. (prob.) I. H. Brigers confmd. in appt. June and to be Flg. Off. (war subs.) Dec.

Flg. Offs. to be Flt. Lts. (war subs.):—Oct.: A. G. Page. Jan.: P. S. Sidney-Smith, S. H. Palmer. Mar.: J. Bowie, I. W. Forsyth, J. M. Somerville, M. M. Marsh, F. J. Holmes, C. R. Barrett. Apr.: G. R. Park, A. R. Povey, I. Bellas F. Cross, D. Crowley-Milling, D.F.C., J. O. Bostock, W. K. Davison, V. Kelley, A. J. Putt, D.F.C., R. M. Taylor, D.F.C., J. L. Mitchell, D.F.C., M. F. Bannerman, T. de L. Neill, L. G. Peace, F. Barrett, R. V. Muspratt, B. L. H. Howes. May: R. A. F. Farquharson, W. E. J. Lunn, H. P. Aiken.

Flg. Off. G. D. S. Horsfall to be Flt. Lt. (war subs.). Apr. (Subs. for notifn. of May 12.)

Plt. Off. W. E. J. Lunn granted the rank of Flg. Off. (war subs.). May.

Plt. Off. (prob.) B. N. Greves is transf. to the Admin. and Spec. Duties Br. May 18.

Plt. Off. (prob.) C. A. H. Collier takes rank and precedence as if his appt. as Plt. Off. bore date July. Reduction to take effect from Feb.

Flg. Off. C. C. Lee relinquishes his commn. on appt. to a commn. in the R.C.A.F. May 31.

Flg. Off. G. U. Hayns resigns his commn. and retains his rank. May 9.

Commns. of the folg. Plt. Offs. (prob.) are terminated:—L. Snazelle. May 13. L. R. Coppock. May 14. F. L. Prue. May 20.

Plt. Off. (prob.) A. G. Lewis is dismissed the Service by sentence of General Court-Martial. Apr. 25.

AMENDMENT.—In notifn. of Apr. 23 concern. Temp. Sgt. H. C. Woodside for Woodside read Woodhouse.

TECHNICAL BRANCH.—To be Plt. Offs. on prob. (emergency):—Wt. Off.: Oct.: L. D. Adams (Sen. July 10). Cpls.: Nov.: Roy Travers (Sen. Sept. 5). Jan., 1942: M. le M. Mansion (Sen. Dec. 13), H. P. H. Gough (Sen. Dec. 23).

To be Act. Plt. Offs. on prob. (emergency):—Wt. Offs.: Apr.: W. P. Nicol (Sen. Dec. 11), C. J. Sullock (Sen. Feb. 12), Alexander Murray (Sen. Dec. 11), F. H. Barnard (Sen. Jan. 29), J. D. Brown (Sen. Feb. 19). Flt. Sgts.: Apr.: D. W. Lambert (Sen. Feb. 12), Robert Dixon (Sen. Mar. 12), Harry Jones (Sen. Dec. 11). May: H. C. Channon (Sen. Feb. 23). Sgts.: Apr.: J. L. Davies (Sen. Oct. 30), M. E. Grigg, Alexander Mitchell (Sen. Feb. 12), A. C. W. Sanne (Sen. Feb. 19), Joseph Dowding (Sen. Feb. 26), A. R. Willis (Sen. Jan. 20). Cpls.: Apr.: H. E. D'Esterre (Sen. Jan. 29), John Roberts (Sen. Feb. 12), T. W. Dowson (Sen. Feb. 26), Anthony Bikker (Sen. Nov. 27), Samuel Fleisig (Sen. Jan. 8), E. L. Millward (Sen. Jan. 29). Acm. 1st Cl.: Apr.: Frederick Mason (Sen. Feb. 26). Acm. 2nd Cl.: Apr.: G. W. Thomas (Sen. Feb. 18).

Plt. Off. (prob.) J. M. P. Dowson confmd. in appt., Aug., and to be Flg. Off. (war subs.), Mar.

Plt. Off. (prob.) F. C. Lowe confmd. in appt., Mar., and to be Flg. Off. (war subs.), Apr.

Plt. Off. (prob.) H. S. Tegner confmd. in appt., Nov., and to be Flg. Off. (war subs.), Apr.

Plt. Off. (prob.) R. W. C. Mills confmd. in appt., Feb., and to be Flg. Off. (war subs.), May (Sen. Feb. 1).

Plt. Off. (prob.) G. A. G. Saywell confmd. in appt., Feb., and to be Flg. Off. (war subs.), May (Sen. Apr. 24).

Act. Plt. Offs. (prob.) to be Plt. Offs. (prob.):—Nov.: R. H. Williams (Sen. July 10). Mar.: F. H. Loveday (Sen. Jan. 7), V. Harris (Sen. Dec. 11), J. P. Kelly (Sen. Aug. 31). Apr.: E. A. Barlow, F. L. J. Binding, A. H. J. Todd, R. C. Clarke, A. Carter, C. C. H. Barker, J. Blake, A. S. Davidson, W. D. Garner, J. C. Holt, K. W. James, R. L. Murphy, A. B. Civil, R. C. Matthews, G. M. Briers, C. L. Hamilton, G. L. Barnes, P. J. H. Tempero, H. R. Roy, D. A. Winton, W. Y. Wilson, P. L. Taylor, L. Schenker, G. A. North, H. B. Cundall, L. Ellerd-Styles, C. P. Astbury, P. W. Harrison, T. C. Beswick. May: A. M. Reid, C. Edwards, W. T. Poulton, H. Durkin, W. J. R. Farmer, M. F. Burrage, O. Ash (Sen. Mar. 3).

Act. Plt. Off. (prob.) H. C. Brown to be Plt. Off. (prob.), Jan. (Sen. Nov. 27). (Subs. for notifn. of Apr. 21.)

Plt. Off. F. C. Potts relinquishes his commn. on account of ill-health and retains his rank. May 26.

Flg. Off. L. B. Ocamb resigns his commn. May 4.

The commn. of Act. Plt. Off. (prob.) J. Fairley is terminated. May 14.

BALLOON BRANCH.—J. G. Murray to be Wg. Cdr. (emergency). Nov.

Plt. Offs. (prob.) confmd. in appts. and to be Flg. Offs. (war subs.):—May: A. P. Chapman (Sen. Apr. 18), L. W. Brown (Sen. Apr. 28), E. Heron (Sen. Apr. 24), A. R. N. Hurdman (Sen. Apr. 18).

Act. Plt. Off. (prob.) S. H. Chalcraft to be Plt. Off. (prob.), Jan. (Sen. Dec. 10).

ADMINISTRATIVE AND SPECIAL DUTIES BRANCH.—To be Act. Plt. Offs. on prob. (emergency):—Feb.: D. V. Byles, E. G. S. Hartley, W. Q. Telger, J. E. Landray, A. J. Howard, H. G. Hammett. Mar.: W. F. H. Arundell, F. G. Biggs, W. L. Bowden, Patrick Campbell, A. W. Chalmers, R. H. Christie-Miller, R. J. Cloigh, E. W. Cowmeadow, Paul Dalaon, Andrew Drybrough, K. G. W. Dutton, A. J. P. Fry, I. B. Hill, M. W. Lanyon, C. F. Mackwood, J. R. Marples, Robert Marsh, M. A. Radik, E. G. D. Ridge, Simon Siddons, J. S. W. Stewart, Robert Viponn, L. R. T. Wasey, R. L. C. Weeks. Apr.: D. G. Moffitt, W. R. Buckland, P. F. S. Flew, F. H. Hiscock, Frederick Jolliffe, G. F. Loewi, D. F. Martineau, A. J. May, Percy Parkhurst, P. W. Read, R. W. M. Rowley, W. L. Williams. Sgts.: Jan.: Gershon Ellenbogen (Sen. Dec. 10). Feb.: R. A. O. Blackwell (Sen. Nov. 19). Apr.: G. H. Werts (Sen. Mar. 11), A. J. P. Furneaux (Sen. Jan. 7), R. H. Steed (Sen. Feb. 19), F. B. Robson (Sen. Mar. 2), Robert McIntosh (Sen. Mar. 3), W. H. Crocker (Sen. Mar. 2). Cpl.: Apr.: A. J. Ketteringham (Sen. Mar. 11). Ldg. Acm.: Apr.: Ronald Fowler (Sen. Mar. 11). Dennis Smith, D. T. Crocker (Sen. Mar. 12), E. M. Goodwin, J. H. Charles, K. R. Reed (Sen. Dec. 10). Acm. 1st Cl.: Apr.: E. F. C. Thomas (Sen. Mar. 12). Acm. 2nd Cl.: Feb.: B. A. Chandler (Sen. Aug. 14), Howell Davies (Sen. Aug. 27), C. D. Fish (Sen. Oct. 22), Apr.: J. S. Baker, J. McB. Guthrie, Leslie Morton, G. B. Tobey, W. J. Hurst (Sen. Mar. 11), E. B. G. Line, A. T. Merritt, H. L. Owen, I. G. Ronald, Sidney Carter (Sen. Mar. 12), J. A. Rigby (Sen. Aug. 5), A. L. Gray (Sen. Jan. 27).

E. J. R. Hack is granted an hon. commn. as Wg. Cdr. May 9.

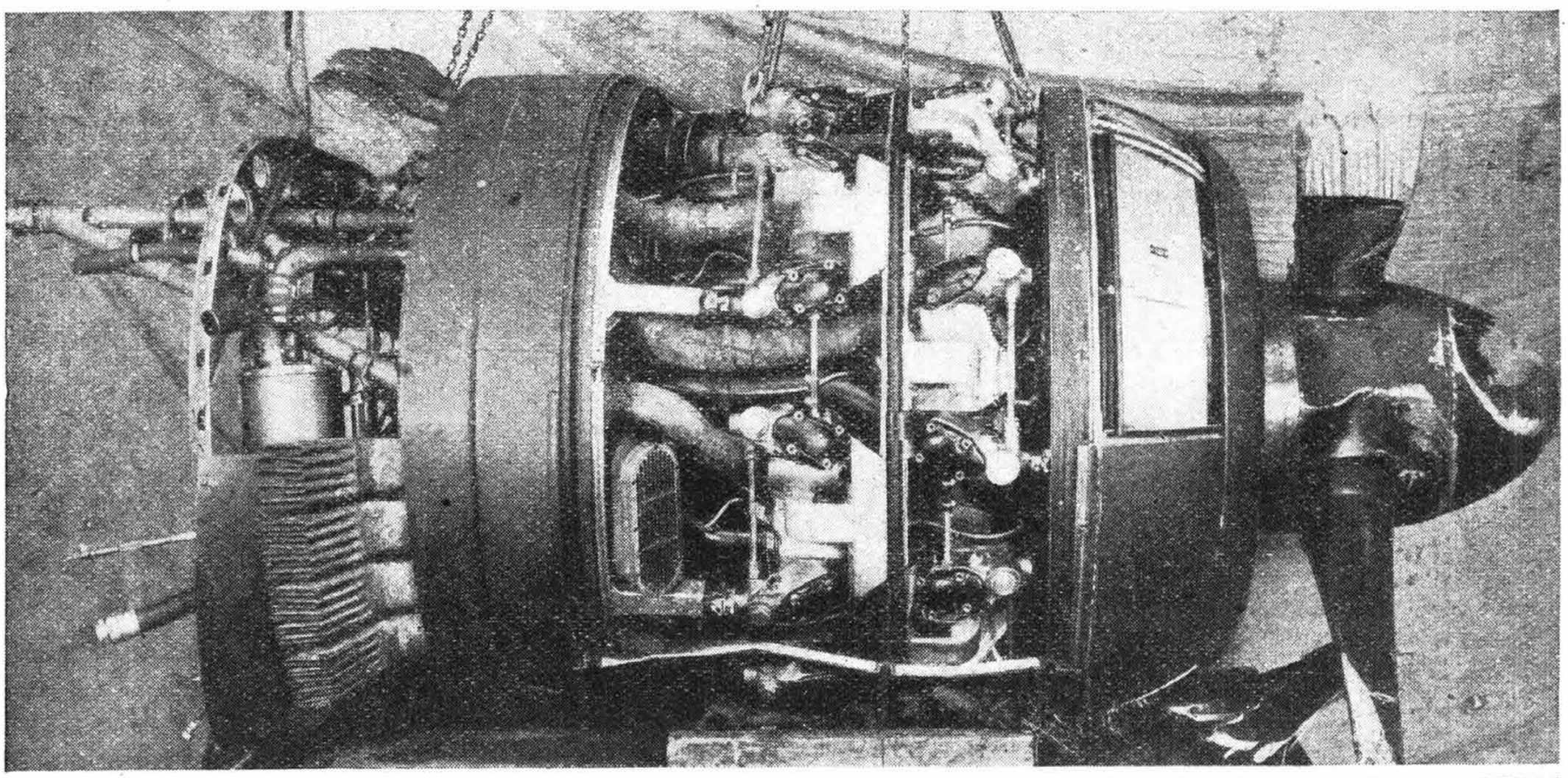
Flg. Offs. (prob.) confmd. in appts.:—A. J. M. Fabian, Nov. T. G. Mapplebeck, Mar.

Plt. Offs. (prob.) confmd. in appts. and to be Flg. Offs. (war subs.):—Apr.: J. V. Midwinter. Nov.: C. A. McD. Anderson, E. S. Beachcroft, C. R. Coleman, B. G. Edgell, C. W. K. Ellem, R. R. Fenner, F. C. Francis, A. O. Gaze, G. A. Grant, W. S. A. Giles, H. E. Hayter, J. A. Hillier, A. V. Jentsch, A. E. Kuring, R. H. C. Laidlaw, L. E. A. Robinson, T. J. K. Starr, J. H. Tonkin, E. E. Tyler, T. Welham, V. H. Young. Dec.: J. Scoular-Blacklock. Jan.: E. A. Legrand, J. W. Swain, F. C. Stacey. Feb.: C. W. Pickering, H. Ezekiel, W. S. Hulme, W. S. Steel, J. P. Condon, E. G. R. Godfrey, H. W. B. Bray. Mar.: E. J. Barker, T. Millar, G. F. Oppenheimer, H. H. Rignold, G. L. Blair, H. A. S. Greenhill, K. F. H. L. de Berniere Smart, H. C. Newman, R. Levy, C. H. Reynolds, A. G. Jenkins, S. E. Penn, E. M. Moore (Sen. Feb. 5), L. T. Jones. Apr.: W. J. Farr, D. E. Harris, C. M. Jones, G. H. J. Margrave, J. Reeve, A. J. Sington, J. F. Addington, F. B. Bean, J. R. Breadner, M. de la Paz Garsia, D. H. Knight, J. Thompson, C. S. C. Flick, J. A. Menhams, C. W. Morris, A. C. McC. Yate, E. McCormac, I. W. Boggis, C. T. H. Bradshaw, J. C. Brady, R. W. B. Burton, F. E. Forrest, E. F. Kennett, G. W. N. Simpson, R. G. Stevens, F. E. Turner, G. R. Webb, M. F. Laming Macadam, G. R. K. Anningson, W. L. B. Callander, A. W. Cook, J. S. Pudney, B. W. Swabey, N. B. Daniels (Sen. Mar. 9), R. G. Sturges. May: G. Mackinnon, J. Potter, H. H. Rofe, R. J. G. Boothby, M.P., H. J. T. Clamp, C. Wright, G. I. Howell, A. A. Aylward.

Plt. Off. (prob.) R. A. Pinchen confmd. in appt., July, and to be Flg. Off. (war subs.), Feb.

Plt. Off. (prob.) L. W. Thackwell confmd. in appt., Jan., and to be Flg. Off. (war subs.), Feb. (Sen. Dec. 9).

(The rest of the appointments under this date will be published next week.)



FORMIDABLE.—The 1,580 h.p. 42-litre BMW 801A 14-cylinder, two-row radial which has fan cooling and a very low drag cowling. This example comes from a crashed Do 217E1.

The BMW 801A Aero-motor

GERMANY has stolen a march on the rest of the World by producing in the BMW 801 aero-motor the most advanced power unit at present in operation.

Basically the BMW 801 is an orthodox 14-cylinder two-row radial. Its especial qualities lie in the design of its cooling and cowling which are undoubtedly of very low drag indeed.

The BMW 801A gives 1,580 h.p. for take-off and 1,460 h.p. at 16,300 ft. Its cowling probably gives it the equivalent of several hundred extra horse-power over normal motors. The notable points of the system are as follows:—

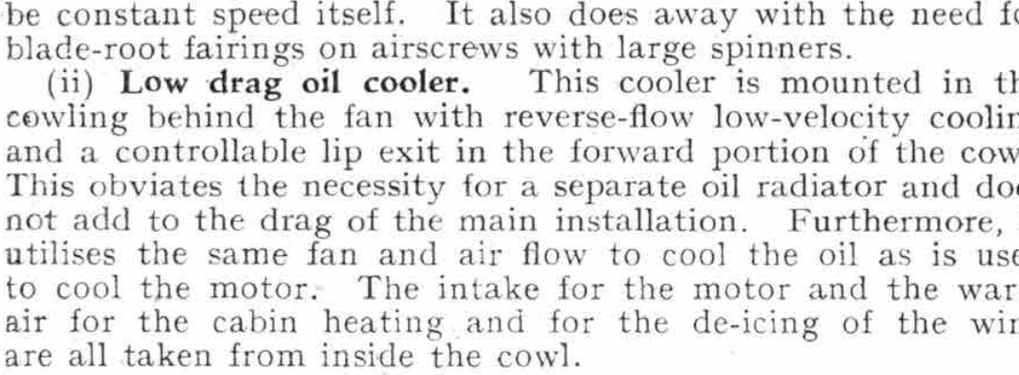
(i) **Fan assisted cooling.** The fan which is mounted immediately behind the airscrew is geared to run at 3.14 times airscrew speed. It gives adequate cooling at high revs. and low forward speeds, and with a constant speed airscrew would be constant speed itself. It also does away with the need for blade-root fairings on airscrews with large spinners.

(ii) **Low drag oil cooler.** This cooler is mounted in the cowling behind the fan with reverse-flow low-velocity cooling and a controllable lip exit in the forward portion of the cowl. This obviates the necessity for a separate oil radiator and does not add to the drag of the main installation. Furthermore, it utilises the same fan and air flow to cool the oil as is used to cool the motor. The intake for the motor and the warm air for the cabin heating and for the de-icing of the wing are all taken from inside the cowl.

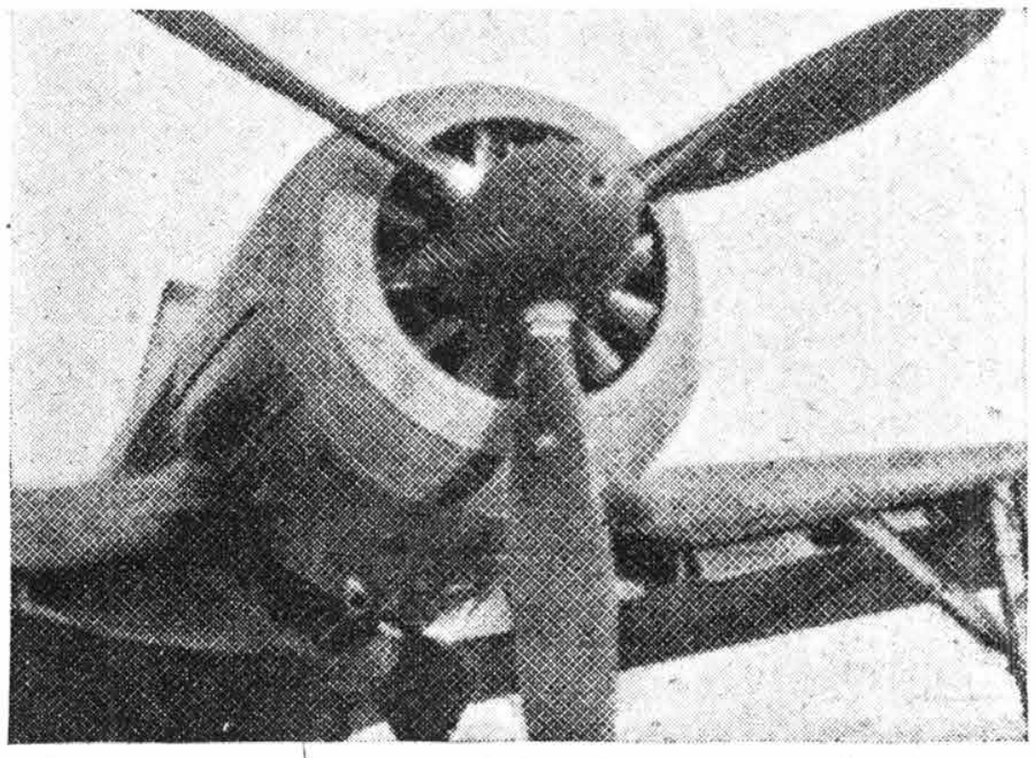
(iii) **Absence of gills.** No controllable gills are fitted such as normally disturb the air flow behind the nacelle. Instead there is a controllable slot at the rear of the cowling which provides space for the exit air without disturbing the flow or adding any material drag.

(iv) **Single lever control.** All the controls from the motor go into a single box from which a single lever control is taken. Compensation for height and boost is automatically provided on opening the throttle.

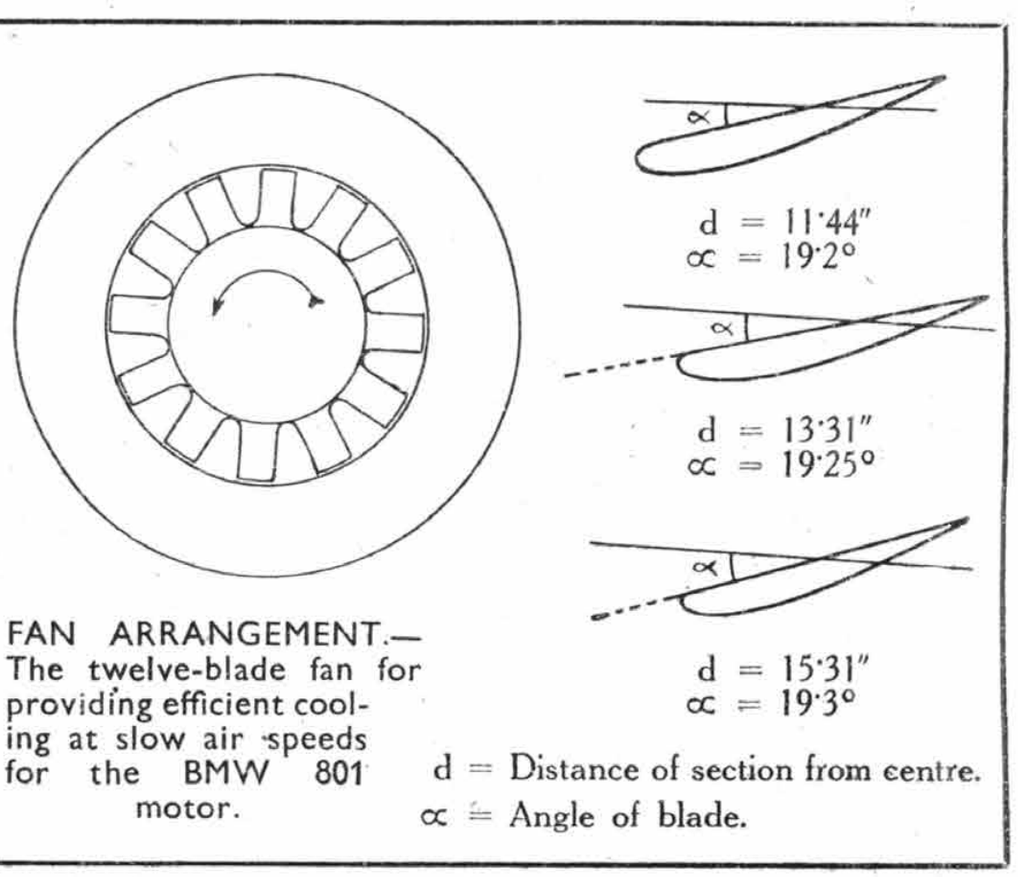
The BMW 801A has fuel injection; the injectors are in the back part of the cylinder heads between the two valves. The least efficient part of the installation are the flame damping exhausts which are projected outwards and thus have no ejector effect on performance. The motor obviously owes much to the Pratt and Whitney Twin Wasp from which it is developed, but it is probably more successful in reducing drag than any other aero-motor now in operation. We are likely to have a great deal of trouble with the BMW 801 in new German aeroplanes in the future. So far it is known to be installed in the Focke-Wulf Fw 190, the Focke-Wulf Kurier, the Dornier Do 217E1 and the Blohm und Voss Bv 141.



DETAILS.—(Left) One of the 14 flame-damping exhausts of the BMW 801A with hot-air muff for de-icing and cabin heating. (Right) The arrangement of the oil cooler in the leading edge of the cowl.



INSTALLED.—A BMW 801 installed in a Focke-Wulf Fw 190 fighter. The fan can be seen clearly behind the airscrew blades.



FAN ARRANGEMENT.—The twelve-blade fan for providing efficient cooling at slow air speeds for the BMW 801 motor.

d = Distance of section from centre.
∝ = Angle of blade.

FAN BLADE SECTION. The angles are for the BMW 801 fitted in the Dornier 217E1.

AEROPLANES OF THE JAPANESE ARMY AND NAVY AIR FORCES—VIII

THE NAKAJIMA NAVY KT-90-2

(One 450 h.p. Nakajima Jupiter motor)

TYPE.—Reconnaissance float-plane.

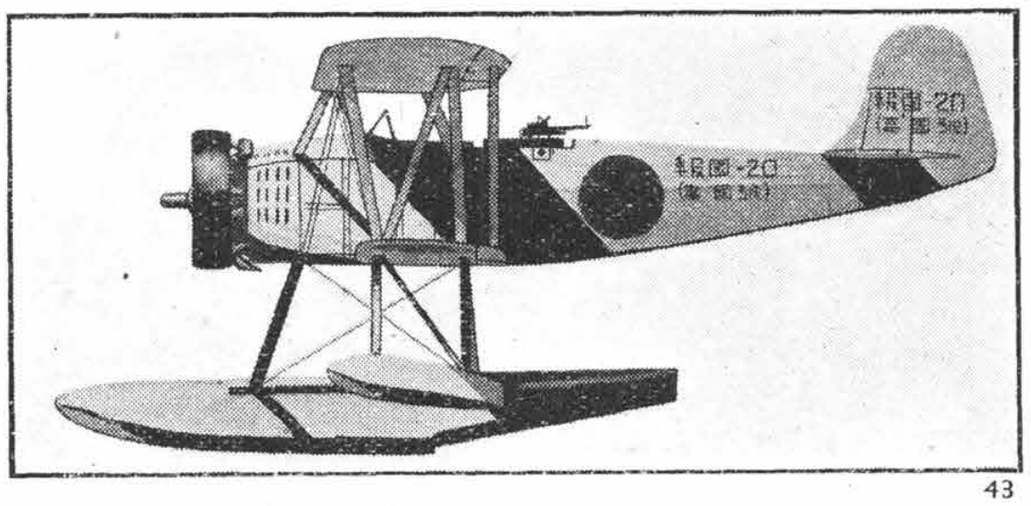
CREW.—Two.

ARMAMENT.—Believed one forward firing fixed machine-gun and one movable rear machine-gun.

DIMENSIONS.—Span, 39 ft. 4 ins.; length, 29 ft. 6 ins.

WEIGHT.—Loaded, 5,500 lb.

PERFORMANCE.—Max. speed, 168 m.p.h. Made by Nakajima Hikoki Kabushiki Kaisha (Nakajima Aircraft Co., Ltd.) at Ohta, Gumma-ken.



43

THE NAKAJIMA ARMY S-91

(One 450 h.p. Nakajima Jupiter motor)

TYPE.—Fighter.

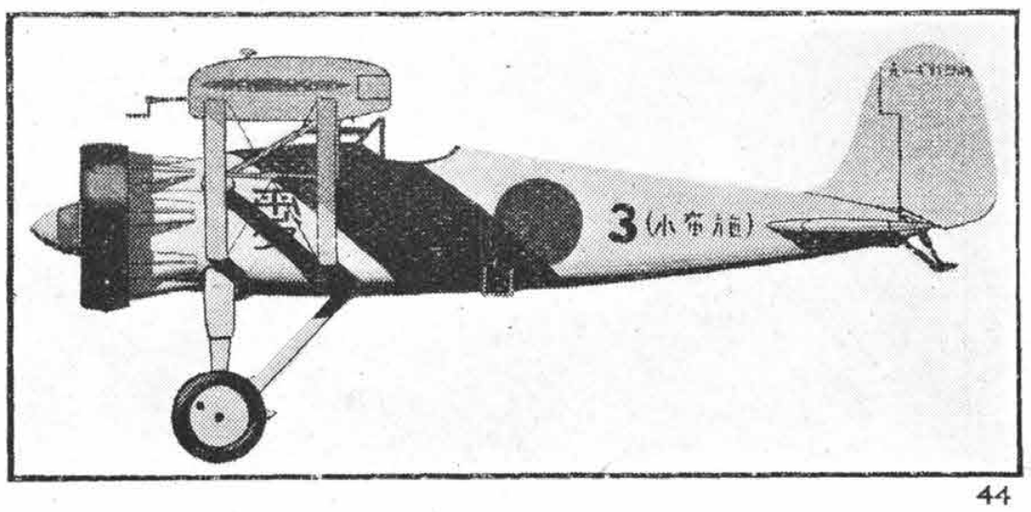
CREW.—One.

ARMAMENT.—Two fixed forward firing machine-guns.

DIMENSIONS.—Span, 36 ft. 0 in.; length, 23 ft. 11 ins.; height, 10 ft. 2 ins.; wing area, 215.2 sq. ft.

WEIGHT.—Loaded, 3,300 lb.

PERFORMANCE.—Max. speed, 192 m.p.h. at 9,840 ft.; range, 372 miles; service ceiling, 28,000 ft. Made by Nakajima Hikoki Kabushiki Kaisha (Nakajima Aircraft Co., Ltd.) at Ohta, Gumma-ken.



44

THE NAKAJIMA ARMY T-94

(One 550 h.p. Nakajima Kotobuki III motor)

TYPE.—Light reconnaissance bomber.

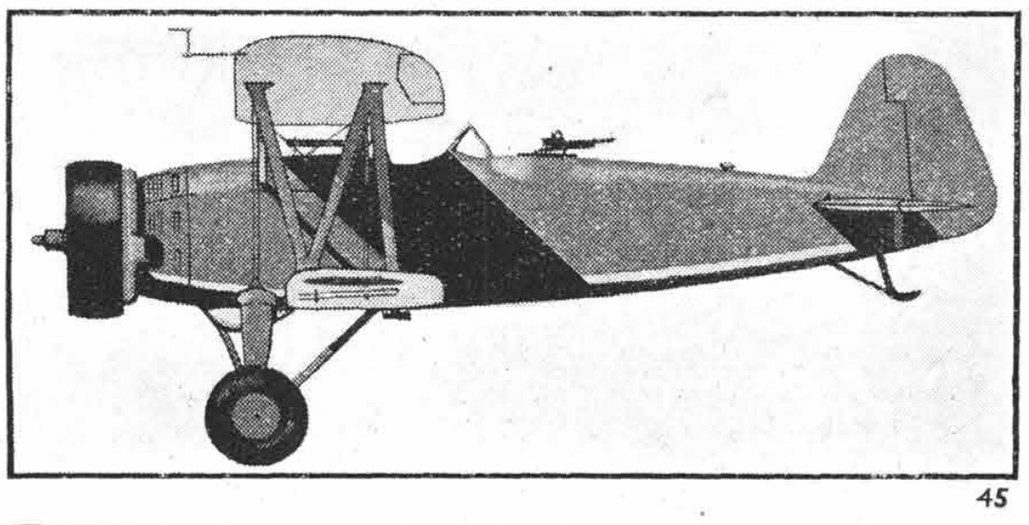
CREW.—Two.

ARMAMENT.—One fixed forward firing machine-gun and one movable rear machine-gun.

DIMENSIONS.—Span, 36 ft. 7 ins.; length, 24 ft. 5 ins.; height, 9 ft. 2 ins.; wing area, 322.5 sq. ft.

WEIGHT.—Loaded, 5,720 lb.

PERFORMANCE.—Max. speed, 186 m.p.h. at 13,000 ft.; range, 470 miles at 150 m.p.h.; service ceiling, 23,000 ft. Made by Nakajima Hikoki Kabushiki Kaisha (Nakajima Aircraft Co., Ltd.) at Ohta, Gumma-ken.



45

THE NAKAJIMA NAVY KT-95

(One 600 h.p. Nakajima Kotobuki motor)

TYPE.—Reconnaissance float-plane.

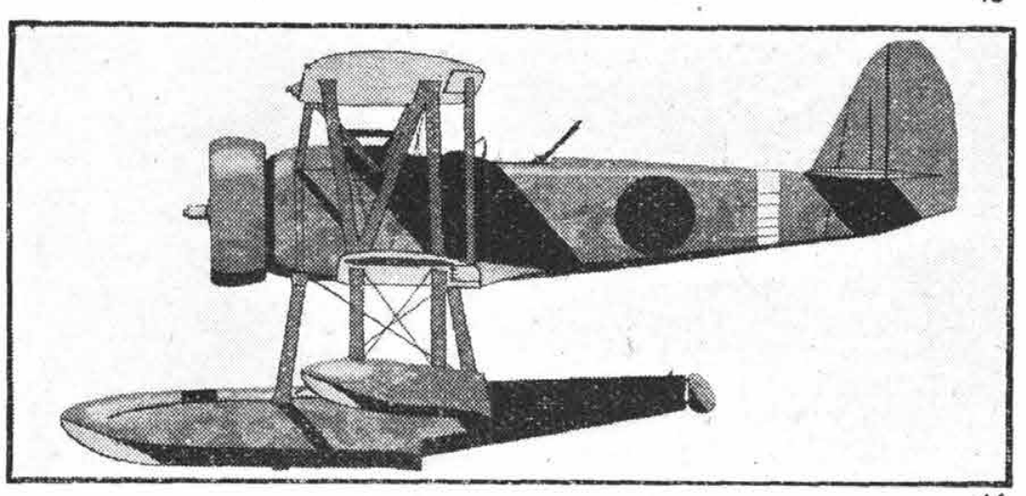
CREW.—Two.

ARMAMENT.—One fixed forward firing machine-gun and one movable rear machine-gun.

DIMENSIONS.—Span, 36 ft. 1 in.; length, 27 ft. 11 ins.; height, 13 ft. 1 in.; wing area, 330 sq. ft.

WEIGHT.—Loaded, 5,800 lb.

PERFORMANCE.—Max. speed, 160 m.p.h. at 11,000 ft.; range, 500 miles at 135 m.p.h.; service ceiling, 18,000 ft. Made by Nakajima Hikoki Kabushiki Kaisha (Nakajima Aircraft Co., Ltd.) at Ohta, Gumma-ken.



46

THE NAKAJIMA NAVY G-96

(One 600 h.p. Nakajima Kotobuki motor)

TYPE.—Torpedo-bomber.

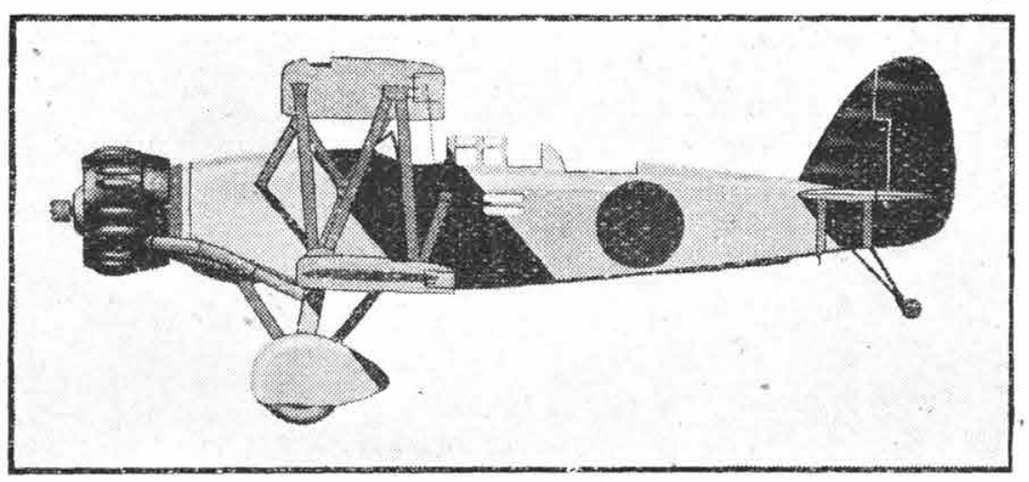
CREW.—Three.

ARMAMENT.—One movable rear machine-gun.

DIMENSIONS.—Span, 49 ft. 0 in.; length, 33 ft. 0 in.; height, 14 ft. 9 ins.; wing area, 540 sq. ft.

WEIGHT.—Loaded, 7,300 lb.

PERFORMANCE.—Max. speed, 168 m.p.h. at 8,000 ft.; range, 900 miles at 145 m.p.h.; service ceiling, 20,000 ft. Made by Nakajima Hikoki Kabushiki Kaisha (Nakajima Aircraft Co., Ltd.) at Ohta, Gumma-ken.



47

THE NAKAJIMA ARMY S-97

(One 800 h.p. Hikari motor)

TYPE.—Fighter.

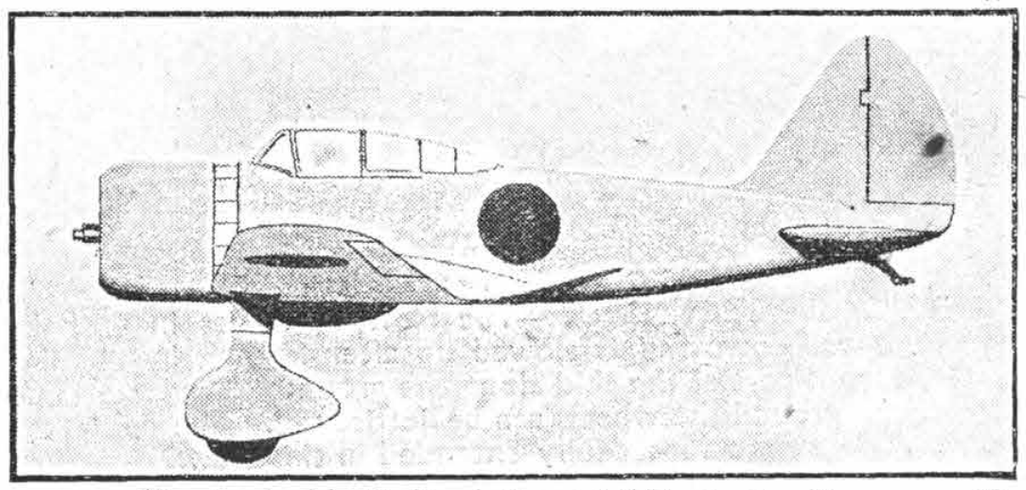
CREW.—One.

ARMAMENT.—Two fixed forward firing machine-guns.

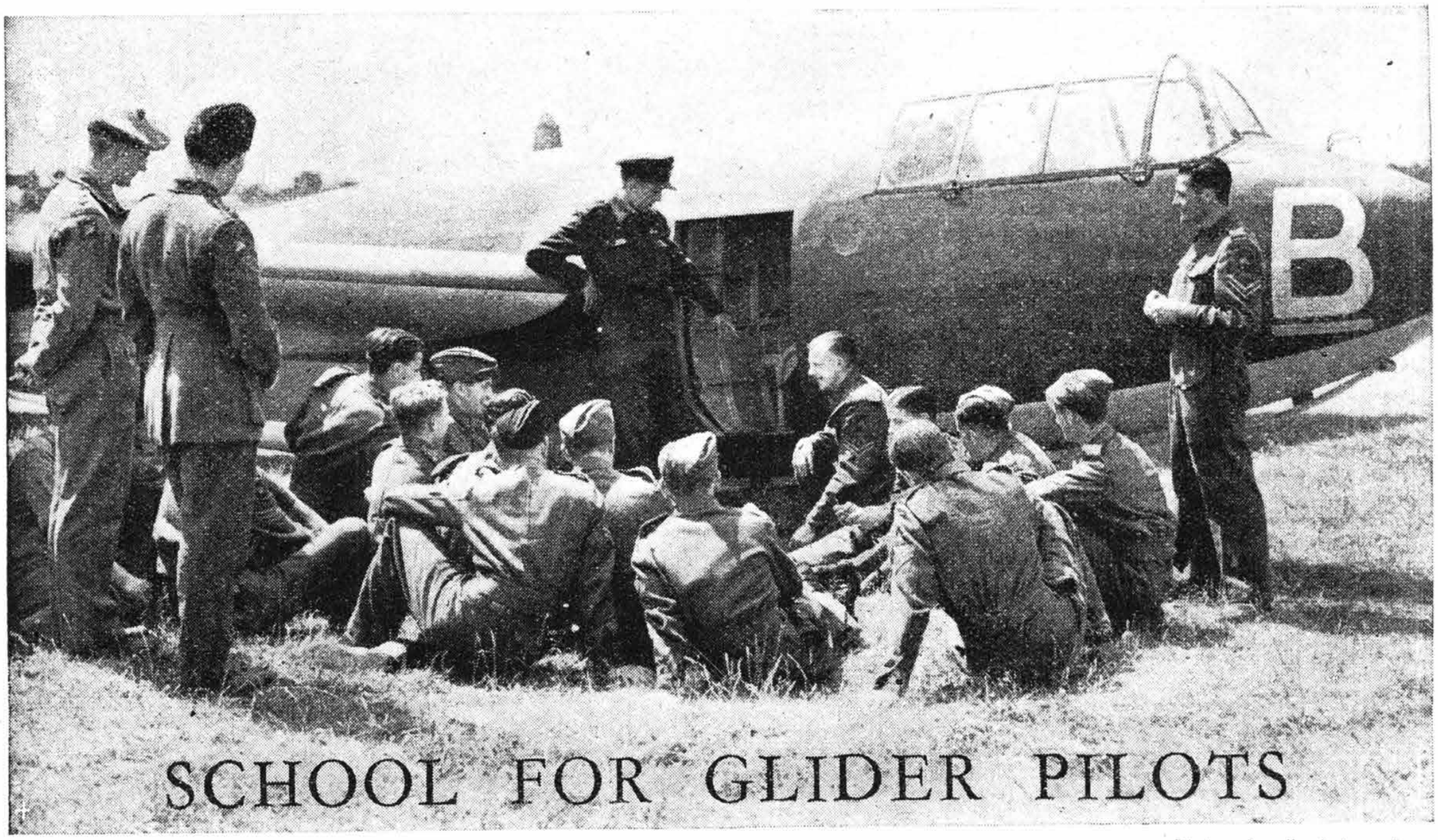
DIMENSIONS.—Span, 36 ft. 0 in.; length, 24 ft. 0 in.; height, 8 ft. 0 in.; wing area, 140 sq. ft.

WEIGHT.—Loaded, 4,400 lb.

PERFORMANCE.—Max. speed, 270 m.p.h. at 15,000 ft.; range, 340 miles at 234 m.p.h.; service ceiling, 33,000 ft. Made by Nakajima Hikoki Kabushiki Kaisha (Nakajima Aircraft Co., Ltd.) at Ohta, Gumma-ken. This aeroplane is also built by Kawasaki as the S-97 with an 850 h.p. Kawasaki motor and a similar monoplane is the Mitsubishi S-97 with a 650 h.p. Mitsubishi motor. All these types appear to be identical apart from the motors.



(Drawings by John H. Stroud. Copyright "The Aeroplane"). 48



SCHOOL FOR GLIDER PILOTS

["Aeroplane" photograph

IF ENGLAND was slow to detect the military value of the glider it was because her ways were the ways of peace and her preparations for war half-hearted. To her, gliding was the first step towards sailplaning and sailplaning was pure sport. She could not picture aerial legions being borne into battle on the wings of the wind, and would have dismissed as fantastic any notion that the glider might one day give her Army a mobility it had never before possessed.

Another nation taught her how gliders could be invested with military qualities of great merit. That nation showed her how armed soldiers and their supplies might be conveyed across narrow seas—and pointed the way to the solution of her own problem. How and when she proposes to solve her problem is largely secret, but signs are not lacking that when the time comes the teacher will find that he taught an adept pupil.

Gliders are pouring from British factories in many shapes and sizes. The skies are dotted with hard-working tugs towing their silent companions behind them. Flying schools are training glider pilots by the score, and when the glider armada has been assembled another British Expeditionary Force will sally forth this time like a cloud that will darken the sun.

Much of the success of any airborne invasion must depend upon the skill of the men who pilot the gliders, and the training of the British pilots goes far beyond the mere art of flying. Men chosen for training are all from the Army. They are mostly N.C.O.s with the rank of Corporal; some are Sergeants and above, and some are officers. They are all volunteers and have to pass a reasonably stiff medical and educational examination. The first stage of their training is given by the Army at a school which corresponds to the R.A.F.'s Initial Training Wing. The syllabus is based on the R.A.F. syllabus, but the time allowed for its completion is slightly shorter.

With the Army I.T.W. examinations successfully passed, the pupil learns to fly an elementary training aeroplane at an R.A.F. Flying Training School. The course is almost identical with that followed by R.A.F. pupils, but greater emphasis is laid upon precision in landings. The reason for this is clear. The pupil will shortly be flying a type of aeroplane on which he will have no option of opening the throttle and going round again if he misjudges his approach. The training at the E.F.T.S. also includes some aerobatics and a few hours of night flying.

Next, the pupil goes to a Glider School, where he is "converted" to gliders. Here, no time is spent in winch or hillside launching. The pupil is put straight into the trainer and taken into the air behind a tug. His first flight is made as a passenger in the rear seat, but for the rest of the course he takes the front seat, and the instructor sits behind. After his conversion, he goes to a Glider Operational Training Unit, where he is given advanced training and then, fully qualified, he joins an Airborne Division.

Until now, few details had been made public about the training of glider pilots for work with the Airborne Divisions, but a recent visit arranged by the Air Ministry to one of its Glider Schools lifted, if only a little, a corner of the veil of secrecy.

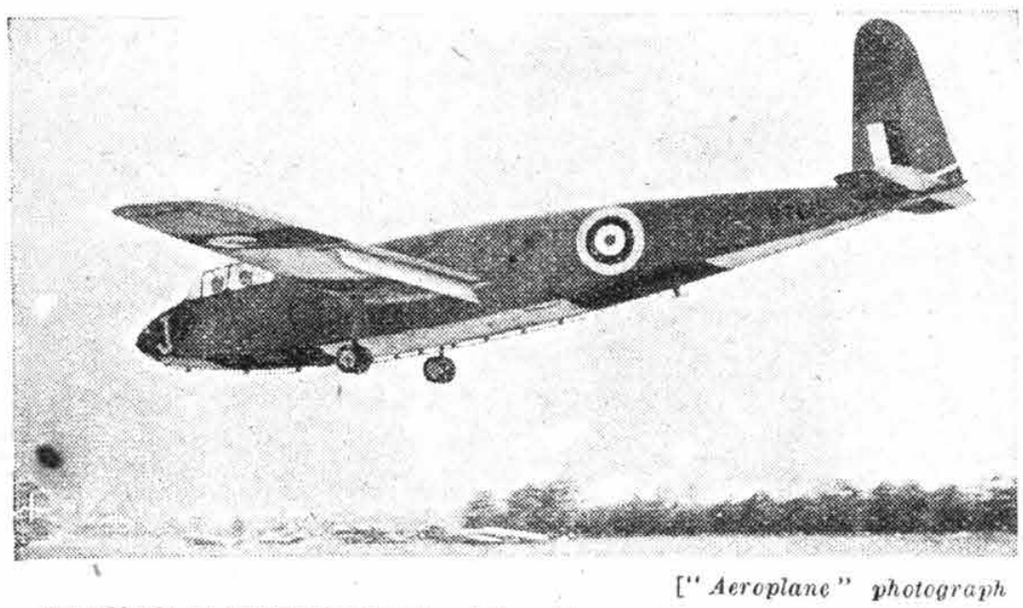
The glider used for training at this school is the Hotspur, which was designed by General Aircraft Limited. To convert it into a trainer the pilot's cockpit hood was altered, but basically the training and the operational Hotspur are the same. The tugs are old biplanes—chiefly Hectors—but they are shortly to be returned to retirement.

A stout two-inch hemp, or two-and-a-half-inch Manila rope is used for towing. A rather elaborate attachment has been devised for both glider and tug, but it gives no trouble and never fails to perform its proper function when the release wire is pulled. Each rope is tested after every flight and is replaced after 30 tows.

The Glider Technique

For the pupil, the trickiest moment is at take-off. The glider almost invariably becomes airborne before the tug and for a short period is flying in the tug's slipstream. A too sudden climb would tend to hold the tug on the ground and the glider pilot settles down to level flight at about five feet from the ground and thus rides above the turbulent air. As the tug comes off and climbs, so the glider pilot climbs too, always trying to keep five feet above the level of the tug until he casts off.

In the early part of the training the cast-off is made at a precise height and at an exact point in relation to the aerodrome. The pupil thereby learns the correct radius and angle



["Aeroplane" photograph

TRICYCLE TECHNIQUE.—The Hotspur comes in with its nose well down and is slowed up after landing by rubbing the front part of the skid along the ground. For landing on rough ground the wheels can be jettisoned. The split flaps are almost fully extended in this view.

of glide, and acquires skill in the use of his flaps. Later, his cast-off point and height are varied. Later still, he learns to make complete circuits and landings "on tow." The glide is fairly fast; with no passengers or ballast the speed is about 60 m.p.h. The landing is similar to the tricycle technique. The glide is checked, but to reduce forward speed after landing, as the wheels have no brakes, the nose is held down so that the skid rubs along the ground. This gives the curious illusion that the Hotspur is liable at any moment to bury itself and vanish from sight.

The pupil also learns another method of approach. In this, he dives steeply while still some distance from his landing place, and flies at grass-top level on the momentum gained in the dive. He disappears from the view of watchers on the aerodrome, reappears as he clears trees, hedges or houses, vanishes again and then comes leaping over the boundary hedge like a steeplechaser. This method has obvious tactical advantages.

When his training is nearing its end the pupil is taught to fly in formation both behind a tug and after casting off. This, perhaps, is the most difficult and the most interesting part of the course. Hitherto the pupil had only to watch his tug; now he must watch his neighbours too, and the sight of stout rope cables dancing all around him and, seemingly, eager to slice off his wing, makes him doubly vigilant. Fortunately, he is not distracted by the tumultuous racket of motor and airscrew; outside his enclosed cockpit a hurricane rages, but he is able to talk in normal tones. Nor is he bothered with helmet or headphones.

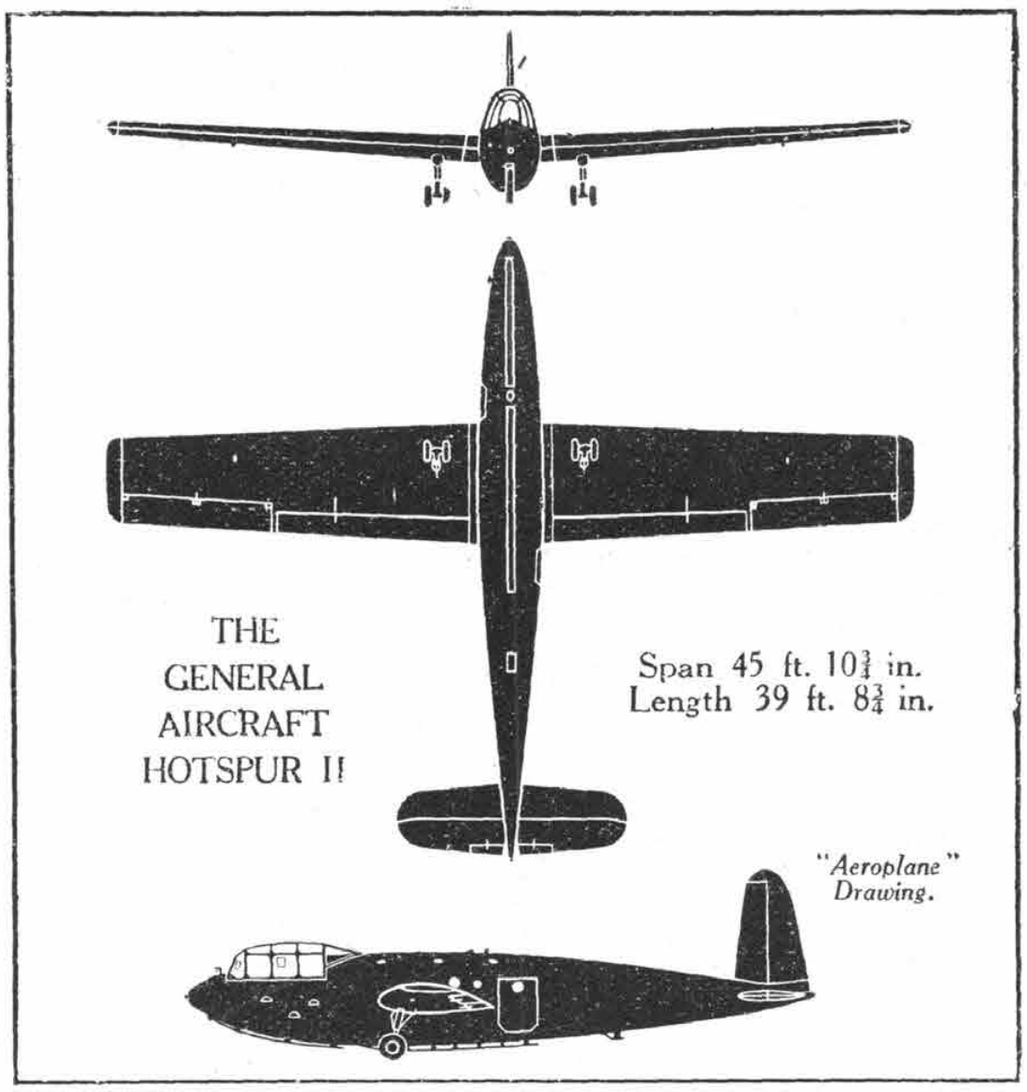
At no point in the training at this School does he carry a full load of passengers. Instead, his glider is filled with ballast when his training is well advanced.

If the impressions gained during a one-day visit are reliable, this School seems to be run with a high degree of efficiency. Tugs and gliders take off at regular intervals, each making about four flights an hour. The cast-off is made, by the glider, at about 1,500 feet. The tug then dives away and flies back to the aerodrome where the pilot drops the tow rope. He then makes another circuit and lands. Meanwhile, the glider has been gradually losing height as it approaches the aerodrome and both tug and glider return almost at the same moment. When the wind is right, tugs land on one side of the aerodrome and gliders on the other.

The tow ropes are retrieved by a ground party, tested, rewound on a drum, and brought back to the take-off point. They are then unrolled and laid out ready for use again.

Much of the School's efficiency arises from the fact that its Commanding Officer, its Chief Instructor and its Flight Commanders are all old glider pilots. The Commanding Officer is a former member of the London Gliding Club and one of his Flight Commanders (also a Dunstable man) once shared the World's duration record for gliders. Their enthusiasm has been caught by all the other instructors and nowhere is the team spirit more marked than here. Half the instructors are N.C.O. pilots and the rest officer pilots. All belong to the R.A.F. They take turns in coaching the pupils and in flying the tugs. They have all had much operational experience, either with the Royal Air Force or with the Fleet Air Arm, and few of them have less than 2,000 hours of flying.

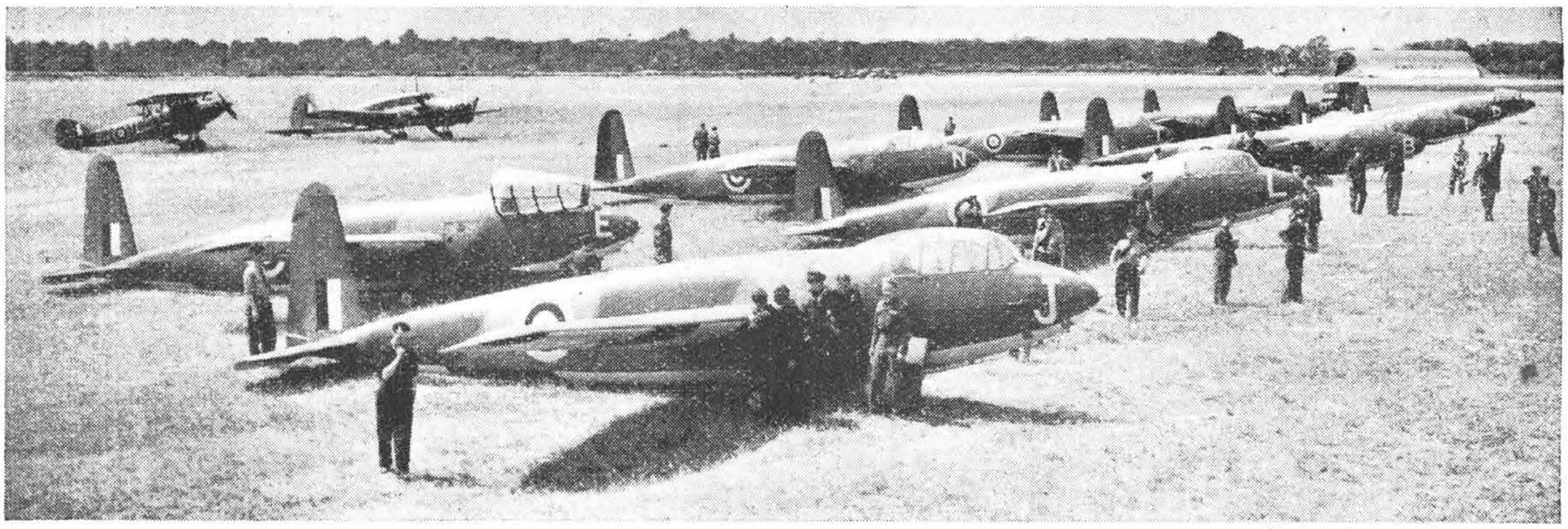
As for the pupils, their keenness defies description. Nearly all of them had wanted to join the Royal Air Force when the War was very young, but in those days vacancies were few and they had to join the Army. The coming of the Airborne Divisions gave them the opportunity to fly which they thought had passed them by, and their selection for training as glider pilots gave them no less pleasure that they would have derived had the Royal Air Force taken them as pilots. These men know that theirs is a responsible job. They will have to deliver so many men or so much material at a specified point—probably in enemy-held territory—and they must have the skill and knowledge to fulfil their tasks. In the air they are pilots: on the ground they become soldiers again, skilled in the use of arms and qualified in every way to engage in hazardous adventures.



The gliders they fly are built for a short life. Some will make return journeys, but the majority will be left where they land. To eyes long grown accustomed to refinement in aircraft construction, the absence of it in the Hotspur was almost offensive. Yet, to have built elegantly for so brief an existence would have been mere extravagance. All the fittings are of the most elementary design, and the cockpit dashboard boasts nothing more than the essential instruments—an air speed indicator, an altimeter, a turn and bank indicator, and a rate of climb indicator.

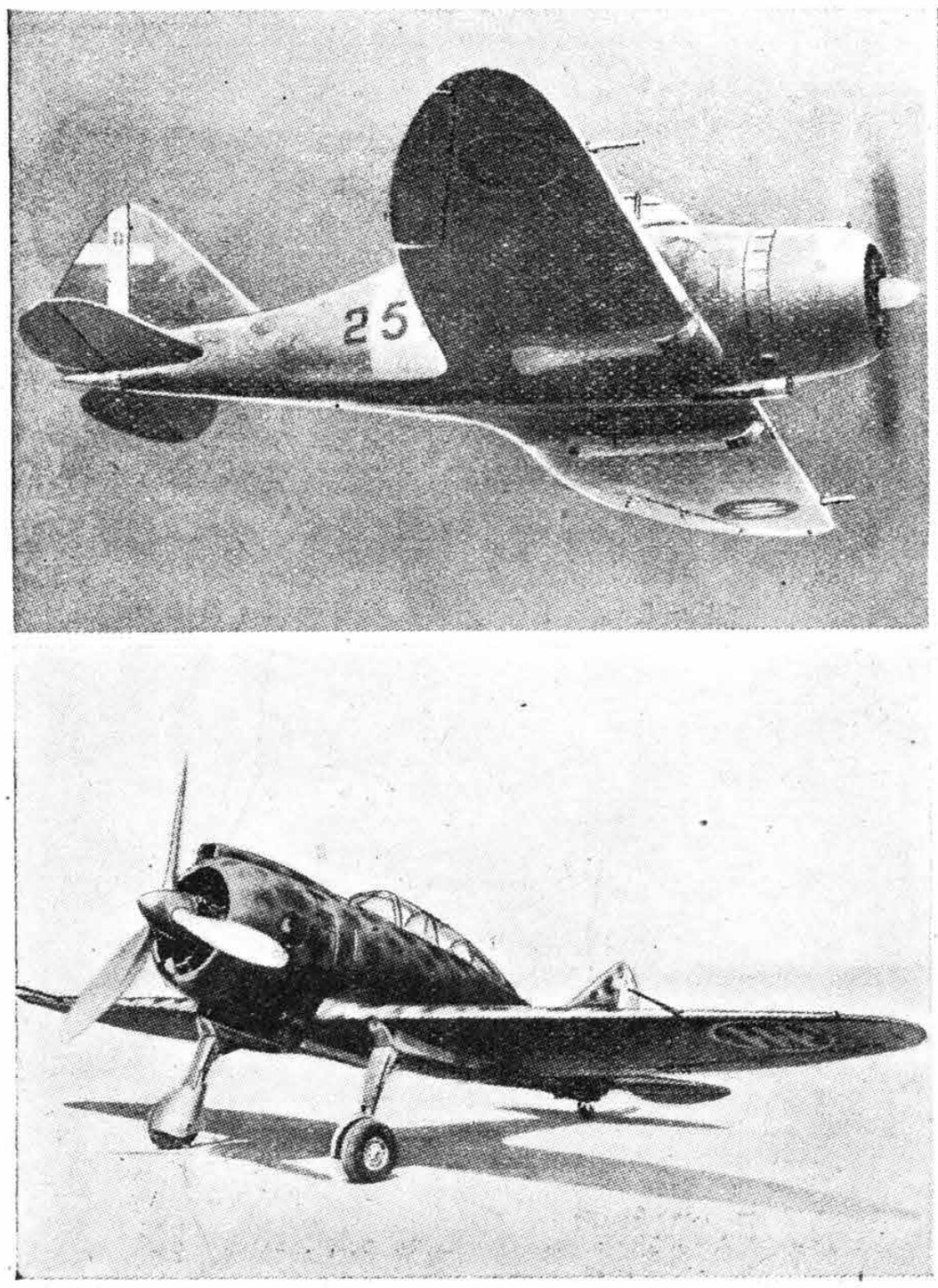
Like all other new types, the Hotspur has had its teething troubles, but in overcoming them the makers have had the advantage of working with men who have long been familiar with gliders. Several changes have been made since the machine first went into service. Among them is a new skid and an alteration in the position of the tow rope attachment. This was formerly under the belly of the machine, near the centre of gravity; now it is in the nose.

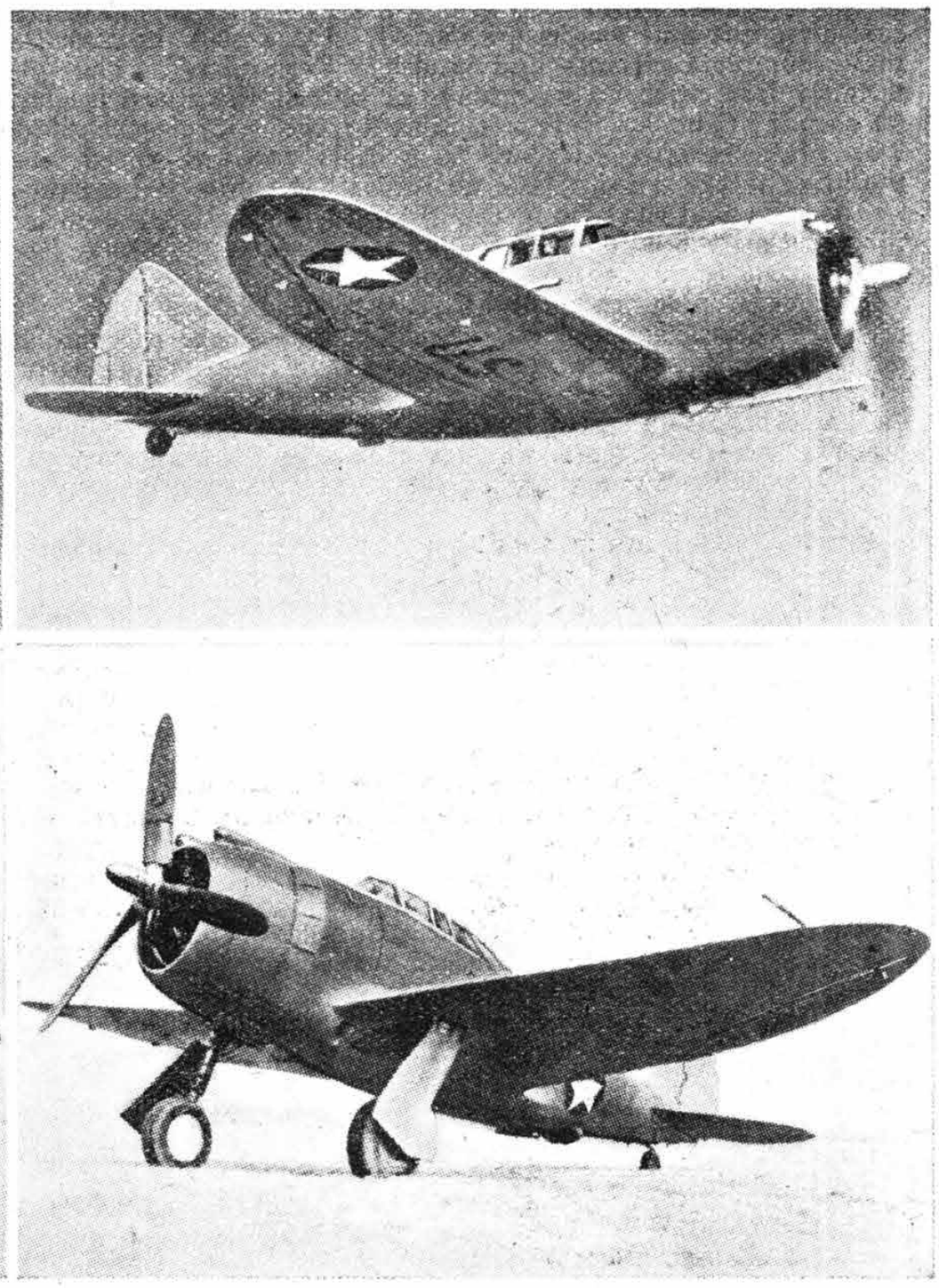
These modifications have not been allowed to interfere with training, and the army of Army glider pilots has been steadily growing. No facts about their numbers may be given here, but they are numerous enough to launch a formidable invasion fleet. If the United Nations' undertaking to open a second front in Europe in 1942 is to be discharged, the Army may soon have the chance to prove the full vigour of its newly acquired wings.—S.V.



["Aeroplane" photograph

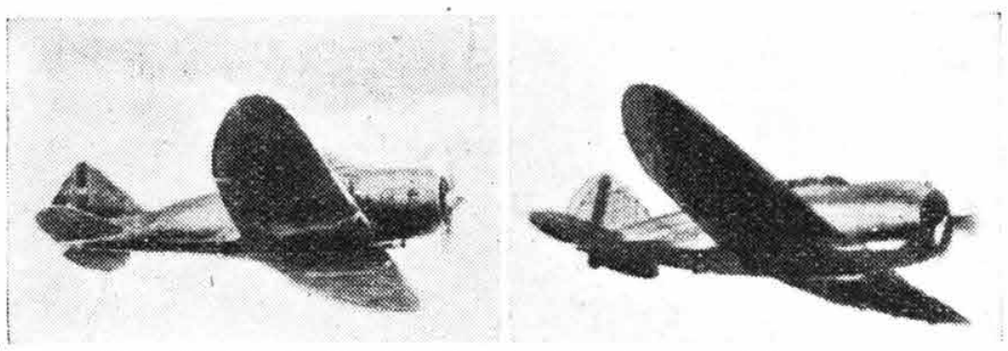
A SILENT ASSEMBLY.—Two rows of Hotspur gliders, with tow ropes attached, ready for an afternoon session at an R.A.F. Glider School where Army personnel, already trained as aeroplane pilots, are "converted" to glider flying. The instructors come from many lands, and include some well-known British glider pilots.





DETAILED ANALYSIS.—The points by which the subjects of the previous recognition problems can be identified are illustrated in the photographs and drawings of the Caproni Reggiane RE.2000—the Falcho I—(left) and the Republic P-43—The Lancer—(right).

Aircraft Recognition



227 PREVIOUS PROBLEMS.—(Left) a Caproni Reggiane RE.2000 and (right) a Republic P-43. 228

THE CAPRONI REGGIANE RE.2000, Falcho I (one 1,000 h.p. Piaggio P.M.R. C.40 radial motor), and the Republic P-43, the Lancer (one 1,100 Pratt and Whitney Twin Wasp R-1830-S3C3-G radial motor) were the subjects of the previous recognition tests.

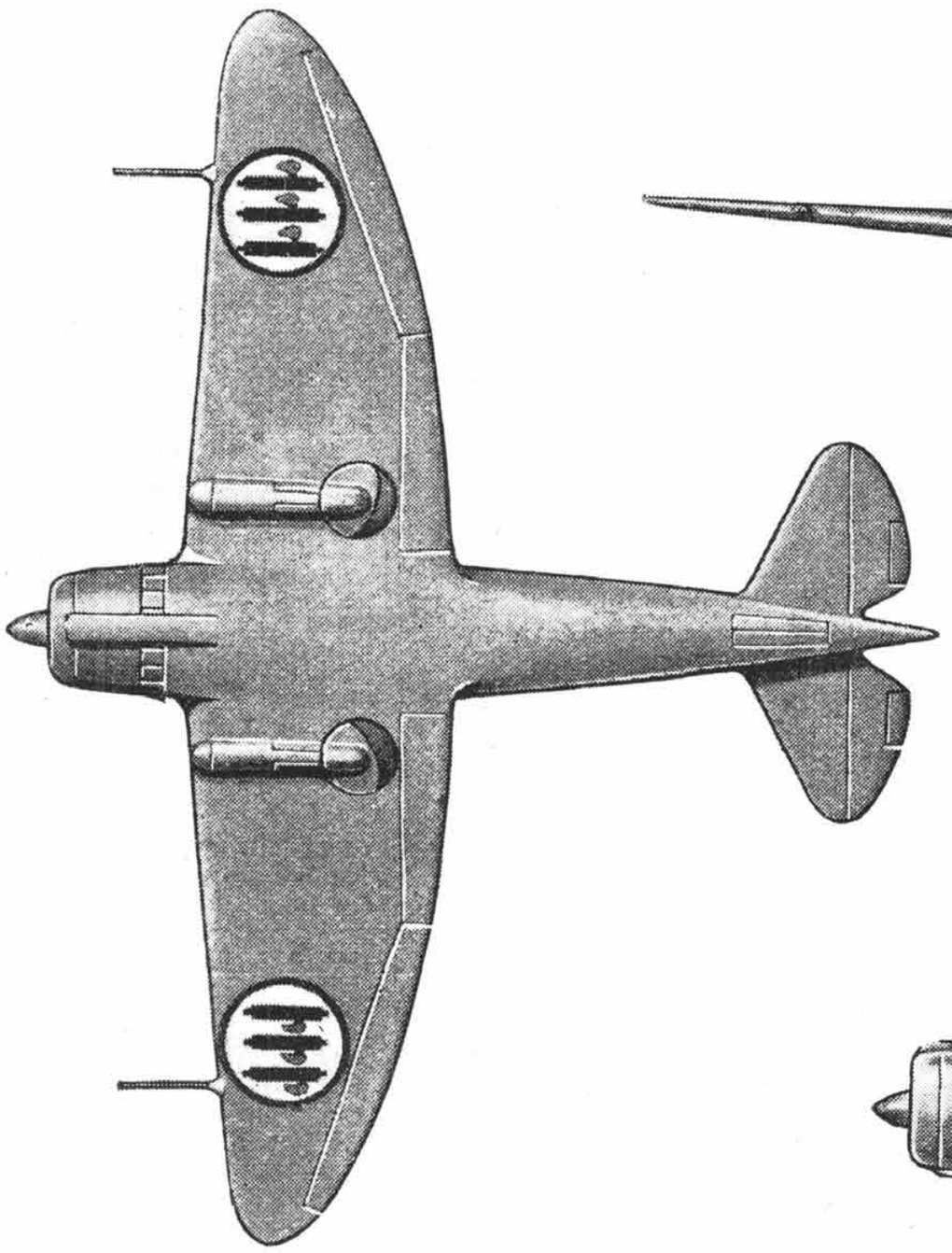
Both the Italian and the American types were developed from the same prototype, the Republic P-35. The distinct similarity between the two is noticeable, though spotting confusion is unlikely as both are in service only in small numbers and in different theatres of war.

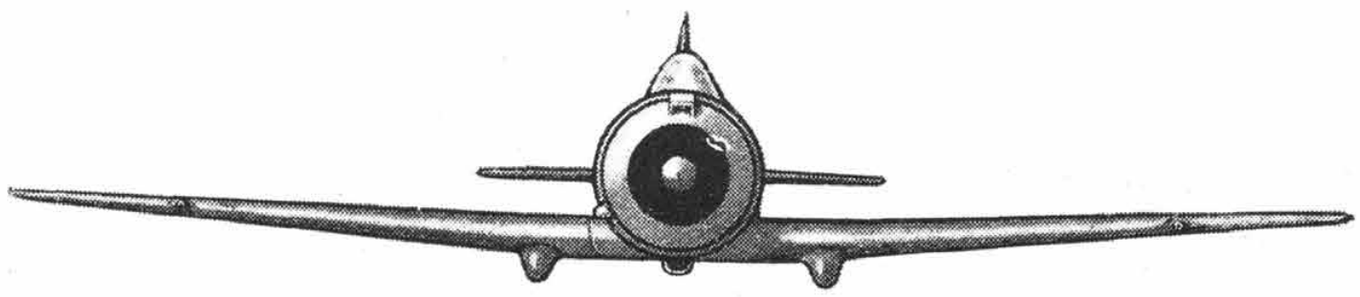
Recognition features which apply to both aeroplanes are the semi-elliptical low wings with the trailing edges swept forward to pointed tips; the short tapering fuselage and stub nose with a large radial motor, the triangular-shaped tailplane and the fin and rudder.

At closer scrutiny differences between the two can be perceived. The undercarriage of the RE.2000 folds back into the wings, the legs not fully retracted, whereas that of the P-43 folds inwards fully submerged. The armament of the RE.2000 is two machine-guns only, mounted prominently in the wings. The armament of the P-43 is eight machine-guns. In the P-43 the large boss of the Curtiss electric airscrew, the turbo-supercharger midway up the fuselage and the non-retracting tailwheel are distinctive, and the dihedral is noticeably greater.

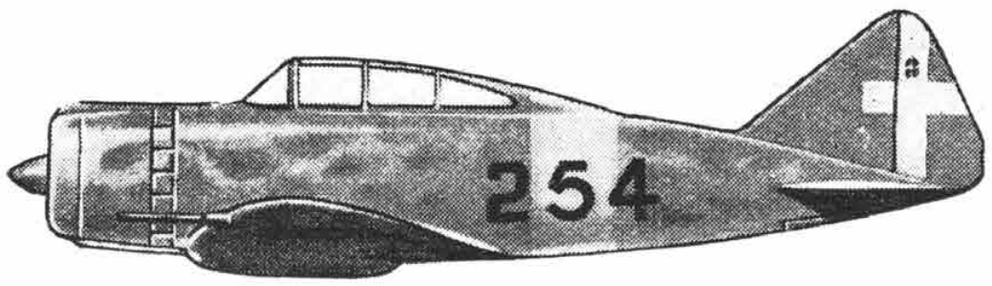
FOR IDENTIFICATION CXV.—Two more photographs to give practice in the recognition of Allied and enemy aeroplanes. What they are and notes on their characteristics will be published with two more photographs on July 17. When the page is viewed at a distance of 1 ft. both aeroplanes are represented as flying at a height of about 600 ft. at a distance of 800 yds.

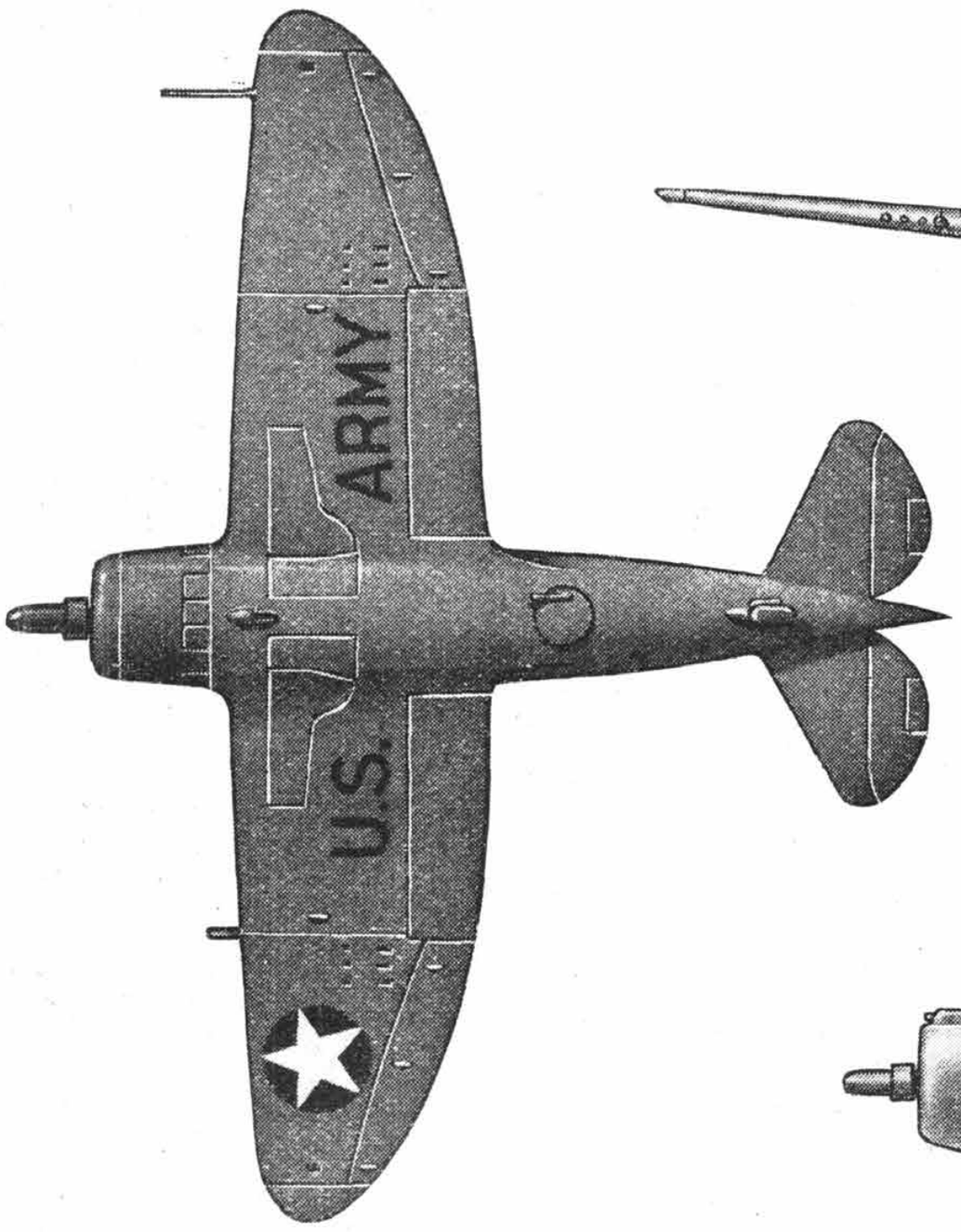
AIRCRAFT RECOGNITION

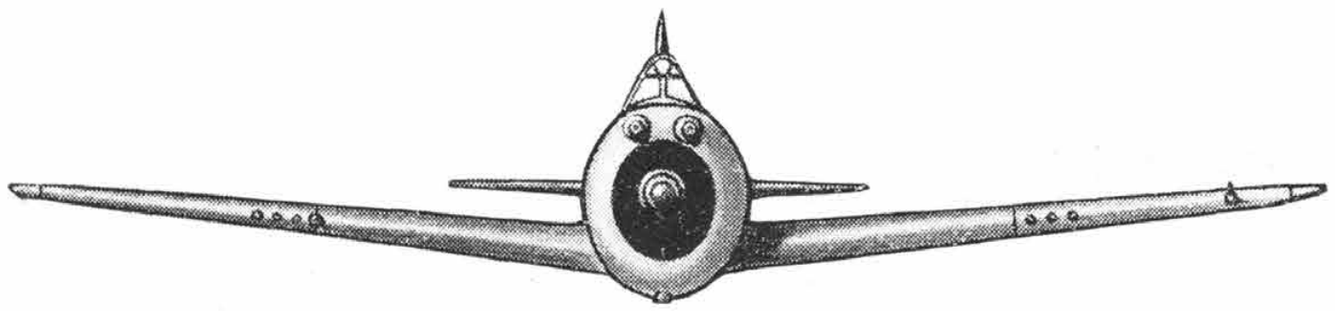




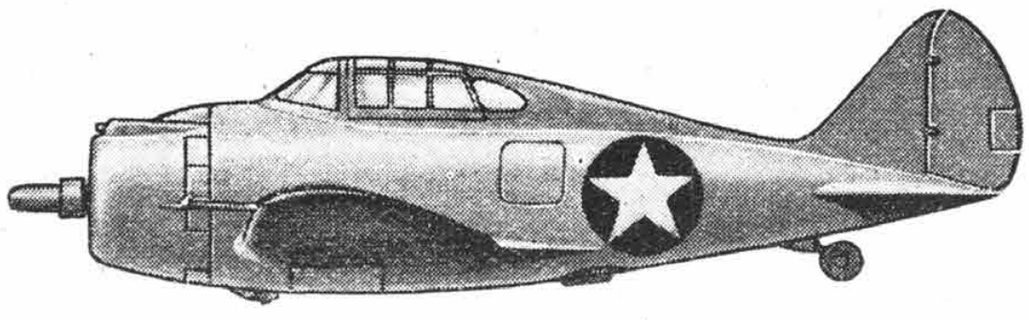
THE CAPRONI REGGIANE RE.2000 THE FALCHO I



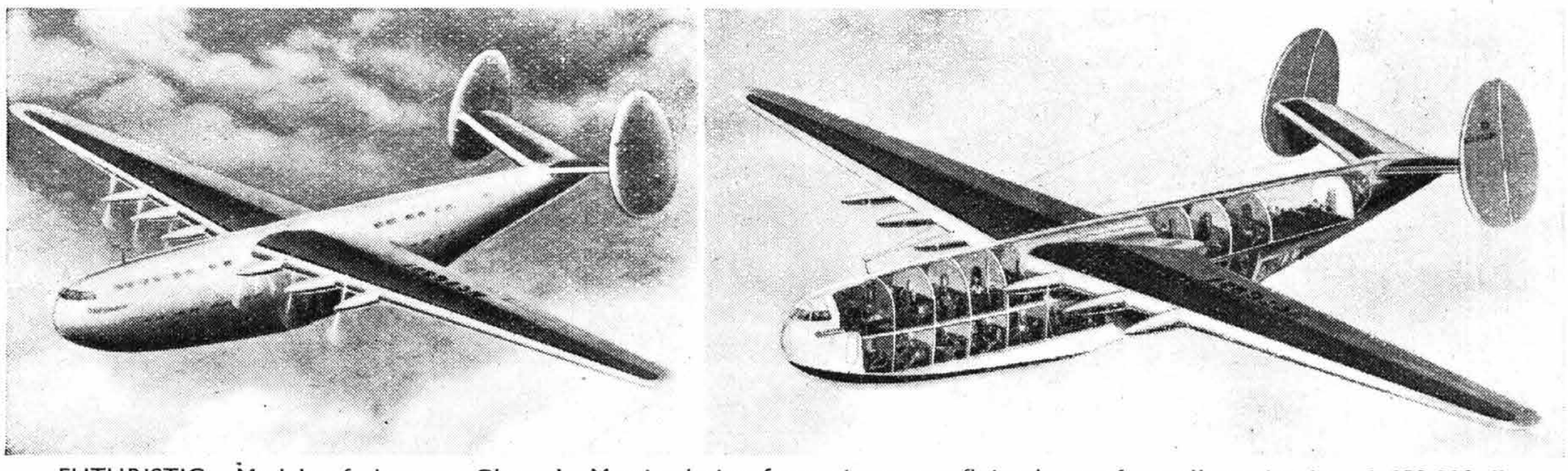




THE REPUBLIC P-43 THE LANCER



AIR TRANSPORT



FUTURISTIC.—Models of the new Glenn L. Martin design for a six-motor flying-boat of an all-up weight of 250,000 lb. It is planned to have accommodation for 102 passengers with a baggage allowance of 80 lb. each and, with 25,000 lb. of mail and freight as well, to fly from New York to London in 13 hrs. The Glenn L. Martin Mars, the largest flying-boat in the World, would have an all-up weight of 140,000 lb.

Hard-working Flying-Boats

TWELVE Short S-23 Empire flying-boats of British Overseas Airways based at Durban for the Horseshoe section of the Empire routes are now flying at the rate of 20,800 hours a year. This works out at a total distance of nearly 3,000,000 miles, or an average of about 250,000 miles for each flying-boat. Engine hours for the twelve boats on operations alone are 83,200 hours a year.

Three of the flying-boats, the Castor, Canopus and Cameronian, have each completed 1,000,000 miles of flying since they first went into service. The Canopus, the first of the S-23s to be delivered to Imperial Airways, has been in service since October, 1936; the Castor, the fifth of the fleet, went into service in December that year; and the Cameronian began operations in October, 1937.

The Horseshoe section of the Overseas routes began as a weekly service between Sydney and Durban in June, 1940, and was the first of the reorganised Empire services after Italy's entry into the War. Later its frequency was increased to twice-weekly. Because of the loss of the Netherlands East Indies the Horseshoe section has now been reduced to a route from Durban to India.

Good German Business

UNDER GERMAN CONTROL Danish Air Lines (D.D.L.) has paid a dividend for the first time, according to the annual report for the year ended May 31. The dividend amounted to five per cent. The State subsidies, amounting to 506,000 kroner, were transferred to the equipment account, together with the insurance money received for the Focke-Wulf Condor which was confiscated in Great Britain.

The total distance flown during the year was 717,000 km., compared with 1,165,000 km. in 1939 and 552,000 km. in 1940. The total number of passengers carried was 32,942, compared with 28,415 in 1939 and 20,219 in 1940.

Danish Air Lines operates for Germany seven aeroplanes and employs nine pilots, four mechanics, four wireless operators, and two hostesses, of whom one completed one million kilometres flying on June 11.

An American Post-War Prediction

A FORECAST that after the War the 19 air line companies in the United States would be consolidated into six or seven companies was made recently by Mr. W. A. Patterson, President of United Air Lines. He suggested that the smaller companies would have difficulty in keeping pace with technical and other developments in air transport.

Mr. Patterson also forecast that from six to nine American and European air line companies would start operating services across the Atlantic shortly after the War ended.

Airgraphs to India

THE FIRST Airgraph letters from Great Britain to India arrived at Karachi on June 11, 13 and 14 in batches of 12,400, 23,000 and 38,500 letters respectively. The inward Airgraph service from India to Great Britain has been operating for some weeks and is averaging about 49,000 letters a week.

A Government Monoply

NO COMPETITION is to be allowed from private air lines in Canada against the Government-controlled Trans-Canada Air Lines. Mr. C. D. Howe, Minister of Munitions and formerly Minister of Transport, made this fact clear in relation to the Alaska routes in the Canadian House of Commons last month.

Trans-Canada Air Lines declared its intention early this year of operating to the Yukon and Alaska as soon as the airports between Edmonton and Whitehorse had been completed by the Canadian Government. Mr. Howe has now stated that these airports would be used for the new route and there would be no duplication. Warning had already been given to the company now operating, that Trans-Canada Air Lines would eventually operate in that territory. He added: "There will be no question of competing lines, if Trans-Canada goes in the other line must go out."

The only Government payment for the route is for mail and the contracts are on a monthly basis.

The other air line operating to the Yukon and holding the mail contract is Yukon Southern Air Transport, one of the most important companies acquired by the Canadian Pacific Railway Company. This is the Company which pioneered the Yukon and Alaska routes from Canada.

Mr. Grant McConachie, General Manager of Yukon Southern Air Transport, and now General Manager, Western Lines, of the C.P.R. Air Lines Ltd., began operating charter services in the bushland of Northern Alberta and in 1933 formed United Air Transport. From the beginning his heart was set on operating through Northern British Columbia and the Yukon and in the Summer of 1937 he established a weekly passenger and mail service between Edmonton and the Yukon. He pioneered this route and established his own radio stations and landing fields. Later he joined with other companies to form Yukon Southern Air Transport.

In 1935 the Civil Aviation branch of the Canadian Transport Department investigated the route and in 1938 it was inspected by the Controller of Civil Aviation, but not until the following year were ground survey parties sent along it, after the route had been recommended to the joint Canadian-U.S.A. Defence Board as a highway to Alaska.

Mr. McConachie has had plans for several years for extending across Alaska to Russia and establishing a new route to the Orient. The C.P.R. obviously has wide plans for its air lines, of which this Northern route must be an important part.

Air transport in Canada is likely to become a battleground for the two railway companies, the C.P.R. and the C.N.R., which, in association with the Government, controls Trans-Canada Air Lines. For the first time since C.P.R. Air Lines Ltd., was formed the Government has shown publicly the attitude it intends to adopt.—"If Trans-Canada goes in the other line must go out."

Services in Rumania

THE FOLLOWING services are operated at present by L.A.R.E.S., the Rumanian air line company:—Bucharest—Sofia; Bucharest—Galatzi—Chisinau—Tiraspol; Bucharest—Jassy—Cernauti; and Bucharest—Sibiu—Arad.

Research on Fighting Aircraft

MR. GORDON A. REEVES, 623, Chestnut Avenue, Niagara Falls, New York, U.S.A., is anxious to obtain copies of "Jane's All The World's Aircraft" in good condition, and particularly the issues before 1920, for use in writing a history of all fighting aeroplanes produced since the beginning of flying. He promises that in return for any information which should lead to his securing copies he will give a substantial cheque to the R.A.F. Benevolent Fund. He would also be interested to hear from any one in Great Britain who has collected data on the fighting aeroplanes of any nation.

Back copies of "The Aeroplane"

AN APPEAL for back copies of THE AEROPLANE and THE AEROPLANE SPOTTER for use in aeroplane recognition is made by an A.A. Regiment through Mr. Wm. Frederick, of 251, Malmesbury Park Road, Bournemouth, Hants.

New Companies

Personal Airways (1942), Ltd.—Private co. Regd. June 13. Cap. £100 in 100 shares of £1 each. To establish, maintain and work lines of aerial communication between such countries or places as may be thought fit, to carry on business as carriers of passengers, goods and mails, railway, canal, ship, and barge owners, etc. Subscribers:—Wm. H. C. Rollo and Geoffrey B. Williams. First directors:—The Hon. Peter R. L. Beatty and the Hon. Peter Pleydell-Bouverie. Solrs.:—Withers and Co., 4, Arundel Street, W.C.2. Regd. office:—4, Arundel Street, W.C.2.

MORTGAGES AND CHARGES

Taylorcraft Aeroplanes (England), Ltd.—Assignment of contract moneys, dated June 2, 1942, to secure all moneys due or to become due from the company to Barclays Bank, Ltd.

UNITED NATIONS HEROES.—Squadron Leader J. D. Nettleton, who received the V C. for his part in the daylight attack on Augsburg, speaking to the crowd from the City Hall, New York, during the recent reception given to heroes of the United Nations. Mayor La Guardia is on the left.

New Patents

Applications Accepted

545,578.—W. S. Thimblethorpe.—Training devices for air crews.—Dec. 2, 1940.

545,611.—J. Pinder.—Balloon-supported net and like obstructions against hostile aircraft.—Dec. 28, 1940.

545,637.—B. F. Goodrich Co.—Ice elimination on wings and other surfaces of aircraft.—Jan. 19, 1940.

Opposition period expires Aug. 17, 1942.
Printed specifications available July 2, 1942.

PERSONAL NOTICES

BIRTHS

Abraham.—On June 21, at Bridlington, to Peggy (*née* Field), wife of Wng. Cmdr. T. M. Abraham—a son.

Baird.—On June 15, at Kimberley, to Gelda, wife of Sqdn. Ldr. Hon. Greville Baird, R.A.F.—a son.

Barnes.—On June 18, at Ballymena, N.I., to Delphine (*née* Poulsen), wife of Flt. Lt. J. B. Barnes, R.A.F.V.R.—a son.

Bartlett.—On June 20, at Cheltenham, to Winifred, wife of Plt. Off. P. G. Bartlett, R.A.F.V.R.—a son.

Bennett.—On June 8, at Ditchingham Hospital, to Dorothy (*née* Palmer), wife of Sqdn. Ldr. R. P. Bennett, R.A.F.—a son.

Bicknell.—On June 18, at York, to Gladys (*née* Jagger), wife of Sqdn. Ldr. Robert Bicknell—a daughter.

Bowling.—On June 24, at Kingston Hill, to Muriel (*née* Nott), wife of Sqdn. Ldr. F. G. Bowling—a son.

Cater.—On June 14, at Louth Hospital, to Elaine (*née* Ingoldby), wife of Sqdn. Ldr. R. S. Cater, R.A.F.V.R.—a son.

Crowther.—On June 23, at Hayes, Kent, to Joan, wife of Flt. Lt. E. R. Crowther, R.A.F.V.R.—a daughter.

Dunlop-Mackenzie.—On June 23, in London, to Letitia (*née* King), wife of Flt. Lt. Robert Dunlop-Mackenzie (reported missing, March, 1942)—a daughter.

Esmonde-White.—On June 13, at George, S. Africa, to Ruth (*née* Wheadon), wife of Sqdn. Ldr. D. B. Esmonde-White, R.A.F.—a son.

Faville.—On June 23, at Northwood, Middlesex, to Molly (*née* Orr), wife of Wng. Cmdr. R. Faville, R.A.F.—a son.

Flack.—On June 17, at Llanelly, to Winifred (*née* Rickson), wife of Flt. Lt. L. J. Flack, A.F.C.—a son.

Fresson.—On June 20, at Brandsby, York, to Barbara (*née* Holdich), wife of Wng. Cmdr. N. H. Fresson, R.A.F.—a daughter.

Gauvain.—On June 23, at Little Bealings, Near Woodbridge, to Barbara (*née* Roberts), wife of Sqdn. Ldr. John Gauvain, R.A.F.V.R.—a son.

Gill.—On June 16, at Ealing, to Eileen (*née* Hickman), wife of Sqdn. Ldr. J. A. Gill—a son.

Handley.—On June 22, at Bournemouth, to Beryl (*née* Ashling), wife of Sqdn. Ldr. A. J. Handley, R.A.F.—a son.

Hinnell.—On June 21, at Twickenham, to Eugenie (*née* Pearce), wife of Flt. Lt. C. J. Hinnell, R.A.F.V.R.—a daughter.

Hodgson.—On June 22, at Winchester, to Muriel (*née* Browne), wife of Lt.-Cmdr. (A.) C. R. Hodgson, R.N.V.R.—a son.

Howe.—On June 21, at Fulmer, to Joy (*née* Collins), wife of Flg. Off. B. B. W. Howe—a son.

Hughes.—On June 14, at Melksham, to Margaret (*née* Sim), wife of Plt. Off. F. R. Hughes, R.A.F.V.R.—a son.

Ion.—On June 16, at Kendal, to Christine (*née* Glass), wife of Flg. Off. D. C. Ion, R.A.F.V.R.—a son.

Levien.—On June 18, at Caversham, to Betty (*née* Squire), wife of Flt. Lt. J. B. Levien—a son.

Lewis.—On June 16, at Holmwood, to Jill (*née* Bradfield), wife of Grp. Capt. K. P. Lewis, R.A.F.—a son.

McCall.—On June 18, at Salisbury, S. Rhodesia, to Peggy (*née* Garrard), wife of Sqdn. Ldr. Ian McCall, R.A.F.—a son.

McFarlane.—On June 19, at Ringwood, to Jean (*née* Warren), wife of Flg. Off. G. J. McFarlane—a son.

Millar.—On June 20, to Patricia, wife of Wng. Cmdr. J. C. Millar, R.A.F.—a son.

Myers.—On June 21, at Northampton, to Rhona (*née* Churchill), wife of Flt. Lt. A. G. Myers—a son.

Neve.—On June 23, at Sutton, to Deborah (*née* Holmes), wife of Plt. Off. C. Neve, R.A.F.V.R.—a son.

Nicholas.—On June 11, at Retford, to Mariuccia (*née* Gomol), wife of Wng. Cmdr. B. D. Nicholas, R.A.F.—a daughter.

Oakes.—On June 21, at Chester Nursing Home, to Myra Nanita (*née* Wilson), wife of Flt. Lt. C. T. Oakes, R.A.F.V.R.—a son.

O'Kelly.—On June 20, at Lingfield, to Margot, wife of Flg. Off. J. H. O'Kelly, K.M.—a son.

Padgett.—On June 17, at Grimsby, to Enid (*née* Dixon), wife of Flt. Lt. F. E. Padgett, R.A.F.V.R.—a daughter.

Partridge.—On June 21 at Beckenham, to Patricia, wife of Sgt. R. D. Partridge, R.A.F.V.R. (reported missing)—a daughter.

Poles.—On June 17, at Herne Bay, to Mollie (*née* Saunders), wife of N. B. Poles, R.A.F.—a daughter.

Powell.—On June 16, at Woking, to Christine (*née* Todd), wife of Sqdn. Ldr. P. B. Powell—a son.

Scatchard.—On June 5, at Huddersfield, to Bettine (*née* Reeve), wife of P. Scatchard, R.A.F.—a son.

Swanston.—On June 18, at Thirsk, to Mollie (*née* Hartley), wife of Dr. Kelly Swanston, R.A.F.V.R.—twin daughters.

Tucker.—On June 20, at Louth and District Hospital, to Felicity Celia (*née* Lawford), wife of Flt. Lt. J. D. Tucker, R.A.F.V.R.—a daughter.

Webster.—On June 19, at Grantham, to Veronica (*née* Plant), wife of Flg. Off. L. A. Webster, R.A.F.V.R.—a daughter.

Woodward.—On June 21, in London, to Alice (*née* Darbyshire), wife of Sqdn. Ldr. F. G. Woodward, D.F.C., R.A.F.O.—a son.

FORTHCOMING MARRIAGES

Barnes—Norbury.—The engagement is announced between Plt. Off. H. J. M. Barnes, R.A.F.V.R., eldest son of Wng. Cmdr. W. T. Barnes, O.B.E., of Baguley, and Elizabeth Mary Norbury, younger daughter of Mr. and Mrs. Gilbert Norbury, of Ringway, Cheshire.

Beamont—Adams.—The engagement is announced between Flt. Lt. R. P. Beamont, D.F.C., R.A.F., only son of Major E. C. and Mrs. Beamont, of Chichester, and A/S/O Shirley Adams, W.A.A.F., younger daughter of Mr. Bernard Adams, R.P., R.O.I., and Mrs. Adams, of Buckland Common, near Tring, Herts.

Corkhill—Coxeter.—The engagement is announced between Act. Ldg. Airmn. R. J. Corkhill, F.A.A., son of Mr. and Mrs. R. Corkhill, of Liverpool, and Joan Melody, eldest daughter of Mrs. Katherine Coxeter and the late Harold Coxeter, of Guildford.

Councer—Smythe.—The engagement is announced between Plt. Off. C. R. Councer, R.A.F.V.R., only son of Mr. and Mrs. C. W. Councer, of Herne Bay, and Dora Evelyn, elder daughter of the late Mr. Robert Smythe and of Mrs. Smythe, of St. Paul's Cray, Kent.

Cox—Day.—The engagement is announced between J. H. Cox, R.A., only son of Mr. and Mrs. H. B. Cox, of Chetnole, Sherborne, and A/S/O Jaqueline Day, W.A.A.F., only daughter of Mr. and Mrs. John Day, of Stone, Somerset.

Davidson—Rowe.—The engagement is announced between Flt. Lt. J. C. Davidson, D.F.C., R.A.F., younger son of Mr. and Mrs. J. S. B. Davidson, of Harrow, and Jean Elizabeth, only daughter of Mr. and Mrs. F. Rowe, of Barnstaple.

Hancock—Davidson.—The engagement is announced between Flg. Off. P. G. M. Hancock, A.A.F., elder son of Mr. and Mrs. O. L. Hancock, of Singapore, and S/O Alison Babette Davidson, W.A.A.F., younger daughter of Mr. and Mrs. J. P. Davidson, of Finchampstead, Berks.

Moore—Butler.—The engagement is announced between Lt. A. R. Moore, D.S.C., R.N., younger son of Capt. and Mrs. A. B. D. Moore, of Sidmouth, and A/S/O Barbara Joan Butler, W.A.A.F., elder daughter of the late Mr. Christopher Butler, of Calne, and Mrs. Butler, of Swindon.

Satchwell—Stewart.—The marriage will take place in July between Capt. Denis Satchwell, British Overseas Airways, only son of the late Capt. and Mrs. F. H. Satchwell, of Budleigh Salterton, and Sheila, only daughter of the late T. Inglis Hall, of Windermere, and of Mrs. E. Grattan Thompson, of Rangeworthy Court, near Bristol.

Titlow—Kemp.—The engagement is announced between Sgt. Plt. M. R. Titlow, R.A.F.V.R., second son of Mr. and Mrs. E. W. Titlow, of Leiston, Suffolk, and A.C.W.1 Doreen Kemp, W.A.A.F., only daughter of Mr. and Mrs. G. Kemp, of Aldringham, Suffolk.

Woodman—Anderson.—The engagement is announced between Cpl. H. Ll. Woodman, R.A.F., only son of Mr. and Mrs. H. Woodman, of Taunton, and Evelyn Anderson, S.R.N., only daughter of Mr. and Mrs. G. A. Anderson, of Stewarton, Ayrshire.

MARRIAGES

Alderson—Branfoot.—On June 20, at Stonegrave, Capt. M. R. Alderson, British Overseas Airways, son of the late Mr. and Mrs. M. J. Alderson, of Tickhill, Yorks, to Joan, youngest daughter of Mr. and Mrs. Clive Branfoot, of Stonegrave, Yorks.

Beacon—Haigh.—On June 20, in London, Flt. Lt. Havelock Beacon, only son of Mr. and Mrs. H. Beacon, to Joan Ann Haigh, younger daughter of the late William Haigh and of Mrs. Lackmann.

Cartwright—Wetherall.—On June 22, at Swansea, Flt. Lt. J. F. L. Cartwright, R.A.F., of Ammanford, to S/O Winifred Wetherall, W.A.A.F., of Swansea.

Gilson—Maine.—On June 20, in London, Flg. Off. Kenneth Gilson, R.A.F.V.R., to Margot Maine.

Green—Pockett.—On June 20, at Ewelme, Oxon, Flg. Off. G. D. Green, D.F.C., son of Mr. and the late Mrs. S. Green, of Thornton Heath, to Beryl, daughter of Capt. and Mrs. J. M. Pockett, of Blackmore, Hants.

Hampshire—Campbell.—On June 22, at Edinburgh, Plt. Off. H. R. Hampshire, R.A.F.V.R., second son of Mr. and Mrs. H. F. Hampshire, of Santos, Brazil, to Elizabeth Maclean, only daughter of Mr and Mrs. D. H. Campbell, of Perth.

Jackson—Lusk.—On June 19, at Illinois, U.S.A., Plt. Off. G. E. Jackson, R.A.F., only son of Mr. and Mrs. A. E. Jackson, of London, to Nancy Colin Lusk, daughter of Mr. and Mrs. G. W. Lusk, of Peoria, U.S.A.

Marsh—Cross.—On June 10, in Bath, Sqdn. Ldr. K. G. Marsh, A.A.F., only son of Mr. E. G. and the late Mrs. Marsh, of Bristol, to A/S/O Ailsa Jean Cross, W.A.A.F., daughter of Mr. and Mrs. Pembroke Cross, of Hayling Island.

Morris—Ogilvie.—On June 27, at St. Mary's, North Mimms, Lt. (A) G. A. G. Morris, R.N.V.R., only son of Mr. and Mrs. A. E. Morris, of Selsdon, to Jean, daughter of Mr. and Mrs. A. Ogilvie, of St. Albans.

Parkins—Teumer.—On June 20, at Leigh-on-Sea, Flt. Lt. D. A. Parkins, D.F.C., R.A.F.V.R., to Barbara Teumer.

Passadoro—Easton.—On June 22, in Cairo, Flt. Lt. D. J. Passadoro, R.A.F.V.R., son of the late Mr. Howard Passadoro, of Genoa, Italy, and Mrs. Ethel O. Passadoro, of West Mersea, to Suzanne Easton, eldest daughter of Mr. and Mrs. T. Easton, of Durban, S. Africa.

Peters—Giles.—On June 16, at Sherford, Devon, Flt. Lt. P. W. Peters, D.F.C., R.A.F., to Frances Joan (Judy) Giles.

Pleasance—Miller.—On June 15, at Tadcaster, Wng. Cmdr. H. P. Pleasance, D.F.C., R.A.F.O., youngest son of the late Mr. and Mrs. A. E. Pleasance, of London, to A/S/O Margaret Alice Miller, W.A.A.F., elder daughter of Mr. and Mrs. G. W. Miller, of Glasgow.

Raffael—Walton.—On June 16, in London, Plt. Off. A. M. Raffael, R.A.F.V.R., elder son of the late Michael Raffael and Mrs. Raffael, of St. Annes-on-the-Sea, to Dorothy Kemp, only daughter of Mr. and Mrs. T. Kemp Walton, of Bath.

Tyerman—de Kantzow.—On June 20, in London, Sgt. Cadet V. J. Tyerman, R.C.A.F., to Ruth de Kantzow.

Watson—Rodgers.—On June 22, Sub-Lt. (A) D. J. F. Watson, R.N.V.R., to Veronica J. Y. Rodgers, of London.

CORRESPONDENCE

Transport Gliders

I NOTICED with great interest a letter from Mr. C. G. Grey in your April 24 issue regarding troop-carrying aircraft, the desirability of same, size required, etc. The fleet of 50-seat aeroplanes which would appear to be essential runs into many thousands, and the designing, development and final construction of this fleet would take several years to complete.

Types which were in existence before the War, or were being built at that time could be counted on one's fingers, and as they were then known only under the name "Civil Airliner," production, or even completion of single machines, was forbidden by the very muddle-headed brass-hat policy adopted when hostilities broke out. Anything labelled "Civil" could not be allowed to divert materials or work from anything labelled "Military," even though the label might be a misnomer. Thus the brass-hats very nearly succeeded in completely wiping civil aviation off the map. If civil flying had had a square deal before the War, sufficient money would have been available for the development of just such sizes of aeroplane as are now so urgently required. Likewise, if the gliding movement had received financial encouragement on a scale ten to a hundred times greater than it did, commercial interest in its immense possibilities would have been stimulated, and passenger- and freight-carrying gliders would have been a common sight instead of absolutely unheard of.

Admittedly, the gliding fraternity themselves feared the commercial exploitation of gliding as being a potential danger to the best sport in the World—a sport to which we were introduced by our present enemies!

If troop-carrying gliders are produced now, then we have a reasonable chance of winning this War in a fairly short time. If we have to wait for troop-carrying aeroplanes before we can move troops from here to anywhere in less than three months, the time taken by sea transport, then the War will go on for many years. Using gliders—and we could have the required number within a year if we got down to it—we can use up obsolescent bombers as towing aircraft, and provide fighter escort as and when necessary. For the cost of one troop-carrying aeroplane we could have five or six gliders each of the same capacity. A bomber could probably tow two or three gliders at a cruising speed of about 150 m.p.h. for a distance of 1,000 miles. The gliders could be piloted by Army personnel, as our present small gliders are (aero-towed gliding is about the simplest form of aerial navigation and requires very little skill), while the towing craft would be flown by R.A.F. crews. All this at about one-fifth the cost and in about one-fifth the time to produce a fleet of aeroplanes of equal capacity.

And after winning the War for us by ensuring that we have plenty of men and materials in the right place at the right time (which is where we have, so far, been unfortunate), these same gliders could provide the economies which will be necessary to make post-War civil aviation pay its way.

J. C. NEILAN.

Cub and Typhoon

LISTENING to Roy Chadwick in the "I am an Aircraft Designer" series of talks on the wireless, I noticed a statement which I should like to query. Mr. Chadwick stated that a bomber which he designed, the Aldershot, was powered by a Napier Typhoon motor. I have always been under the impression that the Typhoon was built and designed by William Beardmore and Co. Ltd. of Glasgow, and not by Napier.

The facts as I understand them are as follow:—

(1) In 1920 A. V. Roe and Co. Ltd. produced the Avro 549, and named it the Aldershot. This machine had a Rolls-Royce Condor motor of 650 b.h.p.

(2) Later the Aldershot was fitted with an 850 h.p. Beardmore Typhoon motor.

(3) In 1923 the Avro 549A (the Aldershot Cub) was produced, and this had a Napier Cub motor, which developed 1,075 b.h.p.

As a friend and I have disagreed as to the correct facts, would it be possible for you to spare the time to reply, and inform me as to whether or not I am correct?

I believe that these facts are to be found in Sir Alliot Verdon-Roe's autobiography "The World of Wings and Things."

R. M. DYE.

[The Aldershot was produced first of all in 1921 with the 1,000 h.p. Napier Cub—the first X-type motor. Later the 1,050 h.p. Beardmore Typhoon 8-cyl. inverted Vee was fitted. Much secrecy surrounded the trials with both these early high-powered motors, which were ahead of their time.—ED.]

A Hybrid Autogiro

I HAVE FOLLOWED the correspondence on assisted take-off with great interest and I should like to point out that there are already reliable heavier-than-air aircraft in existence that can take-off and land, in the smallest of fields. I refer to Autogiros, and I believe that a cross between the Autogiro and the fixed-wing type would give the desired result.

In single-engined aeroplanes the mounting could be placed just aft of the pilot's cockpit, and when not in use could retract downwards into the fuselage, with the rotor blades folded back into a recess along the top decking of the fuselage. The pilot would have to be situated farther forward than is usual, and the airscrew would have to be driven by shafting as in the Airacobra, but these disadvantages are slight in comparison with the advantages of a quick take-off.

For multi-engined aeroplanes, a rotor could be placed just outboard of each of the innermost engines, and could hinge outwards and downwards into a recess extending towards the wing-tips after the take-off had been accomplished.

The rotors would not necessarily have to be large enough to uphold the whole weight of the aircraft, but only to give extra lift while taking off and landing.

J. E. B. ENTWISTLE.

Stakanovism

MAY I offer my profound apologies to your compositors and printer's readers, all Trade Unionists in good standing, for having made them, because of my abominable writing, accomplices before the fact, in my letter on page 710 (June 19), in the heretical crime of accusing Comrade Stalin of introducing "unequal reward for unequal work, in the form of Stalinism"? In fact, I am surprised and grieved that any supporter of our Great Ally should have failed to spot the mistake.

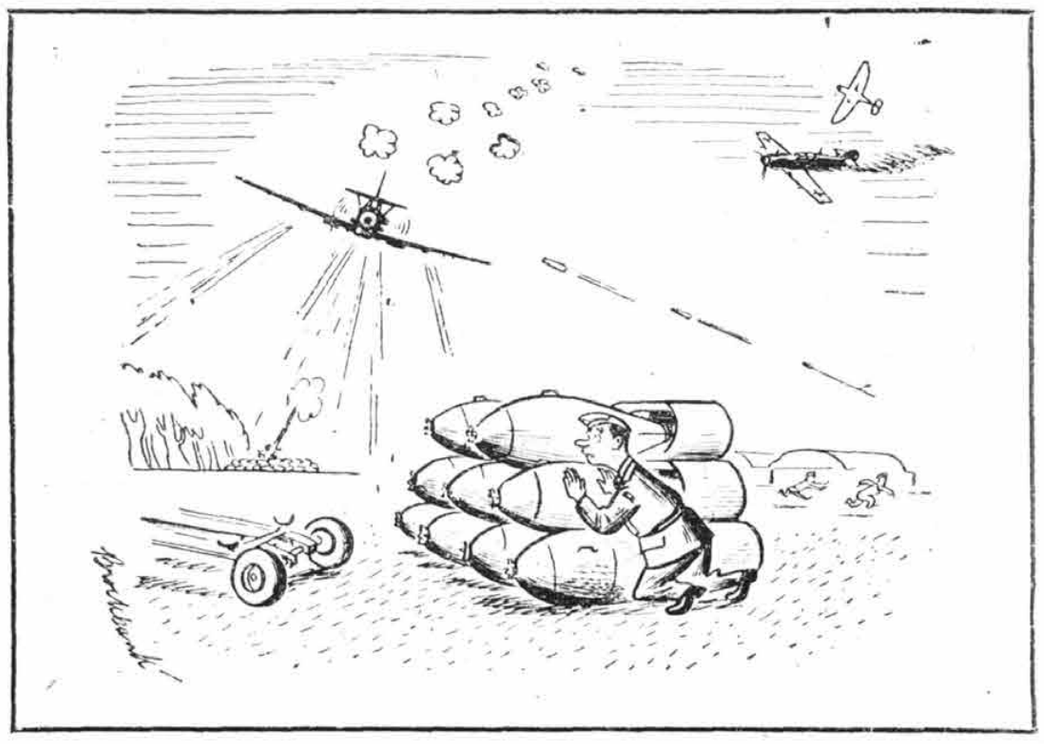
The Comrade whose name has become famous for the speeding-up of output in all the workshops of all the Soviets is Stakanovitch,—as near as our crude capitalistic alphabet can approach his euphonious name. Probably our spelling and pronunciation of it are no nearer to the true Muscovite method than is "Roll Out the Barrel" to "The Volga Boat Song."

Anyhow, the system of payment by results prevalent in the Union of Soviet Republics is known as Stakanovism.

For the benefit of ignorant non-Proletarians perhaps I had better explain that Comrade Stakanovitch was working in a factory and made the discovery that if a man eats more (within reason) he produces more work, and that if you pay him more he can eat more. So, if you pay him more he produces more. In other words, he invented for Russia that system of piecework, premium payments, bonuses on output, and other methods of unequal payments for unequal results which, in a Ca-pit-alist country, are the bases of wage-slavery, profiteering at the expense of the Proletariat, and all the other evils which breed class-distinction, and ultimately lead to the old school tie and the exaltation of Colonel Blimp.

Happily, under Soviet control such evils cannot arise. The profits all go to the Proletariat, who are not mulct in, nor milked of, income tax as in this country. Nor, we may assume, if an ardent Stakanovist is producing vast quantities of armament in a factory, and is being paid in proportion, is he pulled out and cast down a coal mine or shot into a shipyard at half the rate of pay just because he worked in one or other of those poorly paid positions some years ago, and in spite of having forgotten the technique of those jobs and having acquired a high degree of skill at better-paid work. Hail Stakanovitch!

C. G. GREY.



HAWKER SIDDELEY AIRCRAFT

GREAT RECORD OF COMPANY'S AEROPLANES

MR. T. O. M. SOPWITH'S STATEMENT

THE Sixth Ordinary General Meeting of the Hawker Siddeley Aircraft Company, Limited, was held at the May Fair Hotel, Berkeley Street, London, W., on July 1.

The following is the speech of the Chairman, Mr. Thomas O. M. Sopwith, C.B.E., F.R.Ae.S., which has been circulated with the report and accounts:—

Ladies and gentlemen,—The delay in submission of the report and accounts is due to the incidence of exceptional accounting problems arising from operations under war conditions and which are magnified by the ever-increasing volume of output. This is our sixth annual general meeting, and it is not my intention to give other than a very brief summary of our position.

The accounts show the comparative figures for the previous year, and you will observe that we have again provided the appropriate amount for the redemption of Five per Cent. Redeemable Cumulative Preference shares in accordance with the terms of their issue. The profits of the operating companies have been brought into the accounts to an extent sufficient to pay the same dividend as last year, and amount to £620,817, after providing for taxation. Adequate provisions have been made in the accounts of the operating companies for their Excess Profits Tax and other taxation liabilities; for their appropriate proportions of War Damage Contributions and for such other purposes as their directors have considered necessary. Interim dividends of 15 per cent., less tax, and 17½ per cent., less tax, have already been paid, making a total for the year of 32½ per cent., less tax. This total is the same as that distributed last year, and it is not proposed to pay any further dividend for the year. The amount to be carried forward is thus £321,585.

Contribution to War Effort

Of the products of your company—which have been and still are rendering yeoman service in every part of the world where hostilities are in progress—I can, unfortunately, speak only with reticence. You can, however, be assured that their contribution is one of vital importance and of great value to the armed forces. I need only, I think, call attention to three. There is the ubiquitous "Hurricane," with various modifications and improvements, but substantially the same, still used for varied jobs and with efficiency and certainty. The epic stories associated with the achievements of this remarkable machine will, I hope, be available to constitute a permanent record of gallant men and daring exploits. The "Lancaster"—the latest product, and I think the most efficient heavy bomber in the world—was the medium through which the historic raid on Augsburg was carried out; this aircraft in increasing numbers will add very materially to our bomber offensive. Lastly, certain of the "Whitley" bombers have been converted to commercial types to augment the fleet of British Overseas Airways. In the post-war development of civil aviation your company is adequately equipped both from the technical and production aspect to take full advantage of any opportunity which may occur.

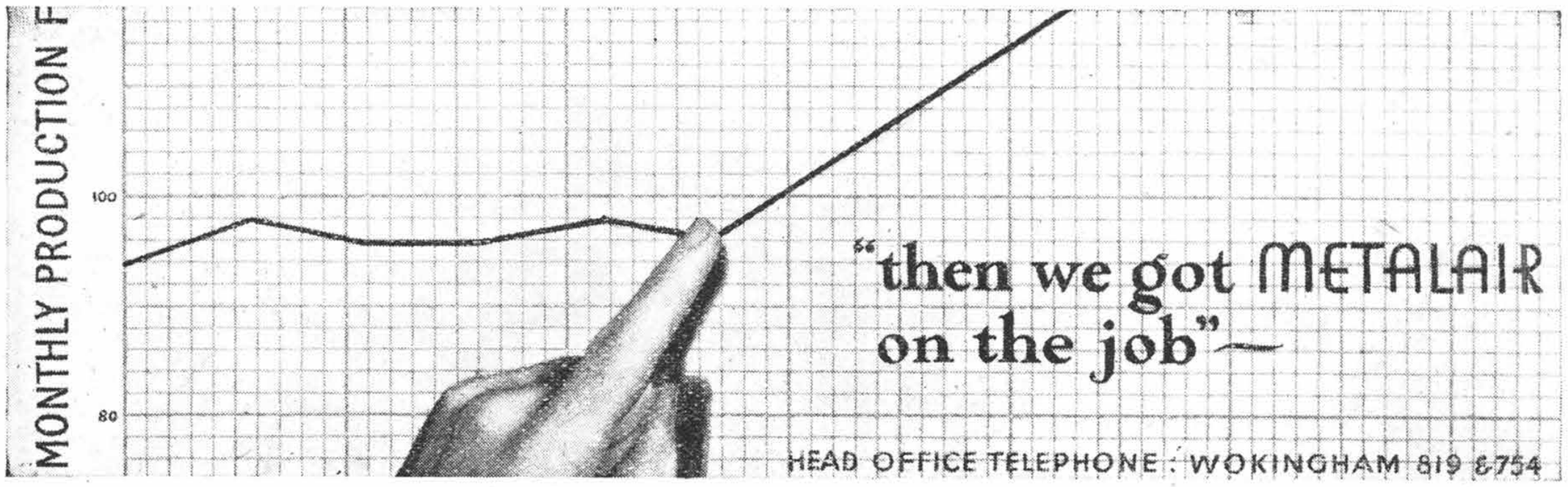
During the period of the war I cannot indicate future developments other than by giving you an assurance that we are determined to maintain a progressive policy. There is little doubt that the quality of the R.A.F equipment in darker days proved a deciding factor, and had it been possible then to have quantity as well the outlook might have been vastly different. To-day, however, the manufacturing potential is available and able to provide the numbers of new types necessary to maintain the hard-earned superiority.

Friendly Relations with Workers

In the other ancillary products covered by your company the same satisfactory state of affairs prevails, and the high standard of mechanical efficiency in certain equipment can be ascribed in part to developments carried through on our initiative. It is a pleasure to record that our relations with the works personnel are on a basis of friendly co-operation; there has been of late a noticeable tendency in private and public discussions to criticise managements and workers, and exaggeration has been shown in many statements. An industrial expansion of the magnitude which has occurred in this country cannot take place without some inefficiency, but on the whole the attainment of full production has been remarkably free from confusion or conflict.

The percentage of female labour, both clerical and productive, employed in this organisation has increased appreciably. Their work is extremely valuable, and I would emphasise the importance of their contribution. You will, I am sure, join in recording thanks for the unexampled manner in which the executive, staff and workpeople have carried out their duties. They have not had an easy task, and have met and overcome the problems involved in changing requirements in a way reflecting very great credit on all concerned. Our maximum efforts are, of course, concentrated on the productive endeavour, but your directors are constantly reviewing the post-war position and have suggestions under consideration to be put into force at the appropriate, and I hope not far distant, time.

The report was adopted.



The Candid Comments of a Production Engineer—No. 2

Well! I am surprised

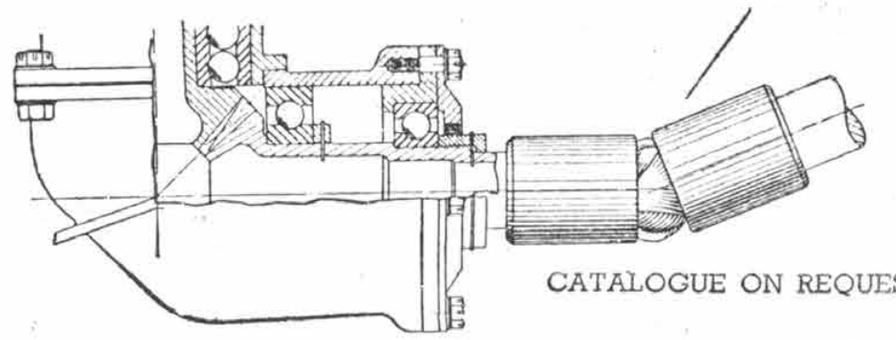
Never heard of Clarke, Cluley of Coventry? Why, they've specialised in precision engineering for fifty years. Textiles, watches, cycles, rayon, motor cars, aircraft—to all of these, and many other industries their skill and experience have contributed. Remember this when planning post-war production. They can be of valuable assistance to you.

Heritage Peters

USED BY LEADING AIRCRAFT MANUFACTURERS FOR REMOTE CONTROL, UNDERCARRIAGES & ACCESSORIES.

ME

PATENT UNIVERSAL JOINTS



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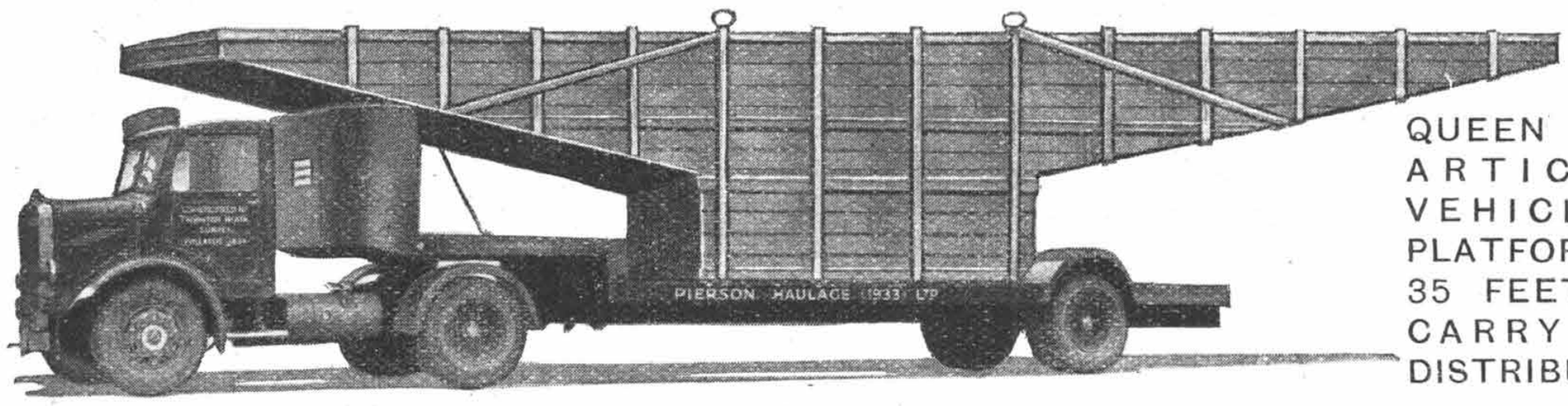

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