FLIGHT, AUGUST 5, 1937. FIRST AERO WEEKLY IN THE WORLD

FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

No. 1493
Vol. XXXII

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

SIXPENCE
EVERY THURSDAY

FLIGHT
The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

Editor C. M. POULSEN
Managing Editor G. GEOFFREY SMITH
Chief Photographer JOHN YOXALL

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1
Telegrams: Truditur, Sedist, London. Telephone: Waterloo 3333 (50 lines).

HERTFORD ST., COVENTRY. Telegrams: Autocar, Coventry. Telephone: Coventry 5210.
GUILDHALL BUILDINGS, NAVIGATION ST., BIRMINGHAM, 2. Telegrams: Autopress, Birmingham. Telephone: Midland 2971.
260, DEANSGATE, MANCHESTER, 3. Telegrams: Iliffe, Manchester. Telephone: Blackfriars 4412.
26B, RENFIELD ST., GLASGOW, C.2. Telegrams: Iliffe, Glasgow. Telephone: Central 4857.

SUBSCRIPTION RATES: Home and Canada: Year, £1 13 0. 6 months, 16s. 6d. 3 months, 8s. 6d.
Other Countries: Year, £1 16 0. 6 months, 18s. 0d. 3 months, 9s. 0d.

No. 1493. Vol. XXXII. AUGUST 5, 1937. Thursdays, Price 6d.

Work Well Done

MR. H. A. JONES, once an observer in No. 47 Squadron, and one who was seriously wounded in air combat on the Macedonian front, has now completed his great work *The War in the Air*. The sixth and last volume was published by the Clarendon Press, Oxford, on July 15 at a net price of £1 5s. The first volume was written by the late Sir Walter Raleigh in 1922, and after his death the work was handed over to Mr. Jones. He produced Volume II in 1928, Vol. III in 1931, Vol. IV in 1934, Vol. V in 1935, and the final volume last month.

It has been a tremendous task, for the author has had to examine official documents, not only in this country but in those of all the countries who were in arms against the Allies in the Great War; he has had to deal with the Royal Naval Air Service, the Royal Flying Corps, the Royal Air Force and the Independent Air Force. He has had to describe operations in Flanders, the North Sea, the Channel, the Mediterranean, Italy, Macedonia, Egypt and the Sudan, Palestine, Iraq, Iran, India, East Africa and South-West Africa. He has had to give accounts of the doings of aeroplanes of all sorts—landplanes, seaplanes, flying boats—as well as airships and carriers. He has had to study the biographies of well-known pilots, and to decide disputed points such as who killed Baron Manfred von Richthofen.

In addition to all this, his work has been complicated by the fact that he was not dealing with a fighting Service which was waging an independent war, but was always an arm of either the Navy or the Army. For this reason he had to study the naval and military situations and explain them in some detail before he could make clear the part, and the value of the part, played in the operations by the air arm concerned. When all this is taken into account, one can only marvel that Mr. Jones has completed his work so quickly as he has, and offer unstinted praise for the complete and exhaustive way in which he has treated every aspect of this great and diversified subject.

An official historian must naturally be cautious in expressing views on the facts which it is his main duty to record. Only when the lessons to be drawn from those facts are very clear, or almost universally accepted by the authorities of the day, can he venture to point a moral. Mr. Jones has been exemplary in his restraint in this respect, and only occasionally has he allowed his own conclusions to appear, and then with much quoting of authorities. In the case of most writers such abstention would result in a dull and dry work, but it is not the least of the merits of Mr. Jones's five volumes that they are always readable and usually very interesting. In his earlier volumes it would have been a good thing if he had given some more information about the performances and fighting qualities of the various types of aeroplane engaged, but in the later volumes he did give some very useful information about various types as they appeared, notably the Bristol Fighter.

Ultimate Victory

This last volume has the cheerful note of victory running all through it, after the dismal story of the supply and production of aero engines has once been left behind. In subsequent chapters we see the Turks driven out of Palestine and Iraq, the Bulgars quelled in Macedonia, Italy victorious over the Austrians, various wars in Iran and India, and finally Haig and Foch driving the Germans to sue for an armistice on the Western Front. It is a most catholic volume, and a great lesson in geography. It would be impossible to notice all the various stories, and only a few points can be selected for special review.

The account of the formation and work of the Independent Air Force is of special interest, as it was the first occasion on which the newly formed Air Ministry attempted something resembling a war on its own, as apart from supplying mere co-operation for the other two Services. It may be said that the idea embodied in this Independent Air Force has since produced the present admirable system of air control in Iraq, and the elaborate schemes for the air defence of Great Britain.

After reading the official account of its formation, one is rather inclined to conclude that in itself the formation of the Independent Air Force was the outcome of a rather childish desire on the part of an infant Ministry to claim that it was now a full-grown man. The Air Ministry wanted this Force to be under no control but its own. Naturally Sir Douglas Haig and Marshal Foch objected. A land war was in progress, and the British Commander-in-Chief pointed out that the imperative need was for squadrons in the battle line where they could affect the issue of the battle. "Long-distance bombing," he wrote, "as a means of defeating the enemy is entirely secondary to the above requirements." Marshal Foch wrote: "Since the military power of the enemy is represented by his Army, and since the sole means we have for destroying his Army is our own Army, it is on our Army that we must concentrate all our efforts in order to render it as strong and well armed as possible In consequence, any combination tending to diminish the Army or hinder its development . . . must be rejected." The Chief of the Air Staff (then Major General Sykes) pointed out that these bombing squadrons were to be the balance after the necessities of the Army had been determined and allowed for, which provoked the retort from the French General Duval that he would be grateful to anyone who could establish the limit of what was necessary to a battle. Ultimately the Independent Air Force was placed under the orders of Foch, but not under those of Haig. Once or twice Foch did require General Trenchard to use his squadrons to help the Army in certain emergencies.

As for the effects of the bombing, the actual damage done to military targets in the Rhine towns was comparatively slight. It did, however, cause some fighter squadrons to be withdrawn from the battle line. Also, coming when it did, after the failure of the last German bid for victory, the bombing greatly depressed the war-weary inhabitants of the Rhine towns. A German summed the matter up: "The direct destructive effect of the enemy air raids did not correspond with the resources expended for this purpose. On the other hand, the indirect effect, the falling-off in production of war industries and also the breaking-down of the moral resistance of the nation, cannot be too seriously estimated." It is admitted, however, that the effect on morale would not have been so great if the German people had not been already war-weary.

The detailed accounts of the bombing make rather a pitiful story. The bomb-aiming in those days was seldom very accurate, the bombs were not heavy enough to do extensive damage to the factories, the engines of the D.H.9 bombers were constantly giving trouble, and the casualities of the I.A.F. in personnel and machines were heavy. Some people felt satisfaction that German populations should suffer reprisals for the air raids made on British and French towns; while others felt shame that the British should have descended to such methods. On the whole it remains a question whether the cause of the Allies would not have gained had the I.A.F. squadrons been used in the battle line.

VEST-POCKET VELOCITY: One of the first pictures of the new T.K.4 racing monoplane, designed and built by students of the De Havilland Technical School. It is only 19ft. 8in. in span and 15ft. 6in. in length. Fitted with the new Gipsy Major Series II engine and D.H. v.p. airscrew, it has been designed for a speed of 215 m.p.h. and, entered by Lord Wakefield, is to compete in the King's Cup Race. It is seen in an unpainted condition. (*Flight* photograph.)

The Outlook

A Running Commentary on Air Topics

A Salient Straightened

FLIGHT welcomes the decision of the Government, announced last week, to hand over to the Admiralty the administrative control of the Fleet Air Arm. We welcome equally heartily the decision not to hand over the administrative control of the shore-based aircraft, including the flying boats of the Coastal Command. As explained by the Prime Minister when he announced the decision in the House of Commons, one proposal which has been before the Cabinet was to give the Admiralty administrative control of shore-based aircraft as well.

For a great many years *Flight* upheld the Air Ministry in its desire to retain administrative control of the Fleet Air Arm, leaving the operational control in the hands of the Admiralty. In those days the Air Ministry was not so well established as now, and there was a very considerable risk that if we gave the Admiralty entire control this concession would be regarded merely as a beginning, and more demands would follow.

During the last few years, however, the position has changed very materially. The Air Ministry is no longer the Cinderella of the fighting services that it was. On the contrary, as someone said the other day in the debate in the House on anti-aircraft defence, the Air Ministry is now gradually becoming the most important of the three. We have often expressed the view that in adhering to its insistence on retaining control of the Fleet Air Arm the Air Ministry left its line of defences with a salient which offered a tempting objective. Do away with that salient by granting the Navy its wish for control of the Fleet Air Arm, and the Air Ministry's line would be correspondingly strengthened.

Provided . . .

SO far, the broad principles only seem to have been agreed to, and they appear satisfactory enough. There is, however, an *aber dabei*, or, rather, several. It is to be hoped that they will not be the cause of that "firing of shots by individuals" referred to by Mr. Chamberlain in the House, let alone by the Admiralty and Air Ministry.

Great questions still remain to be settled, and the matter does not, cannot, end with saying, "Give the Navy its Fleet Air Arm for goodness' sake, and keep it quiet."

Mr. Churchill hinted at possibilities when he asked the Prime Minister if, in principle, the Fleet Air Arm would be permitted to have shore establishments for training its own pilots. To this the Prime Minister replied somewhat vaguely that "there has got to be training of the personnel and there must be places where they are trained."

That reply seems to have satisfied Mr. Churchill, as indeed well it might. But it is very necessary to make quite clear what one understands by training. If Mr. Churchill was referring to, or had in mind, *ab initio* flying training, then it is very much to be hoped that Mr. Chamberlain's "Yes, sir," will be altered into a "No, sir."

Then there is the vexed question of supply; at least it is bound to be a vexed question for some time. On this the Cabinet must take a strong stand and insist that the aircraft for the Fleet Air Arm must be, as now, supplied through the Air Ministry. To have it otherwise would be to reintroduce the evils of competitive bidding by the two services which was rampant before the amalgamation of the R.F.C. and R.N.A.S. into the R.A.F.

Unco-ordinated Defence

SIR THOMAS INSKIP, in the debate in the House of Commons last week, rather reminded one of Will Hay's wheel-tapper. He did not seem to know why he was there—"there" meaning in the office of Minister for the Co-ordination of Defence. Many members volunteered their ideas on why he ought to be there, but at the end of the debate, which lasted from 4.20 p.m. till about 10 p.m. and the report of which occupies some 48 pages of Hansard, the only certainty which emerged was that *no one* knows why he is there.

The House, and, indeed, the country, is grateful to Sir Archibald Sinclair for providing the opportunity to discuss the duties of a Minister for the Co-ordination of Defence, for if the debate did not serve to clarify the position, it did show the growing uneasiness of Parliament about home defence generally and anti-aircraft defence in particular.

Running through the entire debate as a sort of *leitmotif* was the realisation that the air arm has upset all past notions of a nation prepared to defend itself, and the number of questions asked, even if few of them were answered, served to call attention to the almost appalling magnitude of the task of defending the country against air attack. Once the real nature of that task is fully realised we shall find the energy and the means to tackle it.

Rather pathetic was the triumphant way in which Sir Thomas Inskip announced, as an example of how the home defence plans are being carried to completion, that a senior Army staff officer had been appointed to the staff of the A.O.C.-in-C., Fighter Command, in order to act as liaison between the two departments responsible for preparing anti-aircraft defences. Now we shan't be long. The War Office and the Air Ministry are likely to get down to brass tacks almost any year!

Accidents

CIVIL aviation has had three more fatal accidents, and again the man in the street shakes his head and comes to the conclusion that this flying business must be pretty dangerous after all.

He may be excused for coming to that conclusion, what with the newspaper posters making the most of every flying mishap and his own inability to distinguish the fundamental differences between crashes in the R.A.F. and accidents to commercial aircraft operating on regular air routes.

When, on August Bank Holiday, the posters announced "Another air crash, 9 dead," the general effect on the public was that these accidents were becoming almost daily occurrences. That, during the same period, one British aeroplane completed its millionth mile without having suffered in that tremendous distance a single mishap which resulted in injury to a passenger was forgotten.

All these considerations do not mean that we of the aviation world should take a complacent view of civil accidents. Far from it; nothing which human ingenuity can do to minimise flying risks should be left undone. Reduction of fire risks is an urgent problem. Devices are in existence which automatically come into operation when the temperature in the engine compartment reaches a certain figure. Automatic switches have been used experimentally for switching off the ignition. The more general use of such devices might be tried in order to get an idea of their effectiveness in actual operating conditions.

DIARY OF FORTHCOMING EVENTS—PAGE 144d.

CEDA
TOGA
ALIS

Now each University Squadron has some Harts in addition to its Tutors. Three Oxford Harts are seen flying along the South Coast.

TERM is over—in fact, it has been over for some weeks—and the three University Air Squadrons have been in camp. Attachment is the official term for the annual training, for usually each squadron is attached to an R.A.F. station, but camp is an easier and more popular word, and in the case of Oxford this year it is more literally correct. Cambridge and London certainly were attached, Cambridge to Abingdon station and London to Halton, while Oxford lived under canvas on Ford Aerodrome, which at the moment is not one of the stations of the R.A.F., though the Directorate of Works will soon convert it into one.

U.L.A.S.

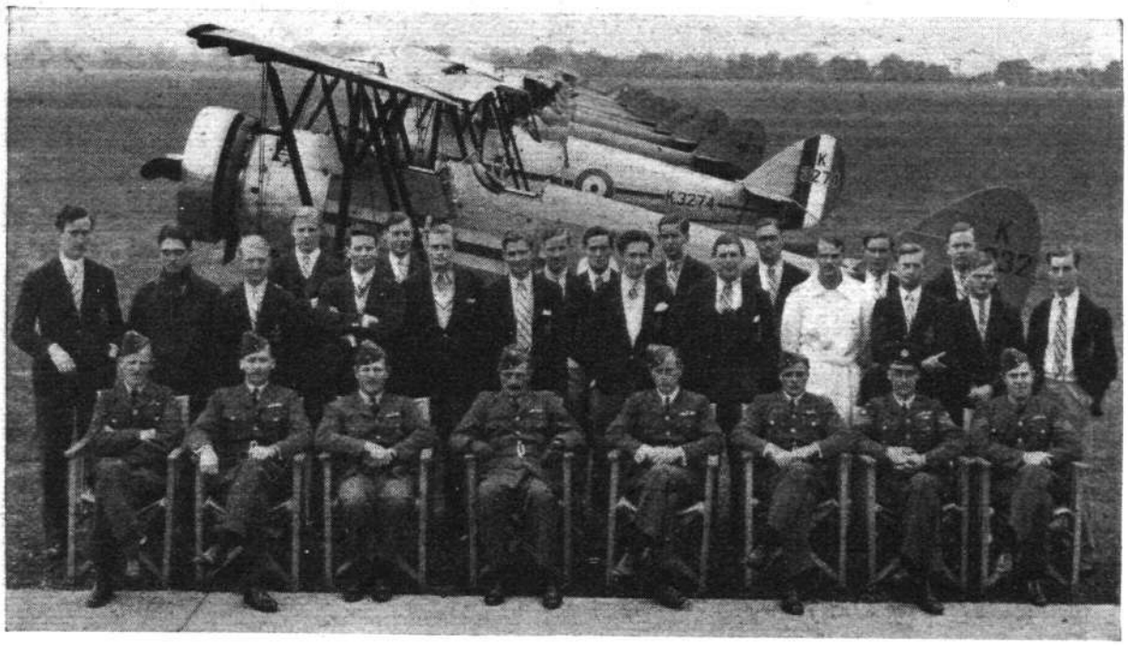
Let us discuss the doings of the three squadrons in the order in which the Air Ministry permitted us to visit them. Thus the University of London Air Squadron takes pride of place, and, after all, it is right to give prominence to the youngest. In term time this squadron goes for flying instruction to Northolt, where the Station Flight teaches its wings to sprout. Ground instruction is given at the H.Q. in Exhibition Road, South Kensington. In these enlightened days all three Universities allow members of the squadrons to fly solo during term time, which was once forbidden, and this is a great boon. Formerly men who were fully competent to fly solo were kept back until the squadron went into camp, which delayed their progress and was apt to dishearten them. By the end of camp practically all the members are qualified to fly solo, though they continue to receive dual instruction when that seems advisable.

This is only the second year in which the U.L.A.S. has gone to camp, and its establishment is still only fifty members. It is hoped that next year it will be allowed to enrol seventy-five, as the two older squadrons are allowed to do. They went to Halton in two batches, each batch for a fortnight. Wing Cdr. T. F. W. Thompson, D.F.C., himself an old London University man, is the chief instructor, and he had with him at Halton his adjutant, Flt. Lt. J. Grandy; the Chief Flying Instructor, Sqn. Ldr. Hamersley, M.C., and eight other instructors, four of whom were sergeant pilots. The

"Stand-easy" by the O.U.A.S. at Ford Aerodrome. Holding a paper is the Chief Instructor, Wing Cdr. C. N. Lowe, M.C., D.F.C., and on the left is the Chief Flying Instructor, Sqn. Ldr. G. M. Knocker.

Three University Squadrons — Oxford, Cambridge and London — Visited at Their Annual Camps

Illustrated with "Flight" photographs



Members of the C.U.A.S. and their instructors. Second from the left is the Chief Instructor, Wing Cdr. Lockyer, and fourth is the C.F.I., Sqn. Ldr. Mason.

aircraft provided were fourteen Tutors and two Harts. Owing to the great demand for training aircraft at the time, two of the Tutors provided had been used by the C.F.S. for inverted flying at Hendon, and were still painted with red and white stripes. These were single-seaters and were used only by advanced pupils.

During each fortnight a formation cross-country flight was undertaken by six machines, each flown by a member with an instructor in the back seat. In the first fortnight the formation went to Waddington and spent the night there, returning next day via Birmingham. The second flight went to Cranwell and up the coast to Usworth (Durham) and next day returned by a zig-zag route over Doncaster and York to Hucknall, and then home.

Halton is very crowded at present, and the aerodrome, though most picturesquely wooded, is not the easiest for instruction. Wing Cdr. Thompson hopes to get the squadron sent elsewhere next year.

O.U.A.S.

This is the last year in which Wing Cdr. C. N. Lowe, M.C., D.F.C., will be Chief Instructor of the Oxford University Air Squadron. He is shortly going to Cranwell as Assistant Commandant, where he will continue the work of instructing youth. Though he is a Cambridge man himself, he has done great work for Oxford, and Cranwell's gain will be Oxford's loss. For his last year he decided to hold a real camp, and tents were pitched on Ford Aerodrome, where only the local flying club kept Oxford company. Ridge-pattern tents proved much more comfortable than the former bell tents. The aerodrome is not large, and the landing area includes some land which still looks like ploughed field but is quite safe to use. Strict rules were drawn up about landing on the right and taking off on the left, quite on the approved system of commercial aerodromes and it worked very well.

Flying started at 06.00 hours and went on till 12.30, except when Press photographers insisted on pictures, which upset the programme; but the undergraduates did not seem to mind an extra half hour's work in the least. In the afternoons the members worked at maintenance of their machines until about 15.00, and then they were free to amuse themselves. The whole squadron was permitted to join a club at Middleton on payment of a moderate lump sum, and there they could get swimming, lawn tennis, and other ways of stretching limbs which might have been cramped by hours in a cockpit. Littlehampton, with all its delirious delights, is quite close.

There were admittedly a few drawbacks to Ford. There were too many telegraph wires round the camp, and the O.U.A.S. disapproved of them and wished somebody would remove them. There was a constant hope and expectation that one of the club Moths would oblige; but it never did. Also the wind sometimes annoyed by blowing in the wrong direction, wrong, that is to say, from the point of view of the pilot who wanted to land. It was

London University in the air: "echelon stepped up" by the U.L.A.S. in their Tutors.

Members of the U.L.A.S. and their officers on the steps of their somewhat luxurious mess tent at Halton. Fourth from the right is the Chief Instructor, Wing Cdr. Thompson, D.F.C., and third from the left is the C.F.I., Sqn. Ldr. Hammersley, M.C.

an interesting study to see the expression on the face of the Chief Flying Instructor, Sqn. Ldr. G. M. Knocker, when somebody pulled his leg by telling him that one of his instructors was landing down wind!

Oxford did no formation flying. Wing Cdr. Lowe concentrated on getting the members to find their away about country, and they all were constantly doing solo cross-country flights of about 200 miles or so. In very thick weather it was sometimes impossible to get over the South Downs back to Ford, but all the members caught in that way made good forced landings, and did quite the right thing.

The camp was made more pleasant by the friendly spirit which grew up between the O.U.A.S. and some Territorial gunners who were camped near by. Though at first the latter did not approve of early flying, which woke them up, they soon got quite reconciled to it, and even seemed to like it. It is rumoured that the two camps took tea with each other.

C.U.A.S.

The Cambridge University Air Squadron this year invaded the Dark Blue territory by going to Abingdon, which is the home aerodrome of the O.U.A.S. Cambridge highly approved of everything which they found there, including an area approved for low flying, a useful thing and not at all a common one. But it was rather bad luck on a zealous constable who reported a Cambridge Tutor for flying low to be told that it was over that approved area.

Cambridge were fortunate in that they went to camp with six Harts in addition to fourteen Tutors. Of the seventy-five members, all except one was a soloist by the time camp was over. Two of the members are expert glider pilots, and they made excellent pilots of powered aircraft, though they do not much like having a lump of metal in the nose.

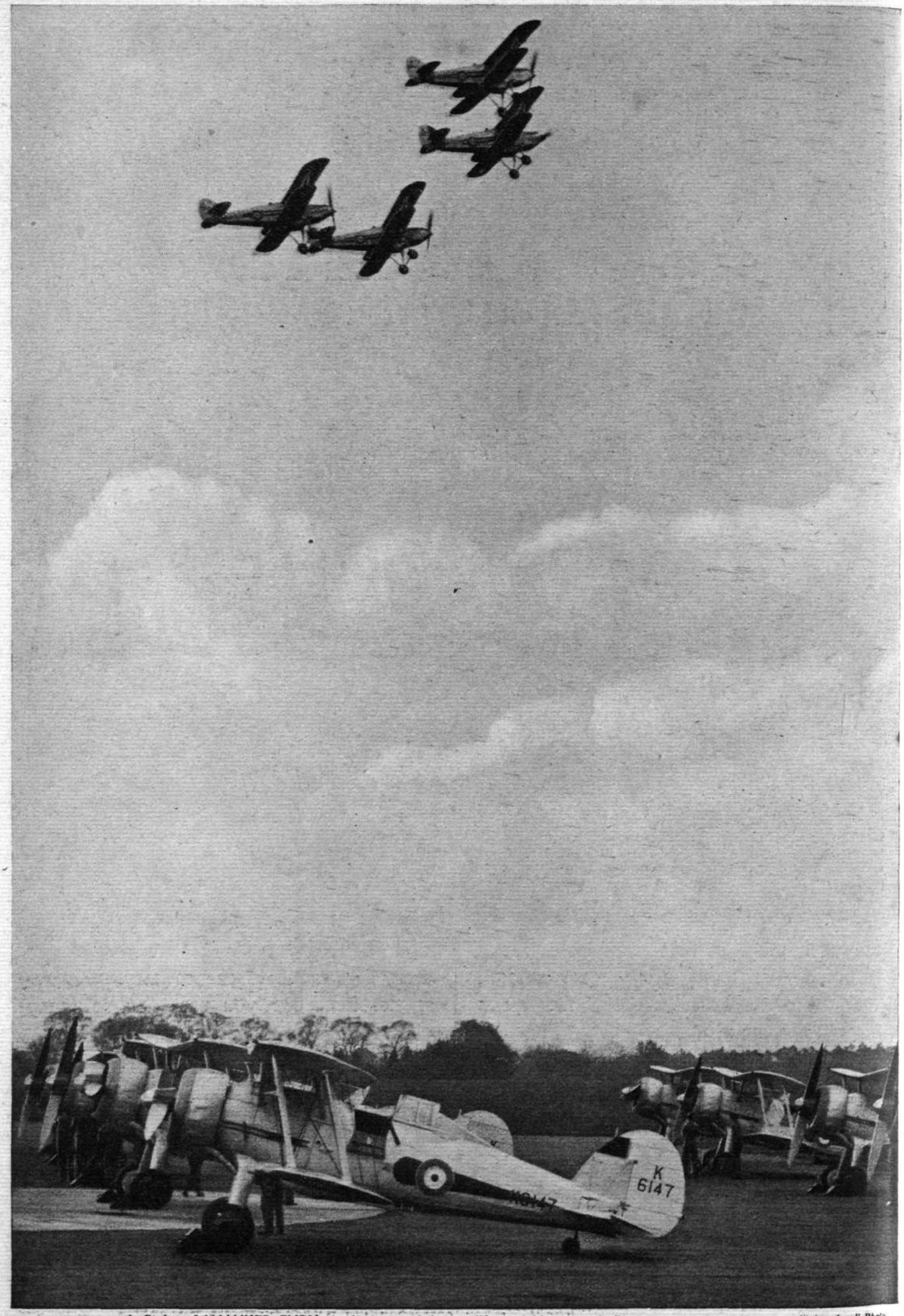
Wing Cdr. C. E. W. Lockyer went in for elaborate cross country formation flights. In one period he sent four Harts and five Tutors over to Aldergrove in North Ireland, which was a great expedition and taught the members a lot. Two other flights to Leuchars were partially marred by bad weather. The Harts got through, but the Tutors had to land and turn back.

In addition to its seventy-five undergraduate members, the C.U.A.S. has five additional members. One is Professor Melvill Jones, who decided this year that he must take up active flying again. He was given some dual, and now flies like the old hand that he is.

Just before breaking up camp and returning to Duxford, the C.U.A.S. was interested to see a visit to Abingdon station by His Highness the Jam Sahib of Nawanagar, a brother of one Cambridge Blue, K. S. Duleepsinhji, and the nephew and successor of the great K. S. Ranjitsinhji. His Highness runs an air mail service in his own State, and showed great interest in everything at Abingdon. "Everything" included two Bristol Blenheims, which were flown over for his inspection.

F. A. de V. R.

Prof. Melvill Jones, of Cambridge University, has recently been enjoying a refresher course of flying as an additional member of the C.U.A.S. He is seen above with Wing Cdr. Lockyer after flying himself over to Abingdon from Duxford.



A flight of HAWKER FURY single-seater fighters (Kestrel V engines) flying over a squadron of GLOSTER GLADIATORS (Bristol Mercury).

["Aeroplane" Photo.

Holland Displays Her Wares : A Good Show by Germany : Few Novelties

INDIGENOUS products form the backbone of the Avia show staged in the new "Houtrust" exhibition hall at The Hague, near the seaside resort of Scheveningen. Great Britain makes comparatively few offerings—though all are prominent in their peculiar fields—Germany has weighed in with her usual collective contribution, but France, Italy and the rest are quite out of the picture.

The Show is on until August 15, and although it can hardly be said to epitomise the latest developments in aircraft construction, a visit will certainly not be wasted by anyone desirous of ascertaining the state of the Dutch aircraft industry and of studying some of the many ingenious instruments and accessories lately evolved on the Continent.

The "gate" last Saturday was largely made up of schoolboys giving the family an instructive day out, but celebrities who had already paid a visit when *Flight* caught the last K.L.M. Douglas from Rotterdam on Saturday included civic dignitaries and officers of the highest importance in Service circles. The arrival of ambassadors was imminent. Dr. Engineer J. A. M. van Buuren, the Netherlands Minister of Public Works, performed the opening ceremony.

A goodly measure of the decibels is being contributed by Europeanised jazz, frequent dissention among the voluble and virile youth of the Netherlands over the ownership of lapel pins and hard-won catalogues and the fractional-h.p. petrol-engined models tethered to a central column, which streak round within protective netting at the bidding of their insatiable constructors. At first they amuse; then they interest; finally they irritate to distraction.

The very *crème de la crème* of aero engines is found on the Rolls-Royce, Bristol, Armstrong Siddeley and De Havilland stands. Mr. Golovine is joined at the R.-R. sanctum—the rendezvous of æsthetes and disciples of liquid (engine) cooling—by colleagues of Techinsche Handelmij, Hollinda N.V., the Netherlands representatives for Rolls-Royce. A surprisingly large number of Kestrels has been supplied to Holland, the most recent acquisitions being 600-640 h.p. fully supercharged Kestrel Vs for installation in Fokker C.X. two-seaters. Merlin-worship is, of course, *de rigueur*. Conversations about recent Continental machines with liquid-cooled power plants usually take the "Yes, but with Merlins—" trend, which, of course, is only to be expected, for during the past year Rolls-Royces have comfortably increased their lead in liquid-cooled development and production. Stand-mate of the Merlin is the Mk. XVI Kestrel (750 h.p. max.), which has little competition to fear in its particular category. Visitors are suitably impressed to learn that even more stables of "horses" are forthcoming from the very latest Kestrels.

The Merlin, by the way, sports a Rotol airscrew hub, which is a novelty to many people.

The superlative sectioned Pegasus on the Bristol stand interests the Hollanders, particularly as their new Fokker T.V bombers are likely to mount a pair of the new Series XX engines. The Pegasus, of course, challenges any high-powered radial "nine" in the world—on any score. Fokker is showing a large photograph of one of his C.X. two-seaters with a Pegasus. This installation gives a top speed way up over the 200 m.p.h. mark and quite a sensational climb.

With the new-series Bristols so much in demand, J. C. Grootenhuis, the Bristol agent for Holland and the Dutch colonies, should be active enough.

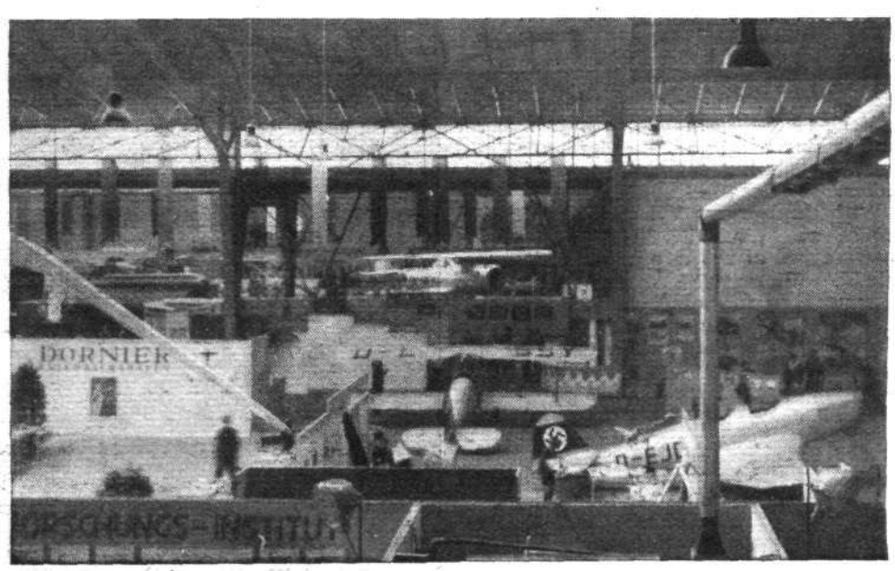
A Two-Speed Blower

Although Bristols are not showing their new two-speed blower engine—the Mk. XVIII Pegasus, which has lately completed official tests at quite phenomenal outputs—Armstrong Siddeleys present their Tiger VIII fourteen-cylinder, two-row radial which has the distinction of being the first unit of its kind in large-scale production. This engine would have a sort of Voronoff effect on certain of the radial-powered Continental types. Complementary Siddeley "lines" are the ubiquitous Cheetah Va and the more recent Cheetah X, a v.p.-rated unit shown snug in its scintillating Avro cowling, now, incidentally, without "helmets" for the cylinder heads.

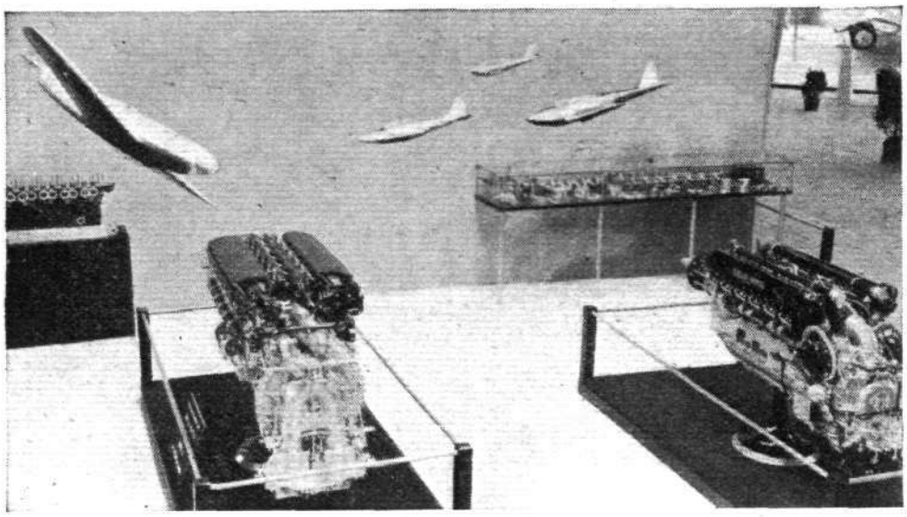
The Gipsy Twelve not being quite prepared for its debut in public, De Havillands concentrate on the Series II models of the Gipsy Six and Gipsy Major, the latter being the most recent model in the low-power category scheduled for production. Such items as a sectioned constant-speed unit, a v.p. hub and a dismantled "4,000" size airscrew are exhibited in strategic positions.

De Havillands are represented by Avon N.V. who, incidentally, handle Percival and Short and Mason products.

Walters, or rather their representatives, Autogiro Import, are there with their inverted vee-twelve air-cooled Sagitta, which, up to the moment, seems to have failed to find any extensive market (although there is a good deal to be said for it), the Scolar radial "nine"



In the foreground of this general view are the Bücker and Klemm exhibits. The Fokker C11W seaplane is in the distance.



The Rolls-Royce "temple" is consecrated to the Merlin and Kestrel XVI.

(180 h.p. max.), the Super Castor (480 h.p. for take-off), the inverted four- and six-cylinder units, already well known, and the intriguing little Mikron, which draws the Koolhoven Junior.

Then, of course, there are the Hirth, Argus and Siemens displays. The Hirths are the HM60R (3.6 litres, 80 h.p.), the HM504A (3.98 litres, 100 h.p.), the HM506A (5.97 litres, 160 h.p.) and the HM508E (7.96 litres, 240 h.p.). All of which reminds us that everyone would be happier if certain manufacturers would simplify the designation of their products. But whatever their titles, the Hirths make a brave show.

Argus present the AS10C 240 h.p. inverted vee-eight, which is a commendable, though not, of course, entirely new, effort.

It goes almost without saying that the Siemens (Brandenburgische Motorenwerke) offering is the Sh14A seven-cylinder radial which has proved particularly popular for aerobatic machines in Germany So much for engines.

The Big Two

It is not surprising that Fokker and Koolhoven have the most impressive displays among the individual constructors. *Le Faucheur*, the twin-hulled Fokker attack machine, was absent, but, as already recorded in *Flight*, it has made its preliminary flights. Fokker's number one string is the D-21 monoplane fighter —a Mercury-powered, low-wing single-seater with a cantilever undercarriage ordered *en série* by the Dutch Army Air Service. The story goes that the D-21 will be regarded as a general-purpose fighter and that something with a higher performance will be adopted for home defence. Denmark and Finland have placed orders.

With the Mercury VII giving 840 h.p. (max.) at 14,000 ft., it is estimated that a speed of 278 m.p.h. would be attained. Alternative armament is: one cannon (Hispano engine) and two or four machine guns; one large-bore machine gun in the fuselage and two of rifle calibre in the wings; four rifle calibre guns (two in fuselage and two in wings); or two 20 mm. cannons in the wing and two machine guns in the fuselage.

Models with engines of fractional h.p. circumscribe their anchorage at high speed.

A superb collection of models illustrates progress in Fokker design since the *Spin* (!) of 1911 to the T.5 bomber now in production. Further models and pictures depict methods and products of the Fokker plant. One gathers, by the way, that the big three-engined Fokker flying boat illustrated was designed, unsuccessfully, to a Dutch Naval specification. It has most peculiar bomb stowage arrangements in the hull. A story is going the rounds that a series of T.VI bombers will be acquired by the Dutch Government in addition to the T.Vs, although, everything considered, it strikes one that Holland would do better to concentrate on fighters.

On the National Defence stand are the Fokker C.X, which corresponds, more or less, to our Hind and the C.11W floatplane, which is consonant with our Osprey. Both are standard types; the C.X (Kestrel V) has tapered wings, but the C.11Ws are parallel in chord and the *Cyclone F engine is specified*. The latter aircraft shares a shallow pool with a collapsible dinghy and a school of lethargic goldfish which, by this time, should be able to write a creditable essay on Fokker float design.

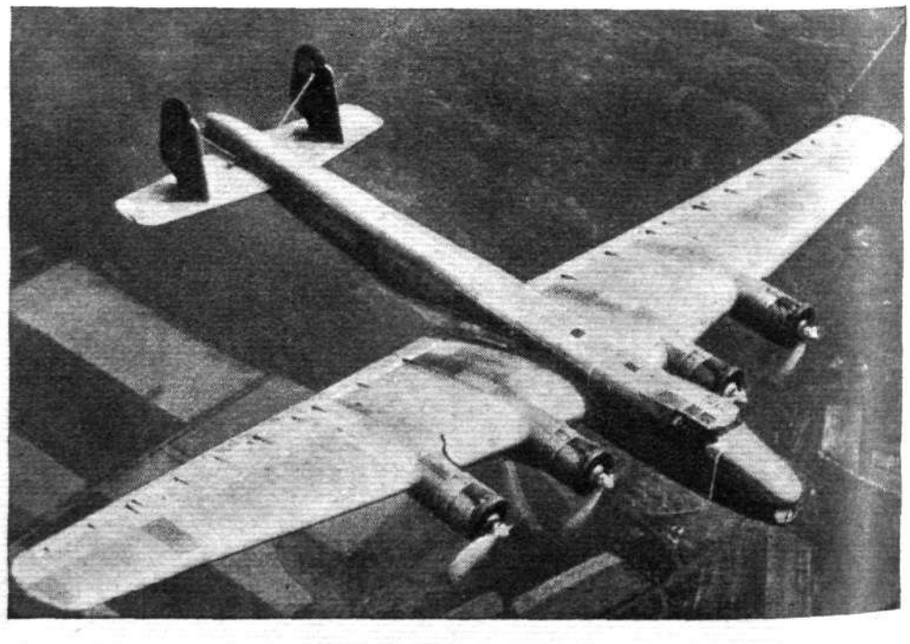
History

Out of the past come Fokker's original *Spin*, which is not nearly so alarming as some devices of its period; a D.7 fighter of war-time vintage, used until comparatively recently in the Netherlands Indies; and the glorious (in fame, if not in figure) old F.2 K.L.M. transport.

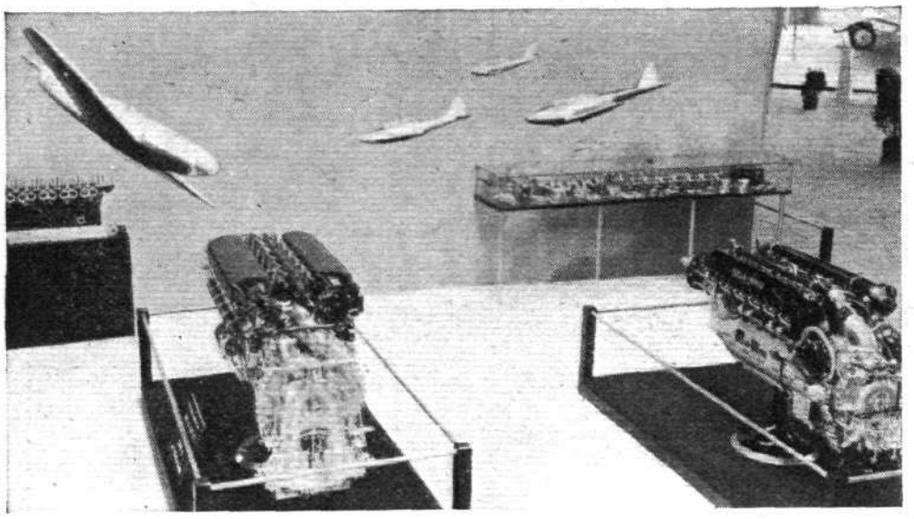
Koolhoven persists with his Wellsian FK55 shaft-drive fighter which has already been dealt with at fair length in *Flight*. Reports of flying trials would be far more convincing as publicity matter than the statement that the machine was *"de 'clou' van den laatsten Parijschen Salon."*

Near by is the Mikron-engined Koolhoven Junior two-seater, which seems quite a sensible little craft but which, again, is known to readers.

Perhaps the best advertisement for the name of Koolhoven is the Rolls-Royce-engined FK26 transport biplane of 1919 —a real pioneer. This was lately saved from possible destruction on an English junk heap and shipped to Holland.



Dorniers show a model of the DO-19 heavy bomber which has four Bramo engines. The prototype has been flying for about three months.



The Rolls-Royce "temple" is consecrated to the Merlin and Kestrel XVI.

(180 h.p. max.), the Super Castor (480 h.p. for take-off), the inverted four- and six-cylinder units, already well known, and the intriguing little Mikron, which draws the Koolhoven Junior.

Then, of course, there are the Hirth, Argus and Siemens displays. The Hirths are the HM60R (3.6 litres, 80 h.p.), the HM504A (3.98 litres, 100 h.p.), the HM506A (5.97 litres, 160 h.p.) and the HM508E (7.96 litres, 240 h.p.). All of which reminds us that everyone would be happier if certain manufacturers would simplify the designation of their products. But whatever their titles, the Hirths make a brave show.

Argus present the AS10C 240 h.p. inverted vee-eight, which is a commendable, though not, of course, entirely new, effort.

It goes almost without saying that the Siemens (Brandenburgische Motorenwerke) offering is the Sh14A seven-cylinder radial which has proved particularly popular for aerobatic machines in Germany So much for engines.

The Big Two

It is not surprising that Fokker and Koolhoven have the most impressive displays among the individual constructors. *Le Faucheur*, the twin-hulled Fokker attack machine, was absent, but, as already recorded in *Flight*, it has made its preliminary flights. Fokker's number one string is the D-21 monoplane fighter —a Mercury-powered, low-wing single-seater with a cantilever undercarriage ordered *en série* by the Dutch Army Air Service. The story goes that the D-21 will be regarded as a general-purpose fighter and that something with a higher performance will be adopted for home defence. Denmark and Finland have placed orders.

With the Mercury VII giving 840 h.p. (max.) at 14,000 ft., it is estimated that a speed of 278 m.p.h. would be attained. Alternative armament is: one cannon (Hispano engine) and two or four machine guns; one large-bore machine gun in the fuselage and two of rifle calibre in the wings; four rifle calibre guns (two in fuselage and two in wings); or two 20 mm. cannons in the wing and two machine guns in the fuselage.

A superb collection of models illustrates progress in Fokker design since the *Spin* (!) of 1911 to the T.5 bomber now in production. Further models and pictures depict methods and products of the Fokker plant. One gathers, by the way, that the big three-engined Fokker flying boat illustrated was designed, unsuccessfully, to a Dutch Naval specification. It has most peculiar bomb stowage arrangements in the hull. A story is going the rounds that a series of T.VI bombers will be acquired by the Dutch Government in addition to the T.Vs, although, everything considered, it strikes one that Holland would do better to concentrate on fighters.

On the National Defence stand are the Fokker C.X, which corresponds, more or less, to our Hind and the C.11W floatplane, which is consonant with our Osprey. Both are standard types; the C.X (Kestrel V) has tapered wings, but the C.11Ws are parallel in chord and the Cyclone F engine is specified. The latter aircraft shares a shallow pool with a collapsible dinghy and a school of lethargic goldfish which, by this time, should be able to write a creditable essay on Fokker float design.

History

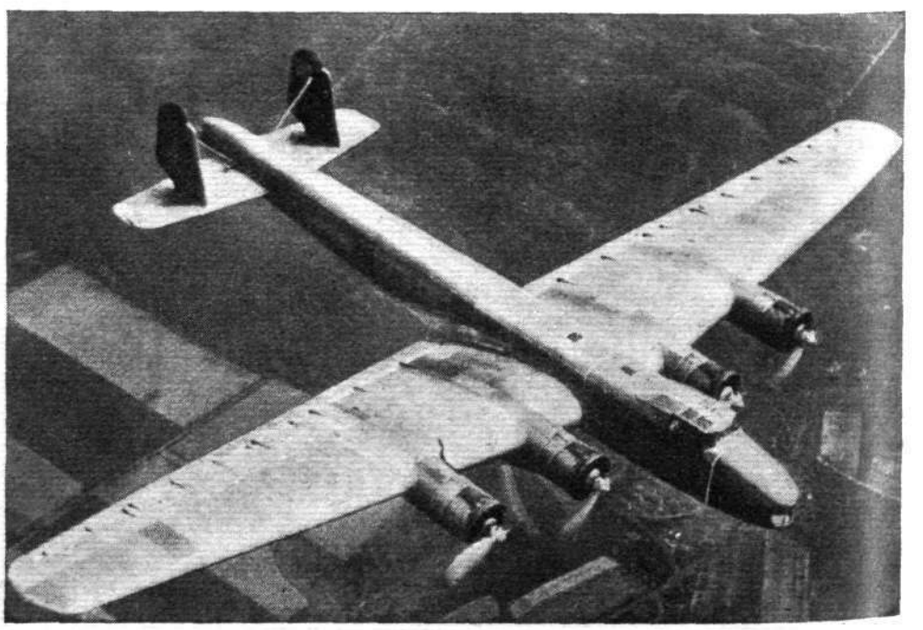
Out of the past come Fokker's original *Spin*, which is not nearly so alarming as some devices of its period; a D.7 fighter of war-time vintage, used until comparatively recently in the Netherlands Indies; and the glorious (in fame, if not in figure) old F.2 K.L.M. transport.

Koolhoven persists with his Wellsian FK55 shaft-drive fighter which has already been dealt with at fair length in *Flight*. Reports of flying trials would be far more convincing as publicity matter than the statement that the machine was *"de 'clou' van den laatsten Parijschen Salon."*

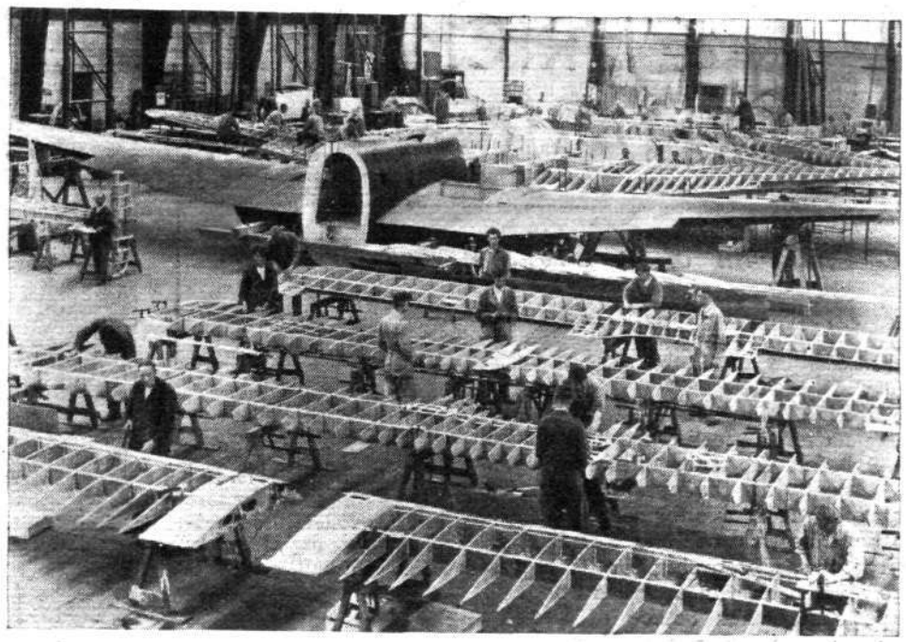
Near by is the Mikron-engined Koolhoven Junior two-seater, which seems quite a sensible little craft but which, again, is known to readers.

Perhaps the best advertisement for the name of Koolhoven is the Rolls-Royce-engined FK26 transport biplane of 1919 —a real pioneer. This was lately saved from possible destruction on an English junk heap and shipped to Holland.

Models with engines of fractional h.p. circumscribe their anchorage at high speed.



Dorniers show a model of the DO-19 heavy bomber which has four Bramo engines. The prototype has been flying for about three months.



An order for Pegasus-engined IV bombers has been placed by the Netherlands Government with Fokker. The machines are seen here under construction.

The Leopard Moth of Mr. J. E. F. de Kok holds the fort for De Havillands on the aircraft side.

Germany sends actual examples of the Klemm K.L.35 two-seater cranked-wing monoplane, and the Bücker Jungmann biplane which is said to be one of the most tractable and responsive machines of its kind in the world. Gliders are also represented. Models of familiar types represent Focke-Wulf (Weihe, Stösser and Stieglitz); Henschel (in particular the Hornet-engined fighter-dive bomber); Hamburger (the trans-Atlantic floatplane); Messerschmidt (Taifun) Gotha (Go.145 and 146) and Arada (Ar. 95 and 96).

No Do. 17

Dorniers are obviously not permitted to publicise the Do. 17 medium bomber, which is commonly claimed abroad to out-Blenheim the Blenheim, but they do present a detailed model of their great Do. 19 bomber which, although quite a successful flying machine, does not quite fit in with Udet doctrines.

It corresponds to the Boeing formula (though, apart from the fact that it is a four-engined monoplane there is no resemblance) and is powered with four 700-1,000 h.p. Bramo radials. The N.A.C.A. cowlings carry concentric slots over the upper portions to smooth out the airflow in the vicinity. Two free cannons are fitted (as the speed is about 225 m.p.h. fire dispersion may not be a very serious problem) and there is a gun-pit, Whitley-fashion in the tail. The bomb-aimer has a little streamlined compartment beneath the fuselage proper.

One gathers that a commercial adaptation is being studied. The Do.X development boat has been dropped. The Do. 22 braced monoplane is shown in model form as a land- and seaplane, and the Do. 18 and Wal are suitably publicised.

Junkers are getting plenty of attention with their model of the four-engined Ju. 90 for Deutsch Lufthansa. The engines are BMW 132 H (820 h.p.), span 115 ft. and all-up weight 44,100 lb. It is very thoroughly flapped, has a smooth metal skin and a cantilever tail with twin fins and rudders. The radiators are underslung and the wheels retract into their long tail fairings.

Batas display the dainty little Zlin XII two-seater which may have the Persy or Mikron engine.

The Avrolanda concern, which has built Dornier Wals and Curtiss Hawks for the Netherlands Indies Air Force, shows appropriate models and Irvin parachutes.

Examples of these latter, by the way, are in evidence on the defence stand which also displays items illustrative of the entire range of Service equipment and activities.

Public Bodies

The Hollanders certainly seem to realise the value of publicity: there are excellent showings by the Civil Aviation Service; Post Office Department; Municipal Commercial Establishment; the City of Hague (with a great map, made by unemployed, of world airways); Royal Netherlands Touring Bureau and Aero Club and its associated Central Youth Committee; the National Aviation Fund and Laboratory; the National Training School; Netherlands Red Cross; Union for Protection Against Aerial Attacks; and the Union of Netherlands Gliding Clubs.

K.L.M. and K.N.I.L.M. have put up an extraordinarily fine show, presenting statistics in an easily digested form.

The Deutsch Lufthansa stand was likewise a model of its kind. It seems, in fact, that all the world's big air operating companies—including Imperials (represented on the K.L.M. stand) have first-rate publicity departments.

Philips exhibit their latest radio and lighting equipment; the Netherlands Titanic works show ropes and varnish of various natures; the Netherlands Dunlop Tyre and Rubber Company present a range of tyres, wheels and pneumatic gear.

Negretti and Zambra are represented by typical products; and Lorenz exhibit their popular equipment. Askani and Siemens display of instruments and accessories which are absorbing and comprehensive in the extreme. The Argus brake which is available for demonstration is being built over here by Averys.

A Wright Cyclone, electrically controlled Curtiss airscrew and Menasco six-cylinder Buccaneer are on the K.L.M. stand.

Schwartz, Heine and V.D.M. airscrews are displayed to great advantage.

The stand of Ed. Pelger offers, among other things, wares of D. Lewis, which seem to be popular abroad.

Photographic, respiratory and fire-fighting apparatus, collapsible dinghies, parachutes and model aircraft are not neglected; and, in all, there are about a hundred exhibitors.

Fokker presents the D.21 fighter (above), adopted as standard by the Dutch, Danish and Finnish Governments. Powered with the Mercury VII it does 278 m.p.h.

The Koolhoven F.K. 26 is one of a number of pioneer types and was obtained from a source apparent in this photograph of the machine being shipped to Holland some little time back.

ZURICH INTERNATIONAL—II

The End of a Great Flying Week : Britain's Fury Pilots Raise a Cheer

Air Vice-Marshal E. L. Gossage, A.O.C., No. 11 (Fighter) Group—which group embraces No. (F.) Squadron, four of whose Furies visited the meeting—chatting with Herr Von Gronau, president of the German Aero Club.

FRIDAY in the Zurich International Week came like the lull before the renewed storm. Practically all the notables took the day off in readiness for what promised to be a hectic week-end. Dubendorf Airport was preparing for its biggest show yet after the previous Sunday's experience, when 80,000 of Zurich's 200,000 population turned up.

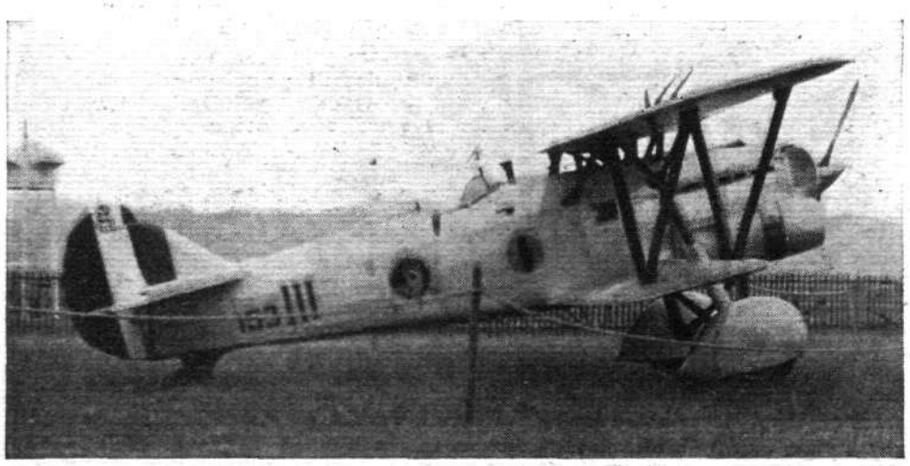
Our own Fury contingent was transported by car to Lucerne, but not until they had done a modicum of work for their livings. Although the majority of them had attended most of the night-long festivities they were all out at Dubendorf by 9 a.m. For half an hour they put in some practice for their displays on Saturday and Sunday.

When they left it was to make way for the Italian fighter squadron, mounted on Fiat C.32 machines. It had been the general opinion that France had shown up best in formation work for polish and finish, but the Italians made up for plenty with their superior dash. For exactly an hour they rehearsed putting up a good many formations new to one used to the more refined British exhibitions. Besides normal Squadron "V"—with the tenth machine's propeller biting just behind the leader's tail—they flew in "H" and "T" formation; then a dive in "V," ending with a completely vertical turn to port by all ten; two loops in flights of five, the second ones ending beneath 200 feet; the ten looping in line astern, this time with the last man coming practically to ground level by the time he'd finished; looping in fives and half-rolling into another half loop; rolling in fives—finishing somewhat raggedly; starting rocket loops in fives from 20 feet and stall-turning off the top to dash into that spectacular form of converging attack immortalised at Hendon in the great past by the Navy's Flycatchers; finally a spectacular roll in the odd formation of a leading flight of five linked to the rear three by two intermediate line-astern people. Such were the Italians.

To be noticed after the Fiat turn was the generously spatted and radiatored Dewoitine 510 fighter monoplane that claims 250 m.p.h. for itself. Its standard equipment includes a driving mirror giving its pilot a fairly satisfactory view of sky behind his tailplane.

A German pilot, Stoer, in a Messerschmitt 35, began his individual display with a loop that turned into a steady upside-down dive. He continued his dive, to pull his fin off the grass with what looked like ten feet to spare. The rest of his show was in the same tradition.

The gliders deserve their own mention. One is assured that the club members who fly them spend about 100 francs—roughly five pounds—a year on their sport. The machines were dragged up in pairs and cast off to formate down. Quite obviously they had to force themselves down to be grounded from 1,500 feet inside their ten minutes' allowance.



The Italians put up an original formation aerobatic show on Fiat C32 biplanes, one of which is seen here. Note the long aileron mass balances.

They finally chased one another down a tight spiral, sideslipped in and settled within 20 yards of each other bang outside their own enclosure. And nobody on the aerodrome considered it deserving of special applause.

Two of Belgium's Hispano-powered Fairy Foxes showed they were as fast as most dog-fighters at Dubendorf, three Czechs landed with the ropes still unbroken, and that just about finished Friday, except for the arrival by Swissair from London of A. V.-M. Gossage to see the Furies perform next day. Meeting him at Dubendorf were Group Capt. Colyer, our Air Attaché in Paris and Group Capt. Medhurst, outward bound for Italy. Group Capt. Don, our Berlin Attaché, was also in Zurich.

The Furies

Without getting carried away by patriotic fervour we can hand it to the Furies at Saturday's post-final show. The actual evolutions of the "diamond" formation are well known enough in England, since they were seen at the Hendon Display, and at Zurich they were not varied. But in the quiet, business-like finish and polish of the display the British team excelled. One of the Furies in the flight, incidentally, was actually among the first batch ever delivered to the Air Force, a good many years back now.

General Milch was more than kind in his remarks to Donaldson, Hanks, Walker and Boxer when they got down. And our pilots were the only ones to get a separate cheer from the enclosures after they had left their machines to walk back to their seats. Very satisfying indeed.

Count von Hagenburg opened the afternoon's serious business with the kind of aerobatics we have come to expect from competent German pilots in Bücker Jungmeisters. He had been upside down and rolled right way up again by the time he crossed the aerodrome boundary after taking-off.

The French Patrouille d'Etampes in its parasol Moranes (490 h.p. Gnôme-Rhônes) did not live up to their justly

earned reputation during the week for precision in their formation stuff. Maybe it was the early afternoon heat bumps —they were obviously irritating. But the French put one thing across well, a complete bunt in Squadron V—a harrowing spectacle to watch when executed on high, thick wings braced by long stays.

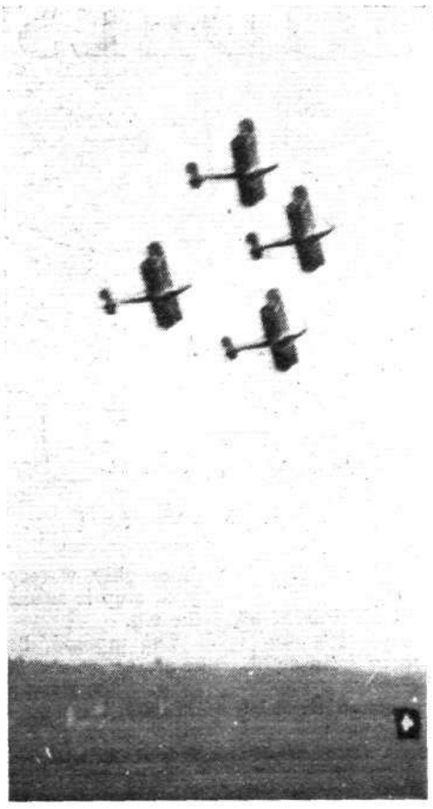
Two parachutists, Wurmli and Williams, appalled by delayed drops from Swissair's venerable Fokker F VII.

Five Gipsy I Moths of the Lausanne section of the Swiss Aero Club formated with changes pleasingly but rather slowly executed before Capt. Burckardt led out his eight-year-old Dewoitine D.27 fighters of the Swiss Air Force. Owing to the Swiss training system the Service pilots have to do most of their practice in spare time. Their show was very creditable, lines abreast—several times—"L" and "T" shapes, and several of the other more usual ones.

Hanna Reitsch in her red overalls is an official German Flugcapitan, a rank that is not awarded until 500,000 kilometres have been flown. She was towed up to a safe height in her "Habicht" ("Hawk"), said to be the only glider in existence capable of the inverted loop. She did this manœuvre several times on her way down, mixed up with loops, steep turns, slow rolls, and what looked as nearly as comfortable to a T.V. dive. Her last dive took her down to a steep turn at no altitude over the parked Furies.

Later on Udet took her up in his Fieseler "super Gugnunc." Lifting into a 45-degreeish climb after a 30-yard run was something new on Hanna. She was to be observed holding on tight when Udet crawled in over the multi-flagged grandstand to sit down with a gentle thump and a spreadeagling of an elastic-seeming undercart. Overhead Reginald Brie hovered in his C.30.

The Italians came on last and repeated



The four Hawker Furies in their famous diamond formation.

their rehearsal of Friday. Ten Fiats make much more noise than four Furies, and the crowd liked it.

Sunday started with rain and A.V.-M. Gossage and his party laying an official R.A.F. wreath on the Dubendorf pilots' memorial, and ended, as far as the International Meeting was concerned, with a cloudburst dead overhead just as the Furies were taking off. It caused acute anxiety for us on the ground, but gave Flt. Lt. Donaldson and his team an opportunity for scoring an even bigger triumph than Saturday's.

Although they disappeared at the top of some of their more prolonged rocketings, there was otherwise no departure from their ordered aerobattings. And the crowd, huddling beneath umbrellas, appreciated it.

On Saturday the Italians got the programme changed so that they came after the Fury turn instead of before. Perhaps they regretted it on Sunday. With the clouds coming down the programme was abandoned at the end of the Fury turn.

Otherwise Sunday went as per the day before. Hanna Reisch glided and Willi Stör aerobatted with his compatriot Graf von Hagenburg. The latter won the aerobatic competition fairly comfortably from two Swiss contestants, Kuhn and Hörning.

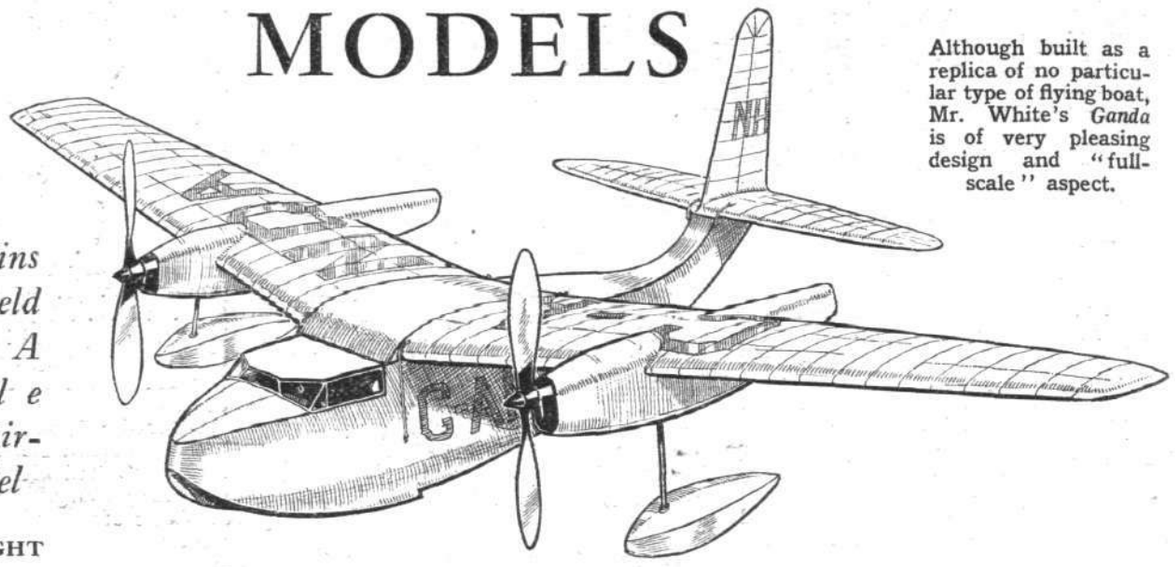
The Czech squadron led by Lt. Novak in their seven Avias (350 h.p. Avia RK 17 motors) gave a fine, polished display of non-sensational formating, including several new shapes in which pilots cricked their necks to fly immediately beneath one another. They won the single-seat category with 243 points over Remondino's Italians with 233. The French and three Swiss squadrons came next.

Briefly . . .

The B.F.W. fighter and the Henschel, which took first and second places in the climbing and diving competition, were fitted with V.D.M. constant-speed airscrews. These, as a matter of interest, are being built in this country by Constant Speed Airscrews, Ltd., of Warwick. Either electrical or hydraulic operation can be specified and the "works" are behind the engine, the action being transmitted to the actual operating mechanism at the boss by means of a flexible drive..

AND AT HOME IN ENGLAND : The Maharajah of Nawanagar, accompanied by the Maharanee, visited the R.A.F. Station at Abingdon. Seen in front of a Bristol Blenheim are (left to right) : Wing Comdr. C. E. W. Lockyer, Mrs. Guilfoyle, Air Comdre. Sidney Smith, O.B.E. (A.O.C. No. 1 Bomber Group, who received the visitors), the Maharajah, Mrs. Sidney Smith, P/O. Hull, the Maharanee, Mr. W. Rootes, P/O. Kemp, Mrs. Edelsten, Group Capt. Guilfoyle, O.B.E., M.C., Mrs. Walmsley, Miss Smith, and Wing Cdr. H. S. P. Walmsley, O.B.E., M.C., D.F.C. The visitors saw demonstrations by Blenheims and by Hawker Hinds of No. 82 (B.) Squadron. (*Flight* photograph).

MODELS



Although built as a replica of no particular type of flying boat, Mr. White's *Ganda* is of very pleasing design and "full-scale" aspect.

France Wins the Wakefield Trophy: A Notable Marine Aircraft Model

By M. R. KNIGHT

France Wins Wakefield Cup

THE Wakefield Cup was won for France by M. Fillon, at Fairey's Great West Aerodrome last Sunday. His model was timed for 11 min. 23 sec. when it disappeared from sight. Too late to make its third flight, it was retrieved from the grounds of a college three miles from Woking, some 16 miles away! Its two flights, divided into three, gave the best average of the day, 253.23 sec. This was France's first Wakefield victory. The successful model, designed by M. Vincre, had a straight-chord wing mounted on, and braced by two short wires to, a fuselage of diamond cross-section.

Great Britain secured second and third places, Mr. R. N. Bullock (Blackheath M.F.C.) averaging 194.53 sec. on three rise-off-ground flights with a shoulder-wing model of fine lines and proportions. It was constructed in haste, to replace the one flown in the eliminating trials and lost on a subsequent flight. Innumerable parts went to the making of the circular-section fuselage, including 12 to every bulkhead. Unlike any other model, hinged ailerons, elevators and rudder were employed for final adjustments. Mr. R. T. Howse (Bristol W.M.A.C.) averaged 193.46 sec. with a straight-cord high-wing, with monocoque fuselage. Fourth and sixth places went to Belgium, and fifth to Sweden.

Teams from America, Belgium, France, Germany, Great Britain, Holland and Sweden took part, and also one youth from Norway. Models from Canada, New Zealand and South Africa were flown by British modellists. The American models got away with an almost vertical climb, hung on their airscrews, and stall-turned down-wind, a procedure calculated to contact any thermals, which, by the way, did play their part in the contest, despite the raising of the minimum weight from 4 oz. to 8 oz. with the idea of making sheer efficiency the sole determining factor. The new rule did, at any rate, result in greater diversity in design, including sundry beautiful monocoque and semi-monocoque types. I propose to return to the design aspect on a later occasion.

A most enthusiastic concourse of aero-modellers gathered at the Park Lane Hotel on Monday evening as guests of Lord Wakefield of Hythe, who sent through the chairman, Dr. Thurston, a most encouraging message to the twelve nations assembled. The winning French team was enthusiastically cheered, and M. Guillet, who received the Wakefield International Trophy, offered a welcome to all teams in France next year.

The Flying Boat "Ganda"

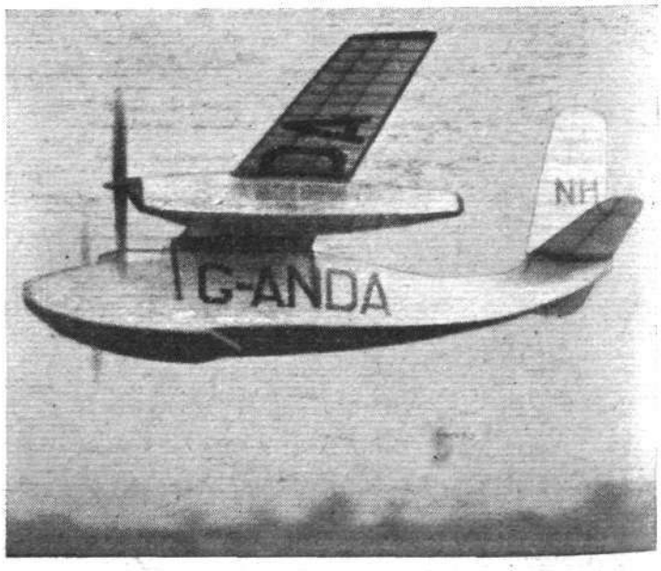
THE model described this month is the flying boat with which Mr. H. E. White, B.Sc., won the C. H. Roberts Trophy of the North Kent M.A.S. Normally, the flying boat is neglected, largely because of the difficulty of combining the necessarily high thrust-line with a satisfactory location of the rubber motor. Mr. White's solution is to adopt a twin-engined layout, an uncommon arrangement for a model, and particularly meritorious in connection with a large boat. *Ganda* weighs 2½ lb., of which 6 oz. consists of rubber, and has approximately 3 sq. ft. of wing surface.

The hull is 45 in. long, 7 in. wide, and 7 in. deep, and weighs 6¾ oz. It consists of spruce longerons and plywood bulkheads, covered with $\frac{1}{32}$ in. balsa and then Jap silk, thoroughly waterproofed by four coats of banana oil. The ½ in. step is situated 14 in. from the nose, and 3 in. ahead of the c.g.

The tapered, back-swept wing, and the nacelles, are built as a single unit, and coupled to the hull by means of rubber strip. The wing section is Clark Y, the span 5 ft. 6 in., and the chord tapers from 7½ in. to 5 in. For the leading edge, which is swept back 10 in., ¼ in. × ¼ in. balsa, rounded off, is used, and for the trailing edge, $\frac{1}{16}$ in. square birch with ¼ in. balsa fairing. Each of the two main spars consists of a length of $\frac{3}{32}$ in. square birch at the top and bottom of the ribs, with $\frac{3}{32}$ in. balsa connecting them. There are 42 ribs of $\frac{1}{16}$ in. balsa, spaced 1½ in. apart. The centre section is covered with $\frac{1}{16}$ in. balsa; from there to the nacelles Jap silk is used, and for the outer panels bamboo paper. Each nacelle is 23 in. long, 3 in. wide, and 4 in. deep, and consists of four ⅛ in. square spruce longerons and numerous balsa stringers and cross-pieces. It houses two 24 in. skeins of ¼ in. rubber, turning an airscrew 16 in. in diameter and 16 in. in pitch, at a higher speed through a 2:1 gearing. There are 4 degrees of downthrust. The wing floats are built of $\frac{1}{32}$ in. balsa with solid balsa bulkheads, and are covered with silk. They are carried on a single bamboo strut which plugs into a socket in each nacelle.

The tail-plane, which lifts throughout the flight, is 28 in. in span, and has a maximum chord of 7 in. Built integral with it is the 12 in. fin, both being covered with bamboo paper. The complete unit is secured to the hull with rubber strip.

Hand-launched, *Ganda* has flown for 30 sec. and reached a height of 200 ft. Flown from the water in rough weather, 25 sec. has been recorded. A smaller and handier boat, by the same constructor, with a span of 4 ft., a wing area of 2 sq. ft., and weighing 12 oz., has flown hand-launched, and is about to undergo water trials.



Ganda in flight at Fairey's Aerodrome.

LOCKHEED

A complete range

Lockheed hydraulic actuation and control gear is made in a complete range to suit all aircraft requirements. The top illustration shows a typical Lockheed undercarriage retracting jack, other jacks also being made for operating wing flaps, bomb doors, etc.

The centralised control valve operates any number of slave units, either separately or together, the lever returning automatically to the neutral position immediately the selected unit has functioned.

The lower illustration shows the new multi-way selector valve which can be used to operate any one of a number of slave cylinders of various sizes and in various parts of the machine, using only the one pump appropriately connected by the selector.

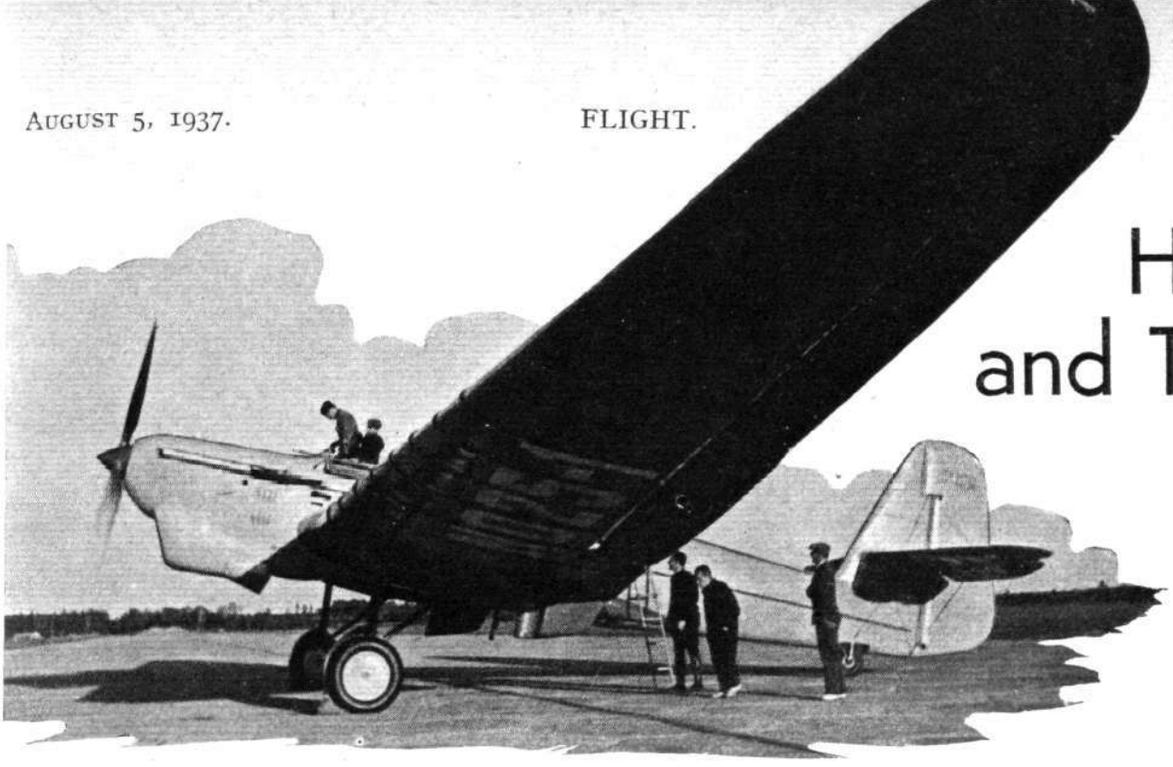
Also the Airdraulic shock absorbing undercarriage strut combining air cushioning with hydraulic shock damping, as now used on the majority of high performance aircraft.

AUTOMOTIVE PRODUCTS COMPANY Ltd.,
LEAMINGTON SPA ENGLAND

LOCKHEED
hydraulic ACTUATION

Covered by British and foreign patents and patents pending

HERE and THERE



PIONEER: The Russian A.N.T.25 (950 h.p. M.34) which lately captured the world's long-distance record by flying for about 6,650 miles in 62 hours. This is the world's largest single-engined aircraft. Despite the 947 sq. ft. of wing area the take-off occupied 2,000 yds.

Less G, More V

SINCE a Grumman fighter disintegrated in a 9G pull-out from a terminal velocity dive the U.S. Navy has become rather less exacting in the matter of accelerometer readings, and Mr. James B. Taylor, who put the new Seversky Cyclone-engined Navy fighter through its diving tests the other week, was required to record only 7½G. It is said that in a series of dives ranging up to 10,000 ft. in length the Seversky touched something between 500 and 600 m.p.h. To protect his internal organs Mr. Taylor wore a tightly laced wide leather belt.

The machine concerned is generally similar to the 85 U.S. Army pursuits now being delivered, but is fitted with the Cyclone in place of the Twin Wasp.

Two Recent Books

Sky-Storming Yankee. By Clara Studer. Three dollars. Stackpole Sons, 250, Park Ave., New York City.

THE tale of Glenn Curtiss's rise in the world is a real twentieth-century romance. Miss Studer's study of this silent, ingenious Yankee is quite a model for modern biographers in that Curtiss the man is pictured without recourse to pseudo-metaphysical discourses.

Not only is the book a successful biography, but it records Curtiss's technical successes, the setbacks he met in the early days (he started in a bicycle repair shop) and his encounters with such giants as Alexander Graham Bell, Henry Ford and D'Annunzio.

Despite the prominence of the name Curtiss in American aviation to-day, many of the younger aeronautical generation will be surprised, on reading this book, to learn the true extent of his contributions to aeronautical knowledge.

The Aircraft Year Book for 1937. Edited by Howard Mingoes. Aeronautical Chamber of Commerce of America, Inc., 30, Rockefeller Plaza, New York.

BARRING the archives of the American Department of Commerce it is doubtful if there is any more useful concentration of general information on American aeronautical activities than this excellent five-dollars' worth. It is claimed that the contents are from official sources, which include Government departments, manufacturers and other aeronautical agencies.

Comprehensive in the extreme, it is lavishly illustrated with photographs and line drawings of current aircraft and engines and is rich in tabulated data of just the right sort.

Air League Lectures

THE Air League announces that its lecture subjects for 1937-1938 are as follows: Air Defence; Air Control of Frontiers; Aviation and the Empire; The Uses of Aeroplanes; History of Aviation; Learning to Fly; Recent Developments in Private Flying; Recent Developments in Commercial Aviation; Recent Developments in Military Aviation.

All these talks are non-technical and can be illustrated by slides, if lantern and screen are available. The Air League does not provide this equipment.

As in the past, no fee is asked for the lecturers' services, but a refund of expenses (whole, or in part) will help the League to extend its lecture programme during the coming season.

Application for lectures should be addressed to the Secretary-General, Air League of the British Empire, 19, Berkeley Street, London, W.1.

The Balloon that Talks by Itself

SOME details are available of a particularly interesting sounding balloon recently developed in Germany. The Telefunken "Radiosonde," as it is called, is an ingenious combination of meteorological measuring instruments with a self-operating radio transmitter.

Existing sounding balloons usually employ various recording instruments which are intended to be recovered and examined after descent—a method with obvious disadvantages in thinly populated territory or over the sea. In any case, an appreciable period of time must elapse before the instruments are recovered and the results of the measurements assessed.

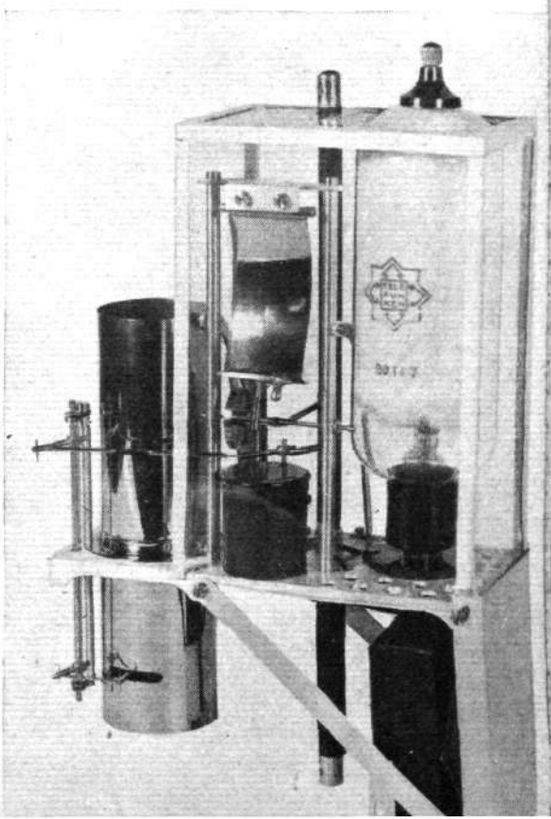
The "Radiosonde," on the other hand, delivers the data during the actual ascent of the balloon. The method is, obviously, specially valuable for information regarding temperature distribution. A bi-metal thermometer moves a small rotating condenser in the tuned transmitter circuit. As the balloon ascends the changes effected by this means are continually recorded in the ground observation station through a receiver specially constructed for the purpose.

Atmospheric pressure is also measured to ascertain height. This is signalled by a series of short, sharp taps interrupting the transmission oscillation—exactly how they are produced, however, is not disclosed.

In order that the accuracy of the measurements may not be adversely affected by humidity effects almost the whole of the transmitter is enclosed in a glass container devoid of air.

The instrument is suspended between the halves of a vertical aerial. The lower wire hangs down free while the upper one is fastened to the balloon.

As the balloon, in order to achieve really useful results, must reach a height of some 30 km. (18½ miles), weight must be as low as possible. The "Radiosonde," including the transmitter batteries, weighs, therefore, only 0.9 kg. (2 lb.). P. R. V.



The sounding-balloon's recording apparatus and transmitter. It is about 15 in. high.

THE KING'S ENVOY One of the first flying views of the specially prepared Airspeed Envoy (two Armstrong Siddeley Cheetah Xs) which is maintained for the transport of Royalty and State personages. The top speed is over 200 m.p.h.

Light Work

AN ingenious light-operated electrical relay has lately been produced. Selenium and photo-electric cells have been in use for several years for bringing various kinds of lighting system into action at sundown, but, in most cases, these entail the additional help of costly and delicate equipment which needs fairly frequent attention.

The new Chilowski light relay operates on a photo-chemical principle depending upon the electrolysis of dilute hydrochloric acid. If a glass container is filled with equal volumes of hydrogen and chlorine gas and exposed to sunlight, the gases combine instantly (or with a slight delay, depending upon the intensity of the light). In darkness no combination occurs.

In the glass container which forms the basic part of the Chilowski instrument, electrolysis of the dilute acid produces the hydrogen and chlorine. On the production of the gases pressure is increased, thereby operating a switch through the agency of a flexible portion of the container (or, alternatively, by moving a mercury column) and automatically lighting, say, the parking lamp of a car. Should the gases now be exposed to sunlight they combine to form hydrochloric acid gas, which at once redissolves in the aqueous acid solution, so releasing the pressure and operating the switch to put out the light.

This simple device, which should have applications in aeronautics, has been produced complete as a disc two inches in diameter and half an inch in width, the weight being only two ounces. The French firm Société Tubest of Fere-en-Tardenois are developing this patented relay, while International Technical Developments, Ltd., of Thames House, London, S.W.1, are watching their interests in this country.

Alloys and the Atlantic

IT may truly be said that the Short Empire *Caledonia*, of Atlantic fame, is a light alloy flying boat, for apart from many tons of aluminium alloys in the form of extrusions, tubes, rod and so on, no less than about eight tons of light alloy sheet are used in the construction of each Empire-type boat.

It is obvious that one of the main considerations in choosing materials for such duty is resistance to corrosion by marine atmospheres. The "Alclad" alloys manufactured by the Northern Aluminium Company, Ltd., were selected for the sheet and strip applications. These included the stressed-skin covering for all hull, wing and float surfaces with the exception of parts of the control surfaces, and rolled sections for ribs, hull stringers and frames, etc.

The characteristics and mechanical properties of these alloys may prove of interest. In the first place, the high corrosion resistance is stated to be due to the composite nature of the sheet, consisting as it does of a strong alloy core coated with aluminium of high purity, over 99.7 per cent. This coating exercises an electrolytic protection, as in the case of zinc on galvanised articles, and as the pure aluminium is electro-negative to the core the latter is shielded from attack in the presence of electrolytes at the expense of the coating. As the latter, however, is high-purity metal which, as is well known, has superior natural resistance to corrosion, the loss is extremely small and the life of the sheet is greatly extended.

From this property emerges a fact which is not generally appreciated, namely, that the protective influence, being electrolytic and not mechanical, has its effect on cut edges and alloy rivets, etc., which may be in contact with it.

Another important advantage claimed for the "Alclad" alloys from a works point of view is its superior forming properties as compared with "straight" alloys. The coating, being in the soft state and having a definite diffusion zone at its junction with the core, provides a surface of graded elongation which greatly facilitates working.

In the Short Empire boats two "Alclad" alloys were used, "Alclad" NA 17ST to specification L.38 and "Alclad" NA 24ST to specification DTD.275, the mechanical properties as required by specification being as follows:—

	"Alclad" NA 17ST.	"Alclad" NA 24ST.
0.1 per cent. Proof Stress tons/sq. in.	13.5	16
Ultimate Tensile Stress tons/sq. in.	24	26
Elongation per cent. on 2in.	15	15

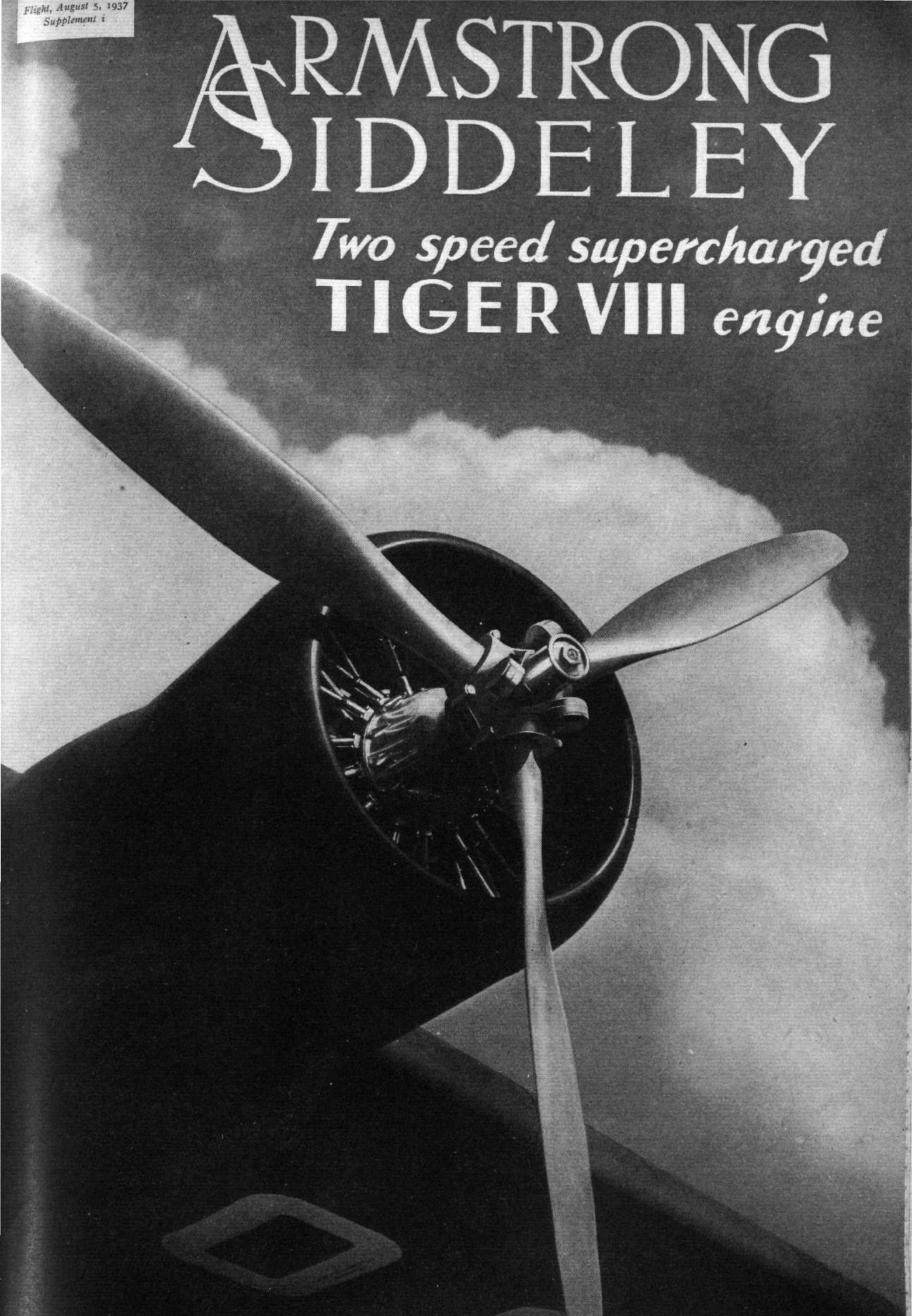
Major-Gen. Sir William Boyce

FLIGHT regrets to record the death of Major-General Sir William G. Bertram Boyce, K.C.M.G., C.B., D.S.O., who has been a member of the Rolls-Royce directorate since 1933.

ARTFUL DODGER The latest armour-decked bomb-target boat built by the British Power Boat Co. It can be controlled by radio.

ARMSTRONG SIDDELEY

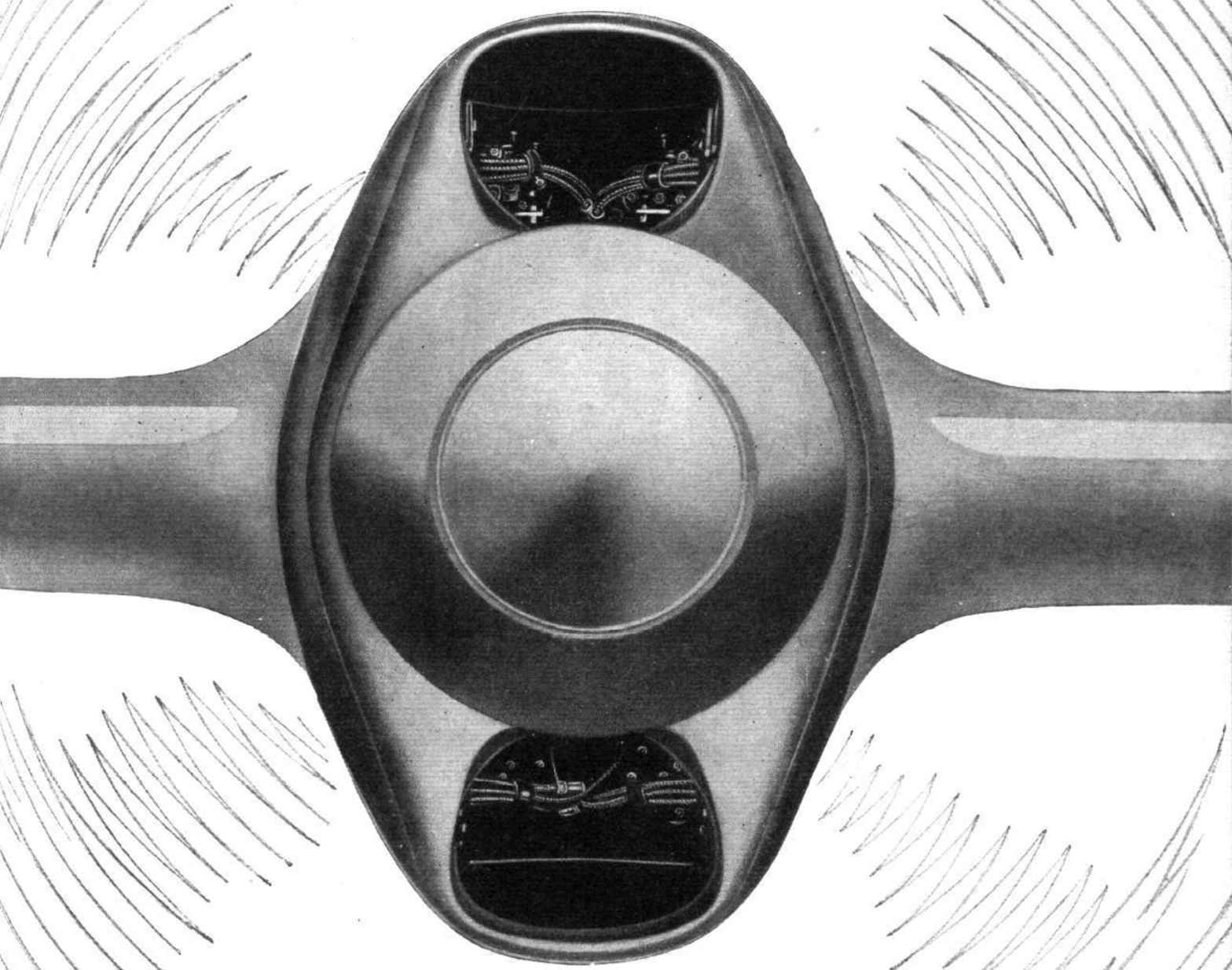
Two speed supercharged TIGER VIII *engine*



ARMSTRONG SIDDELEY MOTORS LIMITED : COVENTRY : ENGLAND

GLOSTER AIRCRAFT CO., LTD., HUCCLECOTE, GLOS.

NAPIER-HALFORD DAGGER



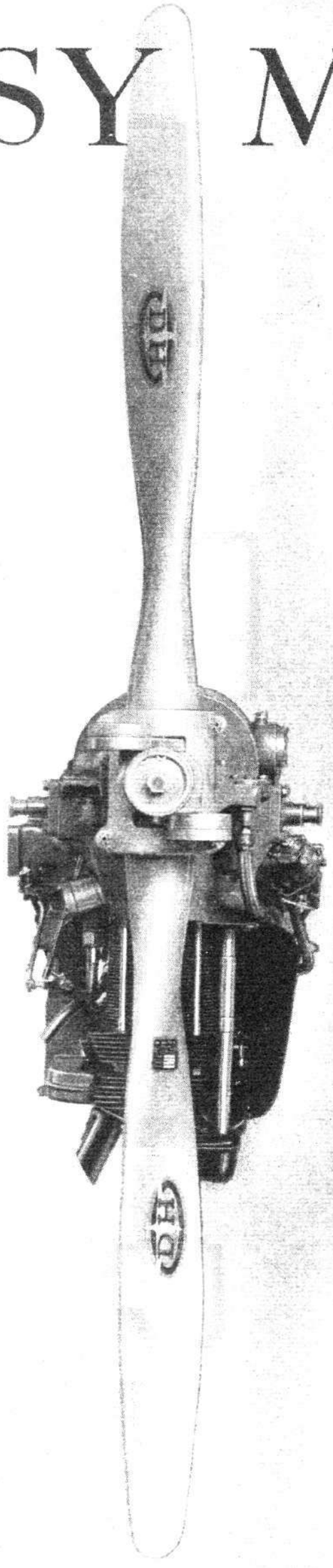
FRONTAL AREA 5·27 SQ. FT.

GIPSY MAJOR

Series II Engine

with de Havilland 1000-size controllable-pitch airscrew.

Maximum power 140 h.p.
Frontal area 3.82 sq. ft.



Designed for universal operation with long life, sheer reliability and economical maintenance.

Nearly six thousand Gipsy Engines have gone into use throughout the world and their record of satisfactory service is unrivalled in their class.

THE DE HAVILLAND AIRCRAFT CO. LTD., HATFIELD AERODROME, HERTFORDSHIRE, ENGLAND

The TREND of INVENTION

Recent Aeronautical Patents Reviewed

Emergency Lowering of Undercarriages

THIS patent suggests means of emergency lowering of an undercarriage in the event of a failure of the normal gear. Two arrangements are described, the one using a spring as a source of energy and the other using compressed air. In the first, a spring is normally held in a compressed state by a locking device, such as a tapered conical member bearing against locking balls. This device is released by the pull of a cable, and it then straightens a folding radius rod and lowers the undercarriage.

In the second arrangement a hydraulic jack is used in which the ram slides over a fixed rail. The interior of this rail forms a reservoir for compressed air and a manually-operated valve can be operated to cut off one end of the jack from the hydraulic circuit and connect it to the compressed air, which will then force the piston outwardly to lower the undercarriage.—*Patent No.* 460316: *G. H. Dowty.*

Control of Variable-pitch Airscrews

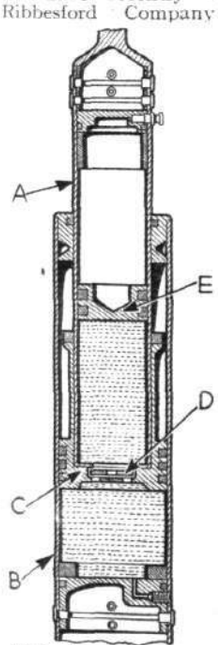
THE advantages to be derived from the use of airscrews in which the pitch is automatically varied in order to keep the speed more or less constant, independent of the power absorbed, are now well known. Means by which this automatic control can be effected are described in this patent.

The pitch of the airscrew is controlled by a liquid pressure system acting against the centrifugal force in the blades. A constant-speed electric motor and the aircraft engine are both coupled to a valve in the hydraulic system. This valve, when the motor and the engine revolutions are the same, prevents any flow of oil and so keeps the airscrew at the same pitch.

When, however, the speeds of these two units vary, then more liquid is pumped into the pitch-control cylinder or allowed to escape, depending on the relative variation in speed, and in this way the pitch is correspondingly altered.—*Patent No.* 457808: *United Aircraft Corporation.*

Shock-absorber Strut

TWO patents dealing with the same type of oleopneumatic shock-absorber strut have recently been granted to the Ribbesford Company. The general construction is shown diagrammatically in the illustration. It consists essentially of two tubes, a plunger A which telescopes into an outer tube B. Attached to the inner end of the plunger is a head C with suitable sealing glands which contact with the inner surface of the outer tube and which form the subject of the second patent. In this head is an annular plate D forming a flutter valve which on the compression stroke exposes a number of holes in the head of the plunger and which closes them on the expansion stroke, thus varying the degree of damping. The air and oil are separated by a floating piston E which, it is claimed, confers many advantages on the strut. If, for example, an oil leak should develop during flight, the air pressure would force the floating piston against the plunger head and so relieve the remaining oil pressure, thus allowing sufficient oil to be left to ensure a safe landing.



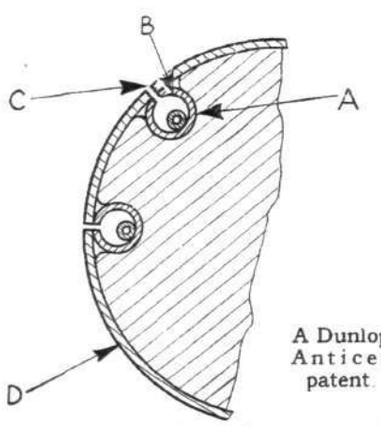
Ribbesford shock-absorber strut.

Further, the packing glands are always working in oil, thus avoiding sliding air seals. Moreover, the strut will function in any position, since the air is always confined to one end by the floating piston. The construction enables ordinary drawn tubing to be used, and the strength and resisting movements are such that the weight is kept low.

The second patent relates to the packings in the plunger head. These consist of inclined rings, and the space between them is connected to the central opening in the plunger head, and so is always on the side of the flutter valve on which the pressure is greater. In this way the higher pressure is always transmitted to the space between the packings to force them against the cylinder tube and provide an effective seal. Furthermore, the seal has a low static friction coupled with a high dynamic friction, particularly during the rebound movement when it is most required.—*Patents Nos.* 461144 *and* 461577: *Ribbesford Co., Ltd., and Others.*

Combating Ice Formation

A METHOD by which anti-icing liquid can be distributed in a positive manner over a given surface and in which the distribution can be equal or unequal as desired, is described in this specification, and is illustrated in the accompanying diagram,



A Dunlop Anticer patent.

which shows a sectional view of a leading edge in which the device is incorporated.

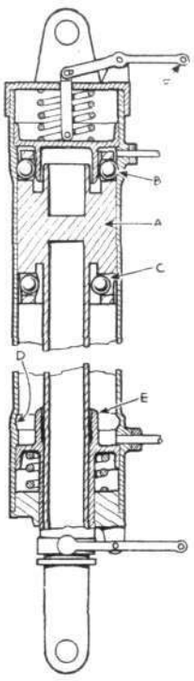
The liquid is contained in a tube B which may be of metal or rubber, as desired. Along the edge of this tube are a number of apertures, C, through which the liquid can pass when subjected to a comparatively low pressure of the order of 5 lb./sq. in. Inside this tube is a small tube, A, which is capable of being distended by air or hydraulic pressure, whereupon liquid is expelled through the apertures C on to the surface D that it is desired to keep free of ice. Owing to the varying thickness of the tube A along its length, distention will establish annular contact between it and the outer tube at intervals, and thus a volume of liquid will be isolated and ultimately expelled as described. The intervals of contact between the tubes may be equal or unequal as desired, and thus the volumes of liquid dispelled can be varied from place to place as required.—*Patent No.* 462570: *Dunlop Rubber Co., Ltd., and J. Wright.*

Locking Devices

MEANS whereby an adjustable strut or a fluid-operated jack can be mechanically locked in either extreme position is described in Patent No. 458005. The unlocking can be effected either automatically or by separate manual operation.

The cylinder and piston of the jack or strut are shown in the illustration. The piston head A has at each end annular projections which are slotted to receive rings of balls B and C, the diameter of the balls being greater than the thickness of the annular projections.

Grooves D are formed in the cylinder at each end and the balls are pushed into these by the projections E, attached to a spring-loaded plunger. When the piston moves to one end of the strut, the balls push back the plunger until they are opposite the groove, when the inclined edge of the plunger forces them into the groove and the plunger slides down inside the ring to hold them in position.



Jack-locking (Pat. No. 458005)

The unlocking is effected by the fluid pressure which operates the jack and which causes the plunger to move out against its spring. Alternatively, the plunger may be moved by a lever mechanism F from outside the tube.—*Patent No.* 458005: *Elektronmetall G.m.b.H.*

Undercarriage Warning Device

WHEN an aircraft is fitted with a retractable undercarriage it is very desirable that some indicating and warning device be provided to inform the pilot before he attempts to land whether the undercarriage is extended or not.

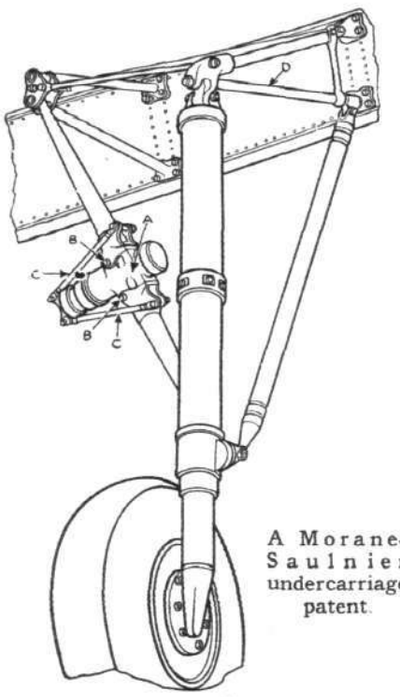
With the arrangement described in this patent no indication is given so long as the aircraft is in the air and flying at normal speed with the undercarriage retracted. As soon as the pilot eases back the throttle prior to landing a sign displaying the word "UNDERCARRIAGE" is illuminated and a horn is sounded to warn the pilot to lower the undercarriage. As soon as he commences to do so a red lamp lights up and remains alight until the undercarriage is locked in the landing position, when the sign and the red lamp are switched off, the horn is stopped and a green lamp is lit.

In addition to a master switch the system is controlled by switches incorporated in the undercarriage mechanism and by a double switch controlled by the throttle lever.—*Patent No.* 457562: *Fairey Aviation Co., Ltd., M. J. O. Lobelle and E. Voss.*

Retractable Undercarriage

THIS retractable undercarriage is composed of three struts, which constitute a pyramid structure. Two of these struts are capable of rotation about a common axis at their points of connection to the aircraft, while the third is capable of folding about some central point. The folding is effected by a fluid-operated jack which is carried entirely on this strut.

In the illustration overleaf the jack A is mounted at right angles to the strut when this is in its extended position, and the two parts of the strut are pivoted at BB to the jack cylinder. The strut is also connected by links CC to the jack plunger. Extension of the jack, therefore, folds the



A Morane-Saulnier undercarriage patent.

struts and so causes the two other struts to rotate about the common axis D.

The novelty of this invention lies in the application of a jack carried by a strut to an undercarriage unit of a pyramid type, which folds in any direction dependent upon which of the legs the jack is attached to.—*Patent No.* 456632: *Aeroplanes Morane-Saulnier—Société Anonyme de Constructions Aeronautiques.*

Variable-pitch Airscrews

THE object in varying the pitch of the blades of an airscrew is to keep the number of revolutions approximately constant even under variations in driving torque or resistance to rotation. This results in a more adequate use of the available engine power in starting, and the avoidance of excessively high speeds or rotation when diving.

The control of the pitch may be effected by centrifugal governors acting against a compression spring in such a way that increase in speed causes an increase in the pitch angle of the blades and therefore a corresponding increase in the resistance.

In this patent it is proposed to have in addition to the above control, depending on speed, an over-riding control depending on the throttle opening, so that for a given output of the engine the airscrew has a corresponding controlled speed. This is effected by varying the tension of the governor spring by a linkage connected to the throttle of the engine. The adjustment is thus effected automatically, and this differs from previous arrangements, where an over-riding control has had to be hand operated.

In this way the datum line about which the speed control device works is varied with the amount of fuel supplied to the engine.—*Patent No.* 460912: *Junkers-Motorenbau G.m.b.H.*

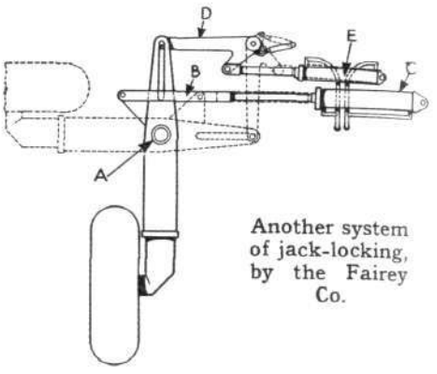
Hydraulic Control Valve

IT has become common practice to operate retractable undercarriages by hydraulic jacks to which liquid is supplied under pressure to either one end or the other, depending on whether extension or retraction is desired. The liquid pressure is generated either by an engine-driven pump or by a manually operated pump and the direction of supply to the jack is determined by a control valve actuated by a lever.

Such a valve is described in this patent. With the lever in its central position, liquid from the pump is circulated idly. When the lever is moved in one direction against a spring, it is held there by a catch and liquid under pressure is fed to one end of the jack. When the jack movement is completed and the flow ceases, the catch is automatically released and the lever returns to its central position, the pipe lines are closed and the jack is hydraulically locked. Movement of the lever in the opposite direction reverses the process.—*Patent No.* 457709: *A. A. Rubbra and R. N. Dorey.*

Operating Gear

THERE are many devices forming the equipment of aircraft that have to be capable of being moved to one or other of their extreme positions of travel, and when occupying these positions, the structure of the gear operating them must be self-locking. The patent deals with operating gear of this

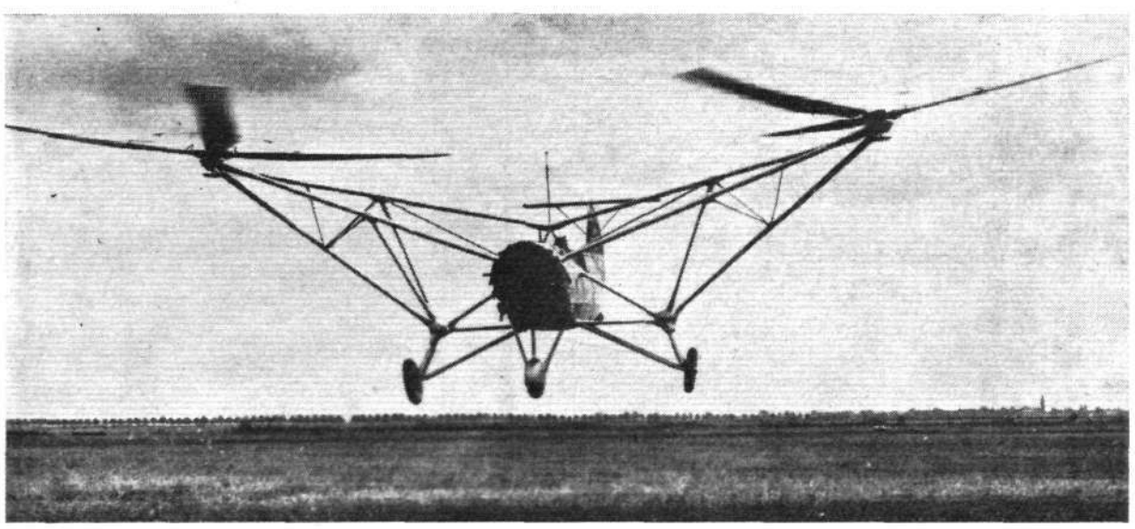


Another system of jack-locking, by the Fairey Co.

type and it will be described in relation to retractable undercarriages, though it is equally applicable for use in connection with retracting bomb gear, rudder-servo bias, flaps and many other devices where it is desirable that they should be locked in the opened and closed position.

In the illustration the undercarriage leg is pivoted at A and is rotated about this pivot by a link B, which is operated by a hydraulic jack C. In addition there is a pivoted ball-crank lever *D*, to which is attached a pin which passes through a longitudinal slot in the leg, and this lever is operated by a second small jack E which is fed with operating fluid simultaneously with the large jack C.

In both extreme positions this lever *D* is perpendicular to the leg, and the structure is therefore self-locking. Other examples of the application of this principle are given in the specification (see illustration).—*Patent No.* 457989: *Fairey Aviation Co., Ltd., and Others.*



D/L? This picture of the Focke-Wulf helicopter suggests that the familiar ratio of lift to drag may have to be reversed in importance. Some years ago this German firm obtained rights in the Cierva Autogiro, but the new machine is a complete departure. It recently broke all the world's helicopter records (including a speed of 76 m.p.h., height of over 8,000 ft., and duration of 1h. 20m.) and it definitely is able to rise and descend vertically.

Forthcoming Events

July 30-August 15. "Avia" Aero Exhibition, The Hague.
July 31-August 2. Yorkshire Gliding Club: Open Meeting, Sutton Bank.
August 1-14. Yorkshire Gliding Club: Instructional Camp Sutton Bank.
August 3-September 7. Public Schools Aviation Camp, Norwich.
August 6-7. Austrian Aero Club: International Rally, Lake Worth.
August 14. Eastbourne Flying Club: At Home.
August 14-22. Yorkshire Gliding Club: Open Contest, Sutton Bank.
August 20. L'Aero-Club de France: Marseilles—Damascus—Paris Race.
August 21. Thanet Aero Club: Aviation Meeting and Race.
August 21. Midland Aero Club: At Home.
August 22-29. Italian Aero Club: Circuit of Littorio.
August 28 and 29. Cinque Ports Flying Club: Lympne International Rally and Wakefield Trophy Race.
August 28-September 25. B.G.A. National Soaring Competition, Great Hucklow.
September 4 and 5. Southend Flying Club: At Home.
September 10-11. R.Ae.C.: King's Cup Race.
September 12. Aero Club de France: Coupe Deutsche de la Meurthe, Etampes.
September 23. Aero Golfing Society: Cellon Trophy.

COMMERCIAL AVIATION

THE BETTER HALF—or, at least, the larger portion of the Short-Mayo composite. Basically an Empire boat, *Maia* has flared-out chines to give better stability on the water when carrying her seaplane, the inboard Pegasus engines are set farther out from the hull to clear the float plane's under-carriage and fixed-pitch airscrews, doubtless designed for efficiency at take-off are fitted.

THE WEEK AT CROYDON

High-pressure Traffic : Minister of Transport Sits Up Aloft Again : The W/T. Lizard

BANK-HOLIDAY activity kept most firms, especially Olley Air Service and Personal Airways, at fever pitch with special charter work, while Imperial Airways issued a special "Holiday Time-table" which was full of extra services to Paris, Le Touquet, and so on, and on Friday Swissair had to run two and Imperial three extra services on the popular route to Switzerland. Air France, I hear, duplicated practically every service, and K.L.M., whose traffic is a steady one usually unaffected by public holidays, was running fully booked machines on every service. Friday appeared to have been a record day for in-and-out passengers at Croydon, but official figures were not to hand when this was written.

Whistling "Wolf"

There is a bit of a mystery about the ear-splitting fanfaronade of sirens to which we are treated every Saturday morning. Some people think it is to make sure starlings haven't built nests in the organ pipes during the week, and that it is deemed necessary to try them out, whilst others suppose that it is a practice fire alarm for the Air Ministry traffic hands. If so, they've got so used to the din that, if leaning against a wall, they don't even straighten up. On Saturday the music started just at the height of the holiday traffic, and the only people who took any notice were a number of passengers, who were so alarmed that they nearly gave up the idea of an air trip. What happens if a fire really starts one Saturday morning after we have all been lulled by all this unnecessary "crying wolf"?

North-Eastern Airways, with considerable enterprise, have started a London-Le Zoute service which leaves Croydon at 6 p.m. daily and at 2.30 and 6 p.m. on Saturdays. The idea is that it's as easy for the tired business man to get to Le Zoute as to Brighton after the day's work. A problem of the future will be the man who elects to live an hour or so from his work and to travel to and fro by air. He may be British by nationality and earn his living here, but he may live and spend his earnings in Belgium or France.

A couple of Bristol "Blenheims," not easily recognised as such owing to "war paint" and blue swastikas on a white ground, came over the airport the other day, hotly pursued by a British Hawker Hart. Actually, the Blenheims had been sold to Finland, and were eventually flown away, I believe, by Finnish pilots, but I thought for a moment things had started—without previous notice, as they probably will next time there's a war.

The Minister of Transport had another busy day last week flying over the road systems. The same captain and wireless officer of Imperial Airways, Capt. Percy and W/O Draper, were placed at his disposal, and this time the route was *via* Staines, Salisbury, Exeter, Plymouth, Penzance, and back *via* Exeter, Bristol and Bath. The same day he did another trip—London, Brighton, Portsmouth and back. He was accompanied by Mr. Cook, Chief Roads Engineer to the Ministry. They returned to Croydon fresh as a couple of daisies, and motorists had better watch their step if little cherubs like these are going to sit up aloft and watch them, all unbeknownst-like.

Marconi's Croydon depot, up whose sleeve you never know what may lie, sprung a surprise on us all last week, and on themselves, too, when they opened a crate from Kissumu said to contain spare parts. Amongst other things the crate held three fabulous-looking eggs, one of which went pop and exuded a perfectly good lizard which was promptly christened George. Every effort was made to bring George up, and wireless experts seen galloping across country and snatching at the air were merely obeying instructions received from the Zoo to feed George on flies. Possibly these were not the right sort—horseflies instead of gadflies, perhaps—or maybe there is truth in the rumour that somebody stood George elevenses consisting of a small squirt of ale from a fountain-pen filler. Anyway, George took and died.

A. VIATOR.

Trans-Tasman Air Mail

DETAILS of the Trans-Tasman air-mail agreement announced recently by Sir Archdale Parkhill, the Australian Minister of Defence, were given last week by Mr. Savage, Prime Minister of New Zealand. An operating company is to be formed on which the Governments of Great Britain, Australia and New Zealand will be represented. Postal revenue from other countries will be divided between the three Governments in proportion to their contribution to the operating company, New Zealand's share being the largest.

Commercial Aviation

The G.A.P.A.N. Fund

LATEST donations to the recently inaugurated benevolent fund of the Guild of Air Pilots brings the total received up to £2,285. Donations should be sent to the hon. organiser, Mr. F. W. Jones, Room 172, Airport of London, Croydon, Surrey. Cheques should be made payable to the Fund and crossed "A/c Payee Only."

New Regulations

SINCE July 31 machines have not been allowed to fly over any prohibited area, whether at a height of more than 6,oooft. or not. After October 31 all emergency exits in aircraft must be clearly marked, their methods of operation indicated and be kept free of obstruction. These are the two principal features of the Air Navigation (Amendment) (No. 3) Order, 1937.

Air Mail Newspaper

BELIEVED to be the first newspaper in the world to complete plans for a regular air mail edition as a result of the new low Imperial Air Mail rates, *East Africa and Rhodesia*, is now printed on the lightest Bible paper.

Readers near the main line of communication, instead of having to wait three or more weeks, will now receive their paper within four or five days of its despatch from London.

Natal's New Airport

A FORTNIGHT ago—on July 23—the new Stamford Hill airport for Durban was officially opened with three days of aeronautical festivities, including a 1,000-mile air race, and a fly-past by eighty machines. The terminal buildings at this airport are on much the same lines as those at Germiston, Johannesburg

Incidentally, South African Airways have been experimenting with a mail service between Germiston (where big extensions are being carried out) and Lourenço Marques, where the Empire boats call on their way to Durban.

Brighton's Air Mail Exhibition

BRIGHTON is perhaps the first town in the world to be presented with a collection of air mail souvenirs. Col. Sir Percival Boxall, Bt., O.B.E., T.D., has given, for exhibition in the Brighton Public Art Galleries, a representative collection of covers carried on the first flights of important air services in many parts of the world.

It begins with a letter carried by balloon out of Paris during the siege of 1870, and goes right up the inauguration of all-air mail to East and South Africa in June of this year.

Sir Percival's family has been associated with Brighton since 1824, and one of the items in his collection is a cover from the first Nairobi-London mail flight of 1931, on which the pilot for the first part of the journey was the late T. Campbell Black. This item was presented by Alderman Milner Black, J.P., the pilot's father, who is also connected with Brighton, where his son was born.

The collection is being publicly exhibited until August 12.

Peiping-Hong Kong

THE Eurasia Aviation Corporation (the Chinese-German concern) has started a ten-hour twice weekly passenger service between Peiping and Hong Kong. Hong Kong is now a terminus or junction for the P.A.A. and Imperial Airways as well as for Eurasia and China National.

Across Again

SISTER ship to the *Caledonia*, *Cambria* took-off from Foynes at one minute after seven in the evening of Thursday. She was bound for Botwood on the second two-way experimental Atlantic flight. Capt. G. J. Powell was in command. At 1.30 on Friday morning *Cambria* was facing a 40 m.p.h. headwind about 1,500 miles out, and the Pan American Clipper, again piloted by Captain Gray, was about 1,000 miles out from Newfoundland.

The Imperial boat arrived at Botwood at 12.48 p.m., after 17 hr. 48 min. in the air. *Clipper III* arrived at Foynes at 10.50 a.m. after a trip lasting 12 hr. 47 min.

The comparatively small amount of Press attention which these two flights received were the finest testimony to the success of the Atlantic experiments.

Rapides for Tatas

THREE D.H. 89s (Rapides) have been ordered for a feeder service which will bring Ceylon into the Empire network air routes. The present service between Karachi and Madras, which was launched by the Tata company with two Puss Moths in 1932, will, as already announced, shortly be extended to Colombo. Early this year Mr. Neville Vintcent, Tata aviation manager, left Bombay in search of suitable equipment for the extended service. He required aeroplanes, that could safely and economically transport 1,200 to 1,300lb. of payload over stages of the order of 450 miles. That load would consist mainly of mails, but provision was necessary to carry a few passengers, particularly because of the increasing demand for passenger accommodation between Bombay and Karachi. Mr. Vintcent spent some time in the U.S., where he tried out all the aircraft likely to fill his needs, but finally decided to order Rapides. The three machines will be fitted with extra tanks, and their still-air range will be nearly 700 miles.

The K.L.M. Disaster

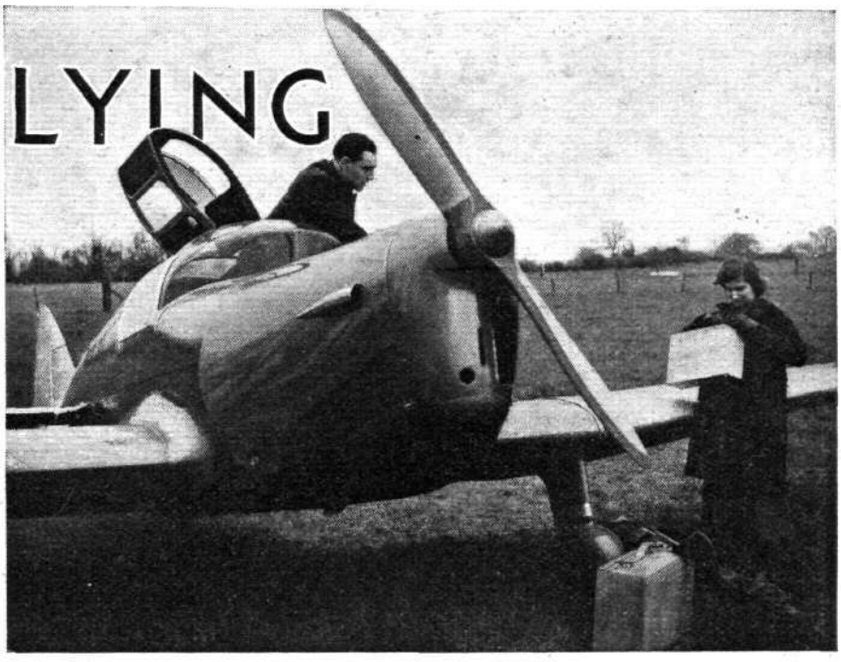
AT Bradges, a few miles south of Brussels, a K.L.M. machine crashed on July 28 with the loss of fifteen lives. The cause of the accident to the machine, a Douglas D.C.2, will not be known for certain until the official report is made—if then—but although it has been suggested that lightning set fire to the machine in the air, this seems a doubtful theory.

From reports, which say that flames came from one engine and that something fell from the machine, there seems to be a possibility that an important engine component broke and that petrol lines and probably the structure were damaged, fire following immediately. The pilot may then have attempted to bring the machine down, but was unable to retain control. All of which is pure supposition, and for the moment we can only express our sincere condolences.

TO ENCOURAGE AIR CARRIAGE: Some picturesque goods and luggage labels issued in Japan. The colours of the originals are vivid, but attractive—and in case we have reproduced any the wrong way up, apologies in advance to our Japanese readers.

PRIVATE FLYING

Topics of the Day



Trainer Technique

EVERY now and again I feel constrained to put in half an hour with an aerobatic trainer, and I am quite sure that even a very little flying in such a machine does one a whole lot of good.

The modern cabin aeroplane, with its perfect view and easy flying characteristics, is not the best of types for practice work. Furthermore—and quite apart from aerodynamic qualities—a cabin machine does not encourage one to fling it about in a manner which is good for everybody once in a way, and a pilot who owns such a machine, and who flies nothing else, is liable to get into a rut. His interests are more and more confined to the purely mechanical or mental ones of highbrow navigation or economical operation according to the direction and speed of the wind and the distance to be travelled. In other words, our aviation is becoming extremely respectable and our aerodromes decorated with far fewer people wearing funny hats decorated with telephones and things.

All of which is interesting and good from practically every point of view, but it is not flying as such. In half an hour with a trainer one can go through a small aerobatic repertoire and do perhaps four spot landings, closing the throttle at different heights and at different points in the circuit. The only possible criticism to be made is that one can spot-land a Tiger, for instance, almost to the yard with a little judicious slipping or swish-tailing, while such tactics cannot always be applied to a cabin machine—particularly where the modern "formula" of cantilever wing and split flaps is concerned.

While I was at Zurich a fortnight ago at least two of the entrants for the individual aerobatic competition were pilots on air transport services, and these two reached the finals. The fact that these pilots executed pretty slow rolls and prettier outside loops in little machines designed for the job did not make me any less confident in their abilities as staid transport pilots. The two forms of flying are so very distinct, and the types of machine used are so very different, that I hardly expected to be looped on my way home in a D.C.3.

Over the Top

BOTH the outward and homeward trips on this occasion were made, for the most part, over the clouds and in brilliant sunshine. We in our earth-hugging bad-weather journeys certainly miss a great deal that is good in flying, but I can see no alternative. Even if we all took our W/T tickets and carried two-way radio, the ground stations simply could not cope with us, and, in any case, the risks of "overweather" flying with a single engine are not to be laughed aside. Only one thing is more unpleasant than flying among the tree-tops in dirty visibility, and that is coming down through clouds which may or may not be sitting quite firmly on some hill-top or other.

But, as I've remarked *ad nauseam*, one could do a very great deal in fairly poor weather with the help of a plain receiving set. On the return journey, for instance, we flew in pleasant sunshine at 12,000 ft. over what appeared to be a low cloud layer for a matter of 400 miles. It happened that the base of this layer was a good 1,500 ft. above sea-level, and it would, consequently, have been perfectly safe to fly from Basle to Croydon over the top in any machine which had the necessary range, provided that the pilot had some means of obtaining knowledge of the weather developments. An initial report is not enough on a four-hour journey; anything may be happening at one's terminal in the interim. This summer, particularly, we seem to have had the most extraordinary changes in weather conditions on quite short trips.

I know of one enthusiastic private owner who consistently flies above the clouds, but he has a fast machine, and the chances of serious changes are not so great. Nevertheless, one cannot feel that he is doing the right thing—air rules or no air rules. I agree with him that the risk of actual collision is very remote indeed, but it is still there, and it is one that will grow with time.

Zurich

INCIDENTALLY, only one of our manufacturers took the opportunity at Zurich of showing about a dozen nations what we could do in the way of light aeroplanes. Which, it must be admitted, are among our better products when performance, initial price, and economy are taken into consideration.

All that was necessary was to enter a few representative types in the "arrival" competition, and, whether the machines did well or not, they would at least have received some little attention. The event was actually won by a French ultra-light of novel design, so that any really earnest competitor, starting from Inverness in a light machine, might have succeeded in being placed. As it happened, the weather in the South of England deteriorated badly during the morning, so I am, maybe, being unduly optimistic in retrospect. The one British entrant, with a five-year-old machine, was placed ninth without trying very hard

Another thing. Practically every machine in the aerobatic competition was a Bücker Jungmeister, a type which is now used by the Swiss Air Force for intermediate training. Surely there was nothing to prevent our people from trying a little harder to explore the possibilities of markets of this sort?

We may not have machines which are quite so aerobatically perfect as this Jungmeister, but that is where salesmanship comes in, and it might have been worth while to develop a rather snappier type for the purpose. Apart from the dozen or more which might have been sold, one or two clubs in this country would be glad to have just one super-aerobatic aeroplane for the use of its more advanced members.

INDICATOR.

FROM the CLUBS and SCHOOLS

YAPTON

FLYING times for the week were 61 hr. 10 min.; the weather has been good and July's total was 184 hours. Messrs. W. Neal and R. Marsden have returned to continue their flying courses.

STRATHRAY

For the week ended July 26 a total of 24 hours' flying was carried out. Mr. Reynolds passed his solo test.

HERTS AND ESSEX

Owing to the increasing number of aircraft coming in for overhaul a further steel hangar is to be erected. Uncertain weather during the past fortnight brought flying times down to 153-odd hours. A first solo was made by Mr. J. Wood.

BRISTOL AND WESSEX

The total flying times for the fortnight ended July 31 amounted to 47 hr. 20 min., and first solos were made by Miss B. Gardner and Dr. A. S. Russell, the latter also passing his "A" licence. Mr. J. H. Lewis and Lady Douglas flew to Paris for the August Bank Holiday week-end.

BORDER

During July the flying times have substantially exceeded those for the same period last year, probably due to increased charter and joy-riding work. Many cross-countries have been made, especially to Newcastle, Northern Ireland and Stranraer. All the club aircraft were away for the week-end and the club was able to close down, giving the hangar staff an unlooked-for holiday.

CAMBRIDGE

Marshall's Flying School has concentrated on blind-flying instruction during the week and 70 hours total flying was recorded, which included cross-country flights to Leicester, Hatfield and Norwich. Mr. Wallis has obtained his "B" licence and Mr. Mitchell passed the dual cross-country test and his engines and airframe examination at Croydon. Mr. Locke completed his first solo.

YORKSHIRE

Club machines flew 73 hr. 15 min. during the week ended July 31, and for the month of July a total of 315 hr. 5 min. was recorded. This shows a substantial increase on the total of 275 hours recorded for July, 1936. Cross-country flights were made to Sherburn, Goodwood, Manchester, Minehead, etc. Mr. H. Barrett passed his "A" licence tests.

PENANG

The two Moth Majors and the B.A. Eagle, together with Major Newbold's B.A. Swallow, flew down to Singapore for the opening of the new aerodrome on June 12. Cross-country flights were made to local aerodromes by club pilots, and a total of 141 hr. 55 min. was logged for the month of June. Mr. T. D. Hughes carried out a successful first solo and Mr. S. Speldewinde qualified for a Straits Settlements "A" licence.

YORK AND LEEMING

During the week ended July 31 taxi trips were undertaken to Bristol, Catterick and Yeadon, and a flying total of 231 hr. 20 min. for the month of July was recorded. A party of members, including the president, Mr. J. M. Barwick, flew to Tours to attend the Air Touraine Rally. Mr. Headlam took delivery of his Miles Whitney Straight and Yorkshire Aviation Services are receiving their Miles Magister early in the week.

BROOKLANDS

A number of members visited Lympne during the week in order to see the race for the Folkestone Trophy. Mr. Ken Waller was competing but was among the unlucky ones. Flying times totalled 112 hours. The bar has been decorated with a number of framed caricatures of members who have become famous or notorious. Others will be added as they become eligible, and at the present rate of progress it seems that the walls will soon be completely covered.

C.A.S.C.

Holidays interfered with the flying last week and 10 hr. 10 min. were recorded, due mainly to a determined effort by Mr. D. Locke, who successfully carried out his first solo.

PORTSMOUTH

An Aeronca, purchased by Mr. Trevor B. Birkett, is available for use by club members. Commander J. D. Harvey has qualified for his "A" licence and Mr. R. W. Duckett made his first solo. A flying total of 63 hr. 10 min. for the week ended July 29 was attained.

LONDON

The Club announces future competitions as follows: Map-reading, Sunday, August 29; navigation, Sunday, September 5; aerobatics and forced landings, Saturday, September 18. Entries, together with the fee of 2s. 6d. per event, should be sent in as early as possible. The flying times for the week ended July 30 amounted to nearly 146 hours. Messrs. P. K. Crowther, H. L. Greenshields, C. B. Lang and Miss C. S. Holmes have completed the "A" licence tests and Mr. G. Florman made his first solo.

HANWORTH

Congratulations are offered to Mr. B. Buchegger on passing his "B" licence tests, and to Mr. J. Brady, aged seventeen, on his first solo flight. Good weather conditions permitted quite a number of other first solos to be carried out, e.g., by Messrs. L. Tand, R. Jude, I. Topka, Sherwood (Midland Bank F.C.) and Scott (M.B.F.C.). Cross-country flights were made to Cardiff, Nottingham and Hull, and a flying total of 145 hr. 55 min. was logged. Successful candidates for "A" licence tests were Messrs. Hidson and Holloway (M.B.F.C.).

The Miles Whitney Straight

IT is regretfully announced that, owing to the still steadily increasing costs of materials and labour, the price of the Miles Whitney Straight has been increased by £100 to £1,100.

£100 for a Bright Young Designer

OPEN to Britain's budding young aircraft designers, a design competition with a cash prize of £100 has been organised by the College of Aeronautical Engineering.

The rules are quite simple. Competitors must prepare a G.A. arrangement giving stress calculations, wing sections, etc., and the estimated performance of the aircraft.

The power plant selected is the 90 h.p. Cirrus Minor four-in-line. Designs must be prepared round this unit for either monoplane or biplane, though it is generally expected that only monoplane drawings will be submitted. The adjudication committee will seek for the following factors:—(1) Quick take-off; (2) Good average cruising speed; (3) Slow landings; (4) Reasonable range; (5) Ability to carry pilot and one passenger.

Competitors, who will have until December 31 next to submit their drawings, should apply for an Entry Form to Capt. Duncan Davis, A.F.C., Brooklands Aerodrome, Weybridge, Surrey. There is no entry fee.

The winning design will subsequently be built by the pupils of the College at Brooklands and will be flown at Brooklands Aerodrome. Should it prove exceptionally useful commercially and result in commercial exploitation an arrangement for royalty will be made to safeguard the designer's interests.

The new Focke-Wulf twin-engined trainer with the little Bücker Jungmeister—a type used for much of the aerobatic work during the Zurich meeting. (*Flight* photograph.)

THE FOLKESTONE TROPHY

Alex Henshaw's Percival Mew Gull Wins Cinque Ports Club's Internationally Supported and Well-organised Race

(Illustrated with "Flight" photographs)

ANY commentary on last Saturday's Folkestone event must fairly contain a hearty pat on the back for the handicappers. Because they were responsible, with officials of the Cinque Ports Flying Club, and others, for engineering, despite dull weather, as good an air race as one could wish to see, the honour of first mention seems rightfully theirs.

A representative entry of nineteen machines were divided into two heats, the five leaders in each qualifying for the final.

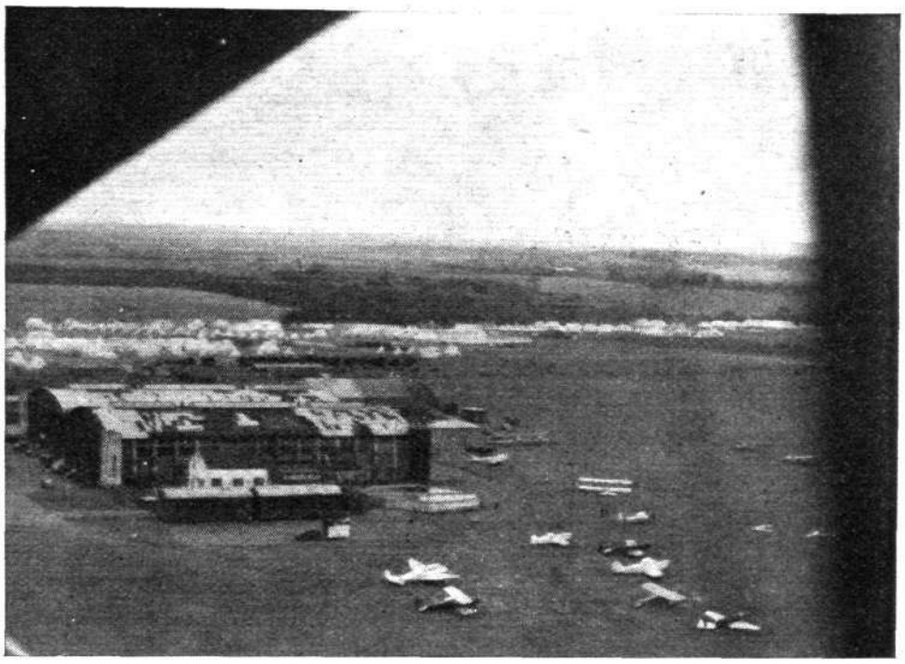
The first heat was run at about 12 noon, when ten machines were led off by a Dart Kitten, entered at the last minute and flown by Mr. C. G. M. Alington. He received 25 minutes 28 seconds start from the scratch man, Mr. Alex. Henshaw, flying his white Mew Gull.

The Lympne circuit is a very suitable one for a friendly club race, and it is possible to follow the progress of the competitors nearly all the way round to Capel Shed, Harbour pier, Hythe gasholder and back to Lympne, a distance of just under 20 miles. The race is over three laps of this course.

A fresh easterly wind faced the competitors at the take-off, after which they at once turned through about 60 deg. round a marking point and headed for Folkestone. From the racing point of view it was a monoplane day.

Mr. Henshaw's Mew Gull was only just off at the first turn, which he skimmed round at zero altitude before disappearing, apparently underground, for the fields near the aerodrome drop steeply down to the marshes and sea shore. He was last to be seen, a white speck popping up over some distant trees. Some of the others in the heat had already completed a lap before the Mew Gull started. Mr. E. A. H. Peat's Moth Major and Mr. R. M. Hackney's Gipsy Moth, squeezing the last ounce from their four cylinders, certainly saved time in their tight vertical turns round the mark.

Time for the finish was heralded by a lull as the machines all closed up on each other on their last lap. Then over the trees came the Hendy Hobo, entered by Mrs. Bill Davids and flown by Mr. A. J. S. Morris; hard on his tail could be seen the Moth Major and the Mew Gull, travelling at a terrific bat. The Hobo was going too well, however, and crossed the line seven seconds ahead of the Mew Gull, with the Moth a close third. The Dart Kitten purred in fourth, followed by Comper Swift and Gipsy Moth. Unfortunately, it turned out that the Comper, fifth across the line, had not obeyed take-off instructions and had to be disqualified, giving the Moth fifth place.



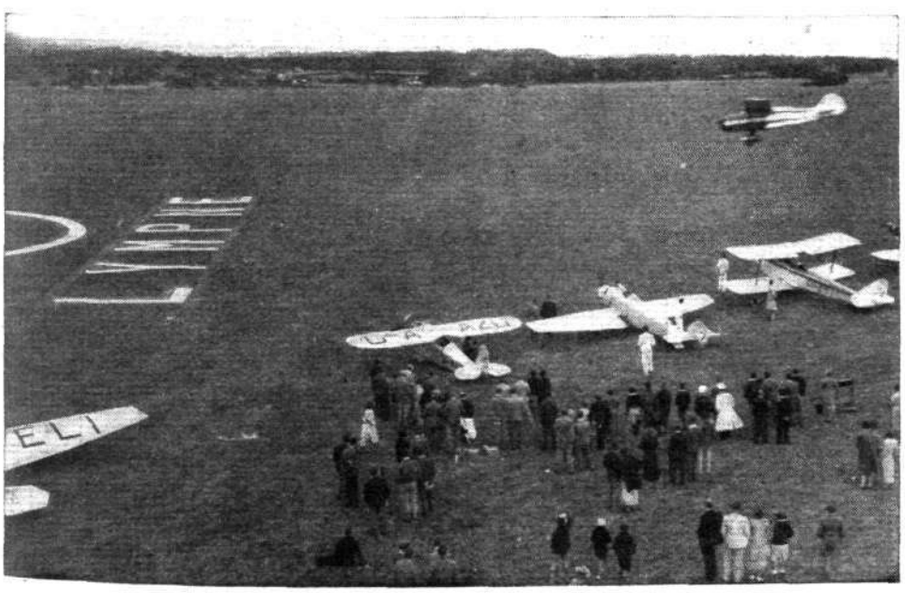
After a successful meeting, a few machines sit outside while their masters sample Cinque Ports hospitality.

The Dutch De Schelde, a roomy, low-winged cabin monoplane, slightly suggestive of a cleaned-up Spartan Cruiser with one engine, was unfortunately eliminated.

After lunch the second heat was run. This time Mr. Geoffrey de Havilland was limit man on the T.K.2, giving 17 min. 26 sec. start to Mr. Palmer on the Swallow. Another late entry, a Vega Gull, and Mr. Walters' handsome Miles Hawk Major, were also near limit, handicapped for about 140 m.p.h.

Three German entries, two Klemm K35s and a Fieseler, all powered by 70-80 h.p. Hirth engines, also flew in Heat 2. The Fieseler is a little smaller and gave the Klemms 28 seconds start. Results showed this to be a mistake, for the Fieseler, which is specially built for aerobatics, proved a little slower. A lunch-time panic that the Germans would not fly because the handicap was too heavy eventually simmered down amicably.

As the finish of the heat drew near, two machines were again to be seen approaching almost together over the trees. Instructor K. K. Brown's Tiger Moth leading Flt.-Lt. Tommy Rose on the B.A. Eagle. It looked as though a dead heat was to result when the Eagle, some ten lengths behind, skimmed over the boundary trimming hedge and long grass, but level with the first spectators it passed the Moth and finished three seconds ahead. The T.K.2, which had been racing superbly, crossed the line third. Herr Matthaei's Klemm came fourth, while Mr. Walters' Hawk Major, finishing fifth, was the last to qualify for the final. The Hawk appeared to lose



Between heats and final mechanics tinkered, while spectators watched demonstrations of the Wicko, seen flying above, the Porterfield "70" and the German Fieseler with 70 h.p. Hirth engine.

(Left) Several slower machines had already taken off when Mr. E. F. Walter was snapped with his Miles Hawk. Tommy Rose may be seen chatting near the B. A. Eagle.
(Below) The Dutch De Schelde with Gypsy Major engine was unfortunately eliminated in the heats. The German Fieseler F.5.R., seen nearer to the hangar, suffered a similar fate.

time on the aerodrome turning point by flying wide and taking some time to return to its course; Mr. Walters may, however, have lost less speed by this technique. The Klemms appeared to take the first lap in rather leisurely fashion. Tommy Rose, as usual, flew a good race and perhaps earned his winning yards by quick retraction of his wheels.

The loud-speaker people, incidentally, were to be congratulated on the clear and faultless relay and amplification of Mr. Bill Davis's announcements.

And now for the final. Pre-start rumour went round that the Hobo "had the race in the bag if the engine didn't blow up," and Lord Crichton-Stewart, the owner, was to be seen standing braced against the slip-stream shouting last-minute encouragement to Mr. A. J. S. Morris before he took off.

The Kitten had nearly six minutes' start on the second man and 25½ on the Mew Gull, and it was not until everyone was away and Henshaw had made his first lap that it looked as if he could catch the leaders. Almost cutting the turn and executing a lightning "S" turn to put things right, the Mew Gull screamed by at terrific speed and was hedge-hopping out of sight again in next to no time.

On the first lap the Hobo, going very well, rounded the home turn with the Klemm K.35, while Brown's Tiger Moth was doing a little better than the other Moths when all three rounded the Lympne mark in quick succession; every "horse" was obviously in full commission in the T.K.2 and B.A. Eagle.

Excitement was terrific just before the winner was due; even the sun had to peep through to see what was going on. Mr. Bill Davis up on the neon beacon told of an approaching group, and cheers greeted the appearance of the Hobo with its Pobjoy "R" running like a dynamo. But white wings were next in sight, and at phenomenal speed the Mew Gull clipped daisies, overtook and beat the Hobo on the line, to win by three seconds. The Tiger Moth was third, then the B.A. Eagle, snatching fourth place from the Moth Major by two seconds only. Sixth place was claimed by the Klemm which led the Kitten not above two lengths ahead of the T.K.2, one second being the difference.

The winner received £50, presented by the Cinque Ports Flying Club, and holds the trophy for one year. Viscount Wakefield's second prize of £25 goes to the Hendy Hobo, and £10 donated by the Marquis of Willingdon was claimed by Mr. K. K. Brown on the Tiger Moth. A further £10 and a model of the machine were presented as a Speed Trophy by Mrs. W. E. Davis.

Seen here are Mrs. Bill Davis, Lympne's "live wire"; Mr. Duncan Davis; Mr. Ken Waller who flew the De Schelde; and Mr. E. F. Walter, wide-turn exponent of the Miles Hawk. Seated are Miss Erskine and Miss Kendall.

HEATS ONE AND TWO.

Entrant	Pilot	Machine	Start	Finish	Time	Speed	Place
				min.	min.	m.p.h	
C. G. M. Alington	Alington ...	Kitten	0.00	43.41	43.41	81	4
Mrs. W. E. Davis	R. M. Hackney	Gipsy I Moth	7.57	44.22	36.25	97¼	5
J. A. M. Du Port	E. A. H. Peat...	Moth Major	10.28	42.47	32.19	109½	3
Mrs. W.E. Davis	A. J. S. Morris	Hobo	14.20	42.26	28.06	126	1
A. Henshaw ...	K. V. H. Waller	Mew Gull	25.28	42.33	17.05	207	2
W. E. Davis ...	K. K. Brown ...	Tiger	4.53	37.56	33.03	107½	2
N.S.F.K. ...	H. Matthaei.	Klemm	8.53	38.42	29.29	120	4
S. H. Horne ...	Flt. Lt. T. Rose	B.A.Eagle	10.51	37.53	27.02	131	1
E. F. Walter ...	E. F. Walter ...	Hawk	14.04	38.36	24.32	144½	5
Capt. G. De Haviland.	G. R. De Haviland.	T.K.2	17.26	38.19	20.53	169½	3

FINAL

Entrant	Pilot	Machine	Start	Finish	Time	Speed	Place
				min.	min.	m.p.h	
C. G. M. Alington.	Entrant ...	Kitten	0.00	43.14	43.14	82	7
Mrs. W.E. Davis	R. M. Hackney	Gipsy I Moth	5.57	44.08	36.11	98	10
W. E. Davis ...	K. K. Brown ...	Tiger	9.52	42.40	32.49	108	3
J. A. M. Du Port	E. A. H. Peat...	Moth Major	10.28	42.52	32.24	109¼	5
N.S.F.K. ...	G. Friedrich ...	Fieseler	13.52	43.09	29.17	121	6
Mrs. W.E. Davis	A. J. S. Morris	Hobo	14.20	42.25	28.05	126	2
S. H. Horne ...	Flt. Lt. T. Rose	B.A.Eagle	15.50	42.50	27.00	13	4
E. F. Walter ...	Entrant ...	Hawk	19.03	43.25	24.23	145½	9
Capt. G. de Havilland.	G. R. de Havilland.	T.K.2	22.25	43.15	20.50	170	8
Alex Henshaw .	Entrant ...	Mew Gull	25.28	44.22	16.54	210	1

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

PASSING-OUT INSPECTIONS

Halton.—On Tuesday of last week Air Chief Marshal Sir John Steel, A.O.C. in C., Bomber Command, carried out the passing-out inspection of apprentices from No. 1 School of Technical Training, Halton.

In his report, the Commandant of the Station said that the August, 1934, entry was the thirtieth entry of apprentices to complete the course. The conduct of this entry during the three years training in workshops had been very good and there had been keen competition owing to a number of apprentices being of approximately equal merit. Although the total time lost—mainly through sickness—had been high, it had not interfered excessively with technical training. There had been no opportunity of giving any practical instruction on the modern monoplane-type airframes, but it was hoped that airframes of these types, or complete components, would be available in the near future.

As regards educational training, the entry had on the whole displayed keenness and attention. In the final examination, the results obtained by the Fitters II were satisfactory, although the average percentages are slightly lower than those gained by the January, 1934, entry—probably due to a change of syllabus during their course, and to unavoidable changes of staff. The work done by Fitters, Armourer, had been very satisfactory, particularly in science subjects.

The general standard of discipline and drill had been average. The entry had done well in sports and athletics and outstanding performances included:—L. A. A. Reid, Inter-Services swimming champion, breast stroke and member of R.A.F. swimming team; L. A. A. Walters, member of R.A.F. swimming team; A. A. Whiteside, winner of Bucks County long jump with a record jump.

This entry, also, was the first to have played two seasons of baseball.

The general health of the entry had been good, although the figures for time lost in schools and workshops did not compare favourably with those of the last entry. This was accounted for by the very severe epidemic of influenza which occurred in January last. The physique of the entry was, he thought, well up to standard. The recent increase in the amount of money available for messing had done much to improve the feeding generally and should lead to a still higher physical standard. For instance, it was now possible, with the money available, to have tea and biscuits before early-morning P.T.

Prize winners were as follows:—

Grand Aggregate 1st Prize, I. Scott; 2nd. R. E. Harris; 3rd, K. R. Knowles.

Educational Subjects

Fitter II.—1st Prize, K. R. Knowles; 2nd, J. E. Twelvetree.
Fitter Armourer.—B. J. Cornelius.
Elliott Memorial Prize.—W. Beringer.
Crebbin-Robinson Cup.—W. C. Simpkins.
Cadetships.—R. E. Harris, B. G. Mace, W. Beringer.
Viscount Wakefield Scholarship.—R. E. Harris.

Electrical and Wireless School, Cranwell.—A.V.-M. J. E. A. Baldwin, A.O.C., Training Command, inspected the apprentices on Wednesday of last week. In his report, the Commanding Officer revealed that the strength of the September, 1934, entry passing out was 48, composed as follows: 39 wireless operator mechanics, 9 instrument makers.

January, 1937, saw alterations in administrative policy, resulting in the separation of apprentices from boy entrants for training purposes and the formation of No. 2 (Apprentices) Wing.

At this time a new squadron was formed and composed entirely of Instrument Makers under training, and for this purpose 27 trainees were transferred from "A" Squadron to the newly formed "C" Squadron, leaving a total of 337, which subsequent casualties had reduced to 333, the present strength. The average age of the entry is eighteen years eight months.

In the final passing-out examination the average percentage of the entry as a whole was 63 per cent. Three Aircraft Apprentices gained distinction with more than 75 per cent.

The results obtained by the 39 W/O. Aircraft Apprentices were as follows: One passed out as Leading Aircraftsman; 25 passed out as Aircraftsman First Class; 12 passed out as Aircraftsman Second Class.

Results obtained by the Aircraft Apprentices in the trade of Instrument Maker were as follows: Four passed out as Aircraftsman First Class; five passed out as Aircraftsman Second Class.

This entry had given every satisfaction in drill and physical training and they received the highest marks for "Inspection Turnout." All apprentices passed their annual musketry course and their anti-gas training, and are equipped with respirators for the latter purpose.

The entry had taken part in all branches of sport and has had representatives in the station hockey, rugby and association football teams. The majority obtained the Royal Air Force Swimming Certificate. The general health of the entry had been satisfactory.

Awards.—Highest Marks, Technical Subjects: 566986 Leading Apprentice R. Humphrey (Wireless Operator Mechanic).

Highest Marks, Educational Subjects: 566977 Aircraft Apprentice W. Dodds (Wireless Operator Mechanic).

Highest Aggregate Marks: 567076 Sergeant Apprentice T. Moremant.

LONG SERVICE AND GOOD CONDUCT MEDAL

The Long Service and Good Conduct Medal has been awarded to the undermentioned airmen:

W.O.s Cullum, W. A., Holbrook, D., Kyle, R., Lockhart, W. R., Rich, F. V. M., Scorgie, J. P., W.O.2 Mansbridge, A. C., F/Sgts. Acquroff, W. W., Alberry, A. W., Archbold, D. N., Ayres, L. W., Baker, G. R. C., Barrand, L. G., Bidgood, F., Boyle, J. M., Brennan, A. P., Brooks, T. H., Buckley, J., Butler, G. C., Carroll, J. J., Cathrall, C. W., Coleman, P. G., Connell, J., Curtis, L. W., Daunt, W. A., Denne, C. A., Duffett, F. W., Fisher, A., Fletcher, H., French, P. M., D.F.M., Garrod, F., Gordon, R., Groom, F. E., Hall, A., Hammond, F. G., A.F.M., Hawkins, E. F., Hawkins, H., Hodgson, R., Howells, C., Hughes, T., Hurst, G. H. F., Joce, E. R. S., Kemp, E. J. W., King, R. W., Land, R. B. P., Leaver, T. H. A., Leicester, T. E., Luke, D. T., McCombe, J. R., McPhail, H., Methven, W. J., Middleton, E. C., Mitcham, L. C., Muir, S., Mumford, F. H., Pacello, E. A., Pirie, J., Press, G. C., Pritchard, T. J., Reed, G. A. J., Reed, W. H., Ridge, J. P., Riley, R., Roberts, T., Robinson, H. C., Rogers, W., Saunders, C. D. A., Shaw, E. C., Shone, J. H., Stainsby, N., Standing, R. J., Sutton, C. J., Twelves, L. C. F., Vousden, W. H. E., Waite, H., Walder, H. V., West, B., Williams, H. H., M.M., Wood, E., Wright, L. T., Sgts. Aikman, G., Armstrong, J., Attaway, A. B., Baker, S. J., Banks, T. L., Barker, F. A., Baxter, C. A., Beck, H. H., Bickell, G. J., Bowerman, J. W., Braithwaite, F. L., Brown, A., Bryan, J. E., Burrell, J. W., Bywater, A. E., Chanter, E. S., Christopher, F. G., Clements, E. S., Compton, S., Cuerel, G., Daley, D., Damerell, A. E., Dean, F. S., Dolman, W. H., Egles, W., Essam, G. W., Ewen, D. W., Fitt, P. A., M.M., Foster, F. H., Fox, F. J., Fraser, J. S., Fraser, S. E., French, H., Fuller, R. E., Gale, F. W., Gamble, R. H. B., Germain, A. F., Giblett, E. J., Gosney, A., Grady, J., Haines, R. L., Hamilton, E. M., Harris, T. W., Harris, W., Hayward, L. W., Hazell, F. V., Heeks, W. H., Holt, S., Hunter, W. H., Jones, J. H., Lawson, H., Lea, J. J., Le Grange, E. A., Lombardi, G. W., M.M., McArdle, W. H., McCann, F., McNaughton, W. S., Markwell, F. J., M.M., Marshall, R. A., Martin, C. A., Millington, A. O., Moffatt, H. A., Moore, W., Morrison, K. M., Mulcahy, J. H., Newnham, N. C. G., Newson, F. C., Nickson, H., Pearson, W. B., Petersen, A. E., Pratt, G. S. J., Pratt, V. D. L., Ross, H. S., Russell, R. H., Sharman, W., Simmons, E. W., Simmons, R. H., Simpson, R. J., Smith, H., Smith, J., Smith, S. F., Stanbrook, M. F., Strong, C. W., Swain, J. A., Tansley, G. A., Temple, J. W., Theaker, S., Thomas, G. W., Tribe, R. G., Tuite, W. J., Turner, L., Ward, J. E., Wedge, E. V., Weeden, J. H., Welham, A. G., M.M., West, F. W., West, J., White, W., Wilcox, H. W., Williams, D., Willis, A. W. M.M., Wiseman, R., Woolmer, G. G., Wright, S. G., A.F.M., Ancsell, E., Argyle, F., M.M., Bain, R. H. F., Barns, P. M., Bell, R., Blythe, W. J., Broad, E. C. W., Burton, V. J., Cairns, J., Carter, R. J., Castle, M. E., Christie, R. T., Coe, F., Cpl/A/Sgt. Cokeley, V. H., Cpls. Colledge, W., Curran, W., Dawson, H., Drinkwater, F. A., Emmins, J., Farrer, A. A., Field, E. J., Filmer, E., Fisher, J. A., Fulcher, R. S., Gault, A. R., Holmes, A. J. H., Humble, W., Jennison, H., Jolly, C. R., Kidson, H. C., Langham, B., Lewis, C. J., McCracken, S., McIntyre, E., Melhuish, T. E., More, S. H. B., Norman, R. T. J., Perry, G. D., Pickworth, J. W., Rowe, H. W., Scamp, C. J., Seller, H. J., Silcock, A. H., Smith, J. T., Stacey, S. M., Stephenson, G. C. H., Taylor, J. N., Terry, J. T., Thompson, R., Waddington, E. A., Watts, P. H., L.A/Cs. Brown, L. L., Humphrey, S., D.C.M., M.M.

RECRUITING BY AIRMEN

With a view to stimulating recruiting it has been decided to inaugurate a system whereby airmen proceeding on leave will be invited to act as recruiters, thereby qualifying for the reward of 5s. for a skilled man attested, and 2s. 6d. for an unskilled man.

ROYAL AIR FORCE GAZETTE

London Gazette, July 27, 1937

General Duties Branch

The following are granted short service commissions as Acting Pilot Officers on probation, with effect from and with seniority of July 12:—R. I. Alexander, D. C. E. Bailey, K. R. Ball, P. E. Barnes, R. J. Bartholomew, C. S. Bartlett, H. F. R. Bradbury, A. E. Brian, R. E. P. Brooker, W. T. Brooks, P. N. Douglass, P. D. MacD. Down, E. W. W. Ellis, P. G. D. Farr, A. J. H. Finch, D. Gibson, J. H. Holloway, H. J. Honour, B. G. Mcharg, G. L. Monk, T. Newton, H. A. Ostler, A. F. Pain, H. G. Paul, G. V. Proudman, E. G. Shults, J. A. Stuart, I. C. Swann, G. Tanner, D. R. Walker, P. Walker.

The following Acting Pilot Officers on probation are confirmed in their appointments and graded as Pilot Officers on the dates stated:—D. S. Richardson (May 11); G. P. Westropp-Bennett (May 18); J. F. H. Booth, J. S. Douglas-Cooper, J. S. Dunlevie, R. H. McClatchey, B. A. Miller, G. V. J. Shaen-Carter, G. E. Watkins (June 15); H. T. J. Anderson, A. W. A. Bayne, J. R. M. Boothby, R. G. Dutton, C. P. Igglesden, M. T. St. J. Pattle, A. E. Thompson (June 29); D. F. Elliot, T. V. Poltock, C. A. Rotheram, F. E. O. Temple-West (July 6); R. Hutchinson, B. A. Mitchell, T. H. Parrott (July 10).

Acting Pilot Officer on probation R. V. Evers-Swindell is graded as Pilot Officer on probation with effect from May 4 and confirmed in his appointment with effect from June 2; Acting Pilot Officer on probation S. Gemmell is graded as Pilot Officer on probation with effect from May 18 and confirmed in his appointment with effect from June 15.

The following Acting Pilot Officers on probation are graded as Pilot Officers on probation with effect from June 8 and confirmed in their appointment with effect from June 22:—E. Holden, R. E. G. Morewood.

The following Flying Officers are promoted to the rank of Flight Lieutenant on the dates stated:—J. Y. Humphreys, seniority September 25, 1936 (April 9); P. B. B. Ogilvie, seniority May 28 (June 30); C. F. C. Wright (July 6).

The following Pilot Officers are promoted to the rank of Flying Officer on the dates stated:—J. A. G. Gordon, seniority October 22, 1936 (January 22); A. J. Young (July 14); R. T. F. Gates, R. B. Nuthall (July 16); R. N. Cook (July 19).

Flt. Lt. R. A. R. Rae is placed on the half-pay list, Scale B (July 26); Cdr. A. P. Colthurst, R.N., Squadron Leader R.A.F., ceases to be attached to the R.A.F. on return to Naval duty (July 2); Capt. W. H. N. Martin, R.M., Flight Lieutenant R.A.F., ceases to be attached to the R.A.F. on return to duty with the Royal Marines (June 22) (substituted for notification in *Gazettes* of June 29 and July 6); Capt. A. C. Newson, R.M., Flight Lieutenant R.A.F., ceases to be attached to the R.A.F. on return to duty with the Royal Marines (July 21) (substituted for notification in *Gazette* of July 20); F/O. K. W. Goudie (Lt., The Highland Light Infantry) ceases to be seconded tc the R.A.F. on return to Army duty (July 15); Flt. Lt. E. C. Smith-Ross is transferred to the Reserve, Class C (July 27).

Accountant Branch

The following Pilot Officers on probation are confirmed in their appointments and promoted to the rank of Flying Officer (June 12):—P. W. Hill, P. N. Isaac.

Medical Branch

Flt. Lt. J. Kemp, M.B., Ch.B., D.P.H., is promoted to the rank of Squadron Leader (May 1) (substituted for notification in *Gazette* of May 11).

Chaplains Branch

The Rev. R. W. Briscoe is granted short service commission with the relative rank of Squadron Leader with effect from and with seniority of July 13.

Commissioned Engineer Officers

The following Warrant Officers are granted permanent commissions as Flying Officers on probation with effect from the dates stated and with seniority of May 18:—A. G. Williams, A. E. Davies, N. W. Fredrick, A. J. V. Parish, R. L. Bell, N. L. Claxton, F. H. Catton (July 15); J. S. Brett, A.F.M., G. H. Harrison, A. B. Kendall (July 16).

Commissioned Signals Officers

W/O. W. E. Wendon is granted a permanent commission as Flying Officer on probation with effect from July 19 and with seniority of May 18.

The following Warrant Officers are granted permanent commissions as Flying Officers on probation with effect from and with seniority of July 15:—J. S. Smith, A. E. Hester.

Memorandum

The permission granted to H. Barker to retain the rank of Captain is withdrawn on his conviction by the Civil Power (July 2).

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss E. M. Buckels resigns her appointment (July 21).

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

M. A. Smith is granted a commission as Flying Officer in Class A with effect from July 20, and with seniority of October 22, 1935; R. U. P. Kay-Shuttleworth is granted a commission as Pilot Officer in Class AA (July 27).

The following are granted commissions as Flying Officers in Class BB (July 27):—A. E. Mayers, P. J. Meade.

Flt. Lt. M. V. M. Clube relinquishes his commission on appointment to a commission in the Auxiliary Air Force (July 12).

The following Flying Officers relinquish their commissions with effect from the dates stated on appointment to commissions in the Auxiliary Air Force on the dates stated:—J. W. Carmichael (June 7); G. M. T. Kerr (July 3)

AUXILIARY AIR FORCE

General Duties Branch

The following are granted commissions as Flight Lieutenants on the dates stated, while acting as Adjutants of Balloon Squadrons:—F/O. R. A. Ford (R.A.F.O.), F/O. A. N. E. Hall (R.A.F.O.), F/O. J. C. Walker (late R.A.F.), F/O. R V. Weeks (late R.A.F.), F/O. D. W. Morrish (R.A.F.O.) (February 8); F/O. J. Evason (R.A.F., Retired) (April 8).

No. 501 (COUNTY OF GLOUCESTER) (BOMBER) SQUADRON.—A. C. J. Percy is granted a commission as Pilot Officer (May 24).

No. 503 (COUNTY OF LINCOLN) (BOMBER) SQUADRON.—F/O. M. A. Smith relinquishes his commission on appointment to a commission in the Reserve of Air Force Officers (July 20).

No. 504 (COUNTY OF NOTTINGHAM) (BOMBER) SQUADRON.—A. H. Rook is granted a commission as Pilot Officer (June 23).

No. 600 (CITY OF LONDON) (FIGHTER) SQUADRON.—The following are granted commissions as Pilot Officers on the dates stated:—P. C. Hannay (April 11); C. R. Moore (May 1).

No. 601 (COUNTY OF LONDON) (FIGHTER) SQUADRON.—T. G. Waterlow is granted a commission as Pilot Officer (April 27).

No. 604 (COUNTY OF MIDDLESEX) (FIGHTER) SQUADRON.—P/O. A. L. Maffey is promoted to the rank of Flying Officer (June 6).

No. 609 (WEST RIDING) (BOMBER) SQUADRON.—A. R. Edge is granted a commission as Pilot Officer (June 22).

No. 610 (COUNTY OF CHESTER) (BOMBER) SQUADRON.—G. M. T. Kerr is granted a commission as Flying Officer (July 3).

The following are granted commissions as Pilot Officers on the dates stated:—P. J. Davies-Cooke (July 1); C. R. Prichard (July 6).

No. 611 (WEST LANCASHIRE) (BOMBER) SQUADRON.—J. N. O'R. Blackwood is granted a commission as Pilot Officer (July 12).

Accountant Branch

No. 501 (COUNTY OF GLOUCESTER) (BOMBER) SQUADRON.—W. G. Duke is granted a commission as Pilot Officer (May 24).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Squadron Leaders.—W. J. Daddo-Langlois, to R.A.F. Station, Grantham; to command, 15.7.37. V. G. A. Hatcher, A.F.C., to Headquarters, No. 11 (Fighter) Group, Uxbridge; for Signals duties, 9.7.37. A. H. Owen, M.C., to No. 115 (Bomber) Squadron, Marham; for flying duties, 12.7.37.

Flight Lieutenants.—W. R. Baird, to R.A.F. Station, Thornaby, 20.7.37. J. A. Tester, to No. 75 (Bomber) Squadron, Driffield, 12.7.37. R. K. Brougham, to R.A.F. Station, Duxford, 12.7.37. L. P. Moore, to No. 217 (General Reconnaissance) Squadron, Tangmere, 1.7.37.

Flying Officer.—R. H. S. McConnell, to No. 240 (Flying Boat) Squadron, Calshot, 6.7.37.

Medical Branch

Squadron Leader.—H. Penman, to Princess Mary's R.A.F. Hospital, Halton; for duty as Medical Officer, 18.7.37.

Dental Branch

Flying Officer.—B. Blackburne, to No. 1 School of Technical Training (Apprentices), Halton, 14.7.37.

Commissioned Engineer Officers

Flying Officers.—The undermentioned are posted to the units shown on appointment to permanent commissions, on probation, with effect from 17.6.37:—

F. A. Kirk, to No. 9 Flying Training School, Hullavington. F. Stevens, to No. 5 Flying Training School, Sealand. J. Bradshaw, to No. 7 Flying Training School, Peterborough. S. G. Dean, to No. 5 Flying Training School, Sealand.

FLIGHT MISCELLANEOUS ADVERTISEMENTS

Prepaid Advertisement Rates: 2d. per word, minimum 3/6. Series Discounts are allowed to trade advertisers as follows on order for consecutive insertions, provided a contract is placed in advance. 13 consecutive insertions, 5%; 26 consecutive, 10%; 52 consecutive, 15%. Situations Wanted ONLY, 18 words, 1/6, 1½d. per word after. Box No., 6d. per insertion extra. Latest time of arrival of advertisements for these columns, **FIRST POST TUESDAY** of each week at: Dorset House, Stamford Street, London, S.E.1, or one day earlier at branch offices (addresses, see first Editorial page).

Aircraft and Engines For Sale

FOR SALE. The Old Etonian Flying Club, having arranged the purchase of a Miles Whitney Straight, wishes to sell the two following: D.H.60 Gipsy I Moth; T.E. hours 1,316; since complete overhaul, 203. T.A. hours 2,003; since C. of A. 45, last February. Miles Hawk Major M2F; T.E. hours, 178; T.A. hours, 166, since C. of A. 12, last November. Apply Heston.

SUPER DRONE, as new. Only 10 hours total flying, ready fly away. £175 or businesslike offer. Take car part ex. Wards, Leasowe Road, Wallasey. Tel. 4151.

GIPSY SIX Percival Gull. Seven months C. of A., excellent condition, fullest equipment. Box No. 161, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

SPARTAN ARROW GIPSY I, 2-seater dual, 12 months C. of A. Engine hours 20 since £100 overhaul; aircraft hours nil. £40 C. of A. Light control for aerobatics. £275. Ward, 3, Leasowe Road, Wallasey. Accept car part exchange. Tel. 4151.

GERMAN Klemm Salmson, twin ignition, C. of A. just renewed, engine overhauled, repainted, excellent condition, seen London, offers wanted. Box No. 162, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

D.H. MAJOR MOTH. Total hours 350; equipped for blind flying; price £365.

D.H. GIPSY III MOTH: Airframe hours 950; in perfect condition; price £340.

D.H. PUSS MOTH. Since complete, 10 hours; blind flying instruments, navigation lights, many refinements; price £425.
Harris and Gillow, Auctioneers, 80-82, Wardour Street, W.1.

SPARTAN 2-seater Gipsy II. £95 or near offer. Brooklands Aviation, Ltd., Weybridge.

FOR SALE. Puss Moth with 12 months' C. of A. 'Phone: Croydon 6123.

B.A. "SWALLOW." New in November, 1936. Total hours 380. Cirrus Minor engine. Offers wanted. Below.

B.A. "SWALLOW." New in March, 1936. 12 months' C. of A. by manufacturers. Total hours 220. Pobjoy Cataract engine Offers wanted. Below.

MALCOLM & FARQUHARSON, LTD., for all types of new or secondhand aircraft. Hire Purchase, Part Exchange and Export Specialists Apply to:—Malcolm & Farquharson, Ltd., Heston Airport, Hounslow, Middlesex. Telephone: Hayes 800.

TWO SHORT SCIONS for immediate delivery. (1) C. of A. March, 1938; 175 hours total. (2) C. of A. February, 1938; 210 hours total. Airframes and Niagara III engines in perfect condition.

B.A. SWALLOW, C. of A. April, 1938. Just fitted with equivalent-to-new Pobjoy reconditioned Cataract II engine. £450.

MONOSPAR ST6 (retractable undercarriage), under 400 hours since new. C. of A. 25th January, 1938. £350. Box No. 164, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

B.A. "CIRRUS" SWALLOW, new April, 1937. Total hours 30. Best offer or would consider exchange Hornet. Apply Box 576, Mundy, Gilbert & Troman, Advertising Offices, Birmingham.

Spartan Cirrus III. 12 Months' C of A. Newly painted, £190. 248 Romford Rd., E.7.

MILES HAWK MAJOR de Luxe trainer type, wide centre-section and undercarriage. C. of A. until June, 1938. Total hours since new 110. Flaps, Titanine special finish wings, fuselage, tail, polished cowling, Sutton harness both seats, instruments and compass front cockpit, streamline headrest, detachable front screen, cockpit cover, deep locker, D.H. lock. Never raced or crashed. One owner. Cost £912, accept £525. Mainwaring, Dolbelidr, St. Asaph.

Kindly mention "Flight" when corresponding with advertisers.

Situations Vacant

ROYAL AIR FORCE.
VACANCIES FOR PILOTS.

Candidates are required in large numbers for short service commissions to train and serve as pilots. No previous flying experience is necessary.
Age 17½ to 25 years.
They must be educated to the standard of the School Certificate, be unmarried and of good physique.
Appointments are for four years, followed by six years' reserve service.
Gratuity of £300 payable.
Apply (by post card) to Secretary (Dept. S.7 BC) Air Ministry, London.

SKILLED SEMI-SKILLED and UNSKILLED MEN may enlist and improve their prospects in the ROYAL AIR FORCE. Apply for age limits and full particulars to: R.A.F. Recruiting Depot, Victory House, Kingsway, London, W.C.2, or any R.A.F. Recruiting Depot.

RESERVE OF AIR FORCE OFFICERS.
OPENINGS FOR PILOTS.

A number of commissions in the Reserve of Air Force Officers are offered to young unmarried men between the ages of 18 and 25.
Candidates should be educated approximately to the standard of the Oxford and Cambridge Schools certificate, be of good physique and be able to devote about one year to continuous whole time flying and ground training. Thereafter the annual training period will not exceed 24 days.
The period of service will be for 5 years. During training, pay will be given, with an annual retaining fee of £25 after the first year. The next course is due to begin in September, 1937. Early application should be made for particulars to the Secretary, Air Ministry (V) S.7. (E), London, W.C.2

DESIGNER or Draughtsman Designer required by large firm for development of aircraft instruments. Apply, stating age, salary required and full details of experience and technical education to Box No. 160, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

WANTED approved Welder and panel beater for aluminium cowlings. Foster Wickner Aircraft, Southampton Airport.

SENIOR Stressman required, apply stating age, experience and salary required. Gloster Aircraft.

SENIOR and Junior Draughtsmen required, apply stating age, experience and salary required. Gloster Aircraft.

SEVERAL Aircraft Draughtsmen and also Jig and Tool Draughtsmen required. Apply stating age, qualifications and salary required to Short and Harland, Ltd., Queen's Island, Belfast.

TWO A and C G.E.'s, preferably with Pobjoy Niagara II and III and Float experience, but week at Works will be afforded to suitable men. West of Scotland Airways, Renfrew.

Situations Wanted

FLYING INSTRUCTOR, B Licence Pilot, requires situation, whole or part time. Home or abroad. Box 163, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

SHIP'S Draughtsman desires position with aircraft factory. Seeks 2-3 months practical experience with promise of entering D.O. Present experience in steel construction and detail work. Age 24 years. Box 7308, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

KEEN young man, experienced aero engines, desires position with prospects manufacturers civil types sales agency. Willing work Continent Perf. French, good German. Box No. 7316, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

"B" LICENCED Pilot, 4,300 hours. 2nd Class Navigator's, G.E.'s and W/T licences requires temporary employment until October Box No. 7317, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

PUBLIC School Boy (18), keenly desires any situation in aviation, whole or part-time. Good knowledge aircraft, small amount practical experience. Salary no object. Box No. 7318, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

"B" LICENCE Instructor with business experience and executive ability, desires appointment. Would consider taking small financial interest. Box No. 165, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

Wireless Operator, first-class P.M.G. and Air Ministry licence, 13 years' sea service, including 5 years on Arctic fishing vessels, seeks situation with commercial air firm or private. Smail, Front Street, Bedlington.

Training and Travel Advertisements

INDEX TO ADVERTISERS

Kindly mention "Flight" when corresponding with advertisers.

Printed in England for the Proprietors and Publishers, FLIGHT PUBLISHING COMPANY, LIMITED, Dorset House, Stamford Street, London, S.E.1, by CORNWALL PRESS LTD., 1-6, Paris Garden, Stamford Street, London, S.E.1. "Flight" can be obtained abroad from the following: FRANCE: W. H. Smith & Son, 248, Rue Rivoli, Paris; Hachette et Cie, Rue Réaumur, Paris and branches. BELGIUM: W. H. Smith & Son, 71-75, Boulevard Adolphe Max, Brussels. AUSTRALIA: Gordon & Gotch, Ltd., Melbourne (Victoria), Sydney (N.S.W.), Brisbane (Queensland), Adelaide (S.A.), Perth (W.A.), and Launceston (Tasmania). NEW ZEALAND: Gordon & Gotch, Ltd., Wellington, Auckland, Christchurch and Dunedin. INDIA: A. H. Wheeler & Co., Bombay, Allahabad and Calcutta. CANADA: Imperial News Co., Toronto, Winnipeg and Vancouver; Benjamin News Co., Montreal; Gordon & Gotch, Ltd., Toronto. SOUTH AFRICA: Central News Agency, Ltd. UNITED STATES: The International News Co., New York. Entered as Second Class at the New York U.S.A. Post Office.