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The First Journal devoted to Soaring and Gliding

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GREAT CHANGES

GREAT CHANGES have taken place in the world in the past five years, nor is it certain that more major events may not alter the conditions of the world even further, politically, economically and technically, before the war is over. What is certain is that we would sigh for the pre-war world in vain. Nor when we remember the slough of despond of those pre-war twenty years, is it difficult to be glad that the ways have altered even if the world does not accept in its entirety the opportunity of making changes so that all may live a fuller and more abundant life.

* *

Our environment and our conditions of life can never be the same again anywhere in the world in whatever state of life we find ourselves. These changes might have occurred almost unnoticed had they taken place in the slow passage of the years. But when five or more years have been spent in absence from the normal scene and in a denial of the favourite pursuits, the return to the past will be even stranger, more difficult, and possibly less pleasurable than had been anticipated. Under the impact of war even familiar scenes have changed. Once green areas of grazing land now are mostly plough. Less pleasant, perhaps, to look at, but much better for thermals.

* *

Old faces we may miss—and a sense of loss will ever be present. But there will be new faces, eager, alive, intelligent, to bring their potential energy and ideas to the common pool. And there will be many more of them. So that instead of a few Gliding Clubs, most of whom struggled for existence with an insufficiency of finance, these may well be increased tenfold and be thriving centres of sport and scientific endeavour.

* *

It is no secret that the number of A.T.C. cadets alone who to all intents and purposes have qualified for their "A" Gliding certificates in the last two years is more than six times the total number of people who took their "A"s in the 20 years before the war.

* *

Many of these have never heard of the Federation Aeronautique Internationale, nor even of the Royal Aero Club. But numerous as they are, they are only the beginning. In the years to come the members of "A" Certificate Holders may be numbered in hundreds of thousands and "B"s in the tens of thousands.

* *

This may be ominous news for the happy few who made up the Soaring fraternity in 1939. But it is excellent news for the Empire. If in addition to the great dynamic of enlightenment which has come upon the Empire's youth (because of the needs and of the development of Air Power), there is a further development of the Empire by turning Air Power to constructive ends, we may be on the eve of possibly the profoundest events in world history.

* *

But if the opportunity is there, so are the responsibilities. A better world will not be lightly achieved. It will demand a new outlook on life, and new ways of thinking.

* *

It will demand the spirit of adventure, the bright vision and the open countenance of the open mind, high spirits and high courage. And this spirit must pervade all its counsels and governors. It must, for they will otherwise be unable to withstand the onrush of progress and events.

* *

The Gliding Movement in this country should now stand on its own feet. It should not need any form of Government subsidy and it should be free from any kind of Government control except the necessary safety precautions.

* *

For the rest it needs only the self-discipline of high morale, which the flying community surely possesses in abundance. Anything which prevents this movement from beginning again where it left off would damp the enthusiasm of those tens of thousands of people who now wish to take it up for pleasure or for profit. *It might well cause again the birth of that cynicism which was so noticeable in the late twenties and which had not a little to do with the attitude of the British public towards politics and world affairs. It is the greatest opportunity in the world's history.*

ARE WE GOING TO TAKE IT?

THE EAR DRUM AS VARIOMETER

By A. E. SLATER

THE human ear-drum was evolved for detecting sound waves, so it must be able to respond to quick changes of atmospheric pressure. Because it can do this, it will also respond to the changes of pressure met with when its possessor moves rapidly up or down through the atmosphere.

The air on the outer side of the drum communicates with the atmosphere through the external ear passage; the air on the inner side, however, is contained in a small cavity, the "middle ear," which is normally closed. If the air pressures on either side of it are unequal, the ear drum will bulge one way or the other until they are equalized by the opening of a slit-like passage, the "Eustachian tube," which leads from the middle ear to the back of the mouth cavity and so to the atmosphere outside. This passage is normally closed but can be opened by the act of swallowing or yawning, or, more simply, by a sort of stifled yawn which airmen are taught to employ.

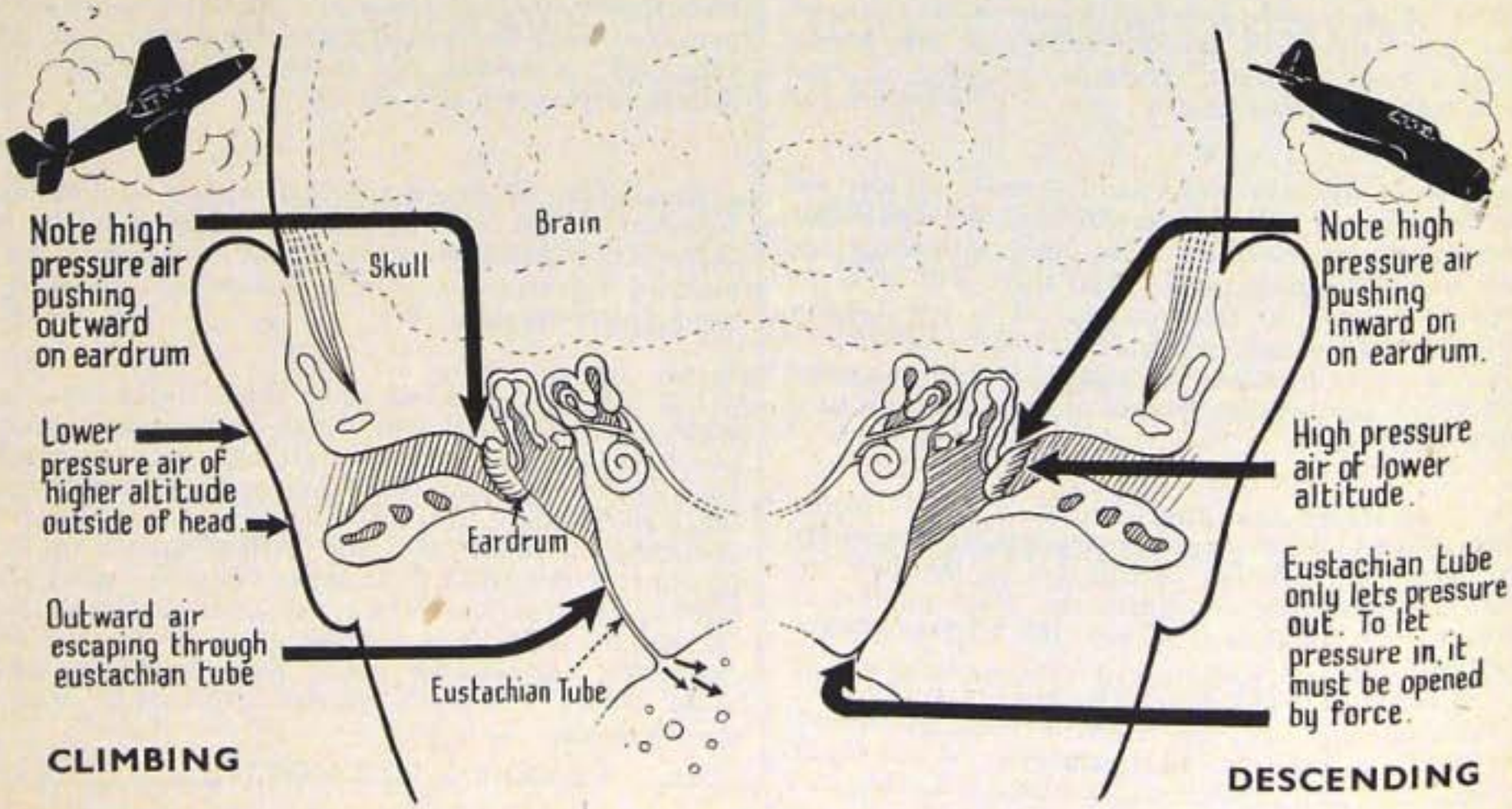
Can this effect on the ear-drum enable the sailplane pilot to tell if he is in an up-current or a down-current? Twelve years ago the present writer tried to solve this problem (see *The Sailplane and Glider* for December 30, 1932) by taking a barometer around in the London tube trains, where sudden changes of pressure are often strong enough to be felt in the ears, no doubt because the trains are such a tight fit in their tubes.

It was found that a sudden rise of pressure equivalent to 0.04 inches of mercury was the minimum needed to produce an effect best described as a bursting sensation. But the minimum fall in pressure which could be felt was 0.06 inches, and the sensation in this case was rather vague and soon passed off unless the outside pressure continued to fall. That is to say, the ear-drum can appreciate a quick loss of altitude of not less than 40 feet, or a gain of at least 60 feet.

A few months later W. Hirth wrote to say that, on March 29, 1933, he had succeeded in making a thermal soaring flight entirely by the sensations in his ears, which he used instead of a variometer. After an aero-towed launch he found three successive thermals in this manner, climbed from 400 to 1,500 feet, and stayed up for 46 minutes. The barogram of his flight is given in *The Art of Soaring Flight*, page 76.

The account of this flight being reproduced in the French paper *Les Ailes*, one Gilbert Raissan then suggested that it wasn't the ear-drums which provided the clue, but the wind blowing across the external ears which are so sensitive as to detect a small change in wind direction. But he forgot that the direction of air flow past a sailplane depends on its gliding attitude, and not on whether it is in an up-current; the vertical velocity of the air which the plane is flying in makes no difference so long as it is uniform.

After this, several British pilots were on the look-out for ear sensations, but appeared to find them only in up- or down-currents of unusual intensity. However, as thermal soaring was only just beginning in England and nobody had had much experience of it, probably in the weaker thermals their attention was fully taken up



by the effort of trying to soar. The up-currents sensed by Hirth lifted him at about 2¼ feet per second when he first entered them.

Some years later a few pilots, both here and abroad, began to notice a characteristic change in the sound of the air flow when a sailplane entered a thermal. The late R. S. Rattray, for instance, wrote in July, 1937, that his Cambridge II sailplane "always makes a sizzling noise in a thermal."

Does this noise originate in the sailplane or in the pilot's ears? If in the sailplane, the most obvious explanation is that the cavity of the wing has to empty some of its air when the outside pressure is reduced during a climb, and this air escapes by whistling through whatever openings exist. The Cambridge II is now in use at an A.T.C. gliding school, and if the "sizzling" sound can still be elicited, it might be worth while seeing if enlarging the openings will eliminate it.

Alternatively the change in note could be attributed to an alteration in the tension of the ear-drum. In the article referred to, I pointed out that there is good reason for the drum to be more sensitive to an increase of outside pressure (corresponding to loss of altitude) than to a decrease (with gain of altitude). The drum is kept taut by being pulled inwards by a special muscle, the *tensor tympani*. So any increase of outside pressure will tighten it still further, though the threshold value of 0.04 inches pressure can be accounted for by a small portion of the drum, the *pars flaccida*, which is normally relaxed and has therefore to "take up the slack" before the drum begins to stretch. A reduction of pressure, as in an up-current, will, on the other hand, cause the drum at first to relax; it will therefore be less sensitive to sound waves and this may account for the changed noise heard by the pilot. Any pilot who hears this "thermal noise" should swallow or yawn, and then listen again.

Modern text-books on aviation medicine are now in a position to give more information than was available in 1932; most of it is based on a notable piece of research by H. G. Armstrong and J. W. Heim, published by them in the *Journal of the American Medical Association* for August 7, 1937 (Vol. 109, No. 6, p. 417).

These experimenters find that the average threshold, or minimum value, for perception of a *fall* in atmospheric pressure varies between 3 and 5 millimetres of mercury, or 0.12 to 0.20 of an inch—just double my own threshold, which varied between 0.06 and 0.10 inch in the tube train experiments. But the latter was in a *sudden* change of pressure, whereas the rate of change used by the American experimenters in their pressure chamber was more gradual, and varied between 5.4 and 27 mm. per minute, corresponding to a climb of 200 to 1,000 feet per minute or 3.3 to 16.7 per second.

Armstrong and Heim call attention to another cause of an increase of outside pressure being so much more troublesome than a decrease. Where the Eustachian tube enters the mouth cavity at the junction between the throat and nose passages, its orifice is so shaped as to act like a valve. This will automatically let air pass out from the middle ear whenever the pressure difference corresponds to a climb of about 500 feet, but will not let air in again unless the tube is opened voluntarily by swallowing or yawning.

The authors do not give the threshold, or minimum perceptible change, for an increase of *outside* pressure, but say that a difference of 60 mm. of mercury causes severe pain, and that at some point between 100 and 500 mm. pressure the ear-drum will burst. An important fact is that, at a pressure difference of 80 or 90 mm., the valve-like entrance to the Eustachian tube becomes so tightly shut that no muscular effort can open it, so that, if the pilot then continues to descend, he will sooner or later rupture his ear-drum. However, it may yet be possible to save the drum, says E. Jokl in his *Aviation Medicine* (Cape Town, 1942), by holding the nose and getting up such a terrific pressure inside the mouth as to force air through the tube into the middle ear. If this doesn't work, the victim is advised to go up higher, and try again—advice which not every sailplane pilot is in a position to take.

A warning is given by V. E. Henderson (*Air Crew in their Element*: Toronto, 1942) that impairment of hearing caused by increasing pressure may upset the landing technique of a pilot who judges his flying speed by sound.

For a sailplane pilot the symptoms of decreasing atmospheric pressure, set up by climbing in a thermal, are of special importance; and it is to be noted that, according to Armstrong and Heim, the *rate* of climb has little or no effect on whether a sensation is felt: only the *amount* of change is really significant. They state, further, that no impairment of hearing is noticed until the pressure reduction reaches 10 to 15 mm., corresponding to a climb of 350 to 500 feet. However, this does not rule out the possibility of sailplane pilots noticing a much smaller change, since they make a habit of listening intently to the wind going past their wings.

The artist who drew the diagram has been asked to include also the Inner Ear, which consists of two structures intended for balancing and hearing respectively.

The balancing organ is made up of three "semi-circular canals," each lying in a different plane, and each filled with fluid which gives rise to sensations whenever it is set in motion by turning the head. It is important to note that this organ registers only a *change in rate* of angular velocity, but unfortunately the brain interprets this acceleration as merely a velocity—hence the difficulty of learning to fly by instruments, an unnatural art which requires frequent practice for maintenance of skill.

The hearing organ is a spiral shell-like structure, the cochlea, filled with fluid, and containing a series of minute organs which are believed to respond to notes of different pitch according to their position in the spiral. The vibrations of the ear-drum are conveyed across the middle ear to this fluid by a chain of three tiny bones. It has been found that people who fly with the help of motive power are liable to lose their sensitivity to high-pitched notes after an hour's flying, and the loss becomes permanent after much repeated exposure to engine noise. (See *Nature*, August 17, 1940, and *Journal of Laryngology and Otology*, Vol. 44, No. 9, 1939.) Sailplane pilots do not, of course, suffer from this unnatural complaint.

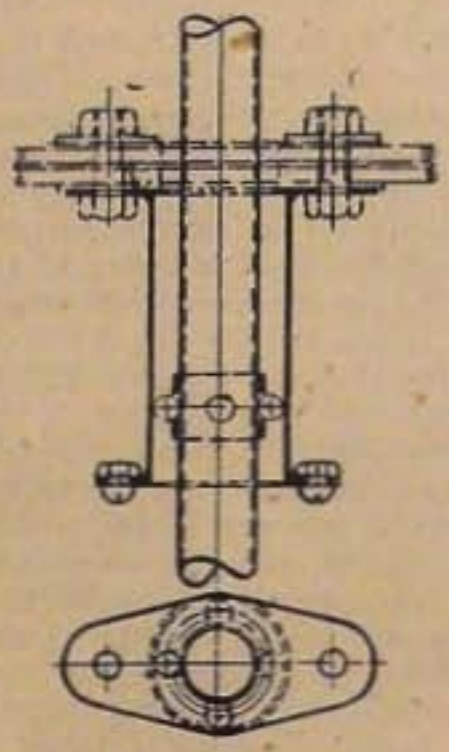
HIGH PERFORMANCE SAILPLANE "KRANICH" 2-SEATER

Translated from "Flugsport" by M. FLINT

MODIFICATIONS have been made by the D.F.S. (German Institute of Sailplane Research) to the Kranich sailplane, to enable this machine to be used for special research flights in clouds and in the ascending currents in clouds in the Alps.

As a safeguard for cloud flying the aircraft has been fitted with diving brakes. The increase in the wing dihedral from 4.5° to 10.5° gives the lateral stability which is particularly desirable when flying blind.

To eliminate the drawback due to the tightening of control transmission cables on reaching high altitudes and correspondingly lower temperatures, the cable control transmissions for the ailerons and elevator have been replaced by rods. Owing to the long lengths of these rods a relatively large number of bearing blocks have had to be introduced in order to keep the weight of the rods within tolerable limits. A special form of bearing

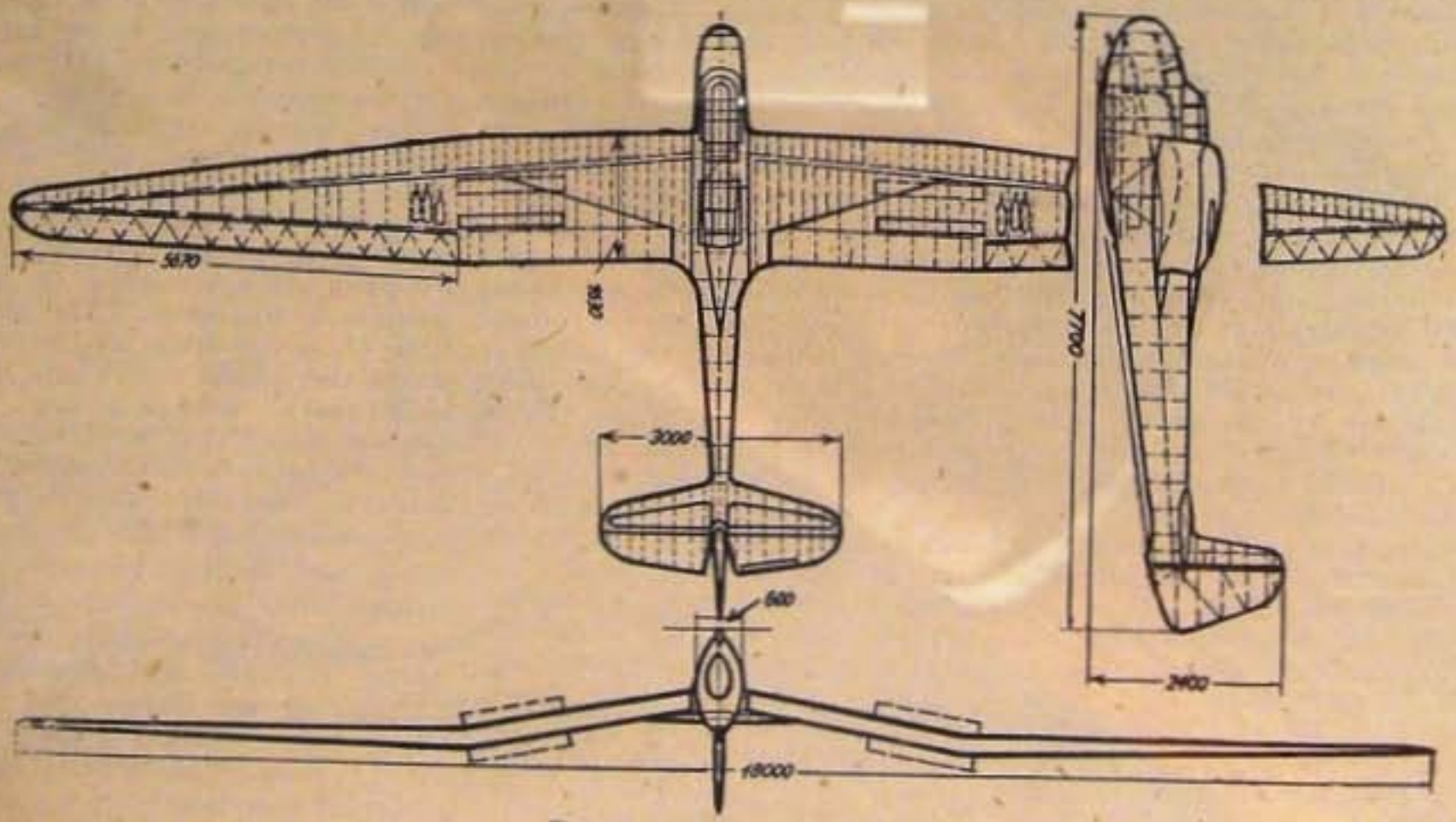


has been evolved for this purpose (above). It costs little to make and weighs about 60 gr. It consists of an outer cylinder on to which an attachment flange is welded. Balls of a diameter of 5 to 6 mm., on which the transmission rods run, are contained in 4 grooves in a ball race made of a plastic or moulded substance. The running surfaces need no special working up.

The rod control transmission system is highly satisfactory, since the absence of cable pulleys minimises friction, and an increase in the control effect is obtained through the greater stiffness in the control system as a whole. Moreover the risk of cables wearing out, and the need for constant overhaul, are eliminated. Further, the pilot is in better touch with his machine, and he can take note immediately of every phenomenon that occurs, *e.g.* diversion of the air flow over the outer wings.

Six oxygen bottles for the pilot and the observer are carried on reinforced ribs in the outer wings and are accessible from below. Each bottle has a capacity of 300 lit., and is sufficient for 1½ to 2 hours with normal breathing. The machine is fitted with the Auer high altitude respirator.

Acknowledgments to R.T.P.3.—M.A.P.



DIMENSIONS IN INCHES



Sailplane and Glider, March, 1944 *J. Huskton.*

"GLIDING IN CZECHOSLOVAKIA"—II.

By MAJOR A. E. SITEK

Czecho-Slovak Gliding Instructor.

ONE of the best known and most enterprising clubs of the Czechoslovakian Gliding Association was the group formed in Brno. This section was built up in the capital town of Moravia and had its club-rooms not far from the world-famed castle of Spilberk.

Once a week, at the Brno Club, with its modern and up-to-date offices, library and reading rooms, a glider club meeting was held, members of which were very enthusiastic and go-ahead. Apart from the usual club meetings, lectures, film shows were often given. The latter were usually reserved for the winter months and for their subject matter took the performances and exercises of the club during the previous summer.

Lectures were of general interest, they were free of charge and open, not only to Association members but also to students and civilians. In quite a short time these lectures and films became very popular, and the club had to take larger rooms in a theatre or cinema as their accommodation was inadequate.

A most important part of the club was its workshops, which could be found almost in the neighbourhood of Brnos' civil aerodrome. Large, light, and airy buildings were used for building gliders, and there were also facilities for improvising and repairing the craft being used. Gliders not in use were housed here. Experts in construction were given permanent employment in the shops and pilots in training had to put in a certain amount of time learning construction and repair. The tuition was compulsory and formed part of the glider pilot's training. This period was heartily welcomed by members, many of whom were students who had previously had no occasion in their lives to use tools. However, under the able supervision they received they soon became proficient and useful mechanics, able to deal with repairs and service their own craft when necessary.

Girls, too, were included in the curriculum; they had the same right to fly as the boys, and had therefore to learn the same technicalities.

Gliders damaged during instruction were repaired, new gliders and sailplanes were built and all their necessary accessories manufactured.

It was, therefore, no uncommon sight to see both boys and girls busy making winches, catapult-rails, transport wheels, transport carriages for gliders and repairing the motor cars used for towing. Generally speaking, all the technical instruction essential for the quick and competent training of good glider pilots was given in these workshops.

Material for building was bought directly from the large aero-factories. Material such as wood and plywood bought in this way was a little more expensive than the same material bought from timber merchants, but had the advantage that it had been passed as suitable for glider and sailplane construction by the inspector of the Ministry of Works, Aero Section. In any case it was usually of a high standard of quality and comparatively speaking cheap.

Some idea of the construction work carried out by the Brno Club can be gathered from the fact that they built gliders, not only for the use of their own group, but also made parts for clubs who had not as yet achieved their own workshops.

Though primary gliders were, in the main, the usual types built, certain high performance sailplanes for Club purposes and for members who owned their own were manufactured. Craft of different type and origin were favoured, one very efficient model being the Sailplane PREROV, designed and built by Mr. Kotiba, now in the R.A.F. Two other types were the high performance Czechoslovak type ZLIN and the German type GRUNAU BABY, the work of the writer of the article.

In the year previous to the occupation of Czechoslovakia by the Nazis an interesting motor glider had just been constructed; the new venture combining a light light petrol engine with a sailplane, which will be described in greater detail in a later article.

Once a year an exhibition was held, usually lasting for 14 days. With the usual perspicacity displayed by members to gain further converts to their sport, school vacations were chosen as the most suitable time to hold the display. The schools were utilized and sketches, pictures, diagrams and photographs were exhibited. Glider and sailplane models and actual gliders and sailplanes used in exercises were on show. There were also instruments used for blind flying and equipment needed by pilots such as parachutes, flying gear and overalls, etc. The Club published in the local papers the date and whereabouts of the exhibition. Although a large percentage of the visitors were students and schoolboys, its popularity could be judged by the fact that people from distant towns and villages visited the exhibition every year, often making long journeys to learn of advancement made by this ever-growing and popular pastime.

SUBSCRIPTIONS

The circulation of *Sailplane and Glider* is limited by its paper quota. This is the reason for the reduction in size, and the thinner and therefore lighter paper. The publishers can dispose of far more copies than can be printed. To be sure of your copy therefore, it is necessary to take out an Annual Subscription of 13/- post free for twelve numbers. Publication date is the 25th of the month dated the succeeding month. Cheques, Money Orders, etc., payable to *Sailplane and Glider*, and crossed.

SAILFLYER'S LIBRARY.

THE only comprehensive up-to-date text-book on soaring flight in the English language is still the late Lewin Barringer's *Flight Without Power* (Pitman, 17s. 6d.), first published in 1940. A new edition is now out, the chief changes in which are the elimination of chapters on sites, clubs, and the future of gliding, to make room for a chapter on Transport Gliders, and some new information on variometers and launching devices. In addition to tactical advantages in war, and the commercial advantage of depositing or picking up payload without stopping, Barringer claims that a " glider train " has an aerodynamic advantage over the same number of machines each fitted with independent motive power. But no figures are given to support the argument, which rests chiefly on an anology with railway trains, coupled road vehicles, and tugs towing barges through the water. I cannot feel that the comparison is valid, as these three forms of transport are adopted for other reasons than the saving of total propulsive power.

There is much new material on variometers, contributed by a physicist, August Raspet. The new types described are the Horn, of similar fundamental principle to the Cobb-Slater but with a large indicating dial; the Electrical Variometer, in which the air-leak impinges on resistance coils; the capillary leak with liquid manometer, in describing which the writer pays tribute to the work of the late David Dent (whose instrument of this type was used for the first British thermal flights); and the " total energy variometer," a remarkable instrument which indicates an up-current even if the sailplane is diving or zooming through it.

A most interesting table is given, comparing the qualities of five types of variometer. For sensitivity, defined as the " smallest graduation in feet per second," the Cobb-Slater comes out best at 0.5; while the smallest lag, 0.1 seconds, is in the electrical type—in fact, some pilots have found this too much of a good thing, and have had to increase its lag to stop it from registering turbulence as well as up-currents. Precision, meaning accuracy of measurement, is best in the Horn and the Electrical. Great store is set on " readability," since a sailplane pilot spends so much time looking at his variometer, and in this respect the Horn shares the honours with the old-fashioned diaphragm type with capillary leak.

In England two small booklets on gliding have appeared during the past year or so. Malcolm Logan's *Gliding and Soaring* (Pitman, 9d.) is an excellent training manual, necessarily concentrated; it deals chiefly with elementary instruction but has a small section on advanced soaring.

W. R. Scott's *Manual of Gliding* (Bernards, 2s.) is a sort of miniature encyclopaedia, with the emphasis on structure, since the author is the founder of Scott Light Aircraft, the firm which produced the Viking sailplane. He describes an apparatus he has designed for reducing the time spent on primary training; it is a glider fixed by a universal joint to a chassis, which dashes along at speed while the resulting airflow enables the pilot to change the glider's attitude in response to the controls. I liked best his autobiography which starts the book, for the most romantic career is always the one decided on in boyhood. But the diagram showing the position of the ailerons in a side-slip is incorrect.

I wish somebody like Mr. Scott would produce a full-sized book on glider construction. At present there is nothing in English comparable to Hans Jacob's *Werkstattpraxis* (Workshop Practice), written by the designer of several highly-successful sailplanes and, more recently, some of the earliest military gliders.

However, the dearth of new full-size gliding books will soon be at an end. Alois Sitek and Vernon Blunt, *The Sailplane's* Editor, have collaborated in producing a work designed as a standard text-book on gliding and soaring, treating of every aspect of the sport. It is expected to be out shortly, published by the Alliance Press. Another book is being prepared by Terence Horsley; it is not strictly a text-book, though much of it can serve as one; it is chiefly descriptive, especially of the author's and other people's soaring flights, and seethes with meteorology. It is to be copiously illustrated, and Messrs Eyre & Spottiswoode will probably publish it late this year.

A new American book has just come to hand: *Gliders and Glider Training*, by Emanuele Stieri (Essential Books, New York, $3). It is a well got-up book with a large size of page (12 by 9 ins.), and a goodly number of beautiful photographs. The chapters on training cover much the same ground as Barringer's book, though that on advanced soaring is less thorough. The historical section is particularly good and full—far the best I have seen since J. B. Weiss's *Gliding and Soaring Flight* of 1923, which was purely historical. Who knows that Chanute, in his 1896 experiments, had an associate named Butusov who arrived with a copy of the famous " Albatross " built by Le Bris, the French sea captain? Its performance was rotten, and monoplanes remained out of favour for many years; Chanute's machines, on the other hand, had wings numbering anything from two to twelve apiece.

In the meteorological chapter there is a good deal about thermals, and the author explains why, even in midsummer, they don't start up at Elmira till 9 or 10 a.m.: it takes all that time for the ground inversion to be well and truly destroyed. There is a chapter on military gliders, and a large section describing in considerable detail how to build a sailplane of Briegleb design, either the BG6 single-seater steel-fuselage fabric-covered utility glider, or the BG8 high-performance two-seater of plywood construction. But the reader who pursues the book to the bitter end will get badly stung by its tail, for there is a final chapter on " Gliders of the Future," dealing entirely, exclusively, and inexcusably with the commercial, cargo-carrying, dividend-earning aerial barge, which he has the temerity to describe as having replaced " the frail, single-place glider of only a few years ago."

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SAILPLANES OVER THE JUNGFRAUJOCH

THE Jungfraujoch, in Switzerland, 11,384 feet above sea-level, was first used as a launching point for sailplanes in 1930, when the late G. Groenhoff flew his "Fafnir" in some prolonged glides down into the surrounding valleys. Launching conditions were troublesome; during one launch half his elevator was knocked off against a boulder, and he had to glide at high speed to maintain control; during another the tail-holding team pulled so hard that the rudder was displaced and put out of action, and the pilot had subsequently to steer by violent movements of the ailerons. One launch was actually made from the leeward side of the mountain, where there was nevertheless an up-current because of the reverse eddy often to be found over lee slopes where they are steep.

In 1932 the first cross-country flights to be made from the Jungfraujoch by a Swiss pilot were carried out by Willy Farner in a "Spyr" sailplane, a Swiss design first produced in 1929, of which an improved version, the "Spyr III," may be remembered by those who attended the International Contest of 1937 at the Wasserkuppe.

The first really big meeting to be held on the Jungfraujoch took place in 1935 from September 4 to 18.

The following account of the meeting was sent by our Swiss correspondent, Otto Frischknecht:

Four nations entered for the contest. The Swiss team had seven pilots and six sailplanes, of "Rhonsperber," "Rhonbussard," "Grunau Baby" and "Spyr III" types. Germany and Austria each sent four pilots with four machines, and Jugo-slavia two pilots with two machines.

The sailplanes had to be stressed for aerobatics and every pilot equipped with parachute, food for two days, and signalling rockets. The machines were transported to the Jungfraujoch by train and lodged in the "Sphinx-Stollen" (ice tunnel). They were usually rigged there and flown to the Jungfrau glacier, where they were protected against the wind by snow walls. From the glacier the sailplanes were pulled by winch to the starting place on the Joch. To save time, pilots often preferred to be towed back by aeroplane from the valley to the Joch.

The chief task of the meeting was the study of high alpine soaring flight. The pilots co-operated with the permanent meteorological station on the Jungfraujoch. The results of this high alpine soaring camp are not to be compared with those of other meetings, as the soaring conditions in these regions are rather complicated and many problems have still to be solved.

There were distance, height and duration competitions; for the latter, pilots had to start and to land on the Joch. The greatest height above starting level, 3,510 feet, was reached by Dittmar in the "Condor II." The next were Gumpert (Austria), 3,300 feet, and Udet, 2,283 feet.

The winner of the duration prize was Gumpert with 4 hours 48 minutes. Dittmar made a flight of 3 hours. Although these flights were of no extraordinarily long duration, it must not be forgotten that flying at some 13,000 feet is physically very tiring.

It was obvious that for the distance prize, pilots would leave the alpine regions; in fact, nearly all the flights were made over flat land in the direction of Berne. The order of distance was as follows:—Hoffman, 67 miles in Rhonsperber; Riedel, 55 miles; Baroni (Switzerland), 51 miles; Dittmar, 51 miles; and Udet, 35 miles. Several flights were made to Interlaken, Thun or Berne.

An outstanding flight was made during the meeting by the Swiss pilot, H. Schreiber, which, however, could not be reckoned as a competition flight as he was an official observer. After an aero-tow to 11,975 feet he cast off in front of the Jungfraujoch and landed 5 hours 47 minutes later at Bellinzona, 56 miles away in a straight line but actually 90 miles by the route flown by Schreiber.

By this first international camp much experience was furnished from the sporting and technical point of view, and among the lessons learned were the following:

It seems to be essential for the competing pilots to stay on the Jungfraujoch, both for the study of soaring possibilities and to get accustomed to the height.

The dates of any future meetings should be varied so as to obtain a more thorough knowledge of soaring conditions at different seasons.

The colour inset is reproduced from a photograph taken at Jungfraujock by Chas. Brown.

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9 GLIDER MANUFACTURERS BACK "GLIDER INSTITUTE OF THE AMERICAS, INC."

"AMERICAN AVIATION" reports that the formation of The Glider Institute of the Americas, Inc., for the all around development of this phase of aviation has been announced by Otis T. Wingo, Jr., executive vice-president of the Columbia Survey Inc., of Washington and New York. Wingo was formerly assistant to the president of Allied Aviation Corp. of Baltimore and Winston-Salem, designers and manufacturers of amphibian transport gliders for the U.S. Marines.

Incorporation papers have been filed with the Recorder of Deeds in Washington, D.C., and nine leading American manufacturers of gliders already have signified their interest in the development of the Glider Institute, Wingo stated.

The announced purposes of the institute as listed in the first communication to the industry are:—

1. Provide an authoritative source and clearing house of available information on military and commercial developments and uses of gliders and towed planes.
2. Accord proper recognition to individuals and organizations making outstanding contributions to the progress of gliders.
3. Aid glider manufacturers, users and enthusiasts in their common problems.

There seems to be no stopping these Air-barges.

METEOROLOGISTS HEAR ABOUT SOARING

WHENEVER a scientific or technical society discusses gliding, the society's adherents are invariably outnumbered by their invited guests from the gliding movement. The "Discussion on Soaring Flight" held by the Royal Meteorological Society on December 16, 1942, was no exception to the rule. Members who tried to secure their share of the tea with which the proceedings started, found themselves harried by a seething mob of strangers who kept rushing up to each other with the cry: "What are you doing these days? Haven't seen you for ages?"

When everyone had settled down, Professor D. Brunt, F.R.S., who is President of the Royal Meteorological Society as well as Chairman of the British Gliding Association, welcomed the guests on behalf of the Society. The Discussion was, of course, his idea; it began with four prepared papers and was then thrown open to discussion.

Senior Commander P. A. Wills, A.T.A., prefaced his paper by a disclosure that, when he joined the A.T.A. as a ferry pilot, he was amazed at the lack of knowledge of meteorology displayed by both the private and the commercial pilots whom he met; most of them took it for granted that it was much too difficult a subject for them to attempt to understand. Yet he felt certain that aeroplane pilots would be much safer with some knowledge of soaring.

The flights discussed by Mr. Wills in his paper have already been described in *The Sailplane and Glider*, and some of these descriptions are being reprinted, so there is no need to repeat it all here. He dealt with two of his distance records, his last altitude record, the altitude record of Mr. N. McClean in the Helm Wind at Cross Fell, and a flight by L. Rotter, the Hungarian, from Berlin to Kiel across the wind direction. Having brought his survey up to the middle of 1939, Mr. Wills concluded with the words: "At this stage Hitler stepped in, and the chapter closes like the end of an instalment of a cinema serial, at the most exciting point."

Mr. D. G. O. Hiscox followed with a paper on thermal activity close to the ground, and as his remarks cover an aspect which has hitherto received little attention in print, they are worth reproducing in full, especially at a time when winch-launching of gliders has become such a widespread practice. Mr. Hiscox said:—

"Rightly or wrongly, I enjoyed a reputation before the war for fairly regularly making contact with thermals from winch-launches of 500 ft. or so. This came about because I made a habit of instructing or assisting in the launching of other pilots during the morning sessions at the Gliding Club and then when nearly everyone went into lunch, I took a launch or two myself. In this manner I was able to satisfy myself with the text-book assertion that thermal activity was most vigorous around noon—real time. I could watch the wind stocking near the launching winch. Having observed its normal angle of flight I judged that when it blew out more strongly a thermal had gone down-wind, and the air flow was momentarily accelerated in its rush towards the up-draught. Conversely when the stocking was nearly limp against the mast, it might be expected to indicate an obstruction to the normal air flow owing to the action of a thermal collecting up-wind. That seemed to be the time to call for a launch.

"If, when those conditions prevailed, the machine was flown tenderly, it would usually be found to drift or slide to one side. From this I concluded that the machine was slipping down the side of a hill of air, and upon arriving at the top of the launch, promptly flew the sailplane in a gentle circuit turning opposite to the direction of the slide. As far as I can remember, I never failed to get going in a thermal when the conditions were as described. At other times the finding of thermals was really due to pure chance. The odds in favour were obviously much better on days of really light wind velocity, and it was almost impossible to expect to pick up anything but an exceptionally robust thermal on days wheh the wind was strong.

"The lowest height from which I got away on a thermal was about 60 ft. I was approaching over farm buildings to land. From feel, and by confirmation of the variometer, I realized that I was not sinking as I passed over the buildings, flying in the arc of a circle, so I decided to continue the turn and completed a circle without sinking; another, and I had gained a few feet. I probably did twelve circles when gaining 200 ft. After this the activity became more vigorous, and another twelve circles found me at 2,000 ft. The usual hunt for the core of the thermal then occurred, and at a little under under 3,000 ft. I lost the lift; I went off in search of some more, and incidentally I found it.

"Almost always when at the top of a winch-climb during likely weather conditions, I have had the feeling that I was in some thermal activity. So much so that I have often wondered if the very action of the winch-launch has not started off a thermal. Or is it an illusion and does the green ball of the variometer stay up, or the red fail to indicate sink because there is air still to escape from the container that actuates the variometer? Can anyone say whether or not it is possible for the actual winch wire to set off a thermal, and have sister or brother pilots themselves noticed the same occurrence?"

Mr. G. H. Stephenson then described his cross-Channel soaring flight of April 22, 1939. He said that for such a flight there must be a high lapse rate of temperature in the atmosphere, and the difference between land and sea temperatures must be as great as possible. It was an ordinary cross-country flight in thermals from Dunstable to Hawkinge, where he was down to 1,000 ft., but he picked up a thermal there which took him up, at a rate which increased to 20 ft. per second, into a large cloud, inside which he climbed to 6,000 ft.—enough to make the sea crossing. When he had landed 10 miles east of Boulogne, the nearest cumulus was 20 miles further down-wind, so he thinks it would be very difficult for anyone making such a flight to continue it far into Europe.

Mr. Stephenson opined that a cloud originates from several different thermals at ground level, which then amalgamate like the roots of a tree into its trunk, the cloud corresponding to the "foliage." In fact, as he climbed near to the base of the cloud mentioned, the lift decreased in intensity but increased in area.

Mrs. Ann Douglas talked of the past and the future. "The flights that we have heard about to-night are really representative of the results of ten years' steady progress by the soaring, as against the gliding, movement in this country. The most interesting point is, I think, that these results have been achieved solely by the expenditure and enthusiasm of private individuals." For the future, she suggested that, as the size of this country sets a limit to the development of long-distance soaring, we should specialise in goal flights and in soaring in other directions than down-wind. Another task is the collection and analysis of all information connected with soaring, such as has appeared in *The Sailplane and Glider* but never yet been studied as a whole. And another is a soaring map of the country.

Captain H. C. Bergel opened the general discussion on the foregoing papers. He pointed out that members of Air Transport Auxiliary to which he is attached, have a unique opportunity to map out the varying thermal-producing capacities of the areas over which they fly. Another question he raised was a possible explanation of the belief, held by some sailplane pilots, that "there are times when it is possible to maintain or even gain height merely by flying up-wind, though when flying down-wind, immediately after; over the same strip of country, height is lost at an abnormal rate." He had only encountered this phenomenon at heights not more than 800 to 1,000 ft. above ground level.

Dr. A. E. Slater drew attention to the frequency with which thermals start up just before the arrival of a cloud shadow. The Cambridge University Gliding Club had made use of this phenomenon for catching thermals off a winch launch, while research at Darmstadt had shown the same effect to be present in the small-scale thermal turbulence close to the ground. A theory put forward by C. S. Durst suggests an arrangement in which the point of origin of each thermal current drifts along behind the cloud into which it rises. If the wind were blowing towards the sun, this effect would coincide with, and reinforce, that due to the cloud shadows.

Mr. D. Justin Shove, a Fellow of the Society, raised a novel point about the conditions found when isobars lie parallel to a coast line. Wind blows along the isobars, but near the ground it is slowed up by friction and is deflected from regions of high to low pressure. When barometric pressure is high over land and low over sea, air is thus deflected from the land towards the sea. But the air stream blowing over the land is slowed up more by friction, and is therefore deflected more, than the air stream blowing over the sea. So the two air streams converge, and are forced upwards, so that a cloud street is produced parallel to the coast line. In the Northern Hemisphere this happens when the wind blows with land on its right and sea on its left. Under precisely opposite pressure conditions the two air steams diverge, and in cloudy weather this may produce a clear strip of sky all along the coast.

Mr. Justin Shove also mentioned having seen cloud streets persistently forming at an angle to the wind, such as 20°, in many cases over flat lowland country. (This contribution was mostly sent in after the meeting for inclusion in the full report published in the *Quarterly Journal* of the Society for April, 1943.)

Mr. J. F. Shipley, another Fellow, showed a drawing of an enormously tall, narrow cumulus once observed, shaped most astonishingly like a series of enormous smoke-rings, placed one upon the other, with air motions just as such rings would possess.

Mr. R. G. Veryard, a well-known meteorologist, pointed out that, theoretically, strato-cumulus should be ideal for sustained flights, because of the regular arrangement of the up-currents.

Mr. S. Humphries described "the attraction of even the higher arts in cross-country flights" as "feminine; you never know what will happen next, you never will resolve the behaviour of the air into simple rules," especially over an island like ours.

He asked whether a cross-country pilot should look up to the clouds or down to the ground in trying to locate thermals, to which Mr. Wills replied that one should observe whichever of them is nearest, because of the fact that thermals are slanting in a wind and thus it is difficult to relate the clouds to the ground effects.

Mr. G. Manley, who has investigated the Helm Wind in the Pennines, asked if similar forms of lift had been found elsewhere; in reply, Mr. J. E. Simpson described how he found something of the sort at the Long Mynd in Shropshire.

Professor Brunt said he had measured the distance apart of cloud streets in a few cases, and found it to be 2½ to 3 times the height of the cloud. With regard to the future, he said: "I have always regarded the sailplane as a meteorological instrument, the only one which is capable of investigating in detail the nature of convection currents in the atmosphere," and hoped that after the war such investigations would be done.

Finally he assured all gliding people that they would be welcome at any of the Society's meetings, whether they joined the Society or not.

A.E.S



THE GLIDER TRAIL

Eleven Air Barges towed by a Russian twin engined transport.

NOTES ON GLIDING IN GERMANY

In the German air force (Luftwaffe) pilot casualties are replaced exclusively from the youth of the country who are trained for this purpose in the German flying clubs (Flieger Hitler Jugend), called F.H.J. This Germany-wide organization incorporates all the air-minded German youth. Flying takes place at week-ends and the evenings. Boys of 14 years and under are instructed in aero model building and physical training. Those of over 14 years are educated in gliding and military technique.

Roughly speaking, the " Flieger Hitler Jugend " can be likened to the British Air Training Corps (A.T.C.). The leaders of F.H.J. are chosen from experienced, civilian fliers, or disabled Luftwaffe officers who are absolutely trustworthy politically and they in turn are supervised by serving officers of the Luftwaffe.

Every year meetings combining races and competitions are held, within the group by all large groups of the organization. The best competitors are sent to the state competition, the Reichs - Wett - Kampf Der F.H.J. This has two categories, one for boys under 14 years of age, and one for those over 14 years. The latter group's activities includes gliding, wireless and workshop knowledge, aircraft recognition, physical drill and small arms drill.

In 1943 the main competition was held between 8—16 September in the areas of Quedlingburg. Many important personages from the army and political party were present, including Reichsjugendfuhrer Axman, Empire youth leader, General oberst Keller, the Commanding Officer of the National Socialistisch Flieger Korp (National Socialistic Flying Corps), Gauleiter Jordan (chief-leader), and the chief of the N.S.F.K. general staff, Grupenfuhrer Kehrberg.

On the last day of the meeting, the representative of Reichsmarshall Herrman Goering, Generalmajor Gallant, was present. From the high percentage of important German leaders prove it clear how much importance is attached to this youth movements.

The chief items were flying and gliding with all kinds of planes, from the primary glider to high performance sailplanes which were exclusively of German origin and construction. The use of non-German gliders was forbidden. Gliders were launched into the air by means of a shock card or balloon winch, or towed behind an engine-driven plane. They had to carry out especially selected manoeuvres in a given time. Particular note was taken of take-off and landing, which had to be performed within the white target markings.

A final race was held for the 15 best glider pilots who, after two minutes' towing behind a plane and with the required turns completed, had to land strictly within the ordered space. A short or long landing was penalised by loss of points, but a long landing was punished more severely than a short one. The winner for 1943 was Carl Seitz of the N.F.S.K. gruppe from Bereich.

After the competition a festival was held, at Quedlinburg, complete with national costumes and many "Sieg Heil's" from ardent Hitlerites.

In the town square Generalmajor Gallant made a speech recalling in complimentary language the famous fighting of the German Air Force and predicting Germany's final victory in this war. He also mentioned that it must be the heroic lot of many of those whom he addressed, to die for their country. Finally he congratulated the leaders on their work and the enormous achievement attained, and ended his speech with shaking hands with the youthful winner and the presentation of a silver cup, given by Reichsmarshall H. Goering.

Reichs Jugendfuhrer Axman spoke of the fortunate lot of the youth of the country in being alive to-day. He pointed out that the possibilities of achieving military fame lay within their own power, and it is not for them to envy the exploits and glory of their fathers and grandfathers. They would have the distinction of making felt the excellent fighting abilities of German men and weapons from the North to the South and from East to West of the hemisphere. Continuing, he said that the greatest heroes of the present would be the young people gathered in the square of Quedlingburg that day, and finished his oration with the statement that " Words are useless—give us actions."

From the foregoing description it is easy to deduce just how much military training the Germans give to their embryo-pilots and how much importance and care is attached to this training.

A.S.

POST - WAR PLANS

Sailplane and Glider understands that the question of post-war Gliding Soaring policy is under discussion with the Air Ministry, at a very high level. We have no knowledge of the subjects discussed in detail, but we imagine that questions of the Subsidy, of safety factors and the relationship with A.T.C. Gliding and the R.A.F. in regard to the use of R.A.F. airfields might come under review. We should be glad to have the views of our readers especially those connected with pre-war Gliding Clubs on the subjects. Suitable letters may be published. The airing of public opinion might well strengthen the hands of the negotiators. In any case our new readers who may have no knowledge of what has gone before will wish to be informed of the situation as far as our space allows.

BACK NUMBERS

We shall be glad to hear of any pre-war copies of *Sailplane* which our readers may wish to dispose of. Owing to enemy action we have no continuous record of the activities of *Sailplane*, and we are trying to build up a complete set.

Two-and-six a copy is offered for any copies in good condition of the February 1944 issue of "Sailplane."

ARE WE APPROACHING THE ERA OF THE ALL PLASTIC AIRCRAFT ?—II.

By **W. R. SCOTT, A.M.Inst.B.E., A.M.R.Ae.S.**

Of the two groups of plastics, the thermo plastic has undoubtedly taken the most prominent place in connection with the manufacture of aircraft components and was, in fact, practically the only one used in the construction of gliders and sailplanes before the war, in the form of transparent cockpit housings, inspection panels and a few small fairings. Thermo setting plastic, was, however, used indirectly as a bonding agent for plywood and in the form of the various brands of waterproof glue, marketed under the trade names, such as "Kaurite," "Aerolite," "Beetle Cement," etc.

Pulleys and small cable guide blocks were also made of thermo setting plastic, but as it will be appreciated, most of these details take little or none of the structural load.

Of the two groups, the thermo plastic materials, the oldest and best known of which is celluloid, are by far the easier to handle. Celluloid, however, has the distinct disadvantage, when considered as a material for the structure of aircraft, of being highly inflammable. Despite this rather pronounced disadvantage, celluloid has, on the whole, held in the past the most prominent place among the thermo plastic materials and is still extensively used. It is extremely easy to mould, by various methods and cements, and is, if anything, rather cheaper than other thermo plastic materials. It can also be coloured with various pigments. Multi-coloured and mottled effects are produced by rolling and twisting sheets of various colours together, after which the block is cut into sheet form again, in a similar way to the cutting of plywood veneers.

The durability of celluloid has, so far, not been superseded by any of the later thermo plastics. The best example of this is the table tennis ball. Through this medium it has found its way into the aircraft industry, for the wings of many of our aircraft have been filled, or partially filled, with table tennis balls when long distance trans-ocean flights have been attempted, the balls being inserted to ensure buoyancy in the event of coming down at sea.

The materials for the production of celluloid (nitro-cellulose) are in abundance, namely, cotton linters, paper pulp, sulphuric acid, nitric acid, camphor and alcohol. The cotton linters are treated with a mixture of nitric and sulphuric acid with water, the mixture containing approximately 60% sulphuric acid and 23% nitric acid. The result in product having a nitrogen content of 10% to 11%. The nitrogen content is of considerable importance, as should the mixture be varied, so that the result in product had a 13% nitrogen content, it would be a high explosive, commonly known as gun cotton.

The treated materials are, at this stage, mixed with camphor as a plasticizer, and the pigments and dyes, if required, are added and the whole kneaded together; the dyes, as a rule, are added in a liquid form, being dissolved in industrial spirit.

The whole mass is then rolled and pressed into blocks, during which time most of the solvents evaporate; after that, the blocks are cut into sheets of varying thicknesses and pressed between the highly polished platens of an hydraulic press, after which, when a good quality surface is required for transparent sheets, they are polished.

Celluloid is generally supplied in the form of sheets, rods, tubes, or extruded forms of various sections, from which it is moulded into the required shapes and forms in a similar manner to cellulose acetate which will be described later.

Cellulose acetate is undoubtedly to-day, for the production of various small components and accessories, the most popular of the thermo plastic materials used in the aircraft industry. Firstly, unlike celluloid, it is non-inflammable and does not discolour so rapidly with age. Although somewhat more expensive than celluloid, it is by far the cheapest of the commercial thermo plastic materials that are available in quantities to-day.

Cellulose acetate is produced by treating cotton linters with a mixture of acetic anhydride, acetic acid and sulphuric acid and acetylated, more or less completely, to give primary cellulose acetate, at which stage it is insoluble in acetone, the whole being diluted with water and allowed to stand, after which the acetate groups are hydrolyzed off. The hydrolysis is allowed to proceed until the acetate groups are removed to produce a secondary cellulose acetate, at which stage it is soluble in acetone.

To produce cellulose acetate in the form of sheets, rods, tubes, etc., the secondary cellulose acetate is mixed with plasticizers, such as dimethyl phthalate, triphenyl phosphate, etc., and acetone, and then undergoes the same process as described for nitro-cellulose. Cellulose acetate is also produced in the form of a coarse powder, for the purpose of injection moulding, which will also be described later. It has an advantage over nitro-cellulose, being heat stable to a much greater extent than nitro-cellulose.

Cellulose acetate is extremely easy to cut and is readily dissolved in acetone, which forms a solution which can be used as a cement for cementing pieces together. It is not, however, a practical proposition to cement two pieces of sheet together by a butt joint, as the joint dries on the outer surfaces, leaving an inner core with a relatively high content of solvent which gives rise to a weakness when such a sheet is bent or cut under strain. As a rule, such joints are made by either lapping, or cementing a strip on one side.

Next to cellulose acetate, polymethyl methacrylate, marketed under the trade name of "Perspex," by Messrs. I.C.I., Ltd., is the most popular thermo plastic material. It is somewhat stronger and stiffer, has extraordinarily good optical properties, is rather more difficult to cement and due to its stiffness has a tendency to crack.

(*Continued on page 16*)

A SAILPLANE AUTO-GYRO?

THE announcement in a recent number of *Flugsport* of the claims (repeated below) in relation to an application for a patent, disclose that there probably exists in Germany a Sailplane Autogyro.

There is nothing impossible in such a design, as the rotating wing is moved by any horizontal airflow. It might be moved by the airflow from the towing aircraft as is suggested in Claim 1. The effect on a glider of having the rotating wing would be varied. There would be greater weight and also greater drag, but unless the eventual result were to make for a smaller sinking speed the whole effort would not be worth while. It is to be expected therefore that this is in fact the result. The combination of the three claims seems to suggest that the ultimate idea is one of enabling the glider to drop into a small space. This capability would be of great value in aero-carriage, expecially in towns or places where large open spaces were rare. It would be possible to soar such a machine in a strong enough up-current. We shall be interested to hear further details after the war.

The point of this particular invention is that there can be no effective junction between the tug and the Aurogyro until the latter has got flying lift and seems to be a sensible precaution.

INVENTOR'S CLAIMS

(Translated by J. HELLEDOREN).

1. Towing connection between a rotary wing glider (autogyro) and a towing aircraft with a coupling arrangement controlled by a member dependent on the running speed of the rotor, whicl locks the coupling members only when the rotor develops the required lift for take-off.

2. Towing connection according to Claim 1 with a coupling on the towing aircraft as well as on the towed aircraft, characterised by an interlocking of the two couplings which function in such manner that the release of one coupling also releases the other.

3. Towing connection according to Claim 1 in which the coupling can be disconnected manually by the pilot.

(With acknowledgments to R.T.P3.)

FEDERATION AERONAUTIQUE INTERNATIONALE

INTERNATIONAL RECORDS

Class D Gliders.

1st Category. Single Seaters.

Distance in straight line (U.S.S.R.).

Miss O. Klepikova, in aircraft "Rot Front 7," from Moscow to Otradnoie, near Stalingrad, the 6th July, 1939, about 465 miles.

Distance with return to the point of take-off (U.S.S.R.).

Boris Kimelman, in aircraft "Rot Front 7," route Toula—Riajsk—Toula, the 23rd July, 1939, 212 miles.

Distance with fixed destination (U.S.S.R.).

P. Savtzov, in aircraft "Rot Front 7," from Toula to Mikhailovka, the 31st July, 1939, 373.8 miles.

Duration with return to the point of take-off (Germany).

Kurt Schmidt, in glider "D-Loerzer" type "Grunau Baby," from Korschenruh (East Prussia), the 3rd-4th August, 1938, 36 hours, 35 mins.

Height above the point of take-off (Germany).

E. Ziller, in aircraft "Kranich," Hirschberg, the 21st November, 1938, 22,429 feet.

2nd Category. Two Seaters.

Distance in straight line (U.S.S.R.).

I. Kartachev, pilot; P. Savtzov, passenger; glider "Stakhanovetz," from Moscow—Ismailovo to Ouchnia (near Tchernigov), the 17th July, 1938, 385 miles.

Distance with return to the point of take-off (U.S.S.R.).

I. Kartachev, pilot, and V. Chechoulkine, passenger, in aircraft "Stakhanovetz," route Toula—Riajsk—Toula, the 23rd July, 1939, 212 miles.

Distance with fixed destination (U.S.S.R.).

I. Kartachev, pilot, and A. Gorokhova, passenger, in aircraft "Stakhanovetz," from Moscow to Gorki, the 1st June, 1939, 243 miles.

Duration with return to point of take-off (Germany).

A. Bodecker and K. H. Zander, in aircraft "Kranich," Rossitten, the 9th-11th December, 1938, 50 hours, 20 minutes.

Height above point of take-off (Germany).

E. Ziller, pilot, and Quadfasel, passenger, in aircraft D-6405 "Kranich," Hartau, the 18th September, 1937, 10,837 feet.

GLIDING CERTIFICATES

"A"	*Certificates.*		*Date*
1728	Charles Henry Burge	C.122 E.G.S.	7. 2.43
1729	Dudley Stanley Bradford	Ditto	27. 6.43
1730	Thomasina Mary Burke	Ditto	17.10.43
1731	Douglas Wellesley Ostle	183 E.G.S.	26.12.43
1732	Alfred Richard Verity	Ditto	27.12.43
1733	Leonard Mann	C.123 E.G.S.	30. 7.43
1734	Stephen Cyril Green	C.122 E.G.S.	6. 6.43
1735	John Harris	Ditto	29. 8.43
1736	Frederick Breeze	M.47	10.10.43
1737	John Reginald Noden	183 E.G.S.	15. 1.44
1738	Rex Meakin	Ditto	15. 1.44
1739	Leslie Harris	183 E.G.S.	27.12.43
1740	Leonard William Hagell ..	C.122 E.G.S.	20. 6.43
1741	Horace John Philip Bayliss ..	Ditto	24.10.43

E. J. FINLAY'S A.T.C. GLIDING SCHOOL, NEAR WOOLWICH



PRIMARY GLIDER CAMOUFLAGED. *Photo: A. E. Slater*



READY FOR A LAUNCH. *Photo: A. E. Slater*

AUSTRALIAN GLIDING ASSOCIATION

QUEENSLAND.—Nundah Gliding Club. Letter 16/7/43. Hon. Sec. Douglas Wymark states regarding Winch Launching: "We use two wires on our winch—this method was adopted after trouble with breakages. No trouble whatever is experienced now, and unnecessary loss of time due to breakages is avoided."

VICTORIA.—The Gliding Club of Victoria. Early in June the Club's Mordialloc hangar was broken into and considerable damage to the primary "Hawk" and Dodge towing car was done. The carburettor and moveable parts of magneto were stolen and the wings of primary were slashed.

No. 2 Winch using a "Moon" Continental 6-cylinder engine mounted on a two-wheel trailer chassis was completed on 27th June, 1943. This winch features an automatic elevating mechanical spreader with a 30" diameter drum.

Motor-cycle retrieving of winch wire is being done with success.

Mr. N. HYDE (Recorder of flights) has furnished the following figures for 1943 flying:—

"Grunau," flown on 5 days, 10 flights, 14 hours 5½ minutes.
"Merlin," flown on 13 days, 217 flights, 9 hours 58¼ minutes.
"H.17," flown on 4 days, 12 flights, 1 hour 39¾ minutes.
"Hawk," flown on 1 day, 13 flights, 3 minutes.

The "Merlin" two-seater was taken to Mordialloc on 27th June and flown on 9 days up to 15th August, 172 flights for 7 hours 23¾ minutes (all winch launches).

On 7th August K. Davies made a flight of 25 minutes in the "Grunau" at Beveridge.

VICTORIAN MOTORLESS FLYING GROUP.—Mr. H. G. Richardson advises: Flying was carried out on 3 days at Mordialloc and on 3 days at Beveridge between 28th March and 22nd August:—

"Golden Eagle."

18th April, Mordialloc, 6 flights, 34 minutes.
25th April, Mordialloc, 6 flights, 42 minutes.
9th May, Mordialloc, 5 flights, 23 minutes.
23rd May, Beveridge, 1 flight, 3 minutes.
1st August, Beveridge, 5 flights, 35 minutes.
15th August, Beveridge, 5 flights, 26 minutes.
6 days—28 flights, 2 hours 33 mins.

"Coogee."

18th April, Mordialloc, 4 flights, 21 minutes.
25th April, Mordialloc, 2 flights, 11½ minutes.
9th May, Mordialloc, 1 flight, 4 minutes.
1st August, Beveridge, 3 flights, 13 minutes.
15th August, Beveridge, 1 flight, 4 minutes.
6 days—11 flights, 53½ minutes.

The "Golden Eagle" was flown by H. G. Richardson, W. Iggulden (junr.) and J. Iggulden. The "Coogee" by T. Proctor. The best flight was of 12 minutes' duration by W. Iggulden on 1st August in the "Golden Eagle." All flights except one on 23rd May were winch launches.

BEAUFORT GLIDING CLUB (MELB.) Hon. Secretary R. Allen advises in letter dated 12th July: "Due to shortage of materials and manpower the constructions of the gliders has not progressed as anticipated. It is desired to thank you for the interest you have shown on behalf of the Australian Gliding Association and would advise that when our construction programme is sufficiently advanced, an invitation will be extended to your members to make a social call and view the activities of our working bees."

NEW SOUTH WALES.—Mr. J. L. Munn, in a letter dated 9/8/43, advises that he has now been posted to F/Sgt. J. L. Munn, 3568, Group 638 R.A.A.F., Strathpine, Queensland. Private address is now "Montana," Daunt Ave., Matraville, Sydney.

The following are details of flying with his two-seater "Falcon" 20/3/43 to 22/5/43 at Wagga, and 17/7/43 and 18/7/43 at Matraville:

At Wagga—140 flights on 8 days for 8 hours 10 minutes.
At Matraville—22 flights on 2 days for 1 hour 28 minutes.

Mr. Munn also states: "I towed my sailplane per trailer from Wagga to Sydney, a distance of 320 miles, without so much as a rub mark and doing the trip in 15 hours. The trailer I use is more or less a tourist trailer, 6ft. by 4ft., and I put a framework on it to carry the wings, etc. I flew the glider at Matraville, a suburb of Sydney, on Saturday and Sunday, 17th and 18th of July respectively, and had a bit of a write-up in the *Sunday Telegraph* and *Sunday Sun* of the 18th. I took up the reporter and photographer of the *Telegraph* for a flight each, which they duly reported they enjoyed very much. This was on the Saturday morning, and during the afternoon Mervyn Waghorn, an Englishman and an ardent gliding enthusiast, who incidentally holds his A.B. and C. licences and has one leg in on the "Silver" C, *i.e.* a flight of 5 hours' duration (all gained at Dunstable Downs, England), took up the woman reporter of the *Sunday Sun*, and she quite enjoyed it too. We had quite a large crowd, who watched our operations on the two days, and although there was hardly any wind of note we were getting from 400 to 600 ft. on our winch launches with durations of from 3 to 5 minutes. On the Sunday, Steve Newbiggin, whom you no doubt know, flew the 'Falcon,' and he was very enthusiastic about its performance and controllability."

GLIDING AND THE AIR TRAINING CORPS. — The following report appeared in the *Melbourne Herald* on 23rd July, 1943, under the heading of "Airborne Men Met Panzers"—"The Under-Secretary for the Air (Captain Balfour), informing the Commons about the progress of glider training in the Air Training Corps, said that in the last 18 months 64,000 'launches' had been given to cadets who were potential air crews and 14,000 'launches' to instructors and instructors under training. Twenty-nine elementary gliding schools and two special schools for instructors were in operation. Five thousand cadets achieved varying degrees of efficiency and 2,000 received dual instruction in two-seater gliders. The scheme had been further speeded up, the aim being to increase elementary gliding schools to 100."

Herald, 8th July, 1943. "Value of Gliding." Letter to Editor by H. G. Richardson.

GLIDERS IN WAR.—July 12th, 13th and 17th. Fairly heavy publicity on success of Allied landings by gliders in Sicily invasion. *Herald*: "Mass Glider Flight." *Age*: "Gliders a Success

(*Continued on page 16, 3rd column*)

GLIDING AND SOARING BADGES

THE paragraphs in *Sailplane and Glider* of February about wings for A.T.C. Glider instructors has brought a number of enquiries about the award of the "A," "B" and "C" Gliding and Soaring Badges.



"A" "B"

It is not possible at the moment to gain more than "B" Certificate in Great Britain, and even then by instructors and only by virtue of passing the A.T.C. test on Gliding proficiency. This comes about in this way. Gliding and Soaring throughout the world are controlled by the Federation Aeronautique Internationale, which has laid down the conditions for the award of certificates and badges, and has delegated to the Royal Aero Club the control of British Gliding.

The conditions for the award of an "A" Certificate are a 30 second flight from the moment of release and a normal landing.

For a "B" Certificate it is necessary to make two flights of 45 seconds with normal landing and one flight of 60 seconds, including a left and right turn.

It is necessary for the flight to be observed by an official Royal Aero Club observer and for him to certify the flight on the official Royal Aero Club form. This, together with two passport photographs and five shillings, is then sent to the Royal Aero Club, and if approved by the committee a certificate and the badges are then issued as below.

At the request of the Air Ministry the Royal Aero Club agreed to abate the five shillings fee to 1/- for A.C.T. Cadets in the interests of post-war British Gliding. But the Committee pointed out that the Air Ministry regulations forbid cadets to go higher than 100 feet. To glide for 30 seconds from this height would require a machine of no greater sinking speed than a "Grunau Baby," and would therefore be beyond the ability of most A.T.C. Gliding Schools. The Air Ministry replied that their regulations said "approximately" 100 feet. This was accepted by the Committee.

The procedure now is that the O.C.'s Gliding Schools certify the flights for the "A" Certificates and forward them to the Air Ministry, who then send in a consolidated list to the Royal Aero Club.

The restrictions on cadets, flying more than 100 feet, does not apply to instructors. They are consequently able to go to sufficient height to be able to fly a sufficient length of time to carry out the qualifying tests for the "B" Certificate.

A short article about Silver "C" and "D" Certificates (Golden C) will appear in next month's issue.

ARE WE APPROACHING THE ERA OF ALL PLASTIC AIRCRAFT

(Continued from page 12)

It is marketed in the form of sheets, rods and powders, for the purpose of injection moulding, and is produced from hydrocyanic acid, acetone and methyl alcohol. Hydrocyanic acid and acetone together give acetone cyanhydrin, which in turn if reacted with methyl alcohol in the presence of sulphuric acid, gives methyl alpha methacrylate, which is a mobile liquid, which in turn polymerizes to a solid resin, when heated with a small quantity of catalyst, such as benzoyl peroxide. The polymerization of the liquid can be carried out in moulds with a catalyst under controlled heating conditions, to give sheets, rods, slabs, etc.

Casein, vinyl, styrene plastics, etc., will be described in the next article, complete with the moulding methods and characteristics of the various thermo plastics.

(To be continued.)

AUSTRALIAN GLIDING ASSOCIATION

(Continued from page 15)

—Courageous Pilots." *Sun*: "Glider troops landed to pave the way" (London). "Airborne troops' key to success" (New York). "Glider pilots heroes in Sicily" (Sicily Correspondent—Roderick MacDonald). *Sun*, 7th August, "Invasion Rehearsal by U.S. Gliders."

Under heading, "Costs U.S. Thousands to Train Pilot," *Melbourne Herald*, 30th July, 1943. "Discounting reports of a high accident rate, Harry Kern (News-week Correspondent) says that the figures are phenomenally low. One advanced glider school had not had a serious crash, and in 70,000 hours of flying a heavy bomber transitional school had not had a single fatal accident."

Argus, 7th August week-end Magazine Article. "The glider is the oldest flying machine," by Max Dunn. *Age*, 7th August "Gliders in Warfare—Nazis invasion weapon—turned against them."

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