APRIL - 1939
Vol. IV No. 41

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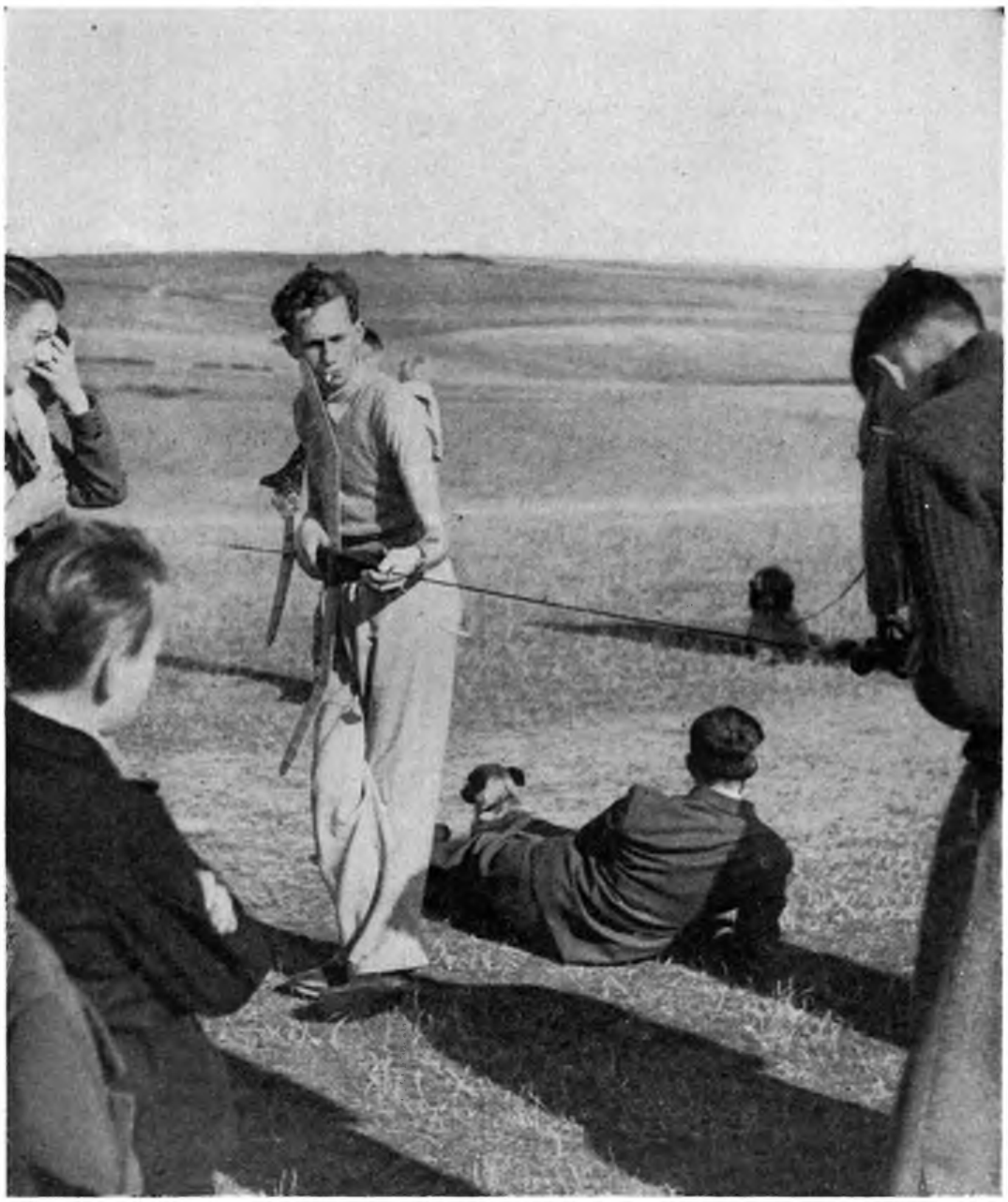

Photo J. Blunt.

Our cover photo—by J. Lucas—shows E. Chasteneuf's model taking off at the Wakefield Trials last year.

APRIL - 1939
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Tel. Leicester 65322

The AERO MODELLER

INCORPORATING THE "MODEL AEROPLANE CONSTRUCTOR"

EDITORIAL

S will be seen from the monthly report of the S.M.A.E., one of the items discussed at the meeting of the Council on February 21st was the question of accepting N.G.A. registration as meeting the S.M.A.E. rules regarding the flying of petrol 'planes. We were present at this meeting. The point was raised that the S.M.A.E. rules stated that petrol 'planes must only be flown from grounds which had been authorised by the S.M.A.E., and for flights not exceeding two minutes' motor-run, as controlled by the time-switch. The N.G.A. insurance policy, as issued, contains no restrictions as to length of motor-run, or type of place from which a 'plane may be flown. Whilst appreciating the comprehensiveness of this type of policy the Council expressed the opinion that this very feature might be the cause of such harm occurring to the sport of petrol 'plane flying as was intended to avoid. Newcomers to the sport might be tempted, or perhaps only in ignorance might attempt, to fly petrol 'planes in unsafe locations and/or under unsafe conditions. The Council, therefore, asked us to limit the policy to afford third-party insurance only to those readers who fly petrol 'planes under S.M.A.E. rules.

At the meeting we agreed to do this, as is stated in the report of the meeting published elsewhere in this issue. Unfortunately, it has been found impossible to insert this limiting clause in the policy. Firstly, because the underwriters were unwilling to alter the terms of the policy once it had been put into operation; and secondly because already over 100 readers who fly petrol 'planes have become insured under the policy, and legally we cannot now introduce this or any other restriction.

The position, therefore, remains as before, that readers of this journal who join the N.G.A. as owners of petrol 'planes, are insured against possible third-party claims whilst flying their models anywhere.

So far as readers who are members of affiliated clubs, and have registered their 'planes with the S.M.A.E., are concerned, they are definitely bound by the rules of the society. These rules are set out in full at the end of the S.M.A.E. report.

We have been asked by the S.M.A.E. to emphasise that it is not necessary for a club to apply for a ground to be approved. Any lone hand can submit particulars of his flying field for approval. Further, anyone can register a petrol 'plane with the S.M.A.E., club membership being immaterial.

It has always been our policy to publish the S.M.A.E. Monthly Report exactly as sent in to us, and we trust that no confusion will result from the reference to our having agreed to insert the proposed limiting clause, and our now having to state that we are unable to do this.

The Society of Model Aeronautical Engineers is the official body governing model aeronautics in this country, and is officially recognised by the Royal Aero Club. As such it is responsible for the rules governing the flying of model aircraft in all S.M.A.E. competitions and by all members of clubs affiliated to it. The S.M.A.E. has clearly shown its authority as a live and responsible body by laying down the rules under which petrol 'planes may be flown by its members, and it is the duty of all members to abide by, and if necessary enforce, them.

So far as the N.G.A. is concerned, we have already explained that it is a "body without substance," formed solely with the one object of providing third-party insurance cover for all readers of THE AERO-MODELLER, irrespective of what type of model they fly, and where it is flown.

Once again we would stress the importance of owners of petrol 'planes effecting third-party insurance cover.

Only the other day we heard of a petrol 'plane flying over Epsom Downs bursting into flames. The engine fell like a stone, but fortunately neither it nor the burning 'plane did any damage. The owner of this 'plane was *not* insured! Neither was a reader who, as reported on another page, has found himself in trouble due to his 'plane stampeding a horse!

IN our Editorial for the October, 1938, issue, we dealt at some length with advertisements, and the relationship between readers, advertisers, and ourselves. We pointed out that since June, 1937, when the Journal came under new management, it had been increased in size from 32 to 56 pages, and that this had been made

possible mainly by the increased revenue from advertisers consequent on the considerably increased circulation of the Journal.

We explained that the readers themselves are mainly responsible for this, for by placing an ever-increasing amount of business with our advertisers they encourage them to introduce new models and accessories, and to take larger space for their advertisements, the revenue from which enables us to increase the size and improve the quality of THE AERO-MODELLER. It is obvious from this that it is in readers' own interests that they should purchase their supplies only from advertisers in this journal.

Now, no trade can develop and prosper without a measure of co-operation between its members, and recently meetings have taken place between representatives of the various firms in the model aircraft industry, which have resulted in the formation of the Model Aircraft Trade Association, under the chairmanship of Mr. F. R. Barnard, and with Mr. H. York as hon. sec. Membership of the association is open to all firms dealing in model aircraft materials or supplying the trade. Already nearly thirty firms have joined, including Model Aeronautical Press Ltd., proprietors of THE AERO-MODELLER, and elsewhere in this issue we publish a list of their names.

In our next issue we hope to publish a notice on behalf of this association, giving a full list of members, together with information as to its aims and objects. We have been made aware of the preliminary draft of rules, and have been pleased to note that a high standard as regards class of goods and quality of materials to be supplied to the aero-modellists, will be insisted on from all members. It is hoped that as this association develops it will render valuable service to all concerned.

LAST month we stated that the April issue would be a Wakefield Number. Here it is, commencing with "Model Aviation in America" in our series of articles dealing with model flying in the different countries of the world. The informative article by Mr. J. C. Smith, Hon. Competition Secretary of the S.M.A.E., will, we feel sure, be of great assistance to all would-be Wakefield winners, and we hope that this article will be carefully studied. The article, "The Trend of Design in Model Aviation," is of a type we have not before published. It has involved a considerable amount of research work on the part of our contributor, and it is very interesting to note the various alterations that have taken place in the design of Wakefield type models during the past two or three years. Our "Wakefield Supplement" continues with a fine article by Mr. Chasteneuf, whose model is depicted on our front cover taking off at Fairey's Aerodrome at the Wakefield Eliminating Trials last year.

Mr. Bullock, in his article this month, discourses on airscrews and provides a full-size scale drawing of a suitable Wakefield type "wind shovel."

Our Wakefield Section concludes with articles by Messrs. Aldworth and H. E. White, and we trust that this series, together with the two free full-size plans given away with this issue, will prove of considerable interest to Wakefield enthusiasts.

Limitation of space has prevented us from publishing some constructional notes on these two designs, but we have had these set up in the form of a leaflet, which can be obtained from our Leicester offices by all interested readers who send us a S.A.E. A full list of materials for both these models is, of course, given in this issue, and is printed on page 313.

An article of unusual interest, also published this month, is that by Major C. E. Bowden, who tackles the theory of "model" flight from a very intriguing angle, and we feel sure that our readers will find this article of great interest. In our next issue, which, by the way, will be a petrol 'plane number, we shall publish quarter-size scale drawings for a 2·5/3·5 cc. high-climbing petrol 'plane designed by Major Bowden, who, in an accompanying article, talks on model topics and fully describes this little model.

An American-built flying scale model of a Waco Biplane, 24 in. span. Average duration 30 seconds.

The "Round the Pole" model illustrated this month is of particular interest, as it seems to disprove the theory that speed models must be heavy-weights.

We offer our thanks to the considerable number of club secretaries who responded to our request for a postcard giving their name and address and the number of members in their club, but at the same time would point out that not all have yet replied. In an early issue we plan to publish a complete list of model aeroplane clubs in the country, so will those secretaries who have not yet sent their particulars please do so right away, to enable us to make the list as complete as possible.

Thank you.

THE EDITOR.

MODEL AVIATION IN AMERICA

By TED ALEXANDER

Officials of a large American club with some of the trophies awarded in various contests.

MODEL aviation in America dates back to a time shortly after the first flight of the Wright Brothers in 1903, when a few inspired young people banded together to form small clubs in some of the larger cities.

But it was not until Lindbergh's famous flight to Paris in 1927 that America became air-minded and model building became the sudden hobby of nearly every American youth. How well the movement has developed can best be described by the fact that to-day there are over three million model builders whose purchases have made the model airplane industry one of America's largest business enterprises, with a yearly trade of some four million dollars!

The rapid growth of interest in model building early pointed to the need of proper organization on a national scale for the protection of the model builder and for standardisation of rules and contests. The first attempt to do this was in 1928 and 1929, when Merril Hamburg founded the Airplane Model League of America, which was conducted through the *American Boy Magazine*. The League was affiliated with model airplane clubs all over America, and its membership reached the impressive total of 400,000.

As the need grew for proper organisation, mercantile houses, newspapers, the wireless and social centres formed clubs for the air-minded youth. One of the outstanding clubs in the country to-day is the Junior Aviation League of Boston, with some five thousand members, yet each participant in club meetings has opportunity to consult with club directors and receive their expert advice on construction and flying. Equally outstanding are The Philadelphia Model Airplane Association, Bamberger Aero Club of Newark, and the Chicago Aeronuts Club, to name a few. Of the larger groups, the Junior Aviators, conducted in all Scripps Howard newspapers, and the Junior Birdmen, conducted in the Hearst papers, did much to make the building and flying of model aircraft one of the leading activities of American youth.

The governing body of model aviation in the United States is the National Aeronautic Association, which is the governing body of all American aviation, and the only organisation receiving the official recognition of the Federation Aeronautique Internationale within the United States. Detailed rules and procedure were established by the N.A.A. Models were divided into classes and the approved record for each class designated. It is interesting to note that the model builders themselves, through the Academy of Model Aeronautics (which will be explained further on), have a voice in the making of the rules and conditions under which they must compete.

Model builders competing in sanctioned meets are certain of fair trials under the supervision of approved contest officials who have been trained by the N.A.A. The N.A.A. places the model builder by official recognition on the same basis as contestants in other forms of competitive aeronautics. The National Aeronautic Association also was instrumental in securing for the model

A Canadian contestant at one of last year's meetings with a modified "Grant" Wakefield model.

builder with outstanding performance international recognition by the Federation Aeronautique Internationale.

The Academy of Model Aeronautics was formed in the fall of 1936 as a result of many discussions by model leaders on the type expert builders' organization best suited to the advancement of model aeronautics in the United States. Its origin was based upon recognition of the fundamental soundness of national model leadership, that is, "of, by and for the model builder," and the necessity of an expert model group within the general structure of the National Aeronautic Association.

The need of such a model organisation in a nation as large as the United States can be apparent to the reader, and the success of the Academy is best indicated by the quality and wide representation of its organising personnel, located in nearly every section of the country, and thus completely understanding the problems of the model builders in their particular section.

The Academy is concerned with encouraging study and discussion of scientific problems in connection with model aeronautics and with the dissemination of scientific news and views. Thus it is concerned with the organisation of discussion conferences and the presentation of technical papers at such conferences.

The Academy has, as a special duty, vested in it by the N.A.A., the establishment of the official rules governing model contests and model records. It is also charged with the technical organisation and conduct of national and international contests held within the United States.

Thus we find that organised model aviation in America is made up of young people who have formed clubs in their respective neighbourhoods, towns, or cities, conducting meetings weekly under the direction of responsible men and women, and supported by small monthly or yearly dues or by newspapers, mercantile houses, or interested friends. These clubs are governed by the National Aeronautic Association, which is in turn advised by the Academy of Model Aeronautics.

With such organisation it is natural that model building itself should become more interesting to the modeller, with a better exchange of ideas and the friendly competitive spirit aroused by properly conducted contests.

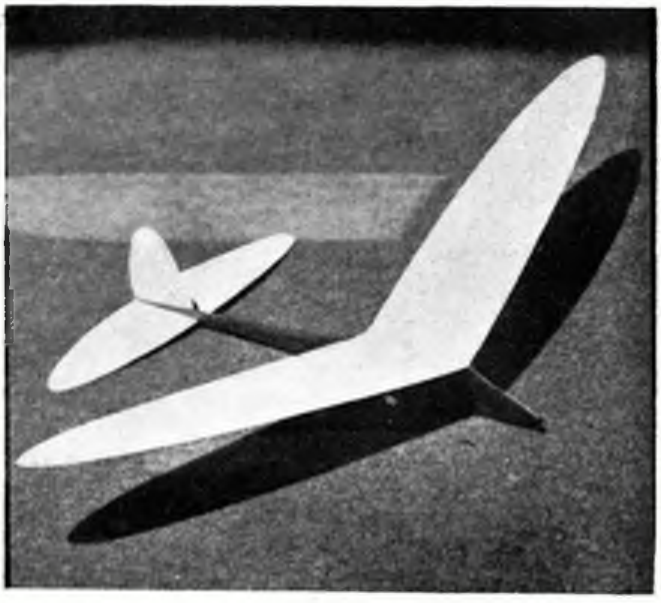
And so models have developed in the past ten years from heavy boxed affairs containing yards of rubber, into highly streamlined, light-weight, highly scientific machines, capable of marvellous flights under ordinary conditions.

We have been the first to realise the value of balsa, and also the first to realise that balsa alone was not enough. The builder had to study stress and strain, mechanical design, and the proper application of theory into practice, before he could develop a model strong enough, light enough, and powerful enough to outfly that of his fellow club member.

The box design was improved, slots were cut in ribs, motor sticks were abolished as needless weight on smaller models, better fin, fuselage and wing build-ups were devised. We found that we could get higher, longer flights with less power and with less weight. It was found that finishes had to be improved, so our model builders with aims at chemistry devised new methods of doping the covering with improved nitro-cellulose concoctions and lacquers.

It was soon found that models could be definitely described as indoor or outdoor flyers. The common stick model became a highly scientific thing, and the experiments of a young college student resulted in micro-film, a covering that revolutionised indoor flying models. Most of American indoor flying is done in buildings with ceilings of forty to fifty feet, thus handicapping the

A typical example of an indoor all-balsa glider, highly polished all over.



builder by ceiling obstructions when attempting record flights. It is felt that by designing models with a limited ceiling range it will be possible to avoid such obstructions and yet obtain longer periods of flight. Tungsten wire is used extensively for bracing, and thus more power is obtained without danger of breaking stick. American models generally feature lifting tail surfaces that aid in decreasing weight. America's largest indoor model contest hall is the dirigible dock at Akron, Ohio, where many of the largest and most important meets are held.

Outdoor models now fall into two classes, both deserving of much praise for design contributions to American commercial avation. The first is the rubber-driven type, and the other is the petrol models.

Despite serious objections arising from accidents in thickly populated sections, petrol models are very popular,

Arthur Kronfelt's petrol engine powered S.E.5. A really beautiful model.

Left: One of the finest radio-controlled petrol planes in the U.S.A. Note the twin engines.

and are now flown extensively in selected areas under restricted rules imposed by the N.A.A. and local government. In praise of the organised petrol model builder, it can be said that none of the few accidents caused by such models are attributable to him, but rather to some person who has no respect for his own, or other persos's property. Many States refuse to permit any petrol model to be flown without the owner possessing an N.A.A. Gas Model Flyer's Licence. Such a licence costs one dollar, the model is given a number, and the owner pledges to obey the rules for safe flying. The N.A.A. has made possible the long-desired petrol model insurance that provides $1,000 worth of insurance ($500 each for Public Libality and Property Damage Liability) for the small sum of one dollar a year.

Three thousand petrol model builders and flyers belong to clubs in the United States, and are registered with the N.A.A. Models have wing spreads from three to nine feet. With the aid of club funds many builders have constructed remote controlled models by the use of radio apparatus. Notable improvements have been made in engines, some with a $\frac{7}{8}$ inch bore and a $\frac{1}{16}$ inch stroke developing $\frac{1}{5}$ horse-power at 5,000 r.p.m. Two types of contests are held at petrol model meets. The endurance contest is where the timing does not begin until the model has been up thirty seconds and begins to glide. Precision contests award points for plane's appearance and originality in design. Take-off, type of flight, and the ability of the ship to set down near the centre of a large circle, all affect the score.

National Championship Model Airplane Contests were started in 1928. For the past three years the meet has been held in Detroit. Model builders representing every type of model design and class interest from every section of the country participate. It is at this time that the American Wakefield Team is selected. This year was the first time America was able to enter a full team in the contests for the Wakefield Trophy, and we take great pride in this team that brought back the famed trophy to America for the fourth time.

Yearly, a group of model flyers from the United States attend the Canadian National Exposition Meet at Toronto, where such goodwill and friendliness is extended us by the Canadian flyers.

We can see for American model aviation a future even greater than its past. The Air Youth of America Committee, headed by Winthrop Rockefeller, Junr., is now conducting a survey that should determine a future goal for our model builders. The Government will perhaps eventually recognise the air-minded youth of America as a great reserve for future air defence. If so, ground training, glider flying, and actual flight instruction may become part of government sponsored activities of every model organisation.

In the immediate future great plans are being formulated for the reception of contestants from the principal countries of the world, who will meet in the United States this year in competition for the Wakefield Cup. It is with a feeling of great friendship and understanding that the model builders of America welcome these teams. Perhaps through such international meetings of model enthusiasts, mutual goodwill, and a desire for peace could be accomplished through the youth of the nations of the world.

BIRD FLIGHT AND THE

By MAJOR C. E. BOWDEN

The Bird and the Model.

FROM the title of this article the reader may imagine that some startling new facts are about to revolutionise the model aeroplane. The fact is that although there is so much in the flight of the bird that does apply to the soaring and stability of the duration type of rubber-driven and petrol-driven model aeroplane, there is also a very great deal in bird flight that does not apply to the model. It is nevertheless very interesting and instructive to study the more important aspects that do affect the model. There are also intriguing tit-bits of information that do not directly apply, but that do form most interesting matter.

There is one aspect of bird flight that I think has not been utilised sufficiently in model work, and that is soaring through the momentum created by weight. I hope this article may suggest some useful points to the model enthusiast.

Aspect ratio, wing plan and loading are of considerable interest. In model work we usually require duration through slow soaring flight after the initial burst of power from the rubber motor. In the case of the petrol model we require a soaring floating type of model to fly upon limited engine power, and with a slow flying speed. We have a considerable amount of weight that we must carry. By studying the large soaring birds we can actually use this weight to advantage.

The German model makers discovered some time ago that really large model gliders with plenty of weight can put up wonderful soaring durations. They were forced to build their models of heavy wood or metal because of the difficulty of obtaining the very light balsa wood that we have used for a long time. We in this country have mostly considered that a very light and smallish sized glider, chiefly made from balsa, would be the most efficient. We have overlooked the fact of using the speed of the wind and sufficient size and weight of the model to gain sufficient momentum to soar into fairly stiff winds.

This country originally thought that it would limit huge soaring durations in the " Wakefield Cup " type of model by increasing the minimum weight of the competing models and limiting the wing area. It has been found in practice that the added weight did not prevent a well-designed model of " clean " aerodynamical form from soaring. In actual fact the durations have been put up a great deal.

I would go further and predict even better results if the model designers were allowed to produce larger models with greater weights.

Many a heavy but skilfully designed petrol model aeroplane is a slow-flying model, and yet has excellent gliding capabilities, and can with modern knowledge be flown by a very small engine power.

In view of all this, let us examine the soaring birds and understand some of the reasons why they soar. From this we can use certain of their methods to help our models to soar.

Weight if correctly used, with the right wing area, can and does produce good soaring flight.

The Bird and its Evolution.

The bird is a wonderfully constructed flying machine, and its flying methods are now more easily understood, due to the use of the camera and the ciné camera. It is all the more interesting when we realise that it has taken millions of years to develop to its present state of flying efficiency. We are told that the bird has been traced back from a cold-blooded lizard type of reptile which started its flying development from its feeding habits, which took it from running along the ground to feeding in trees, where it wished to jump from branch to branch. The reptile's scales gradually stretched and developed on the sides of its long tail and on the after part of the forearms until it could use them as small gliding planes to assist in its leaps. These enlarged scales became gradually ragged at their trailing edges and finally developed into feathers.

As the reptile became more active it gradually became warm-blooded, but it retained its soft snout and teeth for a very long time before it developed a beak.

The arms slowly became wings and the bones became filled with air cavities on the soaring types of birds. As an instance, the pelican, now weighing about 25 lb., has a skeleton weighing only 23 oz.

The upper arm, forearm and hand of the bird's wing can be folded compactly along the side of its body far better than a modern monoplane's wings. The hand has the tip feathers attached.

If the reader studies Fig. 1 of an albatross soaring, and will put his own right arm out in the shape of the right wing he will see how the wing has developed from the arm. He can also emulate the bird's flapping flight stroke.

The bird's flapping flight is made through a power stroke of a forward movement of the outer part of the wings (the forearms and hands), which are then thrust downwards to give lift and finally backwards for

MODEL AEROPLANE

Fig. 1. An albatross soaring. Note shape of the wings, which correspond to upper arm, forearm and wrist, with tip feathers attached.

propulsion. Towards the end of the back stroke the wings are folded in order to offer less resistance on the final upwards and recovery stroke.

The central portion of the wing serves as a supporting plane to a large extent, whilst the outer portion supplies the upward lift and propelling force. The above description only applies to flapping flight of course, and not to soaring flight when the wings are fully outstretched the whole time.

The whole flapping stroke is somewhat like the " crawl " stroke of the human swimmer. Try it with your arms and see. Also study Fig. 2.

From this explanation it will be seen that it is a very difficult problem to make a mechanical model wing to carry out this complicated flapping movement.

On the other hand, the soaring birds make far more use of their wings outstretched for soaring than for flapping flight, and it is this part of flight that we model makers are particularly interested in. It is interesting to note that the soaring birds have very small breast-bones compared to the high-speed flapping type of birds. Before we leave flapping flight it is worth while examining the wing beats of certain birds.

Whereas the humming bird makes up to 200 beats per second, at the other end of the scale the stork makes two beats or strokes of its wings in one second. A pigeon makes eight. It can, therefore, be seen that the larger the bird the slower the strokes, and it also seems almost incredible that the humming bird can make such rapid strokes.

The average speed of birds also varies very much, for whereas the blackbird flies at about 25 to 30 m.p.h. and the robin at from 35 to 38 m.p.h., the swift flies at the really high speed of from 70 to 100 m.p.h. The albatross flies at about 50 m.p.h. and the familiar pheasant flies at about 36 m.p.h.

A point worth noting by the aero-modellist is that the fast-flying birds have flat under-surfaces to their wings, whereas the slow birds have a deep undercamber. This fact, of course, is used by all experienced model makers.

The speed birds have pointed tapered wing tips, and the wings are carefully faired into the body, which is well streamlined as we should naturally expect. (See Fig. 1).

Most of the large slow-flying, or at least slow-gliding birds, like the heron and vulture, have square wing tips and not nearly such a " clean " body shape, just as in

Fully open forward, downward and backward, folded and upward recovery.

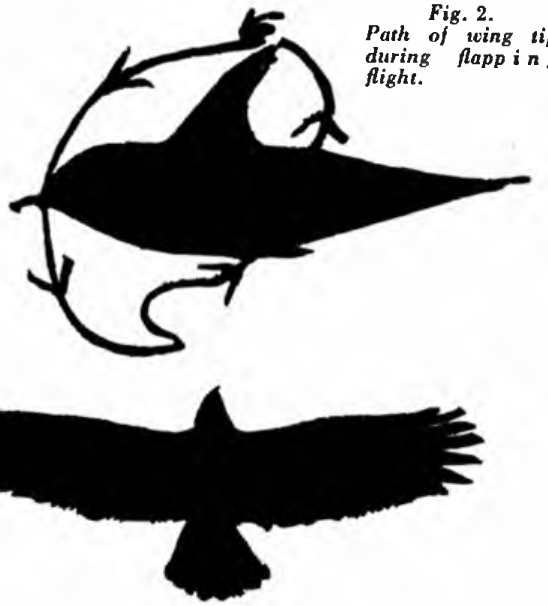


Fig. 2. Path of wing tip during flapping flight.

Fig. 3. The square-tipped wing of the Eagle for slow flying. Note anti-stall device of " slotted " wing tip feathers.

the full-sized type of aircraft that do not study speed requirements as carefully as those designed primarily for high-speed purposes. (See Fig. 3).

Wing Tip Control Devices.

These slower, square-wing-tipped birds have the outer slotted wing-tip feathers spread well out like a number of fingers. (See Fig. 3). This slotted effect undoubtedly keeps lateral control over the wing tips through maintaining good air flow over the tips, on the principle of the Handley Page slot. In this way the wing tips still have a large reserve of control even when the wing itself on the bird is purposely stalled or near the stall in sinking flight and other manœuvres.

The high-speed birds with their highly tapered wing tips can distinctly be seen, in photographs, with the centre of the wing often at a large angle of incidence and the wing tips at a far lesser angle. In other words, the wing tips are " washed out " or at a negative angle of incidence. This feature is used, of course, by model makers who produce really stable tapered winged models that are not guilty of dropping a wing tip when the main part of the wing gets near stalling point. A number of full-sized aircraft use this feature also.

This is a point for the model designer to keep well in mind. The bird's wing shape design varies with the type of flying required, i.e. for slow or fast flying, and its anti-stalling devices also vary to suit the type of wing tip used.

Aspect Ratio.

The average flapping bird's wing has an aspect ratio (i.e. the relation of span to chord) of about 3 to 1. The super soaring bird, such as the albatross, has an aspect ratio of about 5 to 1.

The modern high efficiency full-sized sail-plane of to-day can outclimb a soaring bird and has an aspect ratio as high as 16 to 1 and 18 to 1. The question of even higher aspect ratio, although desirable for sail-planes, is governed by structural difficulties of making

Fig. 4. High aspect ratio wings. An albatross shown side by side with a typical model glider of high aspect ratio.

the wing sufficiently strong over such a huge span and yet keeping a sufficiently thin wing section to offer the minimum amount of drag.

The model maker should realise that good climb and quick take-off, also good soaring capabilities are all obtained by as high an aspect ratio as can conveniently be used in the design.

One of the successful features of the recent long-distance world record breaking British bomber machines was the high aspect ratio wing that permitted a quick take-off and good climb with the machine's huge load of petrol. This abnormal high aspect ratio for this class of aeroplane was able to be used, due to the godetic construction of the wing.

Fig. 4 shows the similarity of a soaring bird against a modern model sail-plane.

Light Wing Loading, but Heavy Weight to Obtain Velocity to Soar.

This is a pet theory of mine and I think is borne out by facts. The white pelican is an ungainly and heavy bird, and has to do much flapping and beating of wings to get off the water, but due to its wing span of 8 to 10 ft., once it is in the air it flies with great ease and buoyancy.

Similarly the bald eagle can soar beautifully and yet it weighs as much as 12 lb., but has a wing span of about 8 ft. My old British record-holding petrol model, called the " Blue Dragon," also had a wing span of 8 ft. and its weight was about 7½ lb. This model had a deeply undercambered wing like a slow speed and large bird.

The albatross is designed for easy but high-speed soaring, and is beautifully " clean " aerodynamically. He may be up to just over 11 ft. span, with a chord of only 9 in. He, therefore, has a reasonably high aspect ratio, and although heavy to give him soaring momentum, he has a comparatively low-wing loading,due to the very large wing span. The albatross can soar for hours with a minimum of effort, and covers enormous distances.

The model maker should always use a lightish wing-loading and high aspect ratio if he desires good climb and slow flying on limited engine power. If the model is sufficiently large a heavy weight may actually be used to the same advantage as the albatross uses his weight to gain momentum against considerable winds to soar. In England we aero-modellists more often than not encounter considerable winds. The albatross is, in fact, an excellent bird to study in many ways. Refer back to Fig. 1 for his general outline plan.

On the other side of the picture birds like the duck and the pheasant, whose wing loading is high, are not soaring birds. They have the weight, but lack the wing area. They require great muscular effort to fly, and so does the heavily wing-loaded model require great horse-power to fly it. *But do not forget that weight in itself is good for purposes of momentum, provided we use a large wing area.*

Whilst on leave in England I have recently turned the above facts to useful account with various 2·5 cc. engines, and obtained great heights on *large* models of light wing loading, whereas the same engines have given me miserable results on tiny petrol models. I and a doctor friend have obtained flights over Exmoor of up to about 1,000 ft. with 2·3 cc. engines on limited engine run and in cold weather without any thermals about.

Soaring Flight and How it is Obtained.

There has been a great deal of discussion as to how the soaring type of birds obtain soaring flight. Modern knowledge on sail-plane flying tells us a lot.

What we have already discussed in this article with regard to high aspect ratio, low-wing loading, weight for momentum, lateral wing tip control, etc., is all pertinent to the question; but let us make a few simple observations on the subject of how soaring is actually done, without going too deeply or in great length into a very complex and large subject that could cover many articles in itself.

If the bird or flying machine is suitably equipped by design for soaring, as already explained, there are certain main methods by which it may soar.

One of the best known is through the use of thermals, due to hot air rising in a column from a variety of reasons.

In this case the bird or model circles in the " riser," as it is frequently called. It is obviously necessary to keep in the rising-up current, however. One frequently sees a model doing close circles and rising rapidly to a great altitude on days when thermals are about. These uprising air currents are often found over sun-heated ground in hot weather and also below clouds. Uprising currents of air also often come from an uprising hillside or even buildings.

One may see gulls soaring for long periods directly into strong winds behind the uprising air from the vertical sides of a moving liner, and also in the hot column of air from the funnels. But they could not soar into such strong winds if they were light-weight balsa models. It requires weight to obtain momentum under these circumstances. I often feel that the average English model glider enthusiast does not make nearly sufficient use of this factor.

Another method of soaring flight is explained by the fact that the velocity of the air is lower nearer the ground or sea.

There are what may be called layers of air, which increase in velocity as the height increases.

Now imagine a bird gliding downhill, or down these layers of air and downwind. The bird's velocity naturally increases, *provided it has sufficient weight to give it the necessary momentum.* The bird then turns into wind and zooms up into the wind with its increased velocity. As it zooms upwards it encounters wind layers moving at greater speeds. The greater speeds give greater lift to the bird's high aspect ratio and aero-dynamically clean wings, and the bird soars. It, therefore, uses the " downhill " rush to first gain extra velocity, and then the increasing speed of the upper air layers when it travels into wind. The bird repeats this cycle of events by soaring in circles. I have seen vultures and similar birds in India and other parts of the world soaring for long periods in large circles in this manner without a single flap of their wings.

Lessons the Model Maker can Learn from the Bird.

I think the main thing the model maker can learn from all this is that weight is actually useful to create velocity to soar, but the weight must be supported by large surfaces of high aspect ratio and small drag characteristics. This, of course, all favours the really large model, except on those very calm days so exceptional in our English climate. Then the ultra-light model will obviously score. A fair number of years ago a model maker on Wimbledon Common rather surprised most of the " experts " at that time by getting average flights of up to about two minutes on rubber-driven models of up to 12 ft. span. And one must remember that those models were anything but aero-dynamically clean as we have learnt to make our real winners to-day.

Two or three years ago I was interested in this idea of soaring flight for models based on the robust and heavy petrol-engined models that I had built, but with a light wing loading, as I had noticed that my larger models required less engine power and soared well. I obtained one of the large 8 ft. span model gliders, weighing several pounds, made in Germany by a model gliding expert.

This glider was made of hardwood and the wing largely covered with 1 mm. three-ply. The model had a large piece of heavy brass attached to the nose that could be adjusted to alter the C.G. position.

Needless to say the wing aspect ratio was high.

I found this model exceedingly instructive, and it proved to me that my theories about weight and bird soaring had more in them than mere theory.

The model liked a fairly stiff wind. It shot forward from a launch with its huge brass weight at the nose well ahead of the centre of pressure of the wing, and rapidly gained momentum, and under normal favourable conditions, even from a flat ground, started the most intriguing soaring and gaining of height quite unlike the type of flight one is generally used to seeing the light and small average English type model glider do.

The fundamental secret was undoubtedly the heavy weight to create forward momentum and so velocity coupled, of course, with the large wing area of high aspect ratio. One must also remember that a large model wing probably has a better air flow over its more generous section. As built by the German designer this model had one disadvantage. All fixings were too rigid and it was prone to damage.

I, therefore, built myself a large span glider with more " flexibility," but with the same characteristics, and I have used the same principle on models for the very tiny 2·5 cc. type of engine, where the power is very limited. It is noticeable now that in certain quarters in America this principle is being used for the tiny engines. The " Atwood Phantom " midget engine set up a huge observed flight recently over 11,000 ft. altitude with a model of about 8 ft. span and weighing over 4 lb., all on about 2·5 cc.

I feel that we can learn a great deal from the heavy soaring birds and the large German model gliders. It is noticeable that there is a tendency amongst a few people in England now to turn to large gliders and rubber-driven models.

I think the added weight rule of the Wakefield Cup, originally introduced largely to keep durations down and prevent soaring away from sight, has proved a surprise to many now that it has actually increased the durations of well-designed examples of that class of model. It has made a lot of us think.

I hope I shall not be misunderstood by some people in one respect. I am not suggesting for one moment that just a heavy model is " the goods." Far from it. The weight must be skilfully used in a well-designed model, otherwise it will merely reduce any duration that the constructor hoped for, as so many people know to their cost. My suggestion is that one should study the soaring birds and apply some of their principles to advantage in our models. They should make us think and experiment; which after all is perhaps the greatest fascination in this intriguing hobby of ours. One can never get bored with aero-modelling.

THE NATIONAL GUILD OF AERO-MODELLISTS

CONTACT! Members contact! I must say this last month has gone away with a great burst, and membership forms have rolled up in their hundreds. Our membership is now really astounding, and I should here like to thank everyone for the very great response to this scheme, and also for the very able way in which all the forms have been completed.

Now, just a word to those who may be writing to me in the future: (1) Please mark your envelopes N.G.A. (2) Please don't forget to send a stamp if you wish for a reply. (3) Please *quote your membership number;* this is most essential, as otherwise it involves such a lot of work, and my reply is bound to be delayed. I have already received a lot of letters, especially from club secretaries, and I must say the tone of most of these has been so flattering as to make me blush. For instance, Mr. Hassell, of the Birmingham Club, says: " My club welcomed this scheme as the most progressive step yet taken in the interest of our hobby." Thank you, Mr. Hassel, for those kind words, I can assure you they are very much appreciated. Now, then, you other club secretaries, come along and help to further this scheme, as you must certainly appreciate the necessity of making sure that all your members are covered for third party insurance.

To this end I will quote you from a letter received from a member with his application form: " My plane went into a farmer's hedge whilst one of the farmer's horses was loading up. My 'plane went very close to the horse and made it bolt. It knocked a gate stump down on the farmer's ground and also damaged the horse cart. If the farmer demanded payment would I be bound (by law) to pay? " Yes, you would; this farmer has a *bona fide* claim, and it is just such a contingency as this for which we have insured the Guild's members.

Now, I should like to explain what you should do in the event of your having an accident and a third party making a claim upon you: (1) As soon as you have any communication from him holding you responsible send me the letter, together with your very full version of the occurrence and, if possible, a sketch; also every witness's statement which it is possible to obtain. Do not on any account admit liability, as this immediately prejudices the position of the insurance underwriters.

Simply inform him that you will notify the Guild Secretary upon receipt of a formal claim from him. I should like to stress a point here; do not unnecessarily advertise the fact that you are insured, because I can assure you that if you do unscrupulous people will endeavour to make money out of these claims, and in the best interests of our sport this must be avoided at all costs.

This brings me to another point. All your models must bear the Guild transfer, but unfortunately owing to the huge cost of these, and the even greater demand, it has been found necessary to allow only four free ones per person; any over and above this number that you require will be sent to you on receipt of one penny in stamps for each additional lot of four. Please don t affix these stamps to your application, leave them loose, otherwise they are useless to me. I am sure that you will also understand that the demand being so great and the subs. so small, it would be an uneconomical proposition to give them all away free.

You have no doubt noticed that the application forms for membership have undergone a slight change, and in future will all applicants for membership *please send a postal order* instead of the 6d. stamp. This has been found necessary owing to the enormous amount of work the stamp system involved both to my staff and to the postal authorities, who have asked me to alter the system.

The response to the Wakefield fund has fallen a little below my expectation, so do come along, you " Lone Hands,'" and send something, for you don't need me to tell you how much we must pull together, and give as much as we can if we wish to send a really strong team to America this year.

And now a word about affixing the transfers. Several members, quite politely, have written to tell me that they have been printed the wrong way round!

Well, I'm glad to say that they are not right! Here is the proper way to affix them. Place the transfer, just as you receive it (that is, with the thick white backing paper, *and* the tissue on top of it), in some water, and let it soak for a few seconds. Then, carefully slide away the *backing paper* and lay the transfer face upwards on the wing of your model. Gently smooth out any wrinkles, still keeping the tissue on top of the transfer. When all wrinkles have been smoothed out, and you are sure that the transfer is in the correct position, peel off the tissue, and there you are!

Several members have sent me photographs of themselves and their models. I welcome these, and shall be pleased to publish them from time to time on this page, so let's hear from you so that I may make these notes really interesting each month. Let me know something of your plans, your 'planes, and your queries. Finally, I should like to extend a welcome to all members of the Guild when in Bournemouth to come to my office and meet me, and also my secretary, who has done so much work in connection with this Guild.

I must switch off now, and wish you all good flying in this coming season, and don't forget, try to enrol at least one new member each during this coming month.

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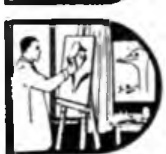

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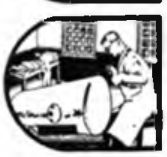


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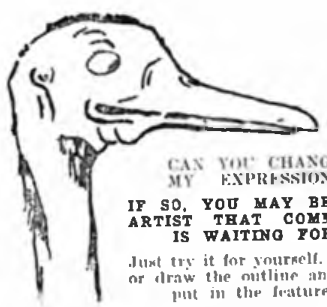

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ON TEST—THE "EAGLET" AND "BRAT" PETROL ENGINE

These three photos. of the model built by our staff expert show the simple yet elegant lines of the model.

Report by OUR TEST PILOT

Supplied by Model Supply Stores, 17 Brazennose Street, Manchester.

THE subject of our " On Test " report this month is of exceptional interest, as it is one of the smallest " gas " kits on the market. It is manufactured by the Scientific Model Aeroplane Co., of America, and the makers claim of simplicity in construction is certainly borne out in practice, in fact, plenty of rubber-driven models I have built have taken far longer.

The whole job is nicely proportioned and well streamlined, with a complete absence of " bittiness " ; it looks what it actually is, a well-designed 'plane. The construction is quite easy, thanks to the excellent plan and fully detailed instructions provided in the kit.

Of the make-up of the kit itself I can fairly say that it is very good value for money. Material is of good quality, ample supplies of dope, tissue, etc., are included ; and all parts are clearly printed.

The wing is of 44 in. span, with nicely-shaped tips, adding greatly to the sleek lines of the whole 'plane, while the covering of the leading edge with sheet balsa makes up a very rigid structure.

The tail-plane is not adjustable, but like the rudder is provided with tabs for trimming purposes, and these I found quite sufficient. The well-proportioned cabin with curved windshield gives quite a scale appearance to the machine, and a door in the side of the cabin is provided to give access to the coil and condenser.

Immediately in front of the windshield, a little hatch lifts up, giving access to the petrol tank and filler cap ; the only projection other than the cylinder is the fuel control needle, all other accessories being placed well out of sight inside the cabin.

The design of the undercarriage is simple but very strong, and although no free movement is incorporated in the undercarriage, the " spring " in the wire legs is ample to absorb landing shocks, with so light a model. A good quality bamboo paper is supplied for covering both the fuselage and wing, and when doped and decorated to the design suggested in the kit, looks very well indeed. Included in this kit is a prop. blank suitable for the small engines recommended for this machine.

Now a few words about the engine recommended for this 'plane. Messrs. Model Supply Stores, when submitting this kit to us for test, supplied a " Brat " as the most suitable power plant for the machine, and a most efficient and neat job it is. Of 1-10th h.p., it is only 3 in. high, and weighs 3¼ oz. less coil and condenser. It is a very easy starter, starting on a 2-volt dry battery quite easily.

The bore is $\frac{9}{16}$ in., and stroke $\frac{5}{8}$ in., and the engine is rated as having a speed of 500—8,000 r.p.m.

A lot of the credit for its easy starting abilities must, I think, go to the coil. It is a most efficient unit, weighing, complete with condenser and heavy armoured H.T. lead, a bare 3 oz. A Champion ½ in. plug is fitted with much finer points than usual, and during test runs extending over many days, it never once oiled up.

The needle valve is rather sensitive to adjust, requiring exactly three-quarters of a turn for the best running position, but once set it did not require constant twiddling, and on test runs it would run without a hitch until the petrol tank was empty. The ignition timing is adjustable.

After several preliminary glides to check the wing position, an R.O.G. power flight was attempted. No time switch was fitted at the time of the test, so only sufficient fuel was poured into the tank for a short flight —(the transparent fuel tank makes this quite easy)—and the engine started up. As soon as the 'plane reached an estimated speed of eight miles an hour, that is, a brisk trot, the machine became air borne and climbed well.

After the engine cut out the glide was found to be quite flat and straight, and the machine came in to a good landing. After flying this little machine for a number of times I can sum up my impressions of this model—it is a simple model to build, and a simple model to fly. It is possessed of inherent stable qualities which give me confidence to say that it is capable of good flights in all but bad weather conditions.

The makers' estimate of the weight of the finished model, ready for flying, is 17 oz. ; but the model I built (and painted ! as will be seen from the photograph) weighed a trifle under 20 oz. Yet the little " Brat " engine would pull it off a short-cropped grass field with a run of not more than 20 ft.

WAKEFIELD CUP RULES, 1939

By J. C. SMITH, Hon. Competition Secretary, S.M.A.E.

NOW that the S.M.A.E. Handbook for 1939 is available it will be found to contain, in addition to more comprehensive matter than last year, a set of Wakefield Contest Rules, which have been the subject of much " tightening up."

At the invitation of the Editor I have been asked to explain both the additions which have been incorporated in the tightening-up process, and also, for the benefit of the new entrants we expect again this year, exactly what is meant by the wording of the rules.

Rules, we all know, are necessary evils. It is the application of them that can cause difficulties. For the man, or country for that matter, who sits down and studies a set of rules, merely for the purpose of finding loopholes, so as to gain an unfair advantage of his fellow competitors, I have no time.

If there were no rules, obviously there would be chaos, but the S.M.A.E. rules for international competitions in principle are now so well known that regular competitors know full well what is intended.

So now to the rules proper. The fuselage formula remains, as in previous years, but even so, confusion still exists because the wording, " Overall length of model " is not understood to mean what it says. So remember, if the tail skid of your model extends beyond the stabilizer fin or fuselage such distance will be measured in overall length. The same applies to propeller shaft, free wheel devices, etc., fitted to the front of model.

One other note regarding the formula : If two fuselages are used each may be half the necessary cross section area of one fuselage.

In the rule covering area of main-plane (or if more than one, main-planes), will be noted a change in wording which is expected to eliminate misunderstanding. The area now to be calculated will be " the actual plan area of *cambered* surface, measured along the chord line irrespective of dihedral or polyhedral."

The introduction of fairings at wing roots, too, has caused a deal of correspondence in the past, so perhaps a word on this subject will at least help new constructors. When the cambered surface gives way to fairing curves the areas of such fairings are not included in the total. The total area of cambered surface allowed still remains at 190 sq. in. minimum, and 210 sq. in. maximum. Note, too, that stabiliser area must not exceed 33 per cent, and not 33⅓ per cent of main-plane area of model. A mere ⅓ per cent, but sufficient to cause disqualification !

Minimum total weight of model must be eight ounces.

The rule about release of model has been rewritten, and now permits only of models being held by airscrew (or airscrews), and also by the wing tip. At least one club has shown a sensible reaction to this innovation in so far as it has held a series of tests using the method laid down, and it is only by such thorough attention to detail that these tests suggest that progress can be hoped for in the expected increased field of competitors in the 1939 events. These trials are understood to have proved the method of realease quite satisfactory.

And now to the vexed question of timekeeping. Last year provided its usual crop of expressed dissatisfactions. I can promise that the contest organisers will make full arrangements to have sufficient timekeepers available this year, but that fact alone cannot guarantee, for instance, that competitors can expect two timekeepers to follow them about all day waiting for a job of work. Neither can they expect to wind their models up fully, clap hands and expect timekeepers from out of the blue ! No, a tolerant appreciation of the responsibilities of both parties is essential. To competitors, please remember that timekeepers are still volunteers, and as such should be requested to time a flight, and not, as I heard on occasions during the past year, get shouted orders in not too pleasant a manner. To timekeepers : Remember, in the heat of an important competition, such as the Wakefield trials, competitors are keyed up to concert pitch, and perhaps inclined to be a wee bit " edgy " and impatient. It means such a lot to them, and truly the disappointment of having to complain of timekeeping ruining a good flight by inattention, or at times complete obliteration of timekeepers, is too hard to bear !

It is just as much the responsibility of the timekeepers who have been allotted a machine to time to do that job in their most able manner, as it is the competitor's job to observe that both timekeepers are on their job before releasing his model on its flight.

A new rule will be found to have been incorporated which disposes of the vexed question of whether or no a time is recorded for three attempts to get away. The ruling for 1939 Wakefield Contest is that in the event of three such failures of under five seconds to get away no time shall be recorded for that round.

The rule which gives judges the right to disqualify a competitor from a round should he not be ready when called is obviously included to obviate competitors, should any of them be so inclined, endeavouring to choose their own time to " fly off." For thus is upset all efforts to organise the event to the satisfaction of all. Be ready for your call, except for winding, and do be patient. In passing, I should like to mention the business-like way in which certain teams conducted themselves in last year's National Cup Contest. No prizes are offered for their names. But one of them earned a just reward !

And now this " no replacement " ruling. No, a new propeller *cannot* be fitted, even if it be the same pitch, weight, and in every way similar to the original. Rubber *may* be replaced, but even so the model must be rechecked after such replacement. After any damage needing repair it is advisable to report same to judges in the same manner as it is necessary to obtain permission for trial flights.

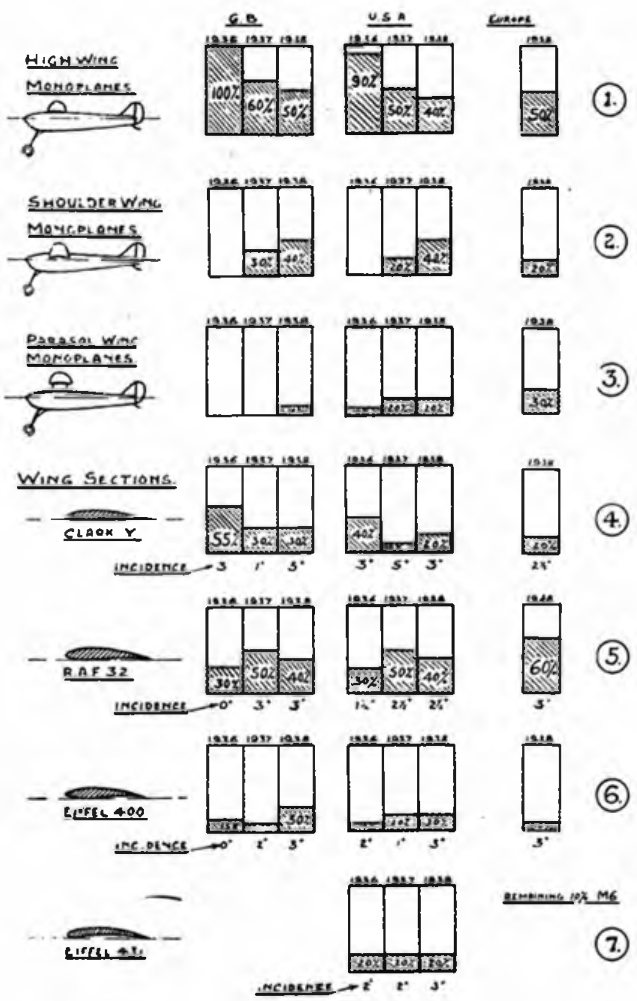
Exactly what may, or may not, be purchased when making your model, is perhaps not clearly defined. But honestly, you know as well as I what the Council of S.M.A.E. consider that you should make yourself and what you can buy. Is it cricket to buy a complete machine, even though it was constructed in its entirety by the seller ? Most certainly not. To win a place in the Wakefield team is an honour in itself. Go to it. Win that honour. We want a particularly good team this year. Know your rules, obey them, and give the contest officials a full opportunity to concentrate on the smooth running of the contest on the day, and don't harass them by turning up with a model that does not comply 100 per cent with the rules.

THE TREND OF DESIGN IN MODEL

By ARNOLD WATHEW

WHEN sitting down to design an entirely new model, whether of Wakefield specification or not, most of you must have wished for really full details of the most successful machines of the past, so that you might be certain whether, for example, a certain wing section was in general use on contest machines or not; and whether its use was increasing or decreasing. Just such feelings inspired this article.

It was, of course, impossible to get sufficient details of all the successful machines of any one year, but a compromise was made by taking particulars of the leading contest-winning machines, as detailed from time to time in this and other model aircraft publications.



My grateful acknowledgments are due to THE AERO-MODELLER, *The Model Aircraft Constructor*, *The Model Airplane News*, and last, but not least, Mr. Frank Zaic's invaluable "Annuals." A word of explanation as to the method of procedure. Some seventy models were chosen upon which to base my figures, and these were grouped into the years 1936, 1937 and 1938, according to the date of publication of plans, etc. These were again grouped into Great Britain (G.B.), United States (U.S.A.), and European. Unfortunately, insufficient European machines were found for the years 1936 and 1937 to give any accurate idea of design for those years, so that only the 1938 machines have been considered when dealing with European design.

What might be termed "freak" machines have not been included; autogiros, wing flappers, etc., coming under this heading. Low-wing monoplanes and biplanes, although in no sense "freaks," were so few that no general conclusions could have been drawn had they been included.

As even the most enthusiastic are inclined to gib at too many percentage figures, almost all the results are shown in tabular form, with the percentages inserted for those who desire them. The tables are in three columns, headed respectively Great Britain, U.S.A., and Europe. Let us take them as they come and see what they can tell us.

Tables 1, 2 and 3. Machine Types.

The most remarkable thing here is the fall from favour of the high-wing monoplane type. Its place is being rapidly taken by the shoulder-wing and parasol-wing types, Europe being rather more fond of the parasol form than either Great Britain or America.

Tables 4, 5, 6 and 7. Wing Sections.

If you will study these four tables carefully you will note that two major changes are taking place. Firstly, that the under-camber sections are ousting Clark Y from pride of place; and, secondly, that these under-cambered sections are no longer flown at 0 degrees incidence, but at approximately 3 degrees, as Clark Y used to be (and still is when used).

I confess to a feeling of surprise that Eiffel 400 should be so generally used, and to a feeling of national pride that our friends in Europe should show such a marked liking for such an essentially British section as R.A.F. 32! A word here with regard to the figures given for incidence. Clark Y (Table 4) at 5 degrees—this is an isolated case and should be disregarded. No less than 15 machines fly this section at 3 degrees, so one presumes it to be about the correct figure.

Where half degrees are shown it means that that is the average of the machines using that section in that year. Say, two machines fly it at 2 degrees and two at 3 degrees, then I have put 2½ degrees.

But we must pass on to—

AEROPLANES—

Tables 8, 9 and 10. Tail-plane Sections.

And this is where our old friend Clark Y has his revenge! No longer leader of the wing sections he has beaten all others hands down for use on tails. The symmetrical tail section seems to be dying out, save in Europe. As a matter of interest, why do 95 per cent of the 1938 petrol models still use the symmetrical tail section? A nice little problem there for someone.

Table 11. Power/Weight Ratio.

The figures given are for rubber weight over machine weight (not total weight).

Here we seem to score by being able to put more rubber into our machines than anyone else, especially in 1938!

Table 12. Aspect Ratio.

Shows a tendency to get smaller, but is remarkably steady, at an average of 8 to 9.

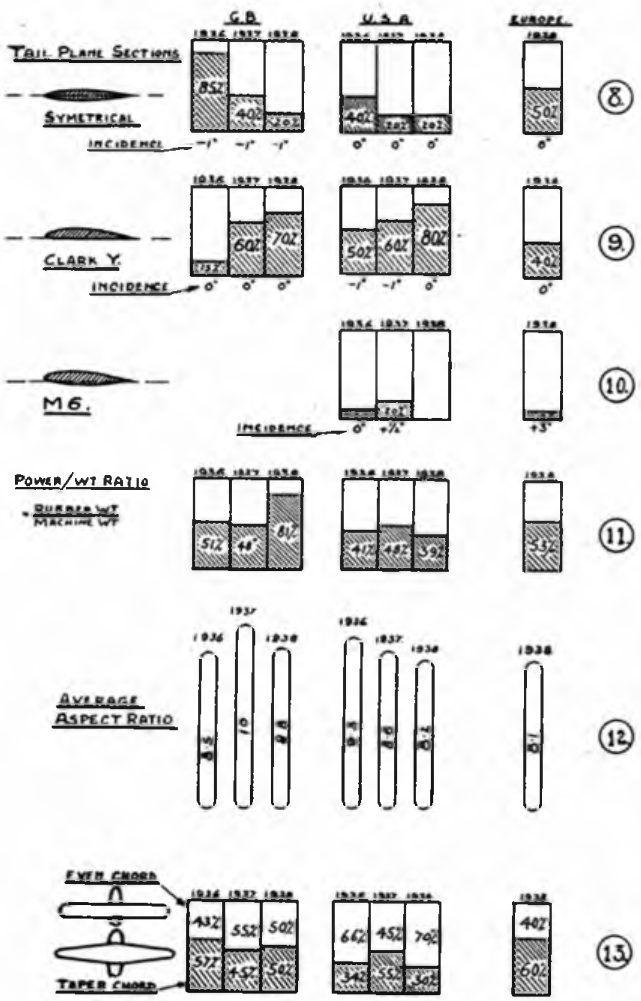


Table 13. Even Chord versus Taper Chord.

Great Britain and America prefer the even chord, whilst Europe does not. Is the taper chord giving trouble by tip-stalling, or is it just too much bother to make?

Tables 14, 15 and 16. Fuselage Shapes.

These three tables might have been included expressly for the benefit of those who argue that streamlining *does* pay. Certainly the oval or round section fuselage has won its way to pride of place. But why do we ignore the diamond shape? M. Fillon found it good!

Table 17. To Streamline or not to Streamline?

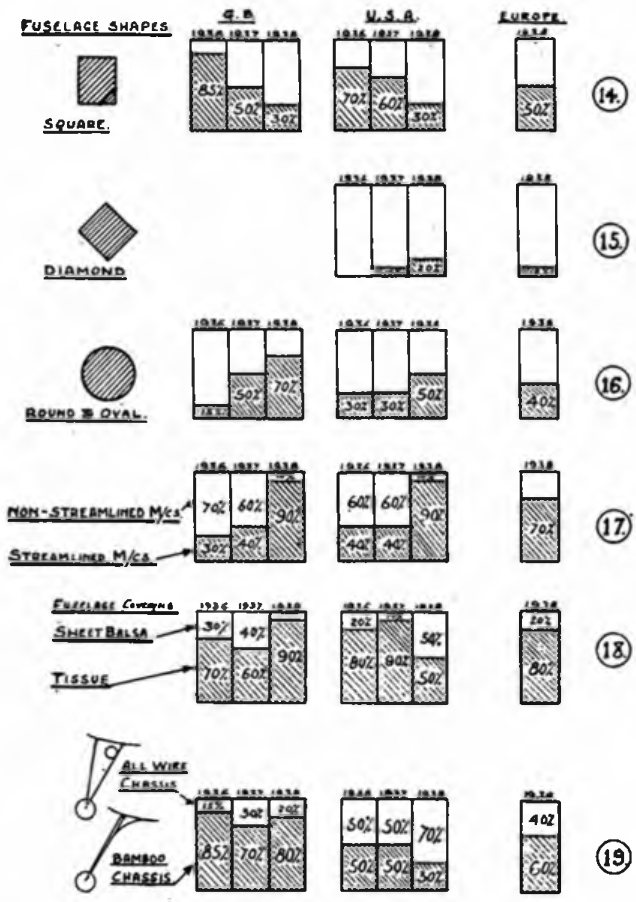
To some extent this covers the same ground as Table 16, but I put it in to show you that even the builders of square section fuselages nearly all take the trouble to fair both nose and tail to such an extent that they may be truthfully said to be streamlined.

Table 18. Fuselage Coverings.

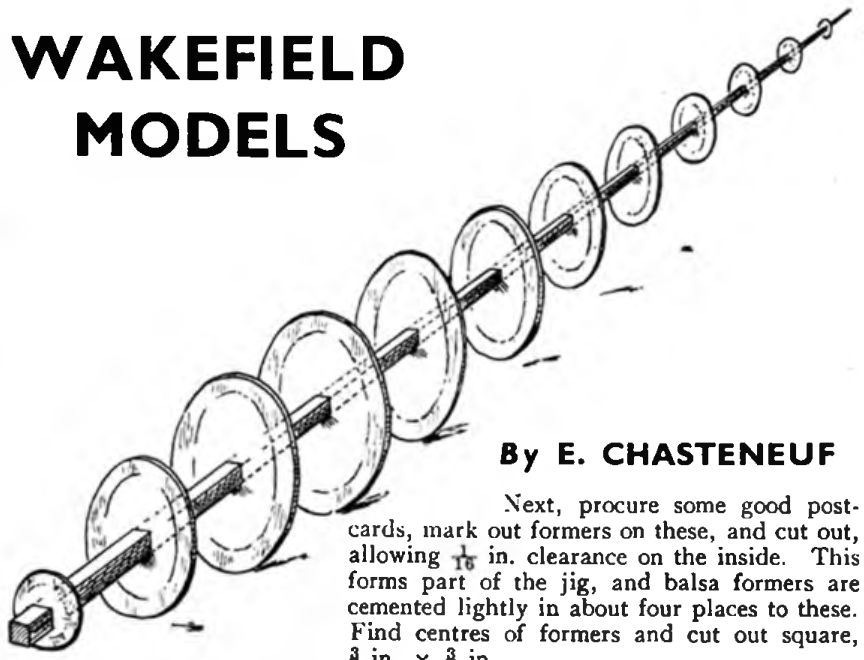
America seems to have had a boom in all-balsa fuselages in 1938. Taken in conjunction with Table 11 this would seem to explain the poor power/weight ratio of the 1938 American machines. And yet they did well in the Wakefield! Perhaps it is worth it!

Table 19. Chassis Construction.

Here we seem to differ entirely from the Americans, who favour the all-wire type. Bamboo, with top stiffening or springing is definitely the favourite over here.



WAKEFIELD MODELS



By E. CHASTENEUF

HERE we are building or thinking of our Wakefield design for 1939, and having the same old problems all over again. "Shall I make it a streamlined job with retractable undercarriage, wing fairings, folding propeller, or shall I stick to last year's design and endeavour to improve on last year's performance?" That is the problem that besets very nearly all of us. Well, I have had all these problems in past years and again this year. I had a new design all drawn out, low thrust line, hump back fuselage, with double ellipse wing, double ellipse tail-plane and fin. But after quite a lot of thought I decided to stick to last year's design and try to improve it. So the purpose of this article is to try to help you make up your mind and a few methods and hints on constructing a streamlined job, because I am quite convinced this is the best to use for the competition, and if it is well-finished is a credit to its owner.

If you decide to try a retractable undercarriage, remember, if it cannot be made absolutely foolproof, it is not worth it, because one slip on the day of the competition probably means finish to your chances. I have had this idea in mind for some time, but decided when I heard that new competition rules had been made, i.e. when launching model only to be held by the wing tip and prop. only. Well, the difficulty as I see it is, if the weather happens to be windy, it will be rather difficult to get a model away under these new rules with a retractable undercarriage, which, like mine, was not rigid enough, in my opinion; when the undercarriage was in the down position it was not rigid enough to take it under adverse conditions, such as might come along.

Having got that over, I will get on to some constructional details. Firstly, I have not described in print my method of building a streamlined fuselage. Draw out your fuselage design plan and top elevations. Draw out your formers and cut them from balsa, I usually make my formers from two or three-ply $\frac{1}{32}$ in. sheet balsa, laminated with grain crossing. This is not the only method of doing the job; one other method comes to my mind. Firstly, make formers from $\frac{1}{16}$ in. sheet balsa, from six or eight pieces, cemented together. This takes quite a bit more time and patience, but when finished looks a job to be proud of.

Next, procure some good postcards, mark out formers on these, and cut out, allowing $\frac{1}{16}$ in. clearance on the inside. This forms part of the jig, and balsa formers are cemented lightly in about four places to these. Find centres of formers and cut out square, $\frac{3}{8}$ in. × $\frac{3}{8}$ in.

You will need a piece of deal, or wood of any description will do, which must be perfectly straight and true. Mark positions for formers on this, then thread on cardboard formers with balsa formers attached. If fuselage has been carefully drawn out the stringers should fit on beautifully now. Put on half the number of stringers, which can either be $\frac{1}{16}$ in. × $\frac{1}{16}$ in., or $\frac{3}{32}$ in. × $\frac{3}{32}$ in. Then carefully pull out rod and knock out cardboard formers; then cement on rest of stringers.

There are three types of undercarriages which can be used. The one most used is the cane legs sprung with piano wire, and fitted into fuselage with brass or dural tubing. Another very good method of doing this job, which I am using this year, is the cane legs only, which are plugged into paper tubes. When using this one it is best to make a sound fixing in the fuselage, and have the legs a little on the weak or pliable side, so that in the event of a heavy landing the legs will snap and not break up the fixing inside. The paper tubes should be rolled on to a leg which will be used and cemented well. It is sometimes best to grease the bamboo before wrapping paper round, then it will not stick and will be easy to slide out. It is best to make the legs go right to the top of the fuselage, and brace it forward at the top and also where the legs enter the fuselage. This will, of course, be braced backwards. I think it is also advisable to fill in between the formers, where the legs come out.

Lastly, we have the retractable undercarriage, which is a job for the expert builder, and is one of the things which should improve Wakefield models' performance.

The idea I have been thinking of most is to have the legs attached to the fuselage under or just forward of the centre of gravity. This will make the legs as short as possible, and they will swing forward and fit in slots along the fuselage. The wheels will have to be considerably smaller than we have been using up to now, otherwise the slot in fuselage will have to be very deep to accommodate the large wheels. Fairings should be attached to the outside of the legs if this can be conveniently arranged to fit over legs and slots in fuselage to make good streamline. Of course, the great difficulty is to get the legs to snap back into the fuselage without a great deal of complication also to go into fuselage quickly

so you do not loose the initial burst of power before the model comes into perfect trim. On method, I thought of using was quite simple, and I think would be very effective, was, have the legs pinioned at the fuselage, and from a point about two-thirds down the leg, attach a piece of $\frac{1}{32}$ in. × $\frac{1}{32}$ in. rubber to each leg in tension, and take other end into slots on fuselage. Then from same spot on leg attach backward to a point on the fuselage a light thread. Cement and bind a light hook of 26 or 28 gauge piano wire to fuselage. Then let cotton fit over this hook, when model is on the ground. The legs will be lying slightly backward, and will be tensioned forward with rubber. When model leaves ground the legs will get weight of model off them, and cotton will gradually bend wire hook and slip off, allowing rubber to pull up the legs into fuselage. This will need some careful adjusting, but when right will work quite well, I think.

Next we come to propellers or airscrews. The Americans last year favoured the one-bladed prop. with balance weight on other side, and folding back against the fuselage. This seems to work particularly well. The model is gliding incorporated with a retractable undercarriage. This should be the ideal Wakefield model, because, when power flight is finished, the model becomes a glider or sailplane pure and simple. Even if a thermal is not hooked it should improve the glide considerably. But to get back to the conventional type of propeller that we use. I think an 18 in. prop. with medium amount of blade area is the best to use on a streamlined modern Wakefield ship. A pitch of between 24 in. and 30 in. should be aimed at, dependent on the type of flying you wish to do. If a very fast climb and moderate motor run is wanted, use 16 or 18 strands of $\frac{3}{16}$ in. × 1-30 in., and the prop. of 24 in. pitch. If long slow climb is wanted, and not a tremendous height, use about 30 in. pitch, and higher power, perhaps 20 strands $\frac{3}{16}$ in. × 1-30 in. When using either of these a little downthrust and sidethrust should be built into the design to take care of any stall or torque troubles there may be.

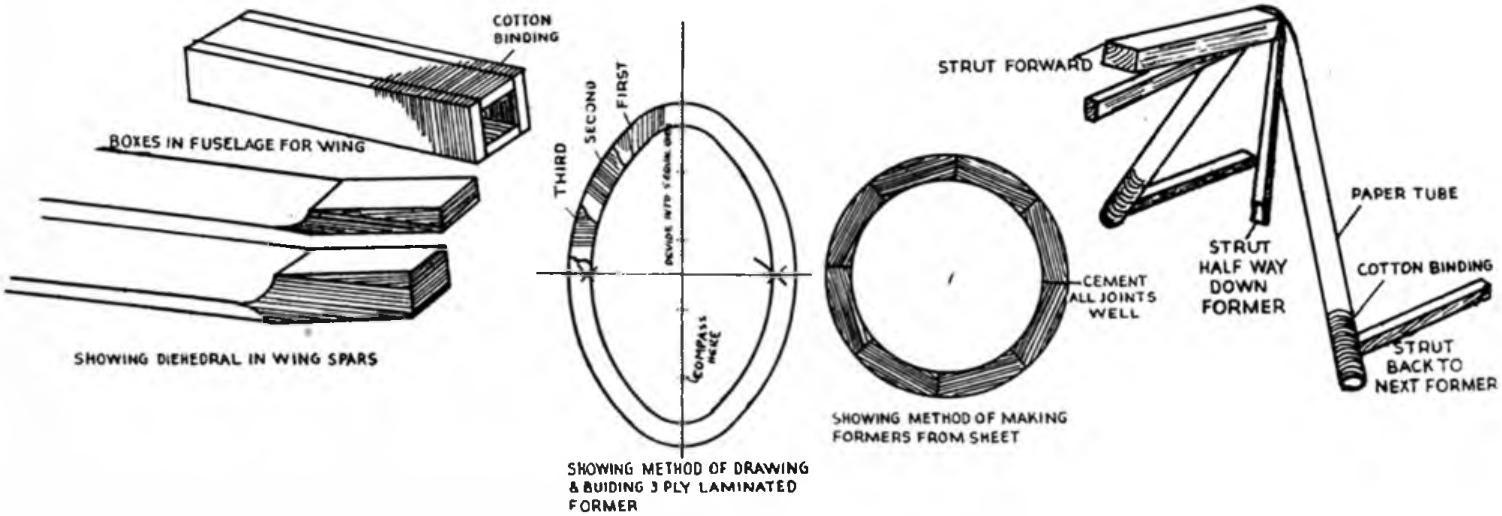
Now the main-plane. Well, I like to plug mine into the fuselage and make it a fixture. I think this is much the simplest way of doing the job and also one of the best. It is easy to assemble, and you have no troubles about the position, because it cannot alter in any shape or form. A very strong fixing can be made with balsa boxes of $\frac{1}{16}$ in. sheet or, if you prefer, $\frac{1}{8}$ in. sheet balsa

Mr. Chasteneuf holds his model for inspection. This is the model shown taking off in the photo on our front cover page.

can be used. The boxes should be built as shown in sketch and bound with cotton or paper. The leading and trailing edges can be extended past root rib to fit snugly into boxes. The wing section is very important and should be carefully chosen, and the ribs carefully cut to keep good section. On a model like this I think it is best to space the ribs 1 in. apart. Ribs can be cut from $\frac{1}{32}$ in. sheet, and leading edge shaped from $\frac{1}{2}$ in. square, trailing edge shaped from $\frac{1}{4}$ in. sheet, all balsa, of course. The best sections to use are Clark Y with undercamber, Eiffel 400, or R.A.F. 32. There is not much to choose between these sections; it is more a matter of choice, or what you have been used to using.

Tail-plane can be either lifting section or symmetrical section variety. I prefer the lifting tail set at 1 deg. negative, or set on the datum line, because this enables you to get your wing forward, always a desirable thing. The C.G., if lifting tail is used, should be just forward of the trailing edge of wing. This always makes the tail-plane do some of the work for you. Also improves

(*Continued at bottom of next page*).



DRAWING FUSELAGE OUTLINES

By H. E. ALDWORTH

WHEN drawing up a fuselage of average "Wakefield" size, that is to say, about 33 in. long, it is very difficult to obtain the required smooth curves of the outline. Forward of the point of maximum cross-sectional area they may be drawn in with a small French curve, being comparatively short, but aft of this point this is not practicable.

To overcome the difficulty of drawing in these long curves I conceived the following idea, which has proved itself very simple and convenient to use.

Obtain a piece of good springy birch, about 25 in. long, and of about $\frac{1}{8}$ in. square cross-section. Next, poke around until about five or six small tins (round ointment tins of $2\frac{1}{2}$ in. diameter will do fine), and some pieces of lead, come to light.

You now require something in which the lead can be melted, so snoop around until you find an old saucepan, or almost "owt wi' 'andle." In my own case an old iron ladle came in very handy for this job. Put the lead in this and heat until molten. If you have used some painted lead soldiers, etc., for your lead, there will probably be some paint floating on top of the lead, but this is of no consequence.

Now fill each of your tins with molten lead, taking great care, of course, as any spilt lead will burn a hole in oilcloth or linoleum, etc.

When the lead is cold, clean up the outsides of the tins, and if it is so desired, give them a coat of paint.

And that, boys, completes the manufacture of the thingummy, so now here is how to use it.

The ends of the curve required have been marked on your drawing, and all that remains is to draw in the long curves. Right. Well, place the birch on the drawing, and hold it down at each end with one of your home-made weights. Now, with the rest of the weights, push the birch into a nice smooth curve. This will be found easy, as the birch naturally bends in a smooth curve. When the curve meets your approval draw round it with your pencil.

The method of pushing the birch to shape is done in much the same way as a longeron is held to shape on the finished drawing, except that we are using weights instead of pins.

The line you have drawn is, of course, quite firm, as it is possible to hold the pencil right up to the birch.

For a large drawing, such as that of a big petrol model, birch of more than $\frac{1}{8}$ in. square cross-section will, of course, be more suitable.

A Direct-Drive Wakefield Propeller.—*Continued.*

thickness of each blade is on the line of maximum camber depth. This point is one-third of the chord from the leading edge. The deepest point of the under-camber is about ·65 from the leading edge.

The centre of the plade area is well out towards the tip, this being important in model propellers, whose tip speed is low. The thickness of the blades near the tip gives aerofoils rather shallower than is generally used. This is part of the scheme to save weight, and is, of course, greatly helped by the introduction of under-camber, which adds to the aerofoil's capabilities, even though of only moderate thickness.

When carving propellers it is essential that you obtain blocks or blanks with the annular rings running either through the block from back to front and parallel with the shaft hole when the block is viewed end on, or at right-angles to the shaft line when the block is viewed end on. This direction of the annular rings is important, as without either one or other of these it is impossible to balance the propeller and keep the blades the same section either side of the shaft. When about to carve, be absolutely certain that the shaft hole is drilled true, as on this depends both static and aerodynamic balance, both essentials of sweet, vibrationless running. Balance after carving, and after armouring with tissue across the grain for the outer half of each blade, should be very carefully attended to, and even on final polishing with banana oil balance should not be neglected.

It may be noticed that the spinner is partly hollowed for lightness. This again should be done with due regard to balance. I might also mention here that a propeller blank or block with its annular rings running through from back to front and parallel to the shaft will make the strongest propeller, and also the one least liable to split.

Full-size plans for a Wakefield type propeller are printed on page 291.

Wakefield Models.—*Continued.*

appearance of model to get wing much farther forward than is possible with symmetrical tail-plane. The symmetrical tail has worked very well in the past, and there is nothing to stop you using it if you prefer it. When making tail-plane ribs should be also spaced 1 in. apart. These can be $\frac{1}{32}$ in. sheet also; leading edge can be shaped from $\frac{1}{4}$ in. sheet, and trailing edge can be shaped from $\frac{1}{8}$ in. sheet balsa. One thing to remember is that rules allow size to be 33 per cent of actual main-plane area, not 33 per cent of maximum area allowed.

Fin should be made from same materials as tail-plane, and should be about 40 per cent of tail-plane area. A very important thing on a fin is a trimming tab of about five square inches. This can be fitted with dural or alli hinges pushed in to balsa. Both tail-plane, fin and wing can be fitted with bamboo wing tips $\frac{1}{16}$ in. square. This can be stripped from bamboo split.

If model shows signs of being over or under elevated a trimming weight of about $\frac{1}{8}$ oz. can be slung on the underside of fuselage, running on a thread from tail of fuselage to nose.

When covering fuselage it will make a very strong finish if fuselage is double-covered with ordinary Jap tissue, with grain running opposite ways. Two coats of dope or banana oil will give a very good finish. One coat of either can be put on wing, tail-plane and fin. Paper covering also makes balsa props. much stronger, and very often saves a split prop. in the event of a bad landing.

A DIRECT-DRIVE WAKEFIELD PROPELLER

By R. N. BULLOCK

THE last article on Wakefield models which I wrote ended up by giving advice about the lay-out of the main-plane, with particular attention to such points as would be likely to increase efficiency. Now an efficient main-plane is not much good without a good propeller to pull it, and in this article I intend to go into a few points in connection with a propeller which has proved itself.

This subject of propellers is one of considerable importance and complexity. I feel quite certain that most aero-modellers have but a vague understanding of a propeller, its characteristics and working principles.

To write on propellers without the use of mathematics is almost impossible, but if an article on propellers is to be written for aero-modellers it must avoid mathematics or be of interest only to the few, and, strange though it may seem, those few would not represent the cream of model-flying exponents; as it is apparent that practice far out-flies theory in model aviation. It appears that just so long as these practical exponents have their food for thought supplied to them in plain words instead of algebraic symbols a yearly advance in flying performance is produced. This is really a sad state of affairs, but it seems it cannot be avoided, so this article is written in compliance with necessity.

The youthful aero-modeller to-day talks glibly of pitch, pitch diameter ratios, slip, slipstream, r.p.m., and efficiency, but I often wonder just how deep this jargon goes, because I have so often seen models with propellers which are quite unsuitable.

In talking and writing of propellers we aero-modellers are prone to make bald statements, which to a real aeronautical engineer appear ludicrous, but just so long as the class of model on which the propeller is to be used is known, the size, pitch and blade widths mentioned are generally within such limits as will fit the case under discussion, and give fairly good results.

Now when it comes to Wakefield models we need propellers which must be very good, or our models will never perform sufficiently well to have much hope in the trials.

I feel, in these articles, to draw attention to my own work or results, but as these are the only ones I have a complete knowledge of and access to, needs must.

For example, I will take my 1937 model and its propeller, and show just how things panned out. It is necessary at this stage to bring actual flights forward in an endeavour to show just what certain propellers are capable of.

I believe that with the large propellers in use on modern direct-drive streamlined Wakefield models that the slip is much less than the generally suspected 25 to 35 per cent. At least this is most certainly so at the lower end of the speed range of the models.

In 1937 testing showed 90 seconds on 600 turns. 20 seconds of this time was glide. The wise ones will say 20 seconds is a small proportion of 90, but it is a fact that direct-drive Wakefields do not give much of a ceiling on half turns, and really only become active and agile under full power.

The propeller used in 1937 was 18 in. diameter and 24 in. pitch, with aerofoil sections on the blades of approximately ·6 of R.A.F.6, and no under-camber. This was a fault which I now freely admit.

But to return to the case in point. 600 turns in 70 seconds is 8·57 r.p.s. or 524·2 r.p.m. As a mean of the whole run this, of course, indicates that the initial r.p.m. was somewhat higher, approximately 600 r.p.m. or 10 r.p.s.

Now let us take the speed of the machine on the mean r.p.m. This was 2 ft. × 8·57 f.p.s.—20 per cent slip equalled 13·712 f.p.s., or only 9·34 m.p.h. Absurd! I hear the cry. But let us just consider the cunning of our automatic trim which produces these results, if and when propellers are capable of giving the thrust necessary at these low r.p.m.

9·34 m.p.h. slower by far than the glide, which was 14·5 m.p.h. on this model, and only because the C.G. was behind the C.P., and the tail of aerofoil section, and the centre of thrust below the centre of resistance, and at this low power output the thrust was insufficient to hold the nose down when working through the down-thrust setting.

The main aerofoil undoubtedly was flown at 6 degrees or more, and the total resistance of the model would then be in the neighbourhood of 1·50 oz., and all this because the propeller was up to its job.

If the propeller is poor, flights of this sort are quite impossible, so now it is made plain that due attention must be given to correctness in shape, pitch, etc.

I am willing to admit that propellers are seldom likely to vary in efficiency by more than 5 per cent, but would strongly advise great care in their design and carving.

With this article is a drawing of a direct-drive 18 in. × 24 in. pitch Wakefield propeller, which is sound and of proved efficiency, and will do justice to any Wakefield model if carefully made to these drawings.

This propeller represents fully all modern principles which have been proved good in model flying, and is entirely suitable for use on a fully streamlined Wakefield job when used in good weather and driven by 18 strands of $\frac{3}{16}$ in. × 30 American brown M.R.L. elastic.

The blade plan, angles and aerofoil sections have been carefully drawn to comply with sound principles. The material distribution is such that the propeller can be expected to have considerable strength.

The grading of the blade sections will give high lift and moderate drag, and the air can be expected to flow into and through the swept disc at almost uniform speeds at the root and tip of the blades. The pitch, r.p.m. and power advocated do not show a large excess of pitch, except for the first 20 seconds of the motor run.

The initial thrust being far greater than that necessary for level flight, or quick take-off and climb. From observation, and the use of my own air-speed indicator, it seems that a modern Wakefield model with a propeller as shown in the drawing published in this article can fly from 9·30 to 20 m.p.h. on its own automatic trim, and a propeller needs to be good if of fixed pitch to fly the aeroplane successfully over this speed range.

The actual blade sections used on this propeller are ·6 of R.A.F.6, with slight under-camber. The maximum

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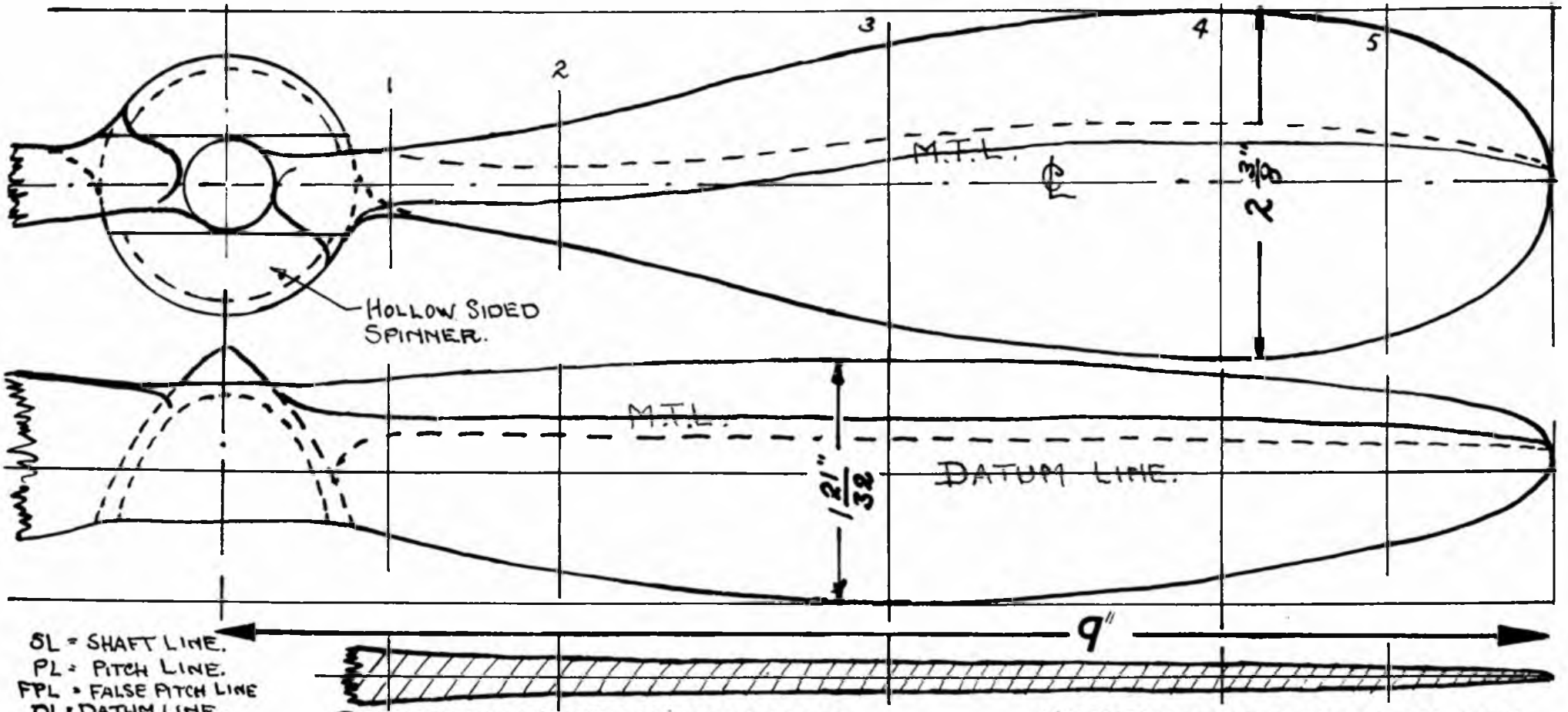
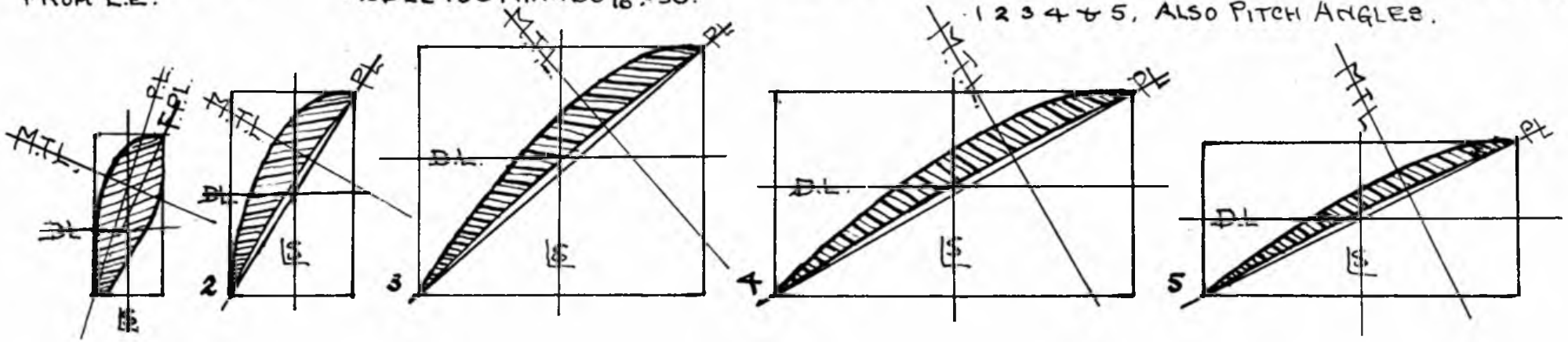


SL = SHAFT LINE.
PL = PITCH LINE.
FPL = FALSE PITCH LINE
DL = DATUM LINE.
M.T.L = MAXIMUM THICKNESS LINE. SITUATED 1/3 OF CHORD FROM L.E.

DIRECT DRIVE WAKEFIELD PROPELLER 18" DIAMETER 24" PITCH. DRIVING POWER NECESSARY FOR STREAMLINED MODEL 18 STRANDS 3/16" × 30.

MATERIAL DISTRIBUTION ON M.T.L

BLOCK AND BLADE SECTIONS AT STATIONS 1 2 3 4 & 5, ALSO PITCH ANGLES.



THE TENSIONING OF RUBBER MOTORS

By H. E. WHITE, B.Sc., N.H.M.F.C.

A winding jig, constructed by a member of the Tees Side Club. This jig is held on the lid of the box by 3 wing nuts; and fits away inside when not in use.

OVER two years ago I wrote a letter to THE AERO-MODELLER, which appeared under the heading, "Why Rubber Tensioning Devices At All?" in which I outlined a method of twisting the rubber skein which would do away with the necessity for the springs, overhanging shafts, etc., which were being used at that time. It was such a simple trick that I was surprised to find that nobody was making use of anything of the kind, and I have been asked so many times since to describe it, both by novices and old hands, that I trust that the readers of this paper will not need any further excuse for the appearance of this article.

The idea arose out of an arrangement which I had used with success on twin-skein motors, with gears. One of the skeins was given an initial 30 turns before the rubber was placed upon the hooks, so that when the hooks were releaseed, and were free to revolve, the skein which had the initial 30 turns proceeded to wind up the free skein, until each had 15 turns, in opposite directions, and this held them both in tension. Now it occurred to me that if a single skein motor were arranged in a similar manner, that is, in *two* skeins, and the same method adopted, the same tensioning effect could be obtained; and, of course, this proved to be so. Next, instead of dividing the skein into two separate parts, I found that if the skein were made into a "rope," by twisting the strands one upon the other, an even better effect was obtained, a motor being produced which, when it was at rest, was in a slightly "wound up" condition, just as the double-skein motor was. This led to the suggestion that by suitably making up the rubber skein, a motor could be produced which would need no rubber-tensioning device. The simplest way of achieving this may now be described in detail.

First decide upon the rubber skein required: let us say it shall be 30 in. long, and shall have twelve strands of rubber. Make up a skein *twice* the required length, and having *half* the number of strands desired. In the case with which we are dealing this would mean a skein of six strands, 60 in. long. Tie a small loop of cotton in the centre of the skein, as shown in Fig. 1, so that you may be sure of the exact position of the centre when the skein is wound up. Now attach one end of the skein to some kind of fixed hook (B) and give the other end a

few turns with a winder in the usual way, as in Fig. 1. Next, whilst you continue to hold the winder in your left hand, take hold of the centre of the twisted skein—the cotton will show the position quite clearly—and get somebody else to remove the end of the skein which is attached to the fixed hook (B), and, taking care not to allow it to unwind, place it on the hook of the winder (A). Take care when you are transferring the two ends of the skein—which are now on the winder—to the hook on the propeller-shaft that you do not allow any unwinding to take place.

The effect of this treatment of the rubber skein will be to form a kind of rope of rubber, and the advantages are twofold. In the first place the skein is, of course, actually shortened, as compared with its length when laid out straight, and the amount of shortening depends upon the number of turns given during the initial winding. Secondly, it causes the skein to become become more *compact* instead of being a loose collection of strands, and this is almost as valuable in the prevention of knotting and consequent bunching as is the actual shortening. The actual number of initial turns is best found by experiment, as it varies so widely with the size of motor used and the length of the fuselage. If you are using a skein suitable for the Wakefield type of model, up to 200 turns may be given with advantage.

Now obviously this initial winding will tend to reduce the number of turns which the skein will take without breaking. This is an undeniable fact. But almost equally undeniable is the fact that one has to pay a price for everything. In this case a certain small percentage of the energy stored in the rubber is apportioned to the task of keeping the rubber skein compact and tight after the motor has run out, just as it is in the mechanical form of rubber tensioner. This arrangement has the following advantages, however, over all mechanical devices: firstly, it entails *no extra weight whatever;* no mechanical complications, which often involve the lengthening, and consequent weakening, of the propeller shaft, not to mention the possibility of added friction in the shaft bearing. Secondly, and a very obvious and important advantage is this, it cannot very well fail to do what is required of it—in other words, it is "foolproof."

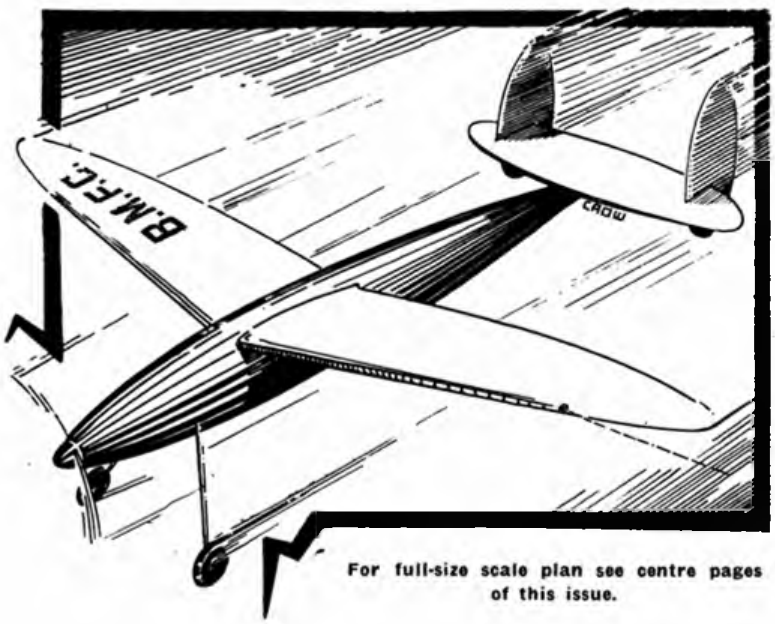
The detailed description of the method of making up the skein may seem a little complicated, but you will find that after a little practice you will be able to do the whole thing quite easily without any help. It should be noted that I have assumed that the number of strands in the final skein may be divisible by four. Should you require a skein that is not divisible by four, e.g. ten strands in the final skein, then the first skein—the skein that is twice the length of the final skein—will have to have only *five* strands. This will entail making loops at each end of the rubber, instead of joining the ends together.

Although I have heard several arguments put forward against this treatment of the rubber, I do not think I can answer them all in a better way than by pointing out that during the past three seasons a large number of our "crack" competition flyers have used the method I have described, and have found no fault with it. It was taken to America by the British Wakefield team, where it aroused great interest and was described in the American Press, and roped skeins are now to be observed at any flying meeting.

THE R.T.P. SPECIAL

Designed by G. COOK

Described and Drawn by S. R. CROW



For full-size scale plan see centre pages of this issue.

Construct and fly this sleek "Round the Pole" speed job, winner of the Blackheath Model Flying Club's first R.T.P. Speed Contest with a speed of 34 m.p.h.

DUE no doubt to the encouragement given by Mr. R. N. Bullock, indoor pole flying has reached a point of very high efficiency among members of the B.M.F.C., and the machine described in the following article was constructed solely for R.T.P. speed flying.

Fuselage.

All formers are cut from $\frac{1}{16}$ in. sheet balsa, quarter grained stock, if possible; in any case, see that when placing the formers on the jig alternate the grain vertically and horizontally. This will considerably increase the strength of the fuselage. Do not destroy the cut-out portion, but with a touch of cement to hold it, push it back into position. Cut a rough $\frac{1}{8}$ in. square in the centre of all formers, and thread them on to a length of $\frac{1}{2}$ in. square balsa (see diagram), which has previously been marked for spacing. Cement strongly to the formers two planks of shaped $\frac{1}{16}$ in. balsa (dotted on drawing) opposite each other. When dry, with the aid of a balsa tool, gently cut the light cementing which is retaining the inside of the former and pull out the jig. With a little manipulating the waste portion of the former will fall out. Planking the fuselage can now be completed. The rear of the fuselage is a solid block through which the rear motor-hook (16 s.w.g.) is thrust and bent over. Insert and cement the tail block.

Undercarriage.

The struts are made from bamboo, and are oval in section ($\frac{1}{8}$ in. × $\frac{3}{32}$ in.). To the top bind the shock absorbing 18 s.w.g. wire unit. (See detail drawing). This plugs into the brass tube which has been cemented and bound in the fuselage to former No. 3. The projecting length on the unit is held firmly by a flat rubber band round the fuselage. The whole fuselage should now be double covered with tissue and given a coat of gloss finish dope.

The wheels, streamline in section, are made from laminated balsa sheet ($\frac{1}{8}$ in. cross-grained to three thicknesses). Bush with 20 s.w.g. brass tube. Axles are made from 20 s.w.g. wire and are bound and cemented to the undercarriage strut. A cup washer soldered to the axles will retain the wheel.

Use birch ply for the block proper, with a block of hard balsa cemented at the back, which plugs firmly into the fuselage. An American type ballrace will increase the propeller revolutions and eliminate vibration. The propeller is carved from an 8 in. block of satin walnut or bass wood. The spinner should be cut with the blank if possible, and faired off at the front with hard balsa.

The tail-plane is cut from $\frac{1}{8}$ in. sheet balsa, and sanded to streamline section. Mark the fin positions before cementing the tail-plane to the cut-out tail-block. The dotted portion of the tail-plane is used for final trimming.

Main-plane.

Shape two pieces of soft $\frac{1}{4}$ in. sheet balsa and sand to aerofoil given on drawing. Before slotting the fuselage and cemeiting the two wing halves in position, give them two or three coats of banana oil or gloss dope, sanding lightly after each coat. This will ensure a high gloss finish to the balsa.

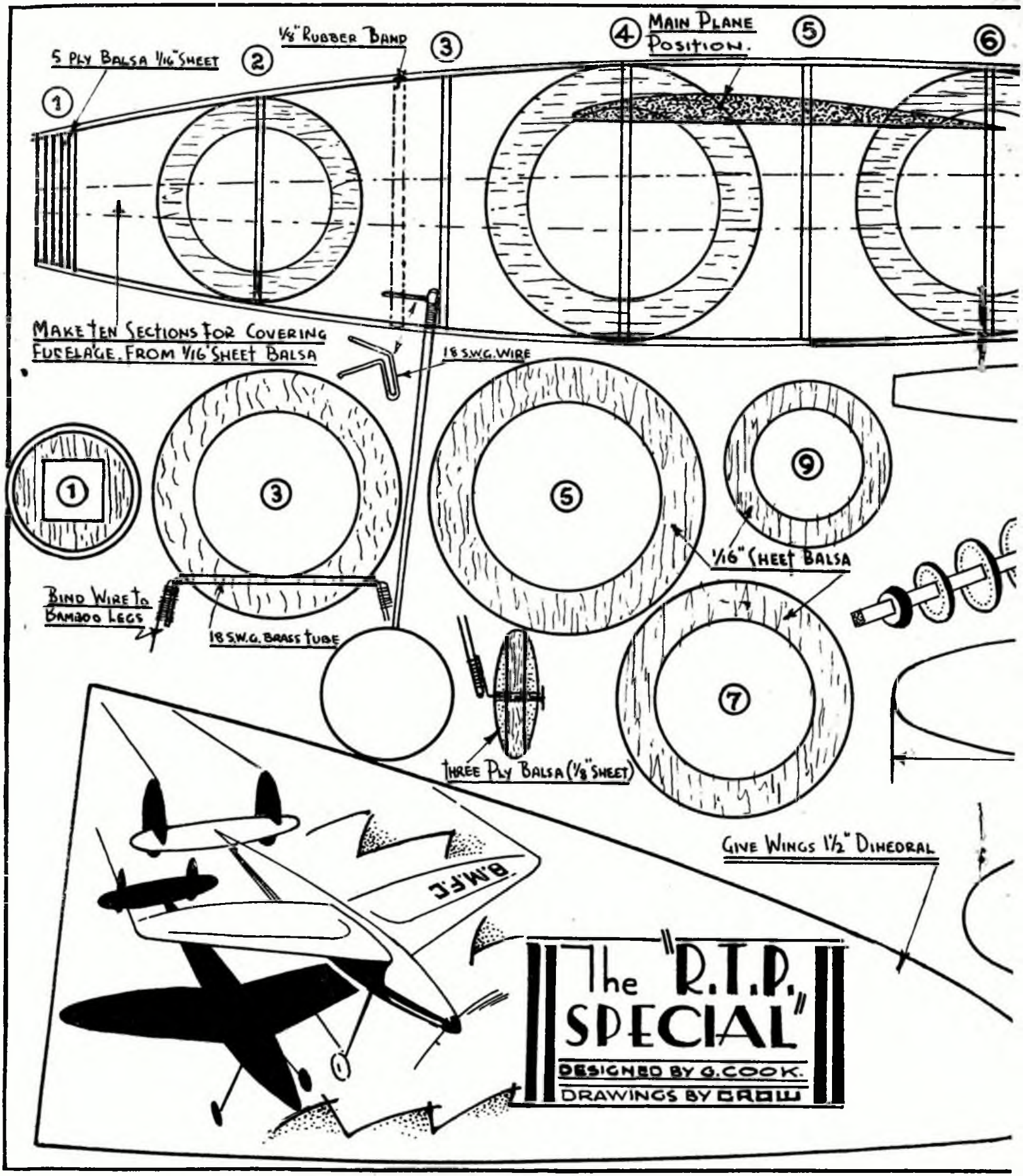
Power used is twenty strands (10 loops 13 in. in length) of $\frac{3}{16}$ in. flat rubber. (Do not forget to lubricate well).

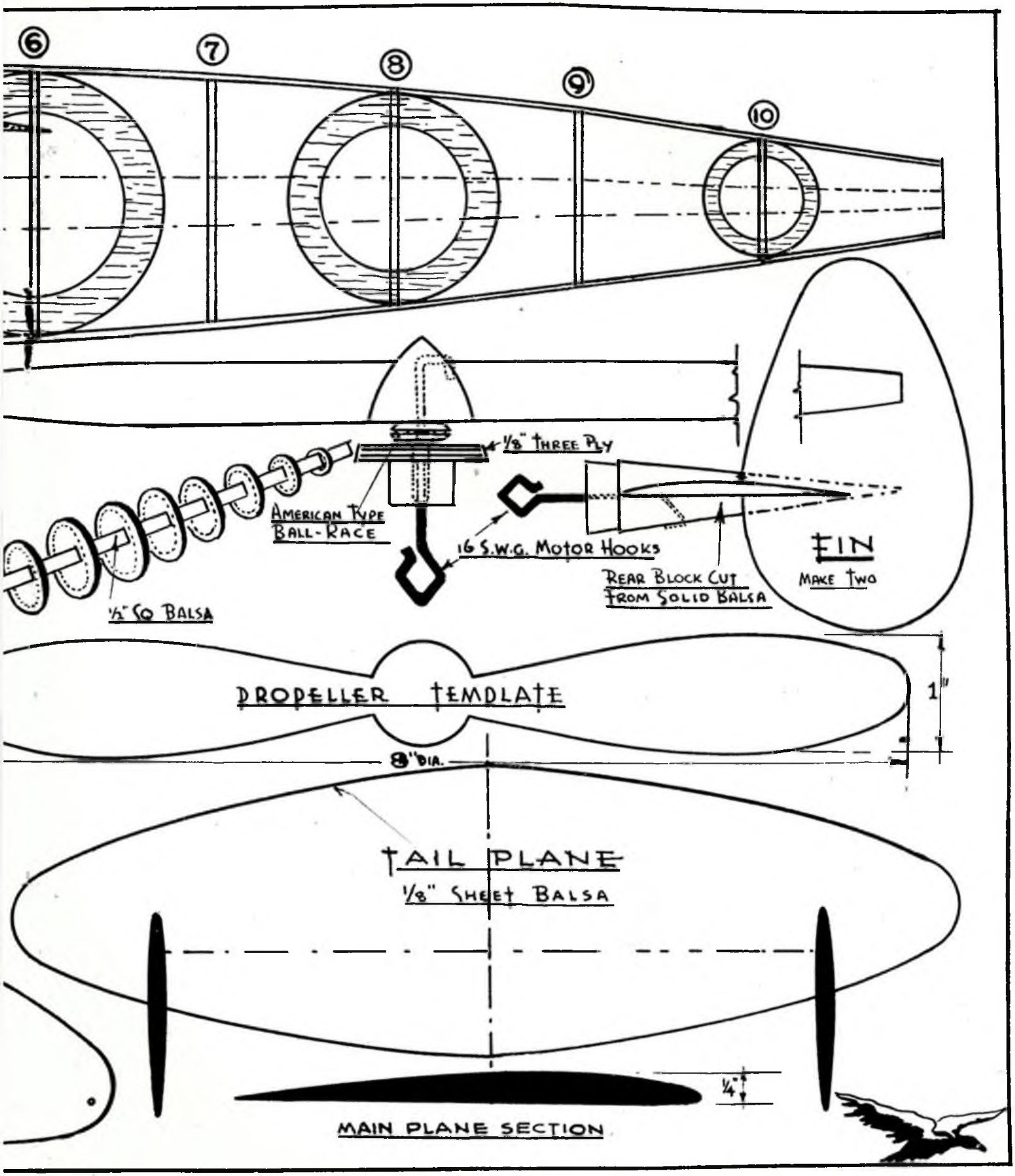
The thread attachment is made at the point shown on wing plan; a bent pin bound to the pole twine will enable a certain amount of trimming to be made by piercing the wing tip in various places.

The pole height should not exceed two feet, and the length of twine used approximately four yards.

Material List.

Wing. 18 in. × 4 in. × $\frac{1}{4}$ in. medium balsa.
Jig. 18 in. × $\frac{1}{4}$ in. × $\frac{1}{4}$ in. medium balsa.
Tail unit. 18 in. × 3 in. × $\frac{1}{8}$ in. medium balsa.
Fnselage. 18 in. × 3 in. × $\frac{1}{16}$ in. hard balsa.
Formers.
Planking. 2 pieces of 36 in. × 3 in. × $\frac{1}{16}$ in. soft balsa.
1 sheet coloured tissue for fuselage.
1 tube cement.
1 small tin banana oil.
1 sheet of $\frac{1}{8}$ in. balsa for wheels.
Bamboo for undercarriage.
2 inches brass tube 18 s.w.g.
16 s.w.g. wire for shaft and back hook.
18 s.w.g. wire for undercart fittings.
1 ball race, for propeller.
1 8 in. shaped hardwood block.
Power. 20 strands $\frac{3}{16}$ in. flat rubber.





THE WESTLAND "LYSANDER" AND ARMY CO-OPERATION

By J. A. BRAMAH

Photo by courtesy, Westland Aircraft Co. Ltd.

THE Westland "Lysander" is the latest type of machine to be adopted by the Royal Air Force for army co-operation work, and is now in production. It is known that delivery is already taking place, but as yet no official announcement has been made of the squadrons to be equipped with this type, and no statement has been made with regard to the number on order. Sir Kingsley Wood, the present Air Minister, announced that an order had been placed for a thousand Vickers Supermarine "Spitfires," to be produced at Lord Nuffield's new factory, now being built. So when such orders are placed for one particular type it is safe to assume that other orders are on a similar scale. We are given to understand that Bristol "Blenheims" and Fairey "Battles" are being turned out like sausages out of a sausage machine.

Before describing the Westland "Lysander" in detail it is proposed to give a brief résumé of the nature and history of Army Co-operation.

It would probably be much easier to make a list of the duties which an Army co-operation squadron is *not* expected to perform than to define all its normal activities. In the Royal Air Force its duties consist of reconnaissance flights for the purpose of locating and determining enemy positions and movements, and the making of photographic records of these for transmission to headquarters. Apart from the photographs, it is essential that any information it gains should be communicated to headquarters as quickly as possible, and this is done by wireless. Wireless is also used for the direction of artillery fire upon enemy emplacements. Direct co-operation with the ground forces consists of the picking-up of messages, the dropping of supplies by parachute, and the attacking of obstacles in the path of the army with light bombs and machine-gun fire. Other duties are the maintenance of communications and the transport of staff officers.

In the United States of America the Army Air Corps makes use of several different types of aircraft to perform

these individual duties, and they have observation, attack and communication squadrons. In their opinion, one particular design cannot discharge all these multifarious duties satisfactorily, but apparently the Royal Air Force thinks otherwise. The real proof of either theory can only be made in a large scale war between two or more major Powers.

The characteristics of an aircraft must be suited to the particular tasks which it has to perform. In the Royal Air Force the pilot of an army co-operation machine does most of the co-operative work, whilst the observer is mainly concerned with watching for the attack of enemy aircraft and the warding off of attack from the rear. He also aims the bombs when bombing duties are assigned, and may sometimes have to do a bit of navigation. The fact that the pilot has so much to do besides merely flying the machine, makes it essential that the aircraft should be stable and easy to control. The picking-up of messages from ground forces necessitates slow flying, and the modern fighter makes a high top speed essential, if attack from other aircraft is to be effectively resisted. Thus it will be seen that a wide speed range must be another characteristic. The duties of the crew are such that a wide field of view is required for the pilot to make his observations, and for the air-gunner to watch for enemy aeroplanes. Since an Army co-operation squadron works with the army in the field, the aircraft have often to operate from small and sometimes temporary aerodromes, and they must, therefore, possess very good landing and take-off qualities. Liability to attack from ground defences calls for optimum performance at ground level and at moderate heights, provided that this does not involve the sacrifice of any of the previously mentioned qualities. There should also be reasonable defensive and offensive armament, and the aircraft as a whole must be easy to maintain under difficult conditions, such as the almost complete absence of workshop facilities.

The history of Army co-operation commenced in England with the formation of the Royal Flying Corps by Royal Warrant on April 13th, 1912. The duties of the squadrons composing it were, purely and simply, those of reconnaissance, or, in other words, to act as the " eyes " of the Army. This was still their function when Nos. 2, 3 and 4 squadrons landed in France on August 13th, 1914, as part of the British Expeditionary Force. Their equipment was an assorted collection of Henri Farmans, Bleriots, B.E.2s, B.F.8s, and Avros, and not a single one mounted a machine gun. As the war progressed, certain adventurous souls took shot-guns, pistols, and even half-bricks with them on their flights with which to decimate the enemy. Up to this period, early 1915, it had been the custom for airmen of the Allied and Central Powers to wave to each other in a friendly fashion when going about their lawful business, and it was this vulgar brawling that led to aircraft being built for purposes other than pure reconnaissance. Machines were designed solely for the express purpose of destroying other aircraft, and then came purely bombing machines, and so on.

At first, Army co-operation consisted of routine flights, the crew of the aeroplane making copious drawings and notes of enemy emplacements and activities, and despatching these documents to headquarters immediately upon their return to the flying field. The introduction of wireless telegraphy enabled this information to be sent much more rapidly, and it was not long before very efficient direction of artillery fire became possible. When an Army co-operation machine was engaged on a " shoot " it would fly in a lazy " figure of eight " path over the target and would call for a salvo from the guns. Having observed the flashes of the exploding shells, correction of fire would be ordered until the target was straddled, that was when the shells fell either beyond or short of the target, but the direction was correct. Only minor adjustments of the elevation of the guns were then required in order to register direct hits.

Perhaps the most famous of all war-time army co-operation machines used by the Royal Flying Corps was the R.E.8, known as the " Harry Tate," but this was only one of the many types used. Some other well-known machines were the B.E.2C, using the 90 h.p. R.A.F. engine, the big lumbering Armstrong Whitworth F.K.8, with its 160 h.p. Beardmore engine, the Sopwith 1½ Strutter, 100 h.p. Clerget rotary engine, originally a two-seater fighter, but later used for Army co-operation work, and last, but by no means least, the Bristol F2A (fighter) using a 200 h.p. Hispano-Suiza engine.

The Germans produced some very successful machines for Army co-operation work, and these always carried the manufacturer's name, together with the letter " C " and a serial number. The Albatross CIII was used a great deal, as were the A.E.G., the Aviatik, and L.V.G. The Hannoveraner, with a 180 h.p. Opel-Argus engine, was produced late in 1917, and was a particularly pleasing machine in appearance, with its deep streamlined fuselage and biplane tail. The aircraft produced by the Rumpler concern for this kind of work were noted for their high-flying ability, and allied fighting-scouts had great difficulty in reaching the altitude of 20,000 feet, at which they frequently operated. Towards the end of the war, however, there were numerous instances of these machines shedding their wings and generally breaking-up in the air, but this must be attributed more to the lack of the necessary material rather than to faulty design.

Since 1918 various types of aircraft have been used for Army co-operation work by the Royal Air Force, and some of these are listed below :—

(1) The Bristol Fighter.
(2) The Armstrong Whitworth " Atlas."
(3) The Westland " Wapiti."
(4) The Fairey IIIf.
(5) The Fairey " Gordon."
(6) The Westland " Wallace."
(7) The Hawker " Audax."
(8) The Vickers " Vincent."
(9) The Hawker " Hardy."

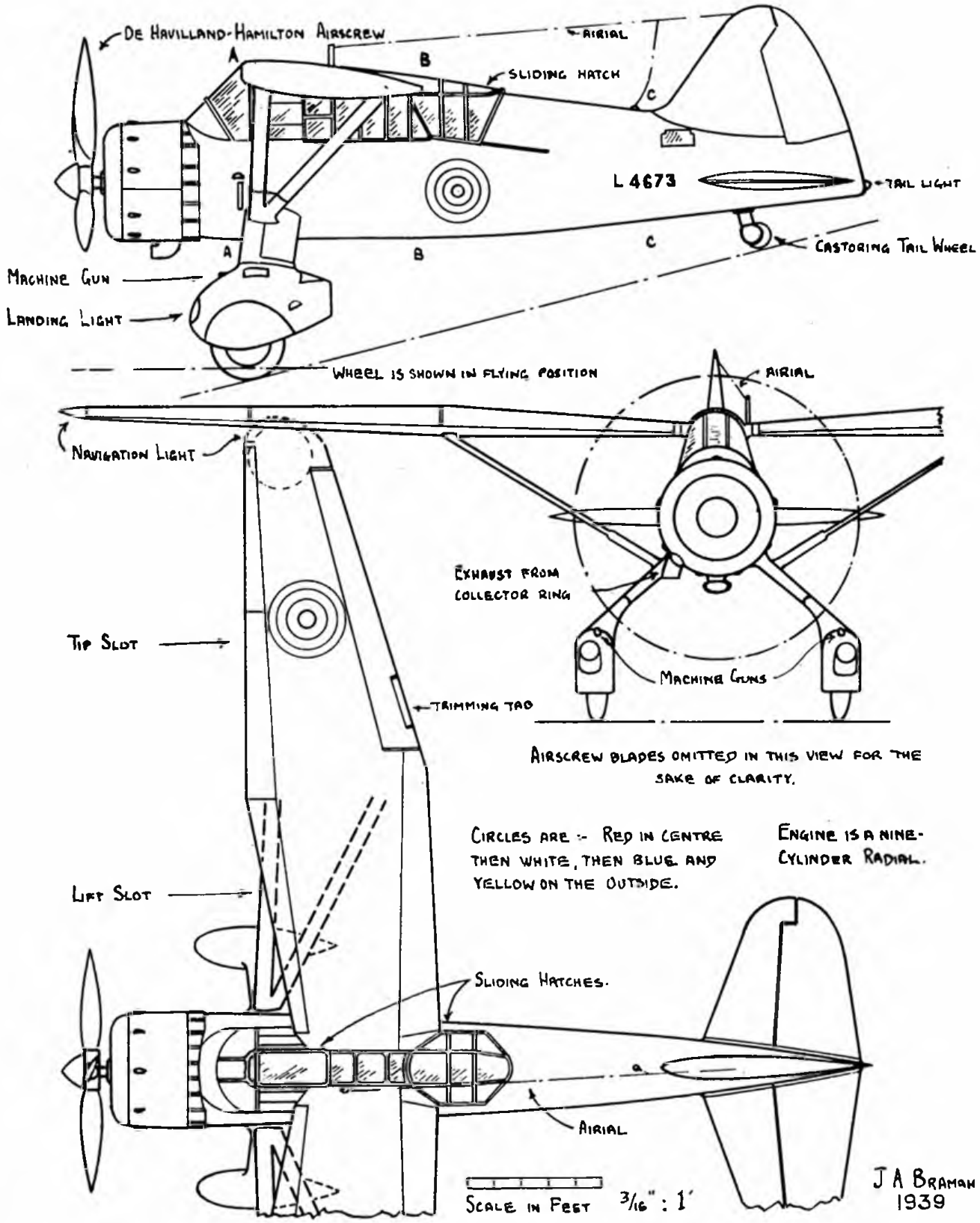
The tendency has been to modify existing types for Army co-operation, for instance, the Hawker " Audax " and " Hardy " are variants of the Hawker " Hart," originally designed as a fast day-bomber and the Vickers " Vincent " is a variant of the " Vildebeest," which was designed as a torpedo-bomber.

This policy has apparently been abandoned, because the Westland " Lysander," the latest type of aircraft to be adopted by the Royal Air Force for the re-equipment of its Army co-operation squadrons, has been specifically designed for such duties. The " Lysander " is a remarkable aeroplane, quite apart from its military characteristics, in that it has a fully slotted and flapped wing, in which all operation is entirely automatic. The leading-edge slots extend over the whole span and are of the Handley-Page type. The outer portions are the normal tip slots, whilst the inner portions are lift slots. These inner slots are connected by levers to the trailing-

(*Continued on page* 302).

WESTLAND LYSANDER MARK I.

ENGINE:- BRISTOL MERCURY XII 890 H.P. RADIAL



(*Continued from page* 300).

edge flaps, which extend from the Frise ailerons to the fuselage, and as the slots open they automatically pull down the flaps. The outer slots, in front of the ailerons, are independently automatic, and are intended to provide lateral stability and lateral control at positions near the stalling point, and when the aircraft is flying at low speeds. This, together with a variable pitch airscrew, enables the " Lysander " to take off from, and to land in, a remarkably small field, and also provides the excellent speed-range of about 4 : 1, the makers claiming a top speed of 229 m.p.h. at 10,000 feet, and a minimum flying speed of 55 m.p.h. with the engine on, which is particularly useful when picking up messages from troops.

In common with all Army co-operation aircraft, the " Lysander " carries an enormous quantity of equipment for its size. There is a two-way wireless set, a camera, a hook for picking up messages which are suspended in a bag from a wire stretched between two poles or rifles stuck in the ground, parachute flares, bombs, chart table, oxygen equipment, landing lights, and numerous other items.

It might be thought that such a heavy load would make the " Lysander " difficult to handle in the air, but apparently this is not so, and it is said to be a pleasant machine to fly, and to fulfil all the qualities required in such a type and mentioned earlier in this article.

To give a complete description of the " Lysander " would take much more space than is now available, and the following description is therefore only of a general nature.

Westland Aircraft Ltd., of Yeovil, Somerset, are the designers and manufacturers of the " Lysander," which is a two-seater high-wing strut-braced monoplane powered with an 890 h.p. Bristol Mercury XII radial air-cooled engine. It is of rather unorthodox construction, in which much use is made of extruded sections of light alloy.

The fuselage is built in two sections, which are joined together by bolts and flat plates, the front portion being built up with square section duralumin tubes joined by bolts and flat plates, and the rear portion being built up with seamless steel tubes joined by welding. The external rounded shape of the fuselage is given by the attachment of wooden formers and stringers to the basic girder construction, and the covering consists of detachable metal panels and doped fabric, with Zipp panels for inspection purposes.

The undercarriage is made in one piece, and is shaped like an inverted ".U " It is an aluminium alloy extrusion of almost rectangular cross section, and although it has to bear most of the weight of the aircraft when on the ground, it is relieved of much of the landing shocks by the provision of Dowty internally-sprung wheels.

The wing has a very substantial front spar and a light tubular rear spar. The leading-edge is metal covered, and the area from the main spar to the trailing-edge is fabric covered. Extensive use is again made of extruded sections, and these are also used for the lift struts, which are of an H section covered by a light fairing.

The tailplane is a cantilever metal structure with a lightalloy sheet covering, and the incidence is adjustable from the pilot's cockpit. Th fin is also a metal structure, but is fabric covered with a sheet-metal tip. The rudder and elevators are fabric covered.

The engine, an 890 h.p. Bristol Mercury XII, is mounted under a Bristol long-chord cowl with controllable gills, which are used for the adjustment of the engine cooling under varying flight conditions, and drives a De Havilland three-bladed controllable-pitch airscrew.

The armament consists of a movable Lewis gun on a Fairey mounting in the rear cockpit, and of two fixed Browning machine-guns inside the wheel-fairings. These latter guns are fired pneuamitaclly by the pilot, and being outside the airscrew arc do not require an interrupter gear. The ammunition for them is fed from boxes in the fuselage down chutes inside the undercarriage leg fairings, and they are sighted by the pilot with the help of a reflector sight which is clamped inside the windscreen on a level with his eyes. When required, small stub wings can be bolted on either side of the undercarriage, just above the wheel fairings, and bombs of various sizes can be carried under them on the racks provided.

The main dimensions are given herewith :—

	ft.	in.
Span	50	0
Length (overall)	30	6
Height (overall)	14	6
Airscrew (diameter)	10	6
Chord (maximum)	6	8
Chord (at root)	5	3
Tailplane (span)	12	6
Tailplane (chord at root)	6	0
Wheel track	9	0

At the time of writing, the " Lysander " is probably the fastest Army co-operation type in regular service with any air force in the world, and is certainly one of the most efficient. Performance figures are given below :—

Speed at sea level, 206 m.p.h. Initial rate of climb. 1,650 ft. per min.

Speed at 10,000 ft., 229 m.p.h. Service ceiling 26,000 ft.

Speed at 20,000 ft., 212 m.p.h. Cruising range, 600 miles at 150 m.p.h.

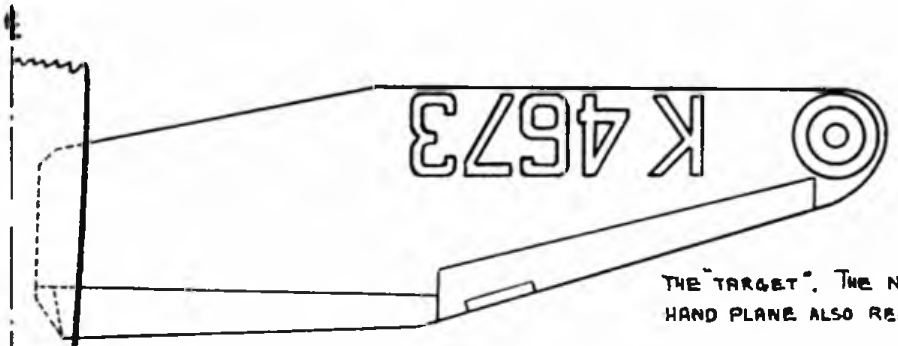
Slowest flying speed, with engine on, 55 m.p.h.

The machine, which has been described, is the " Lysander " I. A later variant, the " Lysander " II, makes use of the 905 h.p. Bristol Perseus, a sleeve-valve radial air-cooled engine, and no figures have yet been released for this model. To all intents and purposes the two machines are identical, but the engines are not interchangeable.

Like all new types going into service with the Royal Air Force, the " Lysander " is shadow shaded, and the colours used are dark green and dark earth with silver under-surfaces on the wings. The usual R.A.F. circles are surrounded by a ring of yellow paint to make them more easily seen. This ring of yellow is only used against the green and brown, and does not appear round the circles on the underside of the main plane. The identification numbers are in black, as are all details. All surfaces have a matt finish, so that the aircraft shall not make its position obvious by the undue reflection of light. The airscrew, which is prone to flash in the rays of the sun, is painted a dull black for the same reason.

No difficulty should be experienced in building a model of the " Lysander," and construction methods have often been discussed by other writers in this paper. It is not, therefore, proposed to deal with that side of the business here. A word of warning, though ! If a model is built of this machine it is advisable to examine photographs of an actual service model in order to make a realistic paint-job of it, and lack of care at this stage in the proceedings can ruin all previous work from an exhibition standpoint.

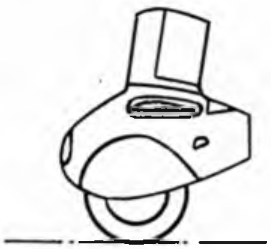
Details of the Westland Lysander.



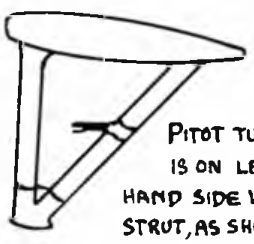
Under-surface of left-hand main plane showing position of circles and numbering. The colour is all silver with black numbers and details. There is no yellow ring round the "target". The number under the right-hand plane also reads towards the centre line.

Three views are shown of the detachable wings from which the bombs are suspended. Various types of bombs may be carried as well as containers of food for the supply of beleaguered troops.

It is not permissable to show details of bomb racks, but sufficient data for model purposes may be obtained from photographs.

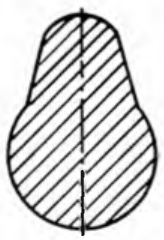


On the left are three views of the gunsight on the cowl drawn twice scale size. There is a ring-sight inside the wind-shield.



Pitot tube is on left-hand side wing-strut, as shown.

Fuselage Cross-Sections.



A

B

C.

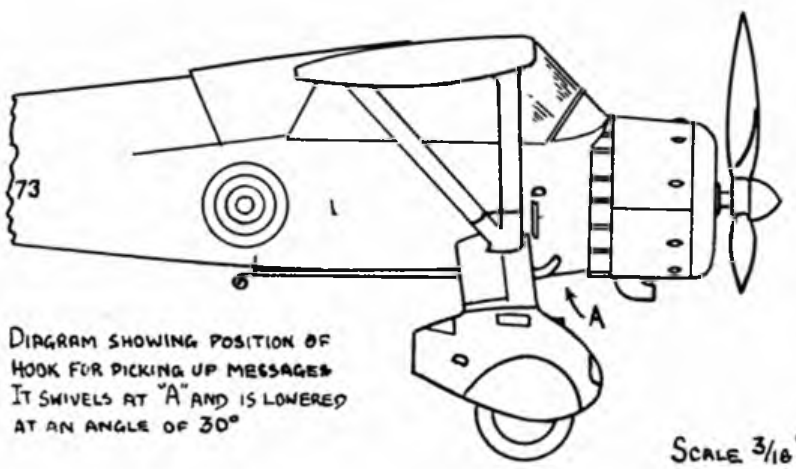


Diagram showing position of hook for picking up messages. It swivels at "A" and is lowered at an angle of 30°

Scale 3/16": 1'

J.A. Braman 1939.

THE S.M.A.E.
DANCE AND

By THE

Mr. Cosh, Mr. Hawkins, Dr. Thurston, Mrs. Thurston, and Mr. Smith.

HELD at the Lysbeth Hall, Soho Square, London, on February 8th, the annual " big social event " of the S.M.A.E. fulfilled all expectations—and excelled in some respects. Undoubtedly the word is spreading that this annual affair is well worth attending, and the response showed an increase of getting on for 50 per cent over the previous year's attendance. I am not sure of the exact figure, but think I am right when stating that 150 enthusiasts turned up for one of the best events yet held.

Unfortunately, if this increase goes on, I'm afraid the Lysbeth Hall will have to be abandoned in favour of a larger hall—and I say " unfortunately " with good reason, as I for one always feel right at home in the atmosphere of this venue.

Having arrived at the hall, one was soon in the midst of a crowd of old and new friends. Guests were received by the President and Mrs. Thurston, and the cocktail wagon was well and truly raided! I noted many well-known persons in the model aeronautical world: F. J. Camm, " Rubber " Caton, " Balsa " Brown, "Scalite" Towner, D. A. Russell, Len. Stott, of Halifax, and wife, who had motored up with the " Rushies," from Manchester, and many others too numerous to mention. You will recognise many in the photo taken at the tables.

Dinner started with gusto, and with a wine here, and a lemonade there, things soon got going good and proper. There is one thing about these affairs, the catering is always okay-doke—but I heard someone asking what was a " Noisy Parisian Lamb "! Never 'eard of 'em.

Arriving at the coffee stage, Dr. Thurston, who, of course, was in the chair, gave the company the toast of " The King," following which Mr. C. A. Brown opened the speech list with a toast to the Society in the following words :—

" Mr. Chairman, Ladies and Gentlemen,

" The Society is very fortunate in having such excellent officers, who spare no effort in making the society popular and interesting in all parts of the country, and through their unceasing efforts, have more than doubled the membership in a very short time. This is a very fine achievement, and one can be sure that the spreading of interest is a happy omen.

" I have been one rather on the outside of the circle, but judging by the happy collection of faces here to-night, it is evidently far better to come inside that circle."

" I wish you to drink the toast of the S.M.A.E. and the affiliated clubs."

Mr. J. H. Towner, in replying on behalf of the society, stated that he was rather awed by seeing such a distinguished company, and taking warning from the quotation on the toast list he " did not propose to stop here longer than I need, except to say that I do like to think of the S.M.A.E. as a collection of clubs, each with their own characteristics, all united together by the S.M.A.E."

With the advent of Mr. M. R. Knight, whose duty it was to propose the toast of " The Visitors and Ladies," everybody sat back in gleeful expectation—and M. R. did not disappoint us! Read the following and you will agree.

" I like the neat little safety device on the toast list. It is on a par with the slot, and our old friend down-thrust. The slot is a check on ' old man stall,' down-thrust is a check on ' old man loop,' and I suspect that ' brevity is the soul of wit ' is intended as a

ANNUAL DINNER

PRIZEGIVING

FANCIER

Dr. Thurston at the microphone.

check on old man Knight! For they tell me that I go for the duration record at the wrong times and in the wrong places.

" However, to come to the point, it is delightful to see so many distinguished visitors.

" We should have had with us two distinguished representatives of the balsa trade. Then we heard that neither of them were to appear, as they were to turn up elsewhere as the guests of the ' Worshipful Company of Iodine Manufacturers.' Secretary Cosh promptly waited upon them, pointing out that the gory fingers of aero-modellers were the cause of the proposed honour, and they were, therefore, under a moral obligation to support aero-modellers by attending our dinner! Eventually they compromised, Mr. Brown supporting the S.M.A.E., and Mr. Brindley the dinner of the Iodine Manufacturers.

" I am rather puzzled to see Mr. Russell at the feast! Rumour said that he was scaling himself down to fit that ½th size Lysander, but perhaps that well-filled glass contains reducing salts!

" It is a great pleasure to welcome Mr. Bishop, who is probably the oldest petrol model builder still in the hobby. His highly successful biplane ' Endeavour ' will be remembered. Mr. Bishop is now endeavouring something else, and no doubt J. C. Smith will be waiting at the door for his registration application and third party insurance policy.

" Then there is Reg. York, brother of our worthy Press Secretary. I have nothing against photography as such, but what shall I say of a man who invades the privacy of one's Paris bedroom by planting a camera in the room opposite and making a noise like a gear stripping, thereby bringing to the window one's ' hubbie ' and oneself in négligé?

" We are glad to welcome Mr. Caton, who has been called the ' India-rubber Man,' probably because his features contort in sympathy when a motor busts in a fuselage—through over-winding, of course!

" Mr. F. J. Camm is a founder member of the S.M.A.E., founder-president of the Society for the Abolition of Down-Thrust, and a prolific writer. If his writing abilities include correspondence, perhaps he could help friend Cosh by taking off his hands 1,000 or so of those letters he has to write for the S.M.A.E during the year.

" Then we come to the ladies! They have rather fought shy of model aeronautics, but we have to thank many of them for helping the S.M.A.E. in a negative way by not watching too closely where the shavings

Messrs. F. J. Camm, Cosh, and Houlberg.

go, not counting the cuts in the dining-room table, and by their generous distribution of late passes.

" What about building models yourselves, ladies? One lady tells me that it sounds a fearfully complicated busines, to judge by the remarks to down-thrust, lifting tails, Wakefield formulæ, and so forth, which her husband babbles about in his sleep. But if the technical aspect threatens to overwhelm you, you can take comfort from the story of the navvy who pulled his barrow, while the others pushed theirs. The architect promptly went all ' slide rule,' hired two navvies with barrows—one to pull and one to push, fitted them up with delicate instruments to record the energy expended, and the time taken, in an effort to find why one pulled while the other pushed. The ' tractor ' and the ' pusher ' proved equal, so he had to fall back on the simple expedient of asking the ' tractor ' enthusiast why he pulled while all his mates preferred to push. ' Lord luv yer, Guvnor,' was the reply, ' I'm fair sick of the sight of the gory thing ! '

" So, come along ladies, and build models. By next dinner I hope there will be no lady *visitors*, because the Golden Age will have arrived when every baby's bottle is filled with banana oil, and it can be said of every lady—' the hand that rocks the cradle now wields the razor blade ! '

" Mr. Chairman, ladies and gentlemen.—I give you the toast of ' Our Visitors,' especially the ladies."

Amidst much laughter and applause, Mr. Knight sat down, and Mrs. Blunt rose to answer to the terrible slanders of Mr. Knight, and confessed :

" This is the very first speech I have ever made, and I am very nervous—but not so nervous as another person in this room ! My husband thinks that after this he will never be able to hold his head up again. The trouble is, you pour out your life story to someone, and when the next issue of THE AERO-MODELLER comes out, you find the Moving Finger has written all about it !

" Before I was married, my friends said to me : ' Shall you let John build in the dining room, or give him a room to himself? ' I said : ' We shall see ! ' Well, if you had come to our house about a month ago you would have found *me* building a model !

" Asked if I would build a model if he bought me a kit, I thought it would be a beauty. It was—a 9d. kit ! I started to make it, and thought if I could put a dress together, I could put the pieces of an aeroplane together. The first side looked quite nice, and so did the second, but somehow, when I tried to put them together, one side was straight, and the other side came in a beautiful curve to meet it. So I gave my beautiful 9d. kit to the little boy next door, and it eventually looked quite like an aeroplane.

" In the words of a well-known air-women, " I think that aero-modellers are *wonderful* ! "

I really think the S.M.A.E. should fork out for a really posh kit, with instructions for building in eight easy lessons, solely to bring Mrs. Blunt back into the small fold of " lady builders." As Dr. Thurston said : " Gentlemen, we have just listened to a very Blunt speech ! "

Mr. E. H. Coote, President of the Northern Heights Club, then proposed the toast of the Chairman in a few well-chosen words :—

" On behalf of everybody here present, I would first like to express the very great pleasure it gives us all to have Dr. Thurston in the chair to-night, and we are pleased to hear that his holiday in Switzerland has made him better in health. Dr. Thurston has been associated with aviation in every form for a great many years—in fact, I am told that when aviation was in its infancy he was associated with Sir Hiram Maxim at Vickers'. Even in those early days his knowledge

Mrs. Thurston presents trophies to Mrs. Cosh, " Rushy," and " Bunny " Ross.

was such that he obviously is not a person to argue with, unless you are standing on very firm ground!

" For many years he has made this society one of his chief interests, and very generously assisted as a go-between the society and the Royal Aero Club, also in international matters, and his genial disposition has made him very popular in this and other countries.

" The society is certainly to be congratulated in having such a man as its president, and Dr. Thurston is lucky in having for his wife one who is a very keen supporter. Mrs. Thurston is also a vice-president of this society.

" I ask you, therefore, to drink to his long life, good health, and future happiness."

In his reply, Dr. Thurston remarked :—

" I have always thought that the president was elected for ornamentation! Well, as a beauty I'm not a star, there are others more handsome by far; but my face I don't mind it, for I am behind it—but I am sure you elected me for some other purpose than ornamentation.

" Since we met here last year, aero-modelling has progressed and grown amazingly. I want to congratulate now every aero-modellist, because they have each taken their part in securing this splendid result, and I should also like to take this opportunity of thanking all the officers of the S.M.A.E., and all the officers of the affiliated clubs. These people have an enormous amount of work to do.

" I don't think we need regret that the Wakefield Cup has gone to America; it will mean a wonderful opportunity to introduce this hobby to thousands of people in the country, and remember they are holding the World's Fair in New York! We have the satisfaction of having the running of the King Peter Cup, and this will give us the opportunity of meeting aero-modellers from all over the country and the Continent.

" Two American ladies, on visiting the Houses of Parliament, saw the Chaplain pass by in his robes of office. Turning to a policeman they said: " I suppose he prays for the members.' ' No,' said the policeman, ' he just looks at them, and prays for the country! '

" Certainly they did not know of aero-modelling, or they would have known it was no longer necessary to pray for the country. Like the engineer who hooked a wallet containing £100—and got quite a shock when asked, not for the £100, but just what bait he used! Well, it is now up to all aero-modellists to find out what bait the chaps used in Yugo-Slavia last year, and use it when angling for the Wakefield Cup.

" I thank you very much indeed for this toast, and would like to congratulate the organisers on the success of the function."

At this period tables were cleared, whilst the prize-giving took place at the end of the room. This is the only criticism I have to make—and mind, it is only a personal opinion. I incline to think that, while there are many dinners, and many dances, there is only one S.M.A.E. prizegiving, and it should not be rushed through. I always feel it is better to hand the cups, etc., out at the table before the party breaks up. When conducted as this year there is too much confusion, etc., for the event to receive its full importance.

Mrs. Thurston presented the prizes, preceding this with a little speech, during which she—

" hoped the day will come when the ladies will enter the Wakefield, whilst the men stay at home and wield the vacuum cleaner.

" I congratulate all the aero-modellers who are going to receive the prizes from the S.M.A.E. Theirs is no mean achievement, and if past records are any criterion, we are in for a very good year.

" Just occasionally one hears a wish expressed that model aeroplanes were more like the real thing. I am a very ' outside ' person, but it does seem to me that full-sized aircraft are direct descendants of models, and in many ways the modellers are superior to the average pilot.

" All the people who receive these cups, etc., will be followed with the greatest interest, and, as it is said, the wise person knows how to say nothing at the right time, I am now going to stop speaking and get on with awarding the prizes."

Great applause was heard as the various successful flyers came forward for their rewards—and some hilarious comments at times! Mrs. Cosh received a great ovation when collecting the Women's Cup; and Rushy had so many odds and ends draped round him for the Lancs. club he looked like the Fuller Brush man! Many fine

Messrs. Coote, President of the Northern Heights M.F.C., and Mr. Brown, of the Plantation Balsa Wood Co.; Mr. and Mrs. Blunt; Messrs. Russell and Bullock, and some of the North Kent lads.

trophies were seen, and a brand new one—the Hamley Trophy—which is some trophy, and how!

Once again, three mysterious packages had been received, together with a cryptic letter from an equally mysterious "Chinese." This, on being read, gave out that the sender had taken notice of the great amount of voluntary work undertaken by the organisers of various rallies, and the packages—which contained extra special cups and saucers—were to be handed to

"Rip," as organising secretary of the largest rally in the south.

"Rushy" as similar function for the North.

And the last to the Fancier. Well, now, could I bring myself to a sticky end by going forward and announcing my identity? Nevah. And the third package was presented to D. A. Russell as a reward for various duties he has carried out. There is no truth that he is to use the cup as a petrol tank for that terrific Lysander.

Dancing commenced, with Mr. Rippon—"Rip" to you—acting as M.C. The fun waxed fast and furious, and what with Lambeth Walks, etc., folk soon let their back hair down, and wallflowers were as scarce as thermals when I fly a model! The Women's Cup was filled with champagne, and with much ceremony, a long line of thirsty chaps, led by the president, took a sip from the bowl.

A posh tea-cosy doll, which was up for raffling—only one this time, and quite a wise move I think—was drawn for, Len Stott being the lucky winner. However, with the Wakefield Fund in mind, he put it up for auction, Mr. Russell finally collecting.

With the witching hour of midnight on the door-mat, Auld Lang Syne was sung with fervour, and thus finished yet another really enjoyable evening. To those of you who have still to experience their first S.M.A.E. annual whoopee—well, I am sorry for you, and you still have a surprise to come. May we have many more, and, as as far as I am concerned, they could come once a month!

To York, Rippon, and Smith, the Fancier's hearty thanks and congratulations on a fine affair, and I will mention you in my will. Who wants my collection of "queer birds"—or is it "bad eggs"?

THE FANCIER.

LETTERS TO THE EDITOR

DEAR SIR,

Re the "stepped wing section" described on page 125 of the January issue of THE AERO-MODELLER.

Well, if it *does* work better than any other we must completely reconstruct our vision on aerodynamical phenomena. It may be that the "step" causes the boundary-layer to become trubulent, and reduces drag and straightens out the flow. Personally, I very much doubt it. That the step should produce a forward push seems quite out of the question. Also it would seem to me that the improved stability of the model can have little to do with the section used, even if the travel of the centre-of-pressure were small.

Yours faithfully,
J. B. VAN HATTUM.

DEAR SIR,

In a past issue of your unique periodical you were kind enough to favourably comment *re* the Model Aircraft Free Service Station, which we initiated at the rally organised by the Midland Model Aircraft Club last year.

It may interest you to learn that the idea was enthusiastically received by others than your good self, so much so that we have decided to extend the service to embrace the whole of the coming season.

May we ask you to again favour us by printing this letter, so that secretaries of clubs caring to have our help may know of our offer, and send in their applications at once.

Our schedule for the season is being rapidly completed, therefore prompt requests will be appreciated.

Distance is of no particular object, and we wish to emphasise that there is *no charge* whatever for the station.

Our only wish is to be of the utmost service in furthering the interests of model flying, and any club, large or small, who think we can help them, need but ask.

There were one hundred 'planes entered at the Midland Rally, of which we repaired and made airworthy 33! That means 33 more 'planes in the air and able to fly in the events for which they were entered.

Thirty-three out of one hundred is, perhaps, inconsiderable, but 33 per cent of 'planes "grounded" at a smaller meeting may spell the opposite of success, and the public, from whom we enthusiasts hope to gain still more recruits, judge largely by the number of models they see performing consistently.

It is our sincere wish that the model flying clubs will take our offer in the spirit in which it is made—we don't mind the work it entails.

Yours faithfully,
pp. Studiette Handicrafts,
Model Department,
F. J. LOFLEY, *Manager*.

P.S.—Will secretaries please give an alternative date when writing—there are many clubs to help, but not many Sundays.

DEAR SIR,

I have just read your article in the March edition of your esteemed journal, under the title, "Some letters to the Editor—and one from him, too!"

To tell you, frankly, I was disgusted that a fellow aero-modellist should run down the men who do so much to stimulate our movement. That a man should so emphatically criticise the supporters of his hobby with no apparent reason for his accusation, is deplorable. This correspondent appears to resent an opinion of the gentleman who writes under the pen-name of "Clubman." If a chap cannot express his own opinions without interference it is a sorry state of affairs. Then he turns his argument into vulgar profanity, apparently not able to vent his feelings in a more decent manner. Yet again he has no apparent reason for grossly libelling our fellow aero-modellists in the northern counties. I hope you will publish this letter, just to publicise the contempt I show to a person who could show such uncalled-for malice.

I am, dear Sir,
Yours sincerely,
JOHN F. PARTRIDGE.

London, N.5.

[Above is typical of a number of letters we have received on this subject.]

THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Notes on a Council Meeting of the S.M.A.E., held by kind permission of the Royal Aeronautical Society, in their Library at 7 Albemarle Street, London, W.1, on Wednesday, February 22nd, 1939.

Mr. Houlberg was in the chair.

The minutes of the previous meeting were read and confirmed.

Arising from the minutes Mr. Houlberg stated that he and Mr. Bullock had given a lecture at the Forum Club and that several ladies were present, who might be able to bring some influence to bear in circles which might be beneficial to the hobby.

A letter from the Glasgow Club *re* their competition was read, asking that the S.M.A.E. might bring some special benediction on this competition. The Council stated that no special significance could be attached to the competition, as it is purely an ordinary club competition.

The following clubs were affiliated :—

Hawker M.F.C., 31 members.
Lincoln Model Eng. Club (Aero Sect.), 20 members.
Wycombe M.A. Assoc., 20 members.

The following clubs were reaffiliated :—

Essex Power M.A., 14 members.
Derby and District M.A.C., 14 members.
Aldersbrook M.A.A., 40 members.

These applications had been held over from the previous monthly meeting (January), as that was the A.G.M.

The applications for affiliation since the last month were as follows :—

Barnsley and District M.A.C.	...	23 members.
Blackpool and Fylde M.A.S.	...	6 ,,
Bushey Park M.F.C.	...	12 ,,
Cardiff M.A.C.	...	40 ,,
Edinburgh M.F.C.	...	12 ,,
Furness Model Aircraft Soc.	...	33 ,,
High Wycombbe M.A.C.	...	35 ,,
Hyde and District M.A.C.	...	10 ,,
Swinton and District M.A.C.	...	11 ,,
Twickenham and District M.A.C.	...	29 ,,
Westwood M.A.C.	...	35 ,,
Willesden and District M.A.C.	...	19 ,,
Wolverhampton M.A.C.	...	34 ,,
Brixton M.A.C.	...	35 ,,
Cheam M.A.C.	...	12 ,,
Dulwich M.A.C.	...	44 ,,
Reading and District M.A.C.	...	28 ,,
Victoria M.A.C.	...	8 ,,

These clubs were all affiliated, and at the Council's suggestion Mr. Cosh was asked to write to the Westwood Club requesting that they insert "Yorks." in their title.

The following applications for reaffiliation were accepted :—

Avenue Aeromodellers' Club	...	30 members.
Bradford M.A.C.	...	56 ,,
Chingford M.F.C.	...	37 ,,
Edgware M.A.C.	...	35 ,,
Frechville M.A.C.	...	12 ,,
Hornchurch M.A.C.	...	54 ,,
Lancaster M.A.S.	...	28 ,,
Harrow and District M.F.C.	...	19 ,,
Yeovil and District	...	17 ,,

Under the ruling passed at the annual general meeting the following clubs were struck off the roll :—

Banbury and District M.A.C.
Romford F.C. (Model Sect.).
Tees Side A.M.C.
Leeds M.F.C.
Mid-Kent M.A.C.

Alterations of timekeepers and Council delegates were made for the following clubs :—

Hayes and District M.A.C.
Cranwell M.A.C.
General Aircraft.
The Model Aircraft Club.
Wembley and District M.F.C.
Ilford and District M.A.C.
Hackney M.A.C.
Letchworth M.A.S.
Lancaster M.A.C.
Northants M.A.C.
Bradford M.A.C.
Chelmsford S.M.E.

The following alterations were made to club titles :—

Middlewood and District to Sheffield Society of Aeromodellers.
Northants M.A.C. to Northampton M.A.C.

An application from the Lancashire M.A.S. for twelve timekeepers instead of six was granted.

The following clubs applied for permission to fly petrol models on various grounds :—

Ulster M.A.C., Halton S.M.A.C., Southport and District M.A.C., Bradford M.A.C., Stoneygate M.A.C., North Kent M.A.S.

Sanction was granted in all cases.

A letter from Lt.-Col. J. T. C. Moore-Brabazon enclosing a donation, and accepting a vice-presidency, was received. Lt.-Col. Moore-Brabazon also intimated that he would be attending some flying meetings during the summer. Miss Pauline Gower was also elected as a patron member.

A letter from the Igranic Social and Sports Club asking the Society's assistance at an exhibition they are holding was referred to the local clubs.

A letter from the New York chapter of the N.A.A. dealing with the forthcoming contest for the Lord Wakefield International Cup was read. A prize of $250 will be given to the winning team ; the second and third teams will also receive subsidiary prizes.

A letter from Mr. Rushbrooke offering to assist Mr. Cosh in his duties was read. Mr. Rushbrooke pointed out that several duties could very well be performed from another part of the country. This letter was passed to the secretarial committee for their consideration.

A letter from the *Daily Express re* the King Peter Cup competition was read. Mr. Cosh was instructed to reply.

A letter from Dr. Thurston *re* the King Peter Cup competition was read. There are still one or two more general rules to be made for this competition, and the Competition Committee was instructed to meet and discuss these rules, and bring them before the Council at the next meeting.

Mr. Hawkins next informed the Council that the Wakefield Fund totalled only about £80. He asked that the attention of all affiliated clubs should be directed to this fund. He pointed out that very few of the clubs had, as yet, subscribed. Mr. Hawkins also acknowledged with thanks one or two amounts which had been received from unaffiliated clubs.

The Council next discussed group insurance for petrol models. The sponsor of the scheme, the Editor of THE AERO-MODELLER, was present. One or two affiliated clubs had asked whether the S.M.A.E. would recognise the group insurance scheme as offered by THE AERO-

MODELLER, as sufficient cover when any of their members required to register a petrol model with the S.M.A.E. It was felt that the present wording of the policy might lead to indiscriminate flying of petrol models, and also that the S.M.A.E. had no knowledge when a cover issued under the scheme expired. It was pointed out that the registration form which had to be signed by those requiring registration with the S.M.A.E. stipulated that the models should only be flown under S.M.A.E. rules. The Editor of THE AERO-MODELLER expressed his willingness to have the wording of the policy altered to ensure that members of the N.G.A. could register with the S.M.A.E. It was suggested that the following clause should be inserted : " It is further understood and agreed that it is a condition of this policy that power-driven machines shall only be flown in accordance with the regulations of the S.M.A.E. governing the flying of such machines." Some further discussion took place, and in order to safeguard everyone concerned, the Editor of THE AERO-MODELLER agreed to a suggestion that N.G.A. members applying for petrol registration should guarantee a minimum subscription to THE AERO-MODELLER of one year. This subscription to be sent when applying for petrol insurance.

Mr. Rushbrooke, representing seven Northern clubs, requested that the Area Scheme be commenced forthwith in Lancashire. A motion was put to the Council that this be approved. The proposal was carried unanimously. It was also suggested that a map of the Area Scheme should be sent out to all affiliated clubs with the next Council summons.

It was proposed that an individual letter to all affiliated clubs, calling their attention to the Wakefield Fund, be sent. Both these proposals were passed.

The following records were passed :—

Indoor fuselage : Mr. L. A. Woodthorpe, Jan. 12th, 2 min. 20 sec.

R.O.G. : Mr. R. W. M. Mackenzie, Jan. 19th, 3 min. 35 sec.

Mr. Houlberg next announced that an amount of £4 4s. 10d. had been raised in aid of the Wakefield Fund at the S.M.A.E. annual prizegiving dinner and dance. He thanked Mrs. Rushbrooke, who was in attendance, for her assistance.

A letter from Messrs. Caton Ltd. containing an offer of a new competition, was read. It proposed that a barometer, to be known as the Caton Trophy, be put up for annual competition. The first prize to be five guineas, second three guineas. and third one guinea. The competition is for the best flight of the year, made either in or out of S.M.A.E. competitions. The only stipulations are that the flights must be timed by S.M.A.E. timekeepers, and the competition is open for rubber-driven models only. These must, of course, conform to the S.M.A.E. fuselage formula. The competition will be open any time during the 1939 competition season. This means that an attempt to win the cup may be made at any time during the season.

Mr. Rushbrooke suggested that the Wakefield Team to America should be provided with an efficient repair box. This Mr. R. J. O'Neil offered to provide.

The meeting closed at 10.15 p.m. with a vote of thanks to the chair.

H. YORK, *Hon. Press Secretary.*

IMPORTANT NOTICE

In connection with above portion of the S.M.A.E. report, we particularly draw attention to this month's Editorial.

The 1939 Wakefield Fund has now reached a total of £65 1s. 11d. This is exclusive of £15 15s. promised by THE AERO-MODELLER.

	£	s.	d.
Already acknowledged	56	0	1
Shorts' Model Aero Club	1	0	0
Cranwell Model Aero Club	2	2	0
Kettering and District M.A.S.	1	15	0
S.M.A.E. Prizegiving	4	4	10
	£65	1	11

RULES GOVERNING POWER-DRIVEN (PETROL, STEAM, ETC.) MODELS

1. No power-driven (petrol, steam, etc.) model shall be flown from public open spaces at any time unless special approval is obtained from S.M.A.E.

2. No person under eighteen shall be allowed to fly a Petrol (Power) model unless under the control of an adult.

3. The model shall carry a mechanical timing device, fitted to the ignition system, limiting the engine run to two minutes. It shall be tested before each flight, and shall be so designed that the model cannot be flown unless the time switch is brought into action.

4. Every person flying a Petrol model shall be in possession of a current insurance policy covering " Third Party " risks.

5. No attempts on duration records shall be made without notifying the S.M.A.E., who shall decide if the conditions are suitable. Record attempts shall only be made on approved grounds and only in the presence of at least three officials approved by the S.M.A.E., who shall decide the airworthiness of the machine.

6. No machine shall be flown with a bent or otherwise defective air screw.

7. Flights are to be made as far as possible away from spectators, and the take-off to be made from the windward side of the ground.

8. All models shall be registered with the S.M.A.E. before being flown. They will be allocated registration marks which shall be clearly painted on the machine. A registration fee of 2s. will be charged; this includes transfers of the registration marks.

9. Machines must be set to fly a circular course.

Material Lists for the Two "Wakefield" Design Models—Full Size Scale Plans of which are Given Away Free with this issue

Materials for "THE SWALLOW"

Balsa strip.

3/32 in. sq.	3 ft.	...	15 off
1/16 in. × 1/16 in.	3 ,,	...	5 ,,
3/16 in. × 1/8 in.	3 ,,	...	2 ,,
1/8 in. sq.	3 ,,	...	3 ,,
1/8 in. × 3/8 in.	3 ,,	...	1 ,,

Sheet.

1/16 in. × 2 in.	3 ,,	...	10 ,,
1/32 in. × 2 in.	3 ,,	...	2 ,,
1-64 in. × 2 in.	3 ,,	...	4 ,,

Block.

8 in. × 1½ in. × 2 in Airscrew		...	2 ,,
14 in. × ⅞ in. × 1½ in. Wing fillets		...	2 ,,
¾ in. × 1½ in. × 5 in Airscrew		...	1 ,,

Three-ply.

1/32 in. ply 12 in. × 12 in.		...	1 ,,

Bamboo.

1/8 in. sq. × 9 in.		...	2 ,,
3/32 in. sq. × 9 in.		...	2 ,,

Tissue.

White or coloured 5 sheets.

Rubber.

4 oz. 3/16 in × 1-30 in., about 37 yds.

Wire.

6 in. 20 s.w.g. 2 ft. 16 s.w.g.

Tube.

Paper or celluloid.

Sundries.

4 ½ in. brass gears.
4 ball races.
10 cup washers.
12 in. × 12 in. sheet brass for gear case
2 rubber bands.
1 in. ¼ in. birch dowel.
Medium tube of cement.
Bottle of dope.

Materials for "THE DOLPHIN"

Balsa strip.

1/16 in. × 1/16 in.	3 ft.	...	14 off
3/16 in. × 3/16 in.	3 ,,	...	2 ,,
1/32 in. × 3/16 in. hard	3 ,,	...	1 ,,
1/8 in. × 3/8 in.	3 ,,	...	3 ,,
1/8 in. × 1/4 in.	3 ,,	...	1 ,,

Sheet.

1/32 in. × 2 in.	3 ,,	...	4 ,,
1/16 in. × 2 in.	3 ,,	...	10 ,,
1/8 in. × 2 in.	3 ,,	...	1 ,,

Block.

24 in. × ⅜ in. × 1½ in. soft		...	1 ,,
16 in. × 1½ in. × 2½ in. medium		...	1 ,,

Bamboo.

15 in. × ⅜ in. × ¼ in.		...	1 ,,
24 in. × 1/16 in. sq.		...	1 ,,

Sundries.

12 in. ⅛ in. diameter birch dowel.
1/32 in. ply 4 in. × 3 in.
Wire, 12 in. 16 s.w.g.; 12 in. 18 s.w.g.
7 in.—16 in. s.w.g. brass tube.
1 in. × 2 in. brass sheet.
Wood screw
1 in. 9B.A. brass screw and nut.
1 ball thrust race.
Paper or celluloid tube.
6 press studs.
Large tube cement.
5 sheets tissue.
Cellophane.

Rubber.

28 yds. 3/16 in.—30 in.

Brief instructions for building both of these models can be obtained free from the offices of THE AERO-MODELLER, *Allen House, Newarke Street, Leicester, on receipt of a stamped and addressed envelope.*

In Next Month's Issue—

A 2·5 cc. High Climbing Petrol 'Plane. By Major C. E. Bowden.
The Overhaul of Petrol Engines. By L. H. Sparey.
A 15 cc. Flying Scale Hawker "Hurricane." By D. J. Miller.
Airfoil Sections—III. By J. W. Cruickshank.
Flying Scale Models. By Howard Boys.
Simple Aerodynamics—XI. By J. Van Hattum.
Solid Models. By B. Carver.
How to Photograph Your Models——Gadgets——Club News.

Petrol 'Plane Number

WE have received from Messrs. Western Aeromodel Supplies, 165 Union Street, Torquay, a kit for building the De Luxe Denny Jr. petrol 'plane manufactured by Reginald Denny Industries, California, and on examination find this kit to be a very well-put-up job. Two large black and white full-size prints and a large full-size blue print, together with a comprehensive set of instructions, a diagram showing the installation of the Auto Knip timer, which is recommended for this model, and a glossary of aeronautical terms explaining how to trim the model, provide one of the most comprehensive sets of building instructions we have yet seen; and with the aid of which a newcomer to the art of building petrol 'planes could experience no difficulty in building up the model.

The kit contains a large tin of dope, an ample size tin of cement, a pair of 4½ in. diameter Denny pneumatic tyres, spun aluminium cowl, 6¼ in. diameter, and an aluminium reinforced fireproof engine bulkhead, together with a complete set of engine mountings, already formed and drilled, in polished aluminium. A sponge rubber tail-wheel, with aluminium mounting already formed and drilled, together with sundry other brackets; a very neat on-and-off switch, and a preformed chassis of stout spring steel wire in which all soldering has been done, completes the metal work. The main wing is of constant chord, and a set of wing ribs is provided, with all necessary slots machine cut. Ample supplies of first quality balsa are provided, together with a parcel containing a supply of good quality covering material for the wings and fuselage, etc. The kit is priced at 57s. 6d., at which figure it appears to us to be very good value for money.

Messrs. Western Aeromodel Supplies also sent us a Dennymite 9 cc. airstream engine which they recommend for this 'plane, and which fits direct on to the engine mountings provided in the kit (which, incidentally contains a completely finished hardwood propeller, included in the price of 57s. 6d.).

The engine is fitted with a spark advance and retard, a nicely-made throttle valve (complete with adjusting sleeve to take up wear in the threads), which sucks direct from a petrol tank bolted direct to the back of the crankcase. The price of this engine, complete with coil and condenser, etc., is £4 2s. 6d. So that for the sum of £7 the complete kit may be obtained. A number of these machines have already been built, and we have heard very good opinions of their performances.

Also included in their parcel was a 1/9 Denny Starling 'plane of 18 in. span, which comes packed in a strong cardboard cylinder. It contains full-size scale plan, with full instructions, and also yellow tissue for covering, all materials, dope, etc., and a partly finished balsa airscrew.

Western Aeromodel Supplies ask us to inform readers that they are sole agents in this country for Denny kits and engines.

* * * * * *

Messrs. A. M. Sweeten Ltd., of 38 Bank Hey Street, Blackpool, inform us that shortly they will have available kits for Cahill's 1938 Wakefield winner, the "Clodhopper." Span 47¼ in., the price of this kit will be 8s. 6d., and full particulars will be given in Messrs. Sweeten's advertisement in our next issue.

* * * * * *

Cinesmith Productions, of St. Mary's Place, Barnsley, whose advertisement appears in page 313, ask us to inform readers that they have taken over all stocks and model supplies of Norman Bell Ltd., which firm has served Barnsley for some time but has now ceased business. Cinesmith Productions carry ample stocks of models and accessories of all types; also engines and ship models.

* * * * * *

The Hobby Shop, 357 Finchley Road, London, N.W.3, draw attention to the Skyrider Blackburn Skua Kit, which is now available. Particulars of this model, and others in the same range, are given in their advertisement on page 312. Their chief designer, Mr. A. J. L. Willett, will be pleased to answer technical queries provided a S.A.E. is enclosed for reply.

* * * * * *

On page 290 appears an advertisement for "Gillow" brand model aircraft. Flying models from as little as sixpence are offered. This range of models is widely distributed throughout the trade, and should be obtainable everywhere. Traders, and readers who cannot obtain supplies through their local model shops, are invited to write direct to "Gillow," 2-5 Dingley Place, City Road, London, E.C.1.

* * * * * *

On the back outside cover page of the March issue appeared a display advertisement of Messrs. Cloud Model Aircraft, 304-306 High Street, Dorking, Surrey. This firm's advertisement occupies the same position in this issue, and will be found there each month for the following ten issues, the contract booked being a sure sign of the "pulling power" of THE AERO-MODELLER. Last month's advertisement gave prominence to the Cloud "Elf" petrol model kit. Span is 52 in., length 35½ in., and weight is 26 oz., including engine, coil, etc. We

have recently received one of these kits, which John Klee is going to build. The kit is well put up in a strong box, and is of a comprehensive nature. As John will fully describe the kit in our " On Test " series in the June issue, we will say no more about it here than that the price is 32s. 6d., and it is suitable for any 2·5 to 3·5 cc. engine. On the back outside page in this issue Messrs. Cloud Model Aircraft advertise an interesting range of models, fuller details of which can be obtained by applying for their illustrated catalogue.

* * * * * *

The Harborough Publishing Co., 40 High Street, Market Harborough, Leicestershire, inform us that Russell's " Design and Construction of Flying Model Aircraft " is practically sold out. This well-known book, which is sold at 5s., or 5s. 6d. post free, has quickly run through a large edition, but may not be reprinted in its present form. A few copies are still available at the above address, to which application should be made as soon as possible.

* * * * * *

Super Scale Kits, Uppingham, Rutland, have introduced another 1 in. flying scale model—the " Lysander " —shown herewith, and of which full particulars are given in their advertisement on page 298 in this issue. This firm is specializing on the larger size flying scale models, so far at a scale of 1 in. to the foot, which means the " Lysander " kit builds up to a model of 50 in. span. An interesting point about the two models so far offered by this firm is that they are both to the designs of well-known builders of flying scale models. Super Scale

Models inform us that their business is the supplying of high-grade *kits*. The designs they prefer to obtain by purchase of copyright from leading aero-modellists *after* the models have been well tried out. By this means they are able to positively guarantee that models built from their kits will definitely give a good flying performance.

* * * * * *

On page 293 appears the advertisement of Mr. J. W. Kenworthy, of 127c Hankinson Road, Bournemouth, in which details of a wide range of accessories is given. One speciality is sets of wing ribs in popular sizes and of well-known airfoil sections. We have received a couple of samples of these, and can testify to the good quality of the wood and manufacture. Traders are invited to apply for discount terms.

MODEL AIRCRAFT TRADE ASSOCIATION

(Current membership list)

Cloud Model Aircraft	High Street, Dorking.
Elite Model Airplane Supplies	14 Bury New Road, Manchester.
International Model Aircraft	Morden Road, Merton, London, S.W.
E. Keil & Co., Ltd.	195 Hackney Road, London, E.2.
Model Aircraft Supplies, Ltd.	171 New Kent Road, London, S.E.1.
Model Supplies Stores	17 Brazenose Street, Manchester.
Northern Model Aircraft Co.	25 Lower Mosley Street, Manchester.
Premier Aeromodel Supplies	2a Hornsey Rise, London, N.19.
Model Shop	2 College Road, Barras Bridge, Newcastle-on-Tync.
Aero Modeller	Allen House, Newarke Street, Leicester.
Aircraft Models	Borough Carriage Works, South Walls, Stafford.
Atlas Motors	14 Oswald Place, Dover, Kent.
Balsa Wood Co., Ltd.	Africa House, Kingsway, London, W.C.
Berrick Bros. Ltd.	13-14 Camomile Street, London, E.C.3.
Bristol Model Aero Supplies	51 Colston Street, Bristol.
Brixton Model Aero Stores	61 Atlantic Road, Brixton, London.
Caton Ltd.	1 Mermaid Court, London, S.E.1.
Chingford Model Aerodrome	155 Station Road, London, E.4.
W. G. Evans & Sons,	Everton Buildings, Stanhope Street, London, N.W.1.
S. Guiterman & Co., Ltd.	35-36 Aldermanbury, London, E.C.2.
Hammond Model Aircraft Supplies	401 Didsbury Road, Heaton Mersey, Nr. Stockport.
A. Hunt	5 South End, Croydon.
Kanga Aero Models	1 Colonnade Passage, New Street, Birmingham.
Model Aero Research Specialities	127c Hankinson Road, Bournemouth.
H. Norman	145 Kingston Road, London, S.W.19.
Plantation Wood Ltd.	Ludgate House, 107 Fleet Street. London, E.C.4.
Star Models	Central Chambers, George Street, Hinckley.
Timber & Tools	11 Whitchurch Parade, Whitchurch Lane, Edgware
Victory Stores	47 Horsham Road, Littlehampton, Essex.

Full particulars of the Association can be obtained from any of the first nine firms mentioned in this list. These firms constitute the committee

CLUB NEWS

By CLUBMAN

Len Stott auctions a tea cosy—and Mr. Houlberg ?

HIYA fellers! Haven't much time to spend with you this month, so will not take too much time with the preliminaries. I always have a thousand and one items I like to discuss with you, but what with trying to get that extra special Wakefield bus off the drawing board—didn't you know I am going to America this August!—and dashing around from pillar to post, it is all I can do to keep my mind one one track for more than two consecutive minutes. And I don't want any wisecracks regarding the state of my mind!

I see there was a record number of clubs passed for affiliation at the last Council meeting—in fact, 18 all told. Thirteen of these are provincial bodies, the membership running from 6 to 44. Quite a number of clubs are getting extraordinary large memberships, and it will be interesting to note the results of our "collection" of club statistics. By the way, did you send your particulars in? Don't grouse if your club isn't on the rostor, you had plenty of time.

Five clubs defaulted in their reaffiliation, at least three having gone out of existence, mostly through amalgamation with other clubs. I am surprised to see that Leeds are out of it; is it that £10 ground charge strangling the finance there?

Well, I see that Mackenzie, of Blackheath, has given the Indoor Fuselage R.O.G. figure a shaking up, and I can see a lot more activity in this section before long. I know a number of chaps who would love to have a smack at some of the indoor records, but lack of a suitable hall restricts their efforts. I heard a suggestion that the S.M.A.E. might be interested in—to arrange an indoor competition meeting at a time when the chaps are in London for one of the outdoor competitions. I'm sure a great deal of interest would be promoted of this was done.

Much of this month's news is related to Wakefield models either on test, or under construction, and it is evident that we are going to have an even greater entry for the trials this year than ever before. May we hope that the organisation is up to it! There is no doubt about it, the trip to America has great attractions, and from what I have read in various journals, the members of the team this year will have the time of their lives. The New York World's Fair will have an added attraction, I think, with the holding of the Wakefield Finals near by. I reckon the team will need to go into strict training on the boat to get in trim for a hectic period of flying, late nights, banquets, etc.

The Area Scheme goes into operation I see, the North-Western lads having applied for permission to get going right away. Undoubtedly the clubs in this area are keen—it is there that the P.A.D.S. has been operating for some time—and I should like to see that keenness spread to other quarters. It is surprising how lax some clubs are in the governing of their own affairs, let alone taking an interest in national matters. But do they grouse when something is passed through Council that does not suit them!

I do not know the exact figure that the Wakefield Fund has reached, but I was rather disappointed with last month's total. Honestly, I thought the clubs could have raked in more than that by now, but from last month's list it seems only half-a-dozen or so clubs have thought of it. Still, I trust the rest of you are getting down to it. Don't save it all up till the last minute; send in anything you may have collected, and keep adding to it! Remember, the register now shows over one hundred clubs listed, and if we can't get £1 from each—well!

Many friends have written praising the Editor for his stand on my behalf—you know, the gentleman who does not like me, the Editor, the paper, in fact, anything about us. Thanks a lot, fellows, for your wishes, and may the Clubman continue to please the majority of you. Obviously, one cannot please all the people all the time, but indications are that most of you are satisfied with my chatter on "thisser and thatter." Honestly, if I could claim to never upset anyone, I would be equipping myself with a moustache and umbrella!

And so, what have we to say to each other this month. Tons of reports this time, but don't revile me if I have to use the blue pencil here and there. It is absolutely impossible to put everything in; we should need two-thirds of the paper to do this. Oh, and another thing. Don't forget the item *re* returning of photos. This definitely *cannot* be done, so don't forget and go wasting S.A.E.s for the return of those prints.

The EDINBURGH M.F.C. packed in their outdoor activities at the end of October, indoor attractions "seducing" some of the members. Boy-o-boy, do I like the way they put that! These chaps are in the midst of an exhibition that is causing terrific interest in the area. Pole flying caused such crowds the exhibition authorities asked the members to restrict their display to ten minute periods, as they were causing too much congestion. I see this bunch have been affiliated to the S.M.A.E.—a very wise move, and I believe the first Scottish club to do so. Who said all Scots were tight! These chaps hope to carry off the trophy put up by the Glasgow club, and are also running a similar competition of their own later on.

Members of the Ealing and District M.F.C. at a recent indoor meeting.

Pole flying—and some! A photo taken by Mr. H. Boys at a recent meeting of the Northampton Club.

The BURNLEY M.A.C. have just completed their first season, and are going ahead very satisfactorily. Arguments are rife on the "slab" v. "streamline" theory, and one gentleman has found that gas mantles and microfilm jobs do not get on very well with each other.

Exhibition fever caught the STOCKPORT AND DISTRICT M.A.C., the advent of "Test Pilot" giving yet another club the chance to show their work to the general public. A show was also given to the Fairey Works club, whose interest has been rekindled as a result.

The FLYING ACES CLUB (Dublin)—shades of the United States!—was formed in October, 1938, since when membership has increased from 6 to 26. At present the main activity is concerned with 8 oz. duration models, whilst large scale models are becoming increasingly popular. Details were sent of a competition to be held on March 17th! Will all secretaries please again note that it is no use sending particulars of events that take place before the publication of THE AERO-MODELLER on the 20th of the month. Get used to thinking a month ahead!

More round the pole flying, at a recent meeting of the Northampton M.A.C. This model holds the club record.

Members of the Bradford Club.

Members of the Cranwell M.A.C. Photo taken after an indoor meeting for the "Baldwin Trophy." Winner behind the trophy.

Members of the Guildford M.A.C. at a recent meeting.

Front row seated, left to right: Capt. C. C. Horner, Mr. W. J. Garnett, Mr. Broderick, Mr. Foster, Mr. Rhodes, but no name of club on the photo! Still a very good gathering; good luck!

The aero section of the LYMINGTON AND DISTRICT MODEL ENGINEERING SOCIETY is in need of members for the model department. Flying ground is at Setley Brake, near Brockenhurst Station, New Forest. How are you off for trees down there?

In January the WOKING AND DISTRICT M.A.C. held a discussion for the benefit of the junior members, and during this meeting a scheme of "adoption" was evolved, the idea being to hold a special competition in which a senior member takes charge of a junior member and puts his model together before each flight, acting, in fact, as the junior's ground engineer and instructor, this being thought a very practical way of teaching the beginners to trim and fly their models. The only snag is the fact that there are about twice as many seniors as juniors, and it is hoped that there will be no "scrapping" between the seniors for the honoured position of "fathers"!

The WARWICKSHIRE M.A.C. chaps are getting well and truly ready for the Wakefield, and report some very good models coming along. Wow—is there going to be a scrap this year! I know of at least a hundred really good models that will be on the board. These chaps have been keeping their winding muscles in trim with pole-flying, but will they find a difference when it comes to winding up forty strands of $\frac{3}{16}$!

BRIGHTON DISTRICT M.A.C. report:—

"Whisper it not abroad, but at last we have been blessed with flying weather again! On Sunday, February 5th, we had perfect weather, plenty of sunshine, and no wind. Messrs. Tugwell and Lucas had their petrol models out for an airing, the latter doing ten flights during the afternoon. Mr. T. J. Lance put up two or three flights of about two minutes with his Zenith.

"On February 19th we were again favoured with fine weather, although it was a little breezy to begin with. Our President, Mr. H. J. Towner, took the opportunity to try out his latest creation, the King's Envoy. In the writer's opinion it is Mr. Towner's best to date, the wing fixing being particularly ingenious. On flying tests it showed promise of being a stable and steady flyer. The all-up weight is just under 16 oz.

"We are planning to hold our fourth annual exhibition next April and May, and to give a demonstration of flying the next day."

A new club, the SLOUGH AND WINDSOR M.A.C., has been formed, and are holding regularly weekly meetings at the Church Schools, The Green, Datchet, on Tuesday evenings, at 7 p.m. Instruction is being given on material for the absolute beginner, and a very wise move, too. These are the chaps we rely on for the expansion of the movement. Chairman is C. H. Orchard. Where have I heard that name before? Seconds out!

At a well-patronised social held by the LANCASTER M.A.S., the following lucky "thermal finders" were presented with trophies for their last season's activities:

Smith Cup, for highest total of points: W. D. Foster.
Gliding Cup: W. D. Foster.
Club Cup (over 6 oz.), C. C. Horner.
Junior Open Cup, R. B. Bibby.
Open Cup: R. Rhodes.

This club is progressing well, and the President has promised a new trophy for the 1939 season.

Another club with a slice of silverware in the offing is the WORTHING M.A.C., this to be used for a handicap competition, so that both young and old will have an equal chance.

An interesting type of contest is held by the ILFORD

AND DISTRICT M.A.C., in which a fellow flying a scale model has his duration multiplied by five, bringing him into line with the duration fiends. One meeting recently held resulted in Mr. A. Gadior winning with a total of 265 points (he flying a scale model), with Mr. R. Haines placing second with 255. D. Lambert was third with 195. E. Stoffel has already clocked three minutes with his Wakefield model.

The BARNES AND DISTRICT M.A.S. (they now have " affiliated to the S.M.A.E." on their stationery !) have been pole flying, and a contest was won by C. D. Hudson (senior) and K. N. Wincott (junior). Forty-five models were shown at the Fulham Men's Institute M.A.C., and a good fillip was received consequently. C. L. Dodd has raised the club biplane record to 45 sec.

The PARK M.A.L., at their recent annual general meeting, discussed the position regarding "professional" members, and it was decided that no professional may become a " flying member " or hold office. Well, I suppose that's O.K., but I doubt if the " professional " element is as harmful in this sport as some. If we cut " pros." altogether, I bet we'd find a vast difference ! I am notified that the weekly news sheet of this club is now available to non-members, but no particulars are sent as to price, etc. Can you let me have this next time, Park ?

I am taken to task by the secretary of the CHELMSFORD S.M.E. for not including his report in the last issue, but I'm afraid it was not received. I have no trace of it, so perhaps he will forgive me ? Snow and floods have prevented these chaps doing much flying—who has these days ?—but experiments were made with skis, and good fun had by all. Better weather recently brought out some of the new planes with which it is hoped to clean things up a bit this year, and some good times were made.

The MACCLESFIELD M.A.S. have not much news this month, as flying has been, as usual, curtailed owing to the weather. However, the monthly medal was flown for, and once again won by Mr. J. G. Eifflaender, with a flight of 2 min. 33 sec. with the same machine, which does not appear to be subject to the ravages of time, and still flies as well as ever ; having seen considerably more of the district than most of the club members ! Their autogyro finished its brief career in violent contact with a tree, which is a pity, as it looked as if good things might come of it.

A new idea for this club is a plan drawing contest in which marks are given for draughtsmanship and neatness, as well as for practicability and originality, the aim being to encourage the members to design their own models. Those members who are not successful will have the benefit of the judge's experience and advice before they actually build their machines.

Wakefield models are built, and being built, but first tests have not been very successful, 1 min. 35 sec. being about the best obtained to date.

The WESTWOOD M.A.C. secretary is evidently mixed in his compass points, and I would point out that the " rude " correspondent anathematised the Northern and Midland folk—it being pretty evident from this that he is a Southerner ! I have met many of the people you mention, Mr. Elwell, and can endorse your opinion of their qualities. This club has now forty members, and has the promise of a cup, whilst a " competition fund " now stands at £3. Seven petrol models are on the stocks, also numerous gliders and duration jobs. A photo shows

" Happy days will soon be here again."

Mr. O'Connor releasing his tow-line glider. Quite a nice-looking job, too.

Two more photos are from the Liverpool M.A.S., one showing Mr. Riding preparing to let his indoor model off the floor of the hangar, the other being of Mr. Haisman's indoor job. Best time with this machine is 108 sec. These fellows get two minutes regularly inside the hangar, the rules for models being 1 oz. maximum weight, all models to be fuselage tissue covered type. Lectures, etc., have been well attended.

Mr. D. Ward, of the ASHTON AND DISTRICT M.A.C., won a recent competition, clocking 86 sec. in drizzling rain. R. Bardsley was next with 50 sec., and G. Sleigh third with 40 sec. C. B. Jackson has just completed a 6 ft. 6 in. all balsa covered sailplane. Should be pleased to received performance details of this when ready, Ashton !

Our friend, Howard Boys, has sent in two photos showing pole flying, and he apologises for the indistinctness of his present efforts. He is experimenting with a synchronised flash gadget on his home-made camera, and expects to get better results later on. Incidentally, he is very pleased to hear that his articles are so appreciated by you chaps.

On Saturday, February 4th, thirty-five members of the Harrow, Stanmore and Wembley Model Clubs met in Harrow for dinner and the forming of a new club. General introductions started the evening, and by the time all were being called by their Christian names dinner was commenced. This was speedily tucked away, and when everybody was too full to retaliate, Mr. Alec S. Hands, hon. secretary of Harrow Model Flying Club, took the chair, and commenced the main business of the evening. The first item was the amalgamation of the clubs, and it was finally decided to name it the HARROW MODEL AERO CLUB, which met with the approval of all. Next came the election of officers, and after a number of speeches by various members with regard to the virtues of their idols, John J. Coote, Esq., was elected chairman, Mr. Alec S. Hands was re-elected hon. secretary, one member paying special tribute to Mrs. Hands for relieving our hon. secretary of his various domestic duties in the cause of balsa busting.

The BRADFORD M.A.C. had a good time at their recent social evening, witness the photo reproduced here. Is that Len Stott I see in the left-hand corner ? Who

1. Hullo, R. M. Howe, of Bradford. Being one of those who know the inside story, I am sure that the Fancier, in his " French," conveyed what he wished to, i.e. neither one thing nor the other! Work it out, old top!

2. Hullo, Needham! If I can't blame the club, who do I blame? Is it those gentlemen who have already had a spoke put into their wheel? You know what I am referring to: " No models in S.M.A.E. competitions may carry advertisements."

3. Hullo, Anderida M.A.C.! It should be written F-LIAR, and that expression refers to an enthusiast, not a model. Incidentally, Stack, what is a " heavy wing section "; and perhaps you can enlighten me on what a " fin rudder " is?

4. Hullo, Dennisen, of Wakefield M.F.C.! Having seen your typewriting, I should imagine that Chinese might be better, and instead of the Basque children, why not certain members of the S.M.A.E.? They may appreciate your generosity.

5. So the Lancs Club now have twelve time-keepers. Were these granted out of kindness of heart, or simply because Cosh, York, Hawkins and Smith wanted to be able to fly their own petrol models instead of having their time occupied in timing? Sure thing, lads; they've all turned G-ASSIES!

6. I wonder if our Leslie realised that he was answering to the call of his ancestors when he decided on the job he is building?

7. I had a wonderful time at the S.M.A.E. prize-giving. Only one thing spoilt my evening, and that was when Mrs. Blunt told the world that I would give anyone's secrets away. How could you, Mrs. Johnny? I am the soul of discretion. If you do not believe it, ask your husband.

8. We saw our Editor " Knighted " with a quill pen. I bet him a shilling that he does not know what happened to that pen afterwards. Condition of the above bet: loser to put 2s. into the Wakefield Fund. Is that on, Sir Ed.? (O.K., M.F., it was presented to my secretary, Miss Mason. Who wins?)

9. I understand that after the dancing one member of the S.M.A.E. set up in business as a chiropodist; another member had to burgle his own house; our sprig of White Heath bumped her nose; while the rest of us got home early in the morning.

10. Judging by the lads' behaviour, I think they all endorsed the words of the G.O.M. Keep her in Halifax, Len, she's too popular down South.

11. I wonder if Morris, of Edgware, knows what happened to his specs. and his ten-bob note?

12. F-LIARS all, there is no truth in the story going the rounds that after the P.M.A.L. had held a dance and made a few bob profit, they invited the entertainments committee of the S.M.A.E. to show them how to do it. Neither is there any truth in the story that they intend building more models this season. I reckon that should stir them up!

13. So Kettering branch of the Northants M.A.C. have broken away. I suppose Mr. Shatford was frightened that his non-flying gas job might be damaged during a " rough house."

14. Hullo, A. G. Jones, of Luton! Instead of

Club News.—*Continued.*

won the cat, and what was the competition for same—roof climbing? A new member has given the club six prizes for scale competitions, and a new cup. Thanks for the Competition Programme; I will refer to this in the calendar in the usual way.

I hear that Warrant Officer Gutteridge is back with the Cranwell boys, and has undertaken the duties of competition secretary. Congratulations. CRANWELL M.A.C. Shall be glad to receive reports of that indoor meeting.

A new club is in operation on the East Coast, known as the LOWESTOFT AND DISTRICT M.A.C. See the list for details of sec., etc. (In next issue.—Ed.).

It may interest you to know that a model aeroplane class has been established at the Bethnal Green Men's Institute, and it is hoped to start a club in the very near future. Fee is 1s. 3d. for a term of 12 weeks.

The postponed competition for the Middlewood Cup, of the Sheffield S.A.E, was won by R. J. Hemingway with an average of 86 sec. (best time 109 sec.), the runner-up being H. E. Platts, with an average of 65 sec. The Cup was presented to the winner by Mr. C. S. Rushbrooke, who paid a surprise visit to the club, much useful information being obtained from him.

The OSSETT AND DISTRICT M.F.C., although only a newly-formed club, has taken tremendous strides towards progress.

On Feb. 9th—11th an exhibition was held in the club-room, and large numbers of people showed keen interest in the models which were on view.

The club, although not affiliated to the S.M.A.E., collected the sum of 10s. for the " Wakefield Fund," by means of a box placed on one of the tables.

Members attempted to fly gliders on Febbruary 12th at the flying field, but the only records put up were 100 yard sprints chasing the models which were streaking down-wind.

I am very pleased to see that effort for the Wakefield Fund.

Now, then, you affiliated clubs, don't let these chaps show you the way.

The ANDERIDA M.A.C. secretary has been getting the bird from his members through not reporting lately! Let's see what we can do to help him re-establish

telling the world how good the Luton F-LIARS are, why not answer my paragraph 10 last month?

15. So a club has been formed in Gainsborough, St. OGGS. But how do they expect to function on an average subscription of less than 1d. per week? Perhaps if they got into touch with the North Coventry Model Aero Club they might be put wise. Congratulations to N.C.M.A.C.; please tell them that the S.M.A.E. will want one farthing per week from that penny.

16. So " Enthusiast " is going strong again. I wonder if he would like to challenge any one member of the 1938 Wakefield team to fly against him? We might see then where Lady Luck entered and where " Enthusiast " subsided. And I wonder why " Enthusiast " doesn't study American humour? Who does he mean by promoters? Surely he realises that the very expression " affiliated to the S.M.A.E." is incorrect. The S.M.A.E. is nothing more or less than a collected body of clubs, and if his club does not help in the " promoting," that's his fault.

17. Wolverhampton send me their love; a slight difference to Liverpool M.F.C., who apparently want me to commit suicide.

18. Hullo, K. B. Evans, of Yeovil! My postbag contains all sorts of things. I can send you a few bricks for the top of your piano if you would like them.

19. So the Brighton and Lancs Clubs thought my competition a joke. A Round Robin might persuade me to put up another Cup.

20. Hullo Morris, of Stoneygate! Perhaps he was referred to as Oosh because £20 had been mentioned.

21. Sure, Croydon, I know all about your raffle, but I don't like the eighteenpenny touch; much rather have a tanner's worth with Lancs.

22. I have it on good authority that several members of the Edinburgh M.F.C. are no longer pure. On my visits to that city I have found no " winter attractions " capable of seducing me. But congratulations on the exhibition and the affiliation.

23. Perhaps some one will send Cosh a pair of air wheels. I suppose you all heard that while landing during his Civil Air Guard training one wheel burst, the machine overturned and Cosh was K.O. for fifteen minutes. I understand that he is taking his liquid refreshment as usual. It's only the good die young!

24. So a gentleman from Sheffield wants to run a competition with a series of questions. I wonder if his name his connected with the answer to most of them.

25. I understand that the Wakefield, 1939, Fund is not exactly a bonny baby. With all the Wakefield models that are being constructed, it looks as though the financial side of the job has been forgotten. What about sending Leslie a bob's worth of stamps, enclosing a halfpenny stamped addressed envelope for the receipt. Come on, let's have an M.F. Collection. 25 Granville Park, S.E.13, is the address.

26. Mrs. Golden Voice tells me that since J.C. has been bitten by the gas bug he gets home early, to make sure his engine hasn't seized up during the day. So now you wives know what to do if your better half stays out late.

27. Hullo, Blackheath F-LIARS! Are you aware that the Lancs lads have printed and circulated a question asking you to place a value on your " glamour girls' " kisses, in aid of the Wakefield Fund? What's to do about it?

28. Hullo, the Essex G-ASSIES! Have not yet heard if you have seen that photograph.

29. Scene: Blackheath.

Bullock and York with their pets, one a chow the other a bulldog.

First Small Boy: " Leave those dogs alone, they belong to those two gentlemen."

Second Small Boy: " Garn, they're Bullock's and York's."

The Moving Finger writes,
and, having written,
vanishes until next month.

CLUB NEWS.—*Continued.*

himself. Mr. G. Gibbons has been doing some good stuff with his Zenith, 150 sec. being put up. Master L. Gibbons has designed a large duration model that has clocked 82 sec., whilst the poor secretary aforementioned did 3 min. 27 sec. with a semi-scale job. Not bad going! These fellows are holding an auction—if they can find anything to put up! What about my reputation? Alright, nuff said.

The BIRMINGHAM A.C. had a thrill recently when Mr. Irving's petrol machine, on its maiden flight, after several near-stalls, made a complete loop and landed quite safely—to the astonishment of all. After correction the job flew remarkably well. Evidently trying to live up to its initial exploits.

The WAKEFIELD M.F.C. have taken pity on my nerves, and typed their report this month, but, ye gods, you should see it. Shall have to get you a competent stenographer. I rather think it's a leg pull, however, so am not letting her go until I know further! Len Stott, of Halifax, paid these chaps a visit, and gave plenty of pointers on his Wakefield bus and F.A.I. glider. At a celebration of the club's birthday there was so much grub over they sent the surplus to a billet of Basque children. Why not the S.M.A.E. Council? Flying was tried recently, when the sender of this report tried smacking the face of a quarry with his model—of which need I say more? Thanks for the typing, Denison; let's see if you can improve with practice.

SALISBURY AND DISTRICT M.E.S. are hoping to hold an exhibition in the near future. Various gentlemen have presented or promised trophies, and it is hoped that the season will be a bumper one. The annual general meeting went off very well, and things are going nicely there. Thanks for the praise, Robert—we can do with a bit now and then to balance the other sort!

I have received a copy of the LANCASHIRE M.A.S. club journal, and would congratulate them on a very presentable effort. This is put out free to members, but subscription is open to non-members. Particulars are obtainable from the secretary. A very interesting series of indoor meetings are being held in the Great Hall at the Manchester College of Technology, and the last two meetings of the season are being thrown open to other clubs. The dates are March 29th and April 18th.

Facilities are provided for pole flying, as well as microfilmies. From the look of the photo sent in this month, these chaps have the use of someone's " baronial hall " for their meetings. Just look at that oak panelling!

A good night's entertainment was recently put on by the WOODFORD M.A.C. in aid of the Wakefield Fund. Dancing, sideshows, local talent contributions, etc., made the evening go with a swing, and a jolly good time was had by all, the result being that it is expected to place about £3 in the hands of the fund secretary. Nice work, Woodford! and you receive one of my very rare " pats on the back."

BRISTOL AND WEST M.A.C. report :—

" Things have been slack here lately, hence the absence of reports, owing to the secretary being of a stolid and unimaginative nature. At the club's sixth annual general meeting, there was a slight shuffle, the new chairman being W. H. Conn, Esq., a very active member, and the offices of treasurer and Press secretary created in order to relieve the hon. secretary. Treasurer, R. T. Howse; Press secretary, A. H. Lee; secretary as before. The club had had a pretty good, though expensive year, and we finished up ' broke.' However, a ' whip round ' put matters right. (All right, we shall doubtless scrape up a few coppers for the Wakefield Fund as well). Pylon flying has been tried and the best yet, with an 8-foot radius circle, is 60 sec. R.O.G., by A. H. Lee. However, we have been able to ' beg ' a much bigger hall, and this record and the microfilm ones will shortly receive a severe shock I hope."

Yes, you were right, Needham, and I bet we don't hear from him again. I wish all secs. were as unimaginative as you—you'd be surprised how many grains of salt I have to use occasionally.

The HALTON MODEL AIRCRAFT SECTION, which has just been affiliated to the S.M.A.E., is in a very flourishing state, the members, numbering about forty, all being aircraft apprentices. The club now has six petrol 'planes built, or in the process of construction, and it is also hoping to bring several Wakefield models to the trials, many hush-hushers being whispered about, of two minutes being accomplished with small 30 sq. in. wing area models. Great amusement has been caused by the artificial " thermals " produced by the oil stoves in the club-room, their effect being most marked on these models, as they fly over them.

The NORTH COVENTRY M.A.C. have got nicely on their feet, and report good increase in the membership. Three silver trophies have been presented to the club, and flying for these commences on April 2nd. I am glad to see these chaps have taken my warning to heart, as they have instituted a subscription rate that is easy without being too small.

The Kettering section of the Northants M.A.C. has now enough members to support itself, and has broken away and formed under the title of the KETTERING AND DISTRICT M.A.S., with Mr. D. A. Russell as president. The petrol section has nine models, while Mr. Shatford has a gas-job now twelve months old, and not flown it! Tut tut.

LETCHWORTH M.A.S. announce a special duration competition on Easter Monday for a trophy donated by their Vice-President, to be flown for at the ground between Letchworth Gate and Bowershot.

The HUDDERSFIELD A.M.S. tried out a new ground recently, and found ideal landings in either a reservoir, a village, or out of sight miles away! As usual, the inevitable crowd of small boys put in an appearance—and sarcastic remarks. Mr. C. Shaw made the best time of the day of 90 sec. These chaps have a very well fitted club-room (see photos below). Parts of an old Avro 504K make some of the furnishing.

A new club that is going strong is the DULWICH M.A.C. with 50 members. An indoor meeting resulted in Mr. Davison winning with an average of 97·5 sec. with a best time of 102 sec., second man being Mr. J. Wrench, with an average of 90 sec.

A jolly fine photo of pole-flying is sent in by the NORTHAMPTON M.A.C., and is one of the best I have yet seen. These chaps are holding an exhibition in a local cinema, also demonstrating pole-flying in the foyer. Some publicity this!

Mr. F. Sanderson, of the SWINTON AND DISTRICT M.A.C., has built a special machine to attack the club record, and has 120 sec. to his credit to date. This club hopes to be well represented at the open indoor meeting held by the Lancs. club, whose secretary, Mr.

Members of the Huddersfield Club in their club-room.

A Club Conquest petrol 'plane built by Messrs. Lutman and Gibson of the High Wycombe M.A.C.

Rushbrooke, is giving the Swinton boys a lecture shortly.

A fine skeleton shot of a petrol model is sent from the HIGH WYCOMBE M.A.C., the builders being Messrs. Gibson and Luttman. Auction sales and lectures are the rage at the moment, many members being surprised at the extent to which mathematics enter into the game.

Whilst in this district I have a letter from the president of the WYCOMBE M.A.A. with details of another new club. Tch tch—that duplicating of clubs again. However, these chaps seem to have studied all the aspects very carefully, and seem all set to go ahead. All interested should get in touch with Mr. C. Tilling, 35 Clarendon Road, High Wycombe.

In anticipation of an early application for S.M.A.E. affiliation, the GAINSBOROUGH M.A.C. are running all competitions under S.M.A.E. rules—a very wise move that I can recommend to all. Forty-two members are on the roll at the moment, with a sprinkling of lady members. A good flying field has been obtained by the Trent, but much pumping will be required before the river goes back to normal. Darned inconsiderate of it, I think! What about getting your seaplane events flown off while you have the opportunity?

The LUTON AND DISTRICT M.A.S. had quite a successful year in 1938—a member in the Wakefield team, Farrow Shield winners, second in the National Cup—and I know that it was one big slice of bad luck that prevented them winning that trophy, the inter-team cup at the Wimbledon Rally, and a cup at the South Coast Rally. It should be noted also that three members were in the top dozen at the trials last year, with H. W. Bexley making second best time of the day with 7 min. 25 sec. Two exhibitions and two dinners—where do you put it all, Luton?—have been held, and if any member who hasn't paid his sub. thinks the club will now go to the dogs, think again! Congrats. on a good season, Luton!

There has been a bit of reshuffling in the HACKNEY M.A.C., the secretary now having more assistance from some of the older members. It is always a mistake to leave too much on one man's shoulders. "Granpa" Burchell gave a lecture to these chaps recently, and his information was well received. A. C. Marvin holds both the light- and heavy-weight records in this club.

The EALING AND DISTRICT M.F.C. have changed their quarters for indoor flying, and now can go "up the pole" with greater freedom. A recent competition resulted as follows:—

Mr. Gilbert	...	43·3 sec.
Mr. King ...	...	41·16 ,,
Mr. Archer	...	31·6 ,,

Mr. B. O'Connor, of the Westwood M.A.C., releases his glider. Average duration with 100 ft. towline is 90 sec.

The new venue is at Ealing College, where they have about three times as much room as before, and less danger of getting the thread wound round their necks! Three photos to hand from this club show a new glider by Mr. Mawby, an interesting feature being the nose, formed of half a Sorbo ball. Is this a shock-absorber or is it! Also shown is a group of models built by Mr. Gilbert, and a view of an indoor meeting, complete with pole, etc.

The HORNCHURCH M.A.C. claim to be putting up three-minute flights on test with new Wakefield jobs, but, in common with everyone else, the weather has prevented much flying. A dance held last month was a great success—likewise a lecture given by "Sammy" (scale record) Crow.

Another newly-elected affiliated club is the FURNESS M.A.S. These chaps run fortnightly meetings, at which a member will rise and "gas" for twenty minutes, after which the rest pull him and his opinions to pieces. The Chairman has presented a cup for scale competition, and I think this club have the most unique trophy yet heard of. This consists of a horse-shoe picked up on their flying field, suitably mounted. You are lucky, Furness. I know of one place where the horses are on the field whilst flying takes place, and the equines have been known to *eat* models!

The NORTHERN HEIGHTS M.F.C., who number many well-known and successful experts in their midst, have been busy in many directions lately, and many fine models are on the go. I hear of a 7 ft. rubber-driven job, and a flexible drive flying boat. Testing took place in a fair wind at Cockfosters, the trees welcoming many new models with open arms!

The SOUTHPORT AND DISTRICT annual open rally will take place this year on May 14th, at Hesketh Park Aerodrome. Classes are as follow:—

Under 150 sq. in.	...	Biplane.
Over 150 sq. in.	...	Scale.

Full particulars are promised for the next issue.

The ALDERSBROOK M.A.A. are suffering under a handicap at the moment, A.R.P. gun emplacements

THE AERO-MODELLER'S CALENDAR

	MARCH.	
22.	Lancashire M.A.S.	Club Dance.
26.	Brighton M.A.S.	Ladder Comp.
29.	Lancashire M.A.S.	Open Indoor Meeting.
	APRIL.	
2.	S.M.A.E. DECENTRALISED COMP.	GAMAGE CUP.
2.	Brighton M.A.S.	Ladder Comp.
2.	Ilkley M.A.S.	Heavyweight Comp.
9.	Bradford M.A.C.	Duration Comp.
9.	Brighton M.A.S.	Ladder Comp.
9.	Salisbury M.A.C.	Duration Comp.
9.	Westwood M.A.C.	Concours d'Elegance.
16.	S.M.A.E. DECENTRALISED COMP.	WESTON CUP.
16.	Lancashire M.A.S.	Northern Challenge Cup.
16.	Brighton M.A.S.	Ladder Comp.
16.	Bradford M.A.C.	Duration Comp.
18.	Lancashire M.A.S.	Open Indoor Meeting.
23.	Salisbury M.A.C.	Special Duration Comp.
23.	Brighton M.A.S.	Vice-Prcs. Comp.
30.	Halifax M.A.S.	OPEN RALLY.
	MAY.	
7.	S.M.A.E. DECENTRALISED COMP.	M.E.I. Cup.
7.	Bradford M.A.C.	Gliding.
7.	Lancashire M.A.S.	R.Ae.S. Cup.
7.	Ilkley M.A.C.	Knock-out Comp.
14.	Southport M.A.S.	OPEN RALLY.
21.	S.M.A.E. DECENTRALISED COMP.	SHORTS' CUP.
21.	Bradford M.A.C.	Seaplane.
21.	Lancashire M.A.S.	Normac.

having been slapped on to their ground, and these covering a large area, with formidable barbed wire enclosures, are not conducive to testing or other activities. Much interest is being shown in solid scale models, as a result of the flying restrictions?

The WHITSTABLE, TANKERTON AND DISTRICT M.A.C. are looking for a larger club-room, owing to the increase in membership. I am told that the secretary is busy on *three* new models. Boy, where do you find the time? I've been trying for weeks to get *one* built! Mr. Newton is going to experiment with the "stepped wing" *after* the Wakefield trials. But why, if you have the confidence in the theory, do you not use it *in* the trials?

HALIFAX M.A.C. hold their open rally on April 30th —not May 30th, as stated last month—the programme being as follows :—

Tow-launch gliding.
H.L. duration.
Team contest.
Timed flight.

Mr. Riding, of the Liverpool M.A.C., about to launch his indoor model in the main hangar at Speke Airport.

The competitions will take place at Clifton Common, Brighouse, as last year, commencing at noon. Tea, etc., will be obtainable. Petrol enthusiasts are asked to take their models along for demonstration, and timekeepers are asked to take their watches and assist if possible.

From the CARDIFF M.A.C. comes the following :—

"Things have been happening down here since our last report; the most important, I think, is that our application for affiliation to the S.M.A.E. was successful. Most of the records have been broken, because most of the previous ones were set up during the late autumn or winter months. The records are now as follow :—

Class A (under 100 sq. in. wing area) : R.O.G. 55 sec., B. Morgan.

Class B (over 100 sq. in. wing area) : H.L. 95 sec., G. Bateman.

Class C (over 150 sq. in. wing area) : H.L. 90 sec., D. Lewis.

Class C (over 150 sq. in. wing area) : R.O.G. 69⅛ sec., V. Hill.

Light-weight (under 2 oz.) : H.L. 73 sec., G. Bateman.

Stick record (fuselage not to S.M.A.E. formula) : H.L. 43 sec., F. Waite.

Spar record (with elastic exposed) : H.L. 27 sec., J. Janes.

Heavy-weight (over 8 oz.) : H.L. 90 sec., D. Lewis.

Scale record : H.L. 14 sec., A. Prior.

Own design record : H.L. 48 sec., L. Dingle.

We shall soon see these records roar, as several Wakefield models are nearing completion.

The most outstanding flight in the club's history was made by Mr. Kale's Korda, which, on a day when no other 'plane could stand the wind, Korda did an O.O.S. flight timed 61 sec.! It fought the wind for about 45 sec. and then turned tail and disappeared, chased by a car and countless cycles. At last we found it at the top of Ely with a broken wing.

Possibly inspired by the notices that application for affiliation had been made, our membership jumped to 47 in one week!

We shall soon be starting a women's section, so our men-folk had better watch out.

We think that a distinction should be made between stick models and spar models, and have records accordingly."

Mr. Jones, of 2 Poyntz Road, Battersea, has formed a club in that area, and asks all interested to get in touch with him.

There is a danger of carbon monoxide poisoning in the BROMLEY M.A.C. club-room; two or three engines running together can kick up quite a stink, also, I think, quite a bit of noise! These chaps have procured a new ground of 30 acres, and hope to get it passed for power flying by the S.M.A.E.

Mr. Ginns, of the LEAMINGTON AND WARWICK M.A.C., has built a fine engine of 1·4 cc. Five petrol models are now on the go in this club—(I trust they are all registered with the S.M.A.E.)—and a new club-room has been fixed up "over a pub." My pal, the M.F., will be very pleased to hear this! This club are in complete agreement with Mr. Morrod regarding the use of Warwick Racecourse for the Wakefield Trials! I dare say you are, seeing that it is on your doorstep, but what about the many others who are not on the spot. I can say from personal experience that I would far sooner fly on Faireys than the Warwick Course—at least it does not need a collector of "rhubard essence" on the job!

The WILLESDEN AND DISTRICT M.A.C. are

THE ADVANTAGE OF LIGHTER-THAN-AIR CRAFT.

extremely optimistic this month, and send me nearly four pages of a report—but tell me I may cut it down! How about buying me a new pencil, Willesden? These chaps fly on Wormwood Scrubs, and some pretty good flying has been taking place, though naturally with the prevailing conditions times are nothing to write home about. However, Mr. K. Moore clocked 65 sec. recently with his " Korda," " while Mr. Jones's model nearly decapitated an innocent bystander! Mr. Read badly bent his model, and promptly proceeded to jump on it, ably assisted by the rest of the members. A lecture given by Mr. J. Worden on props. was much appreciated, the chaps being busy on carving their own these days.

I am forgiven by the ABERDEEN M.A.C., thank goodness. I can sleep now! An indoor flying comp.—not pylon work—resulted in Mr. W. G. Souter placing first with 43·2 sec., W. H. Souter (no relation) next with 42·3 sec., and J. Davidson third with 40·25 sec. Dr. Agnes Thomson gave an interesting lecture on flying in Africa. Mr. Cruikshank, who is writing the articles on wing sections in these pages, is a member of this club.

The READING AND DISTRICT M.A.C. have decided to use a roll of lino. for their take-off board. That's O.K. if you have a nice flat spot to put it on, but I have seen some tricky take-offs from a wavy chunk of lino.! Evidently, bed has just as much pull in Reading as anywhere else, the complaint being that it is left to the same half-dozen to turn up each week. That holds good everywhere, I think, Reading.

I have a very good report from the ST. FRANCIS XAVIER club—the quality lying in its frankness. The Press secretary says that the models were " poorly constructed and badly flown, hence the poor times." How different to some I get, where when one analyses the news it is a wonder that any other club gets a look in at the big prizes! The first contest held by this club resulted in a win for L. Constantinedes with a flight of 29 sec. These chaps send in a plea for information on microfilm, one of their members now trying for the second year running to get his first complete sheet. As the Lancs. M.A.S. " Contact " says: " If it takes a tube and a half of

A collection of models built by Mr. Gilbert, of the Ealing and District Club.

A good display of models at the recent exhibition organised by the Edinburgh M.F.C.

cement to build a fuselage, how many bottles of solution does it take to get your first sheet of microfielm? "

The FARNHAM (Surrey) M.A.C.—(have you heard my agonised pleas to write on one side of the paper only?) —announce that a cup presented to them will be put up for the winner of the most popular contest of the season. An R.O.G. board is under construction, and it is hoped to get a non-flying member as timekeeper. Always a good move this, I think.

GRIMSBY AND DISTRICT M.A.C. put on a " whoopee " recently, with darts, shove ha'penny, and " hot " records—much to the disgust of the high-brows. Didn't know those sort built such common things as model aeroplanes!

A few flashes from BLACKHEATH M.F.C. run as follow :—

" Les Hawkins, the popular S.M.A.E. treasurer, has taken to power ; he is constructing a ' Buccaneer 48.'

" Bill White's streamlined 6 ft. span glider is nearing completion. A unique feature is the bumper wheel inserted in the nose.

" Chasteneuf's new Wakefield is, he tells me, similar to last year's, except for the following modifications : Cantilever bamboo plug-in type undercarriage, no sweep back on wings, propeller shape slightly different, blade width increased a little.

" S. Smith, former member of the Bromley Club, has joined Blackheath, and is helping with the " Powernautic " side.

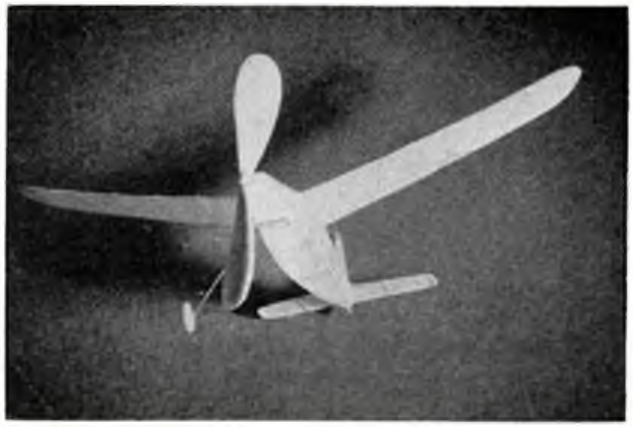
" Eddie Keil has promised to join, once the power section gets going."

Messrs. Bullock and Copland have given lectures to the Blackheath boys, and I understand " Freddie " is as funny in real life as his cartoons. Did you stand for your own model in the " Narcotics " cartoon, Freddie?

The HALTON M.A.C. have just titivated their clubroom, and are now hard at it getting their models ready. A recent successful auction sale realised 25s. for the Wakefield Fund. That's the way, lads!

T.M.A.C. report a very good year in 1938, two members holding British records—Mr. J. Worden, the Biplane R.O. Tank, and D. A. Pavely the " Tail first " R.O.G. figure. Two ideas first sponsored by T.M.A.C. members have been recognised this past year. As far back as 1936 W. L. Henery used the folding type prop. as fitted to the Wakefield winner last year, while the S.M.A.E. have

Mr. L. B. Mawby's King Peter Cup glider. Ealing and District M.F. Club.



An indoor model built by Mr. B. V. Haisman, of the Liverpool Model Aircraft Society. Weight is ¼ oz.

A 7 ft. glider and a petrol 'plane built by Mr. Randle, of the Stoney-gate (Leicester) Club.

stipulated the canvas tank as constructed by Mr. Fialko for this year's Lady Shelley contest. This year's grand rally will be held at Wimbledon on September 10th.

Well, chaps, no time for more now, so will just bid you a hasty cheerio, and hie me off to the workshop—the only place where I can chuck balsa shavings about without getting my head in my hands. Ah me, what it is to be henpecked. Let me have dates of your fixtures for inclusion in the calendar, but don't give me dates that are history by the time the book is on sale. All you wish yourselves!

THE CLUBMAN.

MEMBERSHIP FORM for NATIONAL GUILD of AEROMODELLISTS

For Office Use
M. No.....
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*Make of Petrol Engine(s)*_____

NOTE *The above two forms should both be completed and returned to:—Mr. Dudley Ship, Hon. Secretary, 44, Holdenhurst Road, Bournemouth.*

FORM No. 3

TO BE HANDED TO YOUR NEWSAGENT

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Commencing with the April, 1939, issue, please deliver or reserve for me "The Aero-Modeller" until further notice.

*Signature*_____ *February, 1939*

*Address*_____

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Appendix - Links to the plans

The issue comes (see cover) with a free full size plan for building two Wakefield Cup models.
Maybe the plan is available at SAM 1066 David Baker Heritage Library (Magazines).
Please refer to:
https://outerzone.co.uk/viewpoint/entry.asp?ID=3

Wakefield Models by E. Chasteneuf
Free full size plan for two "Wakefield Cup" designs.
Document Page: 24

The RTP Special (Full size) by G. Cook
Description and full size drawing for a Round the Pole speed model.
Union page added.
https://www.hippocketaeronautics.com/hpa_plans/det ...
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5 PLY BALSA 1/16" SHEET

1/8" RUBBER BAND

MAIN PLANE POSITION.

MAKE TEN SECTIONS FOR COVERING FUSELAGE. FROM 1/16" SHEET BALSA

18 S.W.G. WIRE

BIND WIRE TO BAMBOO LEGS

18 S.W.G. BRASS TUBE

1/16" SHEET BALSA

THREE PLY BALSA (1/8" SHEET)

1/8" THREE PLY

AMERICAN TYPE BALL-RACE

16 S.W.G. MOTOR HOOKS

REAR BLOCK CUT FROM SOLID BALSA

FIN

MAKE TWO

1/2" SQ BALSA

PROPELLER TEMPLATE

1"

8" DIA.

GIVE WINGS 1½" DIHEDRAL

TAIL PLANE

1/8" SHEET BALSA

1/4"

MAIN PLANE SECTION

The "R.T.P." SPECIAL

DESIGNED BY G. COOK.

DRAWINGS BY CROW